

ISSN 2466-5150

SERBIAN ACADEMY OF SCIENCES AND ARTS

# BULLETIN

## OF SCIENTIFIC AND ART RESEARCH

Annual Report for 2019



BELGRADE 2021

# BULLETIN

## OF SCIENTIFIC AND ART RESEARCH

Annual Report for 2019





ISSN 2466-5150

SERBIAN ACADEMY OF SCIENCES AND ARTS



BULLETIN  
OF SCIENTIFIC AND ART RESEARCH  
Annual Report for 2019

BELGRADE 2021

Editorial Board

*Academician Vidojko Jović*  
*Academician Ivan Gutman*  
*Academician Zoran V. Popović*  
*Academician Radoje Čolović*  
*Academician Aleksandar Loma*  
*Academician Časlav Očić*  
*Academician Momčilo Spremić*  
*Academician Todor Stevanović*

Editor

*Academician Vidojko Jović*

Editor-in-Chief

<i>Academician Marko Anđelković</i>
-------------------------------------

Published and Printed

*Serbian Academy of Sciences and Arts*  
Belgrade, 35 Kneza Mihaila Street  
[www.sanu.ac.rs](http://www.sanu.ac.rs)

Translation and Editing

*Vera Gligorijević*  
*Jelena Mitrić*

Layout

*Kranislav Vranić*

200 Copies

© Serbian Academy of Sciences and Arts 2021

## CONTENTS

Editor's Note . . . . .	7
DEPARTMENT OF MATHEMATICS, PHYSICS AND EARTH SCIENCES . . . . .	15
EARTH SCIENCES . . . . .	15
MATHEMATICS AND MECHANICS . . . . .	25
PHYSICS AND METEOROLOGY . . . . .	32
DEPARTMENT OF CHEMICAL AND BIOLOGICAL SCIENCES . . .	45
PHYSICAL CHEMISTRY . . . . .	45
CHEMISTRY . . . . .	46
BIOLOGY . . . . .	54
DEPARTMENT OF TECHNICAL SCIENCES. . . . .	69
DEPARTMENT OF MEDICAL SCIENCES . . . . .	79
DEPARTMENT OF LANGUAGE AND LITERATURE. . . . .	109
DEPARTMENT OF SOCIAL SCIENCES . . . . .	123
DEPARTMENT OF HISTORICAL SCIENCES . . . . .	129
DEPARTMENT OF FINE ARTS AND MUSIC . . . . .	147
CENTRE FOR SCIENTIFIC RESEARCH OF THE SASA AND UNIVERSITY OF KRAGUJEVAC . . . . .	153
INTERNATIONAL COOPERATION ACTIVITY IN 2019 . . . . .	159
SCIENTIFIC MEETINGS AND LECTURES IN 2019. . . . .	165
PUBLISHING ACTIVITY IN 2019. . . . .	175



## **EDITOR'S NOTE**

### **Introductory Remarks**

The SASA Fund allocated the available resources for the following purposes: scientific research and art projects, scientific publications, international scientific cooperation, the organization of scientific meetings, participation of SASA members and their associates in scientific meetings in the country and abroad, acquisition of scientific literature and other purposes under the SASA Scientific Research and Art Programme.

### **Activities Financed by the Fund**

In 2019, as in the previous years, the SASA Fund financed the following activities related to research in sciences and arts:

#### **Scientific Research and Art Projects**

In 2019, the SASA Scientific Research and Art Programme contained 27 projects in the field of mathematics, physics and earth sciences, 23 in the field of chemical and biological sciences, 13 in the field of technical and technological sciences, 29 in the field of medical sciences, 12 in the field of language and literature, 14 in the field of social sciences, 29 in the field of historical sciences and 7 in the field of visual arts and music.

The results of the projects and work of the SASA Committees in 2019 are presented in this Bulletin of the SASA Fund for Scientific and Art Research for 2019.

### **Publishing Activity**

The manuscripts were regularly sent for printing according to the priorities set by the SASA Editorial Board. During the year, the SASA published



63 editions, including 18 collections of works, 17 catalogues, 14 journal issues, 9 monographs, 4 bibliographies and Volume III of *Serbian Encyclopedia* (Srpska enciklopedija). A total of 472 authors published 438 works. The commercial *Catalogue of the SASA Editions: 2017–2018–2019* (Katalog izdanja SASA: 2017–2018–2019) was prepared and published. In addition, 33 manuscripts were technically processed and prepared for printing, while the make-up of four publications and cover design of 16 publications were finished.

### **International Cooperation, the Organization of Scientific Meetings and Participation of SASA Members in Scientific Meetings in the Country and Abroad**

The international cooperation of SASA in 2019, including scientific meetings and lectures, as well as the participation of its members in scientific meetings in the country and abroad, is presented in detail in the chapters of this Bulletin: “International Cooperation in 2019” and “Meetings and Lectures in 2019”.

### **Activities of the SASA Library**

Under the *Law on the Library and Information Service*, the SASA Library is one of the five pillars of the unified library and information system of the Republic of Serbia. In 2012, in order to fulfil its legal obligation, the SASA Library signed the *Agreement on the Full Membership of the Library in the COBISS.SR Library and Information System* with the Centre of the Virtual Library of Serbia (which is responsible for managing the shared database and COBISS system) within the National Library of Serbia. In this way, it formally became part of the shared catalogue of the Republic of Serbia (i.e. the online catalogue that includes the catalogues of 222 libraries in Serbia). During 2019, the SASA Library created 3,111 bibliographic records in the shared catalogue and took 4,567 bibliographic records from it. Thus, the *COBISSANU* database now has 68,223 records. On 1 April 2019, the SASA Library launched the CONOR normative database of personal names for individual authors, which functions as an integral and compulsory part of the COBISS system. It enables the compilation of all works of the same author, regardless of the form of the name under which a work has been published. The SASA Library created 2,504 records in the CONOR database and supplemented 249 records.

In May 2019, under the agreed protocol, the SASA Library established cooperation with the SASA Audiovisual Archive and Digitization Centre in the digitization of old and rare books. In accordance with the Plan for the Digitization of the SASA Library Holdings, prepared in December 2018, the

first to be digitized were two incubules, four books from Tirol's donation and the books from Vuk's personal library. This was followed by the digitization of the group including old Serbian books published before 1832. The first 100 titles from this group were digitized.

In 2019, the SASA Library acquired 3,835 monographic and periodical issues. It also received 2,136 materials units through exchanges, 741 materials units through donations and 429 copies of the editions of the SASA and its institutes. Desiderata were acquired through exchanges. The Library ordered foreign reference editions worth 700,000 dinars by a public procurement procedure, including the 10-volume *Routledge Encyclopedia of Philosophy*, which has no library in Serbia, and 3-volume *Lexicographi Graeci. Pollucis Onomasticon*, containing old Latin and Greek texts, as well as notes on translations and comments.

In 2019, the Section for Old and Rare Books and Special Holdings actively processed its rare editions and the donated or procured libraries (its signature mark PB stands for "posebna biblioteka"/special library/) belonging to Viktor Novak (PB 11), Anton Bilimović (PB 13), Stepan Kuljbakin (PB 14), Sima Simić (PB 15), Borislav Jovanović (PB 40) and Danilo Kiš (PB 30). In 2019, the processing of the legacies of Anton Bilimović (PB 13) and Stepan Kuljbakin (PB 14) was completed and the relevant report was made.

The jubilee bibliographies of Academician Matija Bečković, Academician Momčilo Spremić and Academician Miroslav Gašić were completed. The work on the jubilee bibliographies of Academician Todor Stevanović and Academician Dragan Škorić was continued, while the work on the jubilee bibliographies of Academician Jovanka Kalić and Academician Vladan D. Djordjević began. In 2019, the first volume of *Bibliography of SASA Members* (Bibliografija članova SANU) was published. It contains 30 bibliographies of the newly elected full and corresponding members of SASA (3,005 bibliographic units) on 8 November 2018. It also includes the additions to the bibliographies of 16 Academicians: Zoran Radović, Milan Sudar, Miodrag Mateljević, Slobodan Milosavljević, Radmila Petanović, Radomir Saičić, Miloš Kojić, Zoran Krivokapić, Milorad Mitković, Petar Seferović, Goran Petrović, Zlata Bojović, Milovan Danojlić, Aleksandar Kostić, Ljubodrag Dimić and Milica Stevanović. The same volume also contains the selective bibliographies of 14 corresponding members: Željko Šljivančanin, Tanja Ćirković Veličković, Vlada Veljković, Tatjana Simić, Ljubinko Radenković, Jovan Delić, Zoran Paunović, Pavle Petrović, Alpar Lošonc, Vujadin Ivanišević, Dragan Vojvodić, Mira Radojević, Sava Halugin and Jelena Jovanović.

The editor of the SASA Library Forum is its Director, Academician Miro Vuksanović. In 2019, the SASA Library held 21 forums and presented 12 books and 22 collections of papers (SASA editions, involving the members of SASA, SASA branches and research institutes founded by SASA). Two forums were dedicated to the editions of the SASA Branches in Novi Sad and Niš. The forum participants included academicians, university professors and doctors of science (a total of 91 participants). In 2019, the Library Forum had about 1,500 attendees. The texts to be published in the 8th issue of *SASA Library Forum Almanac* (godišnjak “Tribina Biblioteke SANU”) were collected.

Since the opening of the renovated SASA Library in March 2017, it has been staging chamber exhibitions marking the anniversaries of SASA members. In 2019, it staged 9 chamber exhibitions on its premises.

The SASA Library editions are published within the Academy’s serial publications. Its editor is the Director of the SASA Library, Academician Miro Vuksanović. The SASA Library published the jubilee bibliographies of Academician Matija Bećković, author Dejan Vukićević, Academician Momčilo Spremić, author Ilija Sindik, Academician Miroslav Gašić and author Marina Ninić. The Library also prepared a new edition of the *SASA Bibliography of SASA Members* (SANU Bibliografija članova SASA), Vol. I, which was also published in 2019. The Library also actively participated in the preparation of the second volume of *Academic Speeches* (Akademske besede) and the first volume of *Accession Lectures by Corresponding Members* (Pristupna predavanja dopisnih članova), published in 2019, as well as in the preparation of the first volume of *Accession Speeches by Serbian Academicians (1886-1947)* (Pristupne besede srpskih akademika /1886-1947), which will be published next year. The seventh issue of *SASA Library Forum Almanac* will also be published in 2019. This 286-page issue carries the texts spoken at the forums in 2018.

### Activities of the SASA Galleries

In 2019, the **Gallery of the Serbian Academy of Sciences and Arts**, which is headed by Academician Dušan Otašević, staged six exhibitions.

#### Exhibitions:

- *Marko Čelebonović (1902–1986). Retrospective Exhibition* (Marko Čelebonović /1902-1986/, *Retrospektivna izložba*), 9 November 2018 – 24 February 2019.
- *Svetomir Arsić Basara (Works 1998–2018)* (Svetomir Arsić Basara /radovi 1998-2018/), 15 March–26 May.

- *The Imprint of Time 70/∞. Grafički Kolektiv Gallery – 70 Years* (Otisak vremena 70/∞. Grafički kolektiv – 70 godina), 19 July–18 August.
- *The World and Times of Slobodan Jovanović (1869–1958)* (Svet i vreme Slobodana Jovanovića /1869 –1958/), 5–27 November.
- *Spiritual and Cultural Heritage of Studenica Monastery – Antiquity, Constancy, Contemporaneity* (Duhovno i kulturno nasledje manastira Studenice – drevnost, postojanost, savremenost), 13 December 2019 – 31 March 2020 (as planned).

\*\*\*

The publication accompanying the exhibition *Serbian Artistic Heritage in Kosovo and Metohija. Identity, Significance, Vulnerability* (Srpsko umetničko nasledje na Kosovu i Metohiji. Identitet, značaj, ugroženost) held in 2017, the collection of papers by a group of authors: *Artistic Heritage of the Serbian People in Kosovo and Metohija. History, Identity, Vulnerability, Protection* (Umetničko nasledje srpskog naroda na Kosovu i Metohiji. Istorija, identitet, ugroženost, zaštita), Belgrade 2017; the English edition bearing the same name (*Artistic Heritage of the Serbian People in Kosovo and Metohija. History, Identity, Vulnerability, Protection*), whose editors were Miodrag Marković and Dragan Vojvodić, came out in 2018. The publication was awarded at the 63rd International Belgrade Book Fair in 2018. The second edition of this collection of papers came out in 2018.

The bilingual (Serbian and English) catalogue–monograph accompanying the exhibition *Roman Limes and Cities in Serbia* (Rimski limes i gradovi u Srbiji) held in 2018: No. 145 in the series titled *Gallery of the Serbian Academy of Sciences and Arts* (Galerija Srpske akademije nauka i umetnosti): Group of authors, *Rimski limes i gradovi na tlu Srbije/Roman Limes and Cities on the Territory of Serbia*, Belgrade 2018, was published in March 2019.

The monograph for the exhibition *Painters / Warriors / Witnesses* (Slikari / ratnici / svedoci) (held in 2017), in the *Galerija SANU* Series No. 139, was translated into French and Russian and published in March 2019 (*Peintres / combattants / témoins. La peinture et la photographie en Serbie: 1914–1918. Художники / воины / свидетели. Выставка сербской живописи и фотографии 1914–1918*, Belgrade / Белград 2018).

In 2019, the **SASA Gallery of Science and Technology**, headed by Zoran Lj. Petrović, organized 17 exhibitions and the accompanying programme including expert and scientific lectures (a total of 16 lectures). The Gallery also played host to two very successful forums and participated in the

organization of children's workshops and guided exhibition tours. This year, the Gallery also hosted the International Conference POSMO 2019, which was organized by the Institute of Physics, and the gathering and cultural and artistic programme titled "Serbs in Romania" (Srbi u Rumuniji), which was organized by the SASA Committee for the Study of National Minorities and Human Rights and within which 12 lectures were delivered. The participation in four big important events that attracted a large number of visitors is also noteworthy. Those were the Brain Awareness Week, Night of Museums and Researchers' Night, as well as Art+Neuroscience within which two performances were staged. The lecture cycle titled *Encounters with Creators – Master Class* (Susreti sa stvaraočima – Masterklas) was continued and one such encounter was organized with Academician Dušan Otašević, a member of the Department of Visual Arts and Music.

### **The Conservation and Acquisition of Archival Materials**

In 2019, the SASA Archives enriched their holdings thanks to the following donations: from Academician Radoje Čolović, various documents; from Dr. Zoran Popović (USA): 1. materials on Ustaša crimes against Serbs in the Independent State of Croatia; 2. 1950s materials on Andrija Artuković's extradition and 3. "Jugoslovenski iseljenički list" newspaper; from Dr. Dušan Gruden (Germany): the German and European press on Serbs during the 1990s; from Mr Zoran Kostić (Belgrade): Academician Nikola Radojčić's manuscript legacy; from Academician Bogdan Šolaja: the printed speech by Dr. Šime Macura, Stevo Kalamber's defence attorney at the High Treason Trial against Serbs on 22/23 September 1909; from Mrs Mirjana Lukačević (Belgrade): 1. the collection of sermons of Damaskinos Stouditis, a 16th century manuscript book, 2. three pages from old manuscript books, 3. unbound lithographed manuscript book of Dragoslav Milovanović's *Anthology* (Antologija), Part II, Prose Writers, Nice 1917, and 4. printed book: *Travels of Joakim Vujić, a Slav-Serbian Writer in Hungary, Wallachia, Moldavia, Bessarabia, Kherson and Crimea* (Joakima Vujića, slaveno-srpskog literatora putešestvije po Ungariji, Valahiji, Moldaviji, Besarabiji, Hersonu i Krimu), Belgrade 1845; from Academician Vasilije Krestić: one part of his correspondence.

The Archives purchased the following materials from Mr Vlada Graovac from Belgrade: 1. Branko Ćopić's autograph poem *On the Petrovac Road* (Na petrovačkoj cesti), Milan Rakić's autograph poem, untitled, and poem *Waiting* (Čekanje), 3. documents of the Chetnik youth movement called 501 – Chetnik youth's announcements.

The Archives also took over the 1999-2010 minutes of the meetings of the SASA Executive Board from the SASA Presidency. The minutes of the meetings were put in jackets, classified according to meeting agenda items and stored in folders. It was noticed that the enclosures referring to some meeting agenda items were not complete.

In 2019, the Cabinet for Medals was enriched with the decorations of Academicians Miroslav Pantić, Gojko Subotić, Zoran Knežević, Vladan Djordjević, Dimitrije Stefanović, Radoje Čolović, Borislav Stevanović and Milena Stevanović, corresponding member Sava Halugin and Colonel Vojislav Andjelković. All decorations were entered into the Incoming Inventory and catalogized.

In 2019, the Reference Library of the SASA Archives was enriched with 56 new library units. At present, it has 2,463 titles.

In 2019, 205 researchers worked in the Archives, including 14 from Bulgaria, Italy, Lithuania, Russia and Croatia.



# DEPARTMENT OF MATHEMATICS, PHYSICS AND EARTH SCIENCES

## EARTH SCIENCES

### COMMITTEE FOR PALEOFLORA AND PALEOFAUNA

(Academician Milan Sudar)

The Committee is the result of co-ordinated work on several national themes, and of scientific activities concerning a joint research project with the academy of Romania in the domain of geosciences.

Numerous geological-paleontological researches were carried out in a number of fields in Serbia. Some of them must be highlighted: a) one new genus and one new species of aborescent Lower Cretaceous foraminifers from the Kamenica locality (near Niš) were incorporated in the register of the paleofaunistic taxa of Serbia, b) the new data about the radiolarian fauna from the Jurassic *mélange* of Avala and Upper Triassic radiolarians from the Grivska Formations were established; the Lower Miocene fresh-water fish fauna from the family Gobiidae was also described, c) the taxonomy, paleoecology and paleobiogeography of the shells and brachiopods of Lower Cretaceous (Albian) in the region of Central Serbia (Topola, Oplenac) and the Middle Jurassic terebratulide brachiopods of Northern Jordan were studied in detail, d) a paleoecologic analysis of a number of Pleistocene corbiculas in the territory of Serbia, also following association, comparing with their recent relatives, was carried out, e) the facial and biostratigraphic analysis, and radiometric dating of Lower-Middle Miocene succession of fields near Zaječar (Dacia basin, Eastern Serbia) were done, f) during paleofloristic investigations, attention was focused on the Early Oligo-Miocene flora of Kamenica (Pranjani basin, Western Serbia), etc.

This year, in the fields of Eastern Serbia (Kučaj Zone), where Lower Cretaceous, "Urgonian rocks" were investigated, a field excursion was realized as part of inter-academic collaboration on a joint project with researchers



from the Romanian Academy. Since researchers from the Slovenian Academy were busy, collaboration with the Slovenian Academy was not realized this year.

During the year, two of our researchers were on a study visit in the fields in eastern parts of Romania (South Carpathians).

---

Schlagintweit F., Bucur I. I., Sudar M. N., 2019: *Bispiraloconulus serbiacus* gen. et sp. nov., a giant arborescent benthic foraminifer from the Berriasian of Serbia. **Cretaceous Research**, 93, 98–106 (<https://doi.org/10.1016/j.cretres.2018.09.003>)

Schlagintweit F., Bucur I. I., Sudar M. N., 2019: Corrigendum to “*Bispiraloconulus serbiacus* gen. et sp. nov., a giant arborescent benthic foraminifer from the Berriasian of Serbia” [Cretaceous Research 93, 98–106]. **Cretaceous Research**, 94, p. 259 (<https://doi.org/10.1016/j.cretres.2018.10.006>)

Schlagintweit F., Bucur I. I., Sudar M. N., 2019: *Bispiraloconulus serbicus*, a giant arborescent benthic foraminifera from the Berriasian of Serbia. In: Granier B. (Ed.), JK2018 – International Meeting around the Jurassic-Cretaceous Boundary (December 7-5, 2018, Muséum d’Histoire naturelle de Genève), **Carnets de Géologie**, Madrid, 74–75.

Bragin-Ljubov G., Bragin N. Yu., Kopayevich L. F., Djerić N., Gerzina-Spajić N., 2019: Stratigraphy and Microfossils (radiolarians and planctonic foraminifers) of the Upper Cretaceous (upper Santonian-lower Campanian) Struganik limestone (Western Serbia). **Palaeoworld**, 28, 3, 361–380 (<https://doi.org/10.1016/j.palwor.2019.05.001>)

Bragin N. Yu., Bragin-Ljubov G., Gerzina-Spajić N., Djerić N., Schmid S., 2019: New radiolarian data from the Jurassic ophiolite mélange of Avala Mountain (Serbia, Belgrade Region). **Swiss Journal of Geosciences**, 112, 1, 235–249 (<https://doi.org/10.1007/s00015-018-0313-8>)

Bradić-Milinović K., Ahnelt H., Rundić Lj., Schwarzhans W., 2019: The lost freshwater goby fish fauna (teleostei, Gobiidae) from the early Miocene of Klintci (Serbia). **Swiss Journal of Palaeontology**, 138, 2, 285–315 (<https://doi.org/10.1007/s13358-019-00194-4>)

Vujić V., Rundić Lj., Karan-Žnidarić T. S. 2019: Sexual dimorphism and left-right asymmetry of carapace ornamentation of *Hemicytheria setosa* RUNDIĆ, 2002. **Geologia Croatica**, 72, 2, 101–108 (doi: 10.4154/gc.2019.07)

Feldman H. J., Radulović B. V., Radulović V. J., Ahmad F., 2019: Callovian (Middle Jurassic) terebratulide brachiopods from the Jordan Valley (northwestern Jordan). **Historical Biology**, <https://doi.org/10.1080/08912963.2019.1677643>.

Radulović B. V., Ayoub-Hannaa W., Fürsich F. T., Bogićević B., Nenadić D., Jovanović D., 2019: Taxonomy and palaeobiogeography of the early and middle Albian (Early Cretaceous) bivalves and brachiopods from central Serbia (Topola, Oplenac Hill). **Cretaceous Research**, 104 (<https://doi.org/10.1016/j.cretres.2019.07.005>)

Feldman H. J., Radulović B. V., Radulović V. J., Ahmad F., 2019: Middle Jurassic terebratulide brachiopods from the Jordan Valley (northwestern Jordan). **Historical Biology** (<https://doi.org/10.1080/08912963.2019.1625347>)

Bragin N. Yu., Bragina Lj. G., Djerić N., Gerzina Spajić N., 2019: Late Triassic radiolarians from the Grivska Formation. **Geološki anali Balkanskoga poluostrva**, 80 (1), 17–27. (doi: 10.2298/GABP19011017B)

Rundić Lj., Vasić N., Banješević M., Prelević D., Gajić V., Kostić B., Stefanović J., 2019: Facies analyses, biostratigraphy and radiometric dating of the Lower-Middle Miocene succession near Zaječar (Dacian basin, eastern Serbia). **Geološki anali Balkanskoga poluostrva**, 80 (2), 13–37 (<https://doi.org/10.2298/GAB-P1902013R>)

Lazarević Z., Milovanović Lj., Milivojević J., Vasiljević I., 2019: Palaeoflora of Kamenica (Pranjani Basin, Western Serbia). **Geološki anali Balkanskoga poluostrva**, 80 (2), 53–63 (<https://doi.org/10.2298/GABP1902053L>)

---

## COMMITTEE FOR GEODYNAMICS OF EARTH CRUST

(Corresponding Member Vladica Cvetković)

A regular meeting of the Committee for Geodynamics of Earth Crust was held on 14 June with the participation of all the newly elected members: SASA Corresponding Member Slobodan Marković, Prof. Dr. Dejan Prelević, Prof. Dr. Kristina Šarić, Assist. Prof. Dr. Dejan Radivojević, Dr. Ivan Dulić and Dr. Ana Mladenović. In addition, on 1 and 2 December, the Committee had an electronic meeting during which it was decided to support the initiative of Assist. Prof. Dejan Radivojević for inviting Dr. Gabor Tari, Chief Geologist of the OMV (Austria), as invited speaker at the SASA in 2020. The proposal was approved by the Department of Mathematics, Physics and Geosciences.

The most important activity of the Committee for Geodynamics of Earth Crust in 2019 was the preparation of the monograph for publishing entitled: “Geohazard in Serbia in the 21<sup>st</sup> Century – Knowledge is the best bastion against the natural disasters“, which is based upon the proceedings of the special lectures about geohazards delivered at the Serbian Academy of Sciences and Arts in 2018. In addition, two Committee members, Vladica Cvetković and Prof. Dr. Kristina Šarić, were guest-editors of the Special Volume of *The Swiss Journal of Geosciences* with a geodynamic subject (The Alps as part of a larger system of Circum-Mediterranean orogens, Elsevier, 12, 1, 1-266), whereas the PhD student Nikola Stanković, MSc, completed a two-month visit to the ETH Zurich, during which he received training in the application of numerical modeling for solving geodynamical problems.

---

**Geohazard in Serbia in the 21<sup>st</sup> Century – Knowledge is the best bastion against the natural disasters.** Editor: V. Cvetković, Serbian Academy of Sciences and Arts, Lectures cycle, 5, 129 p. (in Serbian with English summaries).

Schmid S., Cvetković V., Šarić K., Marty D. (Eds.), 2019: The Alps as part of a larger system of Circum-Mediterranean orogens. **Swiss Journal of Geosciences**, Elsevier, 12, 1, 1–266.

Mladenović A., Antić M. D., Trivić B. P., Cvetković V., 2019: Investigating distant effects of the Moesian promontory: brittle tectonics along the western boundary of the Getic unit (East Serbia). **Swiss Journal of Geosciences**, 112, 1, 143–161.

Mladenović A., Cvetković V., Dulić I., Marjanović S., 2019: Earthquake mechanics in slowly deforming intraplate settings: a seismotectonic study of a 2010 Kraljevo seismic sequence (Internal Dinarides, Serbia). EGU General Assembly 2019, **Geophysical Research Abstracts**, 21, EGU2019-551.

---

## Project: **GEODYNAMICS OF TECTONOSTRATIGRAPHIC UNITS IN CENTRAL PART OF BALKAN PENINSULA**

(Academician Milan Sudar)

The Committee is co-ordinated work on few national themes, also scientific activities on join research project in domain of geosciences with academy of Romania.

On many fields of Serbia numerous geological-paleontological research were done. Some of them are highlighted: a) in registrar of paleofaunistic taxons of Serbia are included one new genus and and one species of aborescent Lower Cretaceous foraminifers from locality Kamenica (surroundings of Niš), b) the new data of radiolarian fauna from Jurassic melange of Avala Mt. and radiolarians of Upper Triassic age from Grivska Formations; also is described Lower Miocene fauna of fresh-water fishes from family Gobiidae, c) in detaileare studied taxonomy, paleoecology and paleobiogeography of shells and brachiopods of Lower Cretaceous (Albian) from area of Central Serbia (Topola, Oplenac) and Middle Jurassic terebratulide brachiopods of -Northern Jordan, d) paleoecologic analysis of number of Pleoistocene corbículas from territory of Serbia, also following association, with comparing with their recent relatives is made, e) the facial and biostratigraphic analysis, and radiometric dating of Lower-Middle Miocene succession of fields in vicinity of Zaječar (Dacia basin, Eastern Serbia) were done, f) during paleofloristic investigations attention is focused on Early Oligo-Miocene flora of Kamenica (Pranjani basin, Western Serbia), etc.

This year, on the fields of Eastern Serbia (Kučaj Zone) Lower Cretaceous, “Urgonian rocks” were investigated; the field excursion, as a part of joined project of inter-academician collaboration researchers from Serbian and Romanian Academy was realized. Beacause researchers from Slovenian

Academy were busy, collaboration with Slovenian Academy was not realized this year.

During the year two our researchers were on study visit in fields of eastern parts of Romania (South Carpathians).

---

Haas J., Jovanović D., Görög Á., Sudar M. N., Józsa J., Ozsvárt P., Pelikán P., 2019: Late Triassic–Middle Jurassic resedimented toe-of-slope and hemipelagic basin deposits in the Dinaridic Ophiolite Belt, Zlatar Mountain, SW Serbia. **Facies**, 65, 2, 23 p. (<https://doi.org/10.1007/s10347-019-0566-3>).

Porkoláb K., Kövér S., Benkó Z., Héja G., Fialowski M., Soós B., Gerzina-Spajić N., Djerić N., Fodor L., 2019: Structural and geochronological constraints from the Drina-Ivanjica thrust sheet (Western Serbia): implications for the Cretaceous–Paleogene tectonics of the Internal Dinarides. **Swiss Journal of Geosciences**, 112 1, 217–234 (<https://doi.org/10.1007/s00015-018-0327-2>).

Jovanović D., Cvetković V., Erić S., Kostić B., Peytcheva I., Šarić K., 2019: Variscan granitoids of the East Serbian Carpatho-Balkanides: new insight inferred from U-Pb zircon ages and geochemical data. **Swiss Journal of Geosciences**, 112, 1, 121–142 (<https://doi.org/10.1007/s00015-018-0325-4>).

Rundić Lj., Ganić M., Knežević S., Radivojević D., Radonjić M., 2019: Stratigraphic implications of the Mio-Pliocene geodynamics in the area of the Mt. Avala: new evidence from Torlak Hill and Beli Potok (Belgrade, Serbia). **Geologia Croatica**, 72, 2, 109–128 (doi: 10.41547GC.2019.11).

Mandić O., Rundić Lj., Ćorić S., Pezelj Dj., Theobalt D., Sant K., Krijgsman W., 2019: Age and Mode of the Middle Miocene Marine Flooding of the Pannonian Basin – Constraints from Central Serbia. **Palaios**, 34, 2, 71–95 (<https://doi.org/10.2140/palo.2018.052>).

Zarić J., Nenadić D., Mitrinović D. S., Knežević S., Dimkić M. A., 2019: Alluvial Deposits in the Lower Sava River Basin. **Comptes Rendus de l'Academie Bulgare des Sciences**, 72, 7, 928–936 (doi: 10.7546/CRABS.2019.07.10).

Krstekanić N., Matenco L., Toljić, M., Willingshofer E., Stojadinović U., 2019: Large-scale strike-slip and strain partitioning in an orocline: the Serbian Carpathians of eastern Serbia. **Geophysical Research Abstracts**, Vol. 21 (2019 EGU General Assembly 2019, EGU2019-9855).

---

## Project: **STUDY OF THE OPHIOLITE BELTS OF THE VARDAR ZONE, THE DINARIDES AND THE CARPATHO-BALKANIDES**

(Corresponding Member Vladica Cvetković)

In 2019, within the frame of the project “Study of the ophiolite belts of the Vardar zone, the Dinarides and the Carpatho Balkanides”, the collecting of new data about the Sava-Vardar zone was continued, in order to provide better understanding of the Mesozoic-Cenozoic geological evolution of the Balkan Peninsula. Samples from the drillhole Jelica-1, which had already

been studied petrographically, were prepared for further geochemical analyses; the results of these investigations should confirm that these rocks have similar petrochemical features as do analogous mafic rocks from other Sava-Vardar occurrences. The PhD student Nikola Stanković, MSc., completed a two-month visit to the ETH Zurich, during which he received training in the application of numerical modelling in solving geodynamical problems. In 2019, a study on Cretaceous ultrapotassic magmatic rocks belonging to the Sava Vardar Zone, which occur in the vicinity of Belgrade, was published in *Lithos* (Sokol et al., 2019). In addition, the first synthesis about the Hercynian granitoid rocks of East Serbia was published in a special volume of *The Swiss Journal of Geosciences* (Jovanović et al., 2019).

---

Sokol K., Prelević D., Romer R. L., Božović M., Van Den Bogaard P., Stefanova E., Kostić B., Čokulov N., 2019: Cretaceous ultrapotassic magmatism from the Sava-Vardar Zone of the Balkans. *Lithos*, <https://doi.org/10.1016/j.lithos.2019.105268>.

Jovanović D. B., Cvetković V., Erić S., Kostić B., Peytcheva I., Šarić K., 2019: Variscan granitoids of the East Serbian Carpatho-Balkanides: new insight inferred from U-Pb zircon ages and geochemical data. *Swiss Journal of Geosciences*, 112, 1, 121–142.

---

## Project: **GEOCHEMISTRY**

(Academician Vidojko Jović)

### **1. The geochemistry of the upper mantle and the igneous rocks of the Earth's crust**

In 2019, Prof. Dr. Dejan Prelević continued his research in the scientific field of geochemistry and petrology, with a particular focus on experimental petrology and geochemistry, especially in two directions: he conducted the study of different models of the origin of a metasomatized mantle; in the second part, he conducted a research on the thermodynamic melting conditions and the composition of melts derived from such a mantle. Also, he started to perform a number of experiments where he simulated the recycling of different types of the continental crust within the mantle in the subduction zones, using “piston-cylinder” method. In this apparatus, it is possible to simulate conditions of high pressure and temperature that correspond to the conditions prevailing in the transition from the crust to the mantle in the zones of active continental margins. He also continued to study the geochemistry of radioactive isotopes of Sr, Nd, Pb, Hf, Os, as well as the stable isotopes of O and Li,

and their application in geochronology and mineralogy. Dr. Dejan Prelević continued to apply in situ analysis for chemical and isotopic composition of minerals, trace element analysis, stable isotopes, and U-Pb geochronology, using the method of inductively coupled plasma and mass spectrometer (solid and solution ICP-MS / MC /).

---

Sokol K., Prelević D., Romer R. L., Božović M., van den Bogaard P., Stefanova E., Kostić B., Čokulov N., 2019: Cretaceous ultrapotassic magmatism from the Sava-Vardar Zone of the Balkans. **Lithos**, doi: 10.1016/j.lithos.2019.105268.

Lustrino M., Fedele L., Agostini S., Prelević D., Salari G., 2019: Leucitites within and around the Mediterranean area. **Lithos**, 324-325, 216–233.

Wang Y., Prelević D., Foley S. F., 2019: Geochemical characteristics of lawsonite blueschists in tectonic mélange from the Tavşanlı Zone, Turkey: Potential constraints on the origin of Mediterranean potassium-rich magmatism. **American Mineralogist**, 104, 724–743.

Köpping J., Peternell M., Prelević D., Rutte D., 2019: Cretaceous tectonic evolution of the Sava-Klepa Massif, Republic of North Macedonia – Results from calcite twin based automated paleostress analysis. **Tectonophysics**, 758, 44–54.

Göçmengil G., Karacık Z., Genç Ş. C., Prelević D., Billor Z., 2019: 40Ar-39Ar ages and petrogenesis of middle Eocene post-collisional volcanic rocks along the Izmir-Ankara-Erzincan suture zone, NE Turkey. **Journal of Asian Earth Sciences**, 173, 121–142.

Förster M. W., Prelević D., Buhre S., Mertz-Kraus R., Foley S. F., 2019: An experimental study of the role of partial melts of sediments versus mantle melts in the sources of potassic magmatism. **Journal of Asian Earth Sciences**, 177, 76–88.

Maurer M., Prelević D., Mertz-Kraus R., Pačevski A., Kostić B., Malbašić J., 2019: Genesis and metallogenic setting of the polymetallic barite-sulphide deposit, Bobija, Western Serbia. **International Journal of Earth Sciences**, 108, 1725–1740.

---

## 2. Geochemistry of the rock alteration

Contemporary soil pollution and increasing surfaces of degraded land are causing concern worldwide. The main polluters are: industry, traffic, agriculture, landfills, acid rains etc. Organic polluters and radioactive elements have been investigated in particular detail. The evaluation of pollution has been shown through application of sequential extraction analysis. The polluted soil can be refined using various technologies of remediation.

The growing human population requires a vast production of food, while on the other side there is a growing degradation and a decrease of arable soil surface. This points to the importance of understanding the cause and consequences of global land pollution, as well as the possibilities of remediating already polluted soil.

---

Jović V., 2019: Soil Pollution – Causes and Consequences. **Geohazard in Serbia in the 21st Century – Knowledge is the best bastion against the natural disasters**. Editor: V. Cvetković, Serbian Academy of Sciences and Arts, Lectures cycle, 5, 129 p. (in Serbian with English summaries).

---

### 3. Mineralogy

The aim of this investigation is to provide an overview of an experimental methodology that detects water molecules and (OH) groups in the near infrared (NIR) region and interprets their position in the structure of minerals. The spectra were obtained in two ways:

1) Transmission spectra were measured on oriented crystal sections (beryl, annabergite and lizardite), through a polarization microscope placed in the optical axis of the monochromator;

2) Diffuse reflectance spectra from powder samples (kaolinite and montmorillonite) were obtained with a fiber optic cable system, which allows small area measurements (1 mm<sup>2</sup>).

The polymetallic Bobija ore deposit in Western Serbia is located at the southwestern edge of the Jadar Block, a distal part of the passive continental margin of Adria. The sulphide mineralization consists of fine-grained pyrite, sphalerite, galena and tetrahedrite, and is associated with abundant barite. The deposit is stratabound and hosted by a Triassic sedimentary sequence. We investigated the bulk rock composition and the zircons were subjected to U–Pb dating.

---

Maurer M., Prelević D., Mertz-Kraus R., Pačevski A., Kostić B., Malbašić J., 2019: Genesis and metallogenetic setting of the polymetallic barite-sulphide deposit, Bobija, Western Serbia. **International Journal of Earth Sciences**, 1–16. Geosciences, Multidisciplinary (88/196). doi: 10.1007/s00531-019-01732-8

Kovač S., Dabić P., Kremenović A., Pačevski A., Karanović Lj., Rodić M., Tribus M., 2019: Polyhedral characteristics of the cosalite-type crystal structures. **The Canadian Mineralogist**, 57, 647–662. Mineralogy (21/29). doi: 10.3749/canmin.1900017

Banješević M., Cvetković V., von Quadt A., Ljubović-Obradović D., Vasić N., Pačevski A., Peytcheva I., 2019: New constraints on the main mineralization event inferred from the latest discoveries in the Bor Metallogenetic Zone (BMZ, East Serbia). **Minerals**, 9, 672. Mineralogy (12/29). doi: 10.3390/min9110672

---



**Project: TRACE ELEMENTS IN THE SOLVING  
OF GEOLOGICAL PROBLEMS**

(Academician Vidojko Jović)

The increasing interest in lacustrine sediments since the early 1970s arose from new proof of their scientific and economic importance (e.g. discovery of jadarite). The Belanovica basin occupied the area between the Brajkovac and Bukulja Mountains to the North, and a broad area covered by Albian-Cenomanian flysch.

Petrological and geochemical researches included core samples from three exploration boreholes drilled in the central part of the former lake. Vertical succession of sedimentary rocks and facies, along with the vertical distribution of certain elements (e.g. Cr, Ni, Mg, Ba, Sr, Na, K) were determined enabling a reconstruction of the basin history, since its initial opening stage (alluvial-lake and alluvial-marginal facies), over intrabasinal facies (marlstone and fine-grained clastites) to its gradual closure.

Magmatism caused by the breaking of the Dinarids continental plate in the lower Triassic resulted in highly diverse products due to different paths of magma and its contamination. In the area of Čelebići the most abundant are andesites, which display various wall-rocks alteration. Of particular importance are volcanic rocks discovered in the exploration borehole RRDD023 at 261.6 - 262.3 m depth, which contain brownish-red euhedral garnet crystals that exceed 4 mm in size. Garnets are optically isotropic and chemically consider almandine being in average:  $\text{Alm}_{75.9}\text{Spes}_{3.1}\text{Pi}_{17.8}\text{Gros}_{1.8}\text{Andr}_{1.4}$ .

---

Marić D., Srećković-Batočanin D., Vasić N., Radisavljević M., Djekić T., 2019: History of the Neogene lake basin Belanovica (Serbia) inferred from petrological and geochemical data. **Geologica Croatica**, 72/1, 5–18. doi: 10.4154/gc.2019.05

Srećković-Batočanin, D., Erić, S., Djordjević, D., Stojanović, D., Kondžulović, R., 2019: Andesites from Čelebići – wall-rock alterations and garnet occurrences. **Proceedings of the Second Congress of geologists in Bosnia and Herzegovina**, Laktaši, October 2-4, 2019, 17–27.

Ivanović R. D., Valjarević A. Dj., Srećković-Batočanin D. R., Martić-Bursać M. N., Vukoičić Ž. D., Ivanović M. R., 2019: Hydro geothermal potentials of the Rogozna mountain and possibility of their valorization. **Open Geosciences**, 11, 1071–1083. doi: 10.1515/geo-2019-0083

Šaraba V., Popović S., Obradović V., Štrbački J., Gajić V., Vulić P., Subakov-Simić G., Krunić O., 2019: Macroscopic optical and diffraction assessment of encrustations and SEM analyses of phototrophic microbial mats from wellheads and select zones of emergence of mineral water in Serbia. **Geologica Croatica**, 72/2, 145–162.

---



Project: **RECONSTRUCTION OF PALEOCLIMATE  
IN THE TERRITORY OF SERBIA DURING THE QUATERNARY**

(Corresponding Member Slobodan B. Marković)

During 2019, all planned project (F1789) activities were successfully realized. In October, together with Chinese colleagues (professors at the Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, and colleagues from Fuchou Normal University) led by Professors Quingzen Hao and Binggui Cai, we realized 26 days of joint field work in Serbia related to tree ring investigations, loess and speleothem research.

I organized two scientific conferences “International Conference Dedicated to the Life and Work of Academician Branislav Bukurov” held at the SASA Branch in Novi Sad, 3–5 May 2019, and “Eurasian Environmental Dynamics and Humans: Interactions over Different Time Scales” held at the SASA, in Belgrade, 28–30 June 2019.

---

Constantin D., Veres D., Panaiotu C., Anecitei-Deacu V., Groza S. M., Begy R., Kelemen S., Buylaert J.-P., Hambach U., Marković S. B., Gerasimenko N., Timar-Gabor A., 2019: Luminescence age constraints on the Pleistocene-Holocene transition recorded in loess sequences across SE Europe. **Quaternary Geochronology**, 49, 71–77.

Obrecht I., Zeeden C., Hambach U., Veres D., Marković S. B., Lehmkuhl F., 2019: A critical reevaluation of palaeoclimate proxy records from loess in the Carpathian Basin. **Earth Science Reviews**, 190, 498–520.

Svirčev Z. B., Dulić T., Obrecht I., Codd G. A., Lehmkuhl F., Marković S. B., Hambach U., Meriluoto J., 2019: Cyanobacteria and loess—an underestimated interaction. **Plant and Soil**, 439, 293–308 (Review)

Gavrilov M. B., An W., Xu C., Radaković M. G., Hao Q., Yang F., Guo Z., Perić Z., Gavrilov G., Marković S. B., 2019: Independent Aridity and Drought Pieces of Evidence Based on Meteorological Data and Tree Ring Data in Southeast Banat, Vojvodina, Serbia. **Atmosphere**, 10, 586.

Govedarica D. D., Gavrilov M. B., Zeremski T. M., Govedarica O. M., Hambach U., Tomić N. A., Sentić I., Marković S. B., 2019: Relationships between heavy metal content and magnetic susceptibility in road side loess profiles: A possible way to detect pollution. **Quaternary International**, 509A, 148–159.

Radaković M., Gavrilov M. B., Hambach U., Schaetzl R. J., Tošić I., Ninkov J., Vasin J., Marković S. B., 2019: Quantitative relationships between climate and magnetic susceptibility of soils on the Bačka Loess Plateau (Vojvodina, Serbia). **Quaternary International**, 509A, 85–94.

Perić Z., Adophi E. L., Buylaert J. P., Stevens T., Újvári G., Marković S. B., Hambach U., Fischer P., Zeeden C., Schmidt C., Schulte P., Huayu L., Shuangwen Y., Lehmkuhl L., Obrecht I., Veres D., Vött A., Zöller L., 2019: Quartz OSL dating of late Quaternary Chinese and Serbian loess: a cross Eurasian comparison of dating results and mass accumulation rates. **Quaternary International**, 509A, 30–44.

Smalley I., Marković S. B., 2019: Controls on the nature of loess particles and the formation of loess deposits. **Quaternary International**, 509A, 160–164.

Tomić N., Antić A., Marković S. B., Đorđević T., Zorn M., Valjavec M. B., 2019: Exploring the Potential for Speleotourism Development in Eastern Serbia. **Geoheritage**, 11 (2), 359–369.

Janc N., Gavrilov M. B., Marković S. B., Protić-Benišek V., Benišek V., Popović L. C., Tomić N. A., 2019: Ice Age theory: a correspondence between Milutin Milanković and Vojislav Mišković. **Open Geosciences**, 11, 263–272.

Gavrilov M. B., Lukić T., Janc N., Basarin B., Marković S. B., 2019: Forestry Aridity Index in Vojvodina, North Serbia. **Open Geosciences**, 11, 367–377.

Gavrilović B., Sümegi P., Ćirić M., Radaković M. G., Gavrilov M. B., Mladjen D., Marković S. B., 2019: The Middle and Late Pleniglacial (Weichselian) malafauna of the Zemun loess–paleosol sequence, Serbia. **PalZ** (2019). <https://doi.org/10.1007/s12542-019-00465-y>

Antić A., Tomić H., Marković S., 2019: Karst geoheritage and geotourism potential in the Pek River lower basin (eastern Serbia). **Geographica Pannonica**, 23 (1), 32–46.

## MATHEMATICS AND MECHANICS

### Project: **COMPUTER AIDED INVESTIGATIONS IN DISCRETE MATHEMATICS**

(Academician Dragoš Cvetković)

In the paper [1] we consider the symmetric traveling salesman problem (TSP) with instances represented by complete graphs  $G$  with distances between cities as edge weights. Computational experiments show that there exists a correlation between the sequences of the spectral radii of the distance matrices and of the lengths of optimal tours. In this paper we give a theoretical explanation.

Graphs whose spectrum belongs to the interval  $[-2, 2]$  are called Smith graphs. The structure of a Smith graph with a given spectrum depends on a system of Diophantine linear algebraic equations. In the paper [2] we introduce cospectrality graphs for Smith graphs and study their properties through examples and theoretical consideration. The new notion is used in proving theorems on cospectrality of Smith graphs. In this way one can avoid the use of the mentioned system of Diophantine linear algebraic equations.

Given the spectrum, the structure of a Smith graph depends on a system of Diophantine linear algebraic equations. In this way we can find sets of cospectral Smith graphs. We present also the method of  $G$ -transformations for handling the cospectrality phenomenon of Smith graphs. We apply both

methods in [3] to find cospectral equivalence class of the graph  $Z_n + W_n$ . This comparison indicates that the second method is more efficient.

[4] The minimization of total distance in an asymmetric vehicle routing problem is considered. This problem is used to model a real-life problem of delivering perishable and non-perishable goods to multiple customers. All the customers should be visited exactly ones with one among a limited number of homogeneous vehicles (with the same capacity and speed). Having in mind that the problem is NP-hard, we developed a General Variable Neighborhood Search (GVNS) approach and tested it on a set of available real-life instances. Our computational results show that the proposed GVNS is able to generate high quality solutions within reasonably short CPU time.

[5] This book describes mathematical achievements of Slobodan Simić who died in May 2019. S. Simić was working mainly in spectral graph theory and took part in the work of this project on several occasions.

---

[1] Cvetković D., Čangalović M., Dražić Z., Kovačević-Vujčić V., 2018: The travelling salesman problem: the spectral radius and the length of an optimal tour. **Bulletin de l'Académie serbe des sciences et des arts, Classe des sciences mathématiques et naturelles, Sciences mathématiques**, 43, No. 43, 18–26.

[2] Cvetković D., Todorčević V., 2019: Cospectrality graphs of Smith graphs. **Filomat**, 33, 11, 3269–3276.

[3] Cvetković D., Jovanović I., Todorčević V., 2019: Further results on the cospectrality of Smith graphs. **SYM-OP-IS 2019**, 173–178.

[4] Matijević L., Davidović T., Ilin V., Pardalos P. M., 2019: General variable neighborhood search for asymmetric vehicle routing problem. **SYM-OP-IS 2019**, 185–190.

[5] Belardo F., Cvetković D., Davidović T., Stanić Z. (urednici), 2019: **Matematička dostignuća Slobodana Simića**. Akademska misao, Beograd. (In Serbian)

---

## Project: ASYMPTOTIC FORMULAS IN ANALYTIC NUMBER THEORY

(Academician Aleksandar Ivić)

In the year 2019 A. Ivić published the following works:

---

1. A note on the zeros of the zeta-function of Riemann. **Archiv der Mathematik** (Basel), 113 (2019), no. 5, 497–503. <https://doi.org/10.1007/s00013-019-01368-9>.

2. (with M. A. Korolev) On the distribution of values of the argument of the Riemann zeta function. **Journal of Number Theory**, 200 (2019), 96–131. <https://doi.org/10.1016/j.jnt.2018/12.011>.

---

The first paper deals with the sign Hardy's function  $Z(t)$ , which plays an important role in the theory of the Riemann zeta-function  $\zeta(s)$ . The second paper deals with the sign of the function  $S(t)$ , the argument of the Riemann zeta-function  $\zeta(s)$ . This is a joint work with M.A. Korolev (Moscow).

In March 2018, A. Ivić was at Wako (near Tokyo), where he gave a lecture at the conference "Value distribution of zeta and  $L$ -functions and related topics", organized by the RIKEN Institute. The meeting was organized by A. I. Suriyajaya with about 100 participants from more than 20 countries.

### Project: **EQUATIONS WITH SINGULARITIES THROUGH METHODS OF FUNCTIONAL ANALYSIS**

(Academician Stevan Pilipović)

The analysis of a class of pseudo-differential operators of infinite order, as well as the time frequency analysis were the main subject of the project. Also the analysis of the wave front in the quasianalytic case was given.

The development of methods of Functional analysis related to equations with singularities is a global program of our investigations.

- 
1. Aleksic J., Pilipovic S., 2019: Two scale defect measure and linear equations with oscillating coefficients. **Filomat**, vol. 33, No. 9, 2867–2873.
  2. Atanackovic T. M., Konjik S., Pilipovic S., 2019: Variational problems of Herglotz type with complex order fractional derivatives and less regular Lagrangian. **Acta Mechanica**, vol. 230, No. 12, 4357–4365.
  3. Cappiello M., Gramchev T., Pilipovic S., Rodino L., 2019: Anisotropic Shubin operators and egenfunction expansions in Gelfand-Shilov spaces. **Journal d'Analyse Mathématique**, vol. 138, No. 2, 857–870.
  4. Pilipovic S., Prangoski B., Zigic M. B., 2019: Invertibility of matrix type operators of infinite order with exponential off-diagonal decay. **Linear Algebra and its Applications**, vol. 582, 346–358.
  5. Atanasova S., Pilipovic S., Saneva K., 2019: Directional time-frequency analysis and directional regularity. **Bulletin of the Malaysian Mathematical Sciences Society**, vol. 42, No. 5, 2075–2090.
  6. Carmichael R. D., Pilipovic S., Vindas J., 2019: Vector valued Hardy spaces related to analytic functions having distributional boundary values. **Complex Variables and Elliptic Equations**, vol. 64, No. 10, 1634–1654.
  7. Dimovski P., Pilipovic S., Prangoski B., Vindas J., 2019: Translation-modulation invariant Banach spaces of ultradistributions. **Journal of Fourier Analysis and Applications**, vol. 25, No. 3, 819–841.
  8. Kostic M., Pilipovic S., Velinov D., 2019: Quasi-equicontinuous exponential families of generalized function  $C$ -semigroups in locally convex spaces. **Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas**, vol. 113, No. 2, 453–469.

9. Gordic S., Oberguggenberger M., Pilipovic S., Selesi D., 2019: Generalized stochastic processes in algebras of generalized functions: Independence, stationarity and SPDEs. **Journal of Mathematical Analysis and Applications**, vol. 475, No. 2, 1196–1214.
  10. Pilipovic S., Vindas J., 2019: Tauberian class estimates for vector-valued distributions. **Sbornik: Mathematics**, vol. 210, No. 2, 272–296.
  11. Pilipovic S., Prangoski B., 2019: On the characterizations of wave front sets in terms of the short-time Fourier transform. **Mathematical Notes**, vol. 105, No. 1-2, 153–157.
  12. Atanackovic T. M., Janev M., Pilipovic S., 2019: Wave equation in fractional Zener-type viscoelastic media involving Caputo-Fabrizio fractional derivatives. **Meccanica**, vol. 54, No. 1-2, 155–167.
  13. Atanackovic T. M., Konjik S., Pilipovic S., 2019: Variational principles with fractional derivatives. **Handbook of fractional calculus with applications**. Vol. 1, 361–384, De Gruyter, Berlin.
  14. Atanackovic T. M., Konjik S., Pilipovic S., 2019: Wave equation involving fractional derivatives of real and complex fractional order. **Handbook of fractional calculus with applications**. Vol. 2, 327–351, De Gruyter, Berlin.
  15. Pilipovic S., Toft J., 2019: Wave-front sets related to quasi-analytic Gevrey sequences. **Publications de l'Institut Mathématique** (Beograd) (Novi Sad) (N.S.), 105 (119), 1–16.
  16. Pilipovic S., Prangoski B., 2019: Infinite order pseudo-differential operators. **Landscapes of time-frequency analysis**, 249–276, Appl. Numer. Harmon. Anal., Birkhäuser/Springer, Cham.
- 

## Project: INTERPOLATION AND QUADRATURE PROCESSES BASED ON THE THEORY OF ORTHOGONALITY

(Academician Gradimir V. Milovanović)

According to the plan of this project, the work on the development and applications of quadrature and summation processes, approximation of functions, orthogonal polynomials and special functions is continued.

Quadrature formulas with multiple nodes, generalized degree ( $s$ - and  $\backslash$  sigma) –orthogonality and spline approximations that preserve moments are considered in [1]. Special quadratures with multiple nodes for calculating Fourier-Chebyshev coefficients have been developed in extensive work [2], while in [3] a new summation-integration method for fast summation of slow-convergent trigonometric series has been developed, based on a transformation of series into integrals with respect to some weight function on  $\mathbb{R}_+$  and the development of the quadrature rule of the maximum degree.

Extraction of orthogonal polynomials from the generating function (for reciprocal odd numbers) is treated in [4]. Motivated by certain problems re-

lated to the stochastic analysis of recursively defined time series, some special sequences of polynomials have been defined in [5]. Their connection with the well-known Euler-Apostol and Bernoulli numbers has been established, as well as some new summation formulas for Bernoulli numbers. A generalization of divided differences and applications to new classes of interpolation formulas are presented in [6], including a study of the existence and uniqueness of such new classes of formulas.

New multi-step methods for solving optimization problems without constraints and determining the best constant in general inequalities of Poincare type of high order are presented in papers [7] and [8], respectively. Several problems in the theory of special functions, which refer to the transformations of hypergeometric functions and summation of series, have been solved in [9] – [13].

Finally, with a construction of some new classes of orthogonal polynomials and rational functions on the unit semicircle in the complex plane, a research has begun that enables significant applications in the integration of quasi-singular integrals and numerical differentiation [14].

- 
1. Milovanović G. V., Pranić M. S., Spalević M. M., 2019: Quadrature with multiple nodes, power orthogonality, and moment-preserving spline approximation, Part II. **Applicable Analysis and Discrete Mathematics**, 13, 1–27.
  2. Milovanović G. V., Orive R., Spalević M. M., 2019: Quadratures with multiple nodes for Fourier-Chebyshev coefficients. **IMA Journal of Numerical Analysis**, 39, 271–296.
  3. Milovanović G. V., 2019: Quadrature formulas of Gaussian type for fast summation of trigonometric series. **Constructive Mathematical Analysis**, 2, No. 4, 168–182.
  4. Milovanović G. V., 2019: A note on extraction of orthogonal polynomials from generating function for reciprocal of odd numbers. **Indian Journal of Pure and Applied Mathematics**, 50, 15–22.
  5. Milovanović G. V., Simsek Y., Stojanović V. S., 2019: A class of polynomials and connections with Bernoulli's numbers. **The Journal of Analysis**, 27 (3), 709–726.
  6. Masjed-Jamei M., Milovanović G. V., Moalemi Z., 2019: A generalization of divided differences and applications. **Filomat**, 33, 1, 193–210.
  7. Ivanov B., Stanimirović P. S., Milovanović G. V., Djordjević S., Brajević I., 2019: Accelerated multiple step size methods for solving unconstrained optimization problems. **Optimization Methods and Software**. doi: 10.1080/10556788.2019.1653868
  8. Guessab A., Milovanović G. V., 2019: Best constants for Poincare-type inequalities in  $W_p^r(0,1)$ . In: **Differential and Integral Inequalities** (D. Andrica, Th. M. Rassias, eds.), Springer Optimization and Its Applications, Vol. 151, 391–402, Springer, Cham.

9. Milovanović G. V., Rathie A. K., 2019: On a quadratic transformation due to Exton and its generalization. **Haceteppe Journal of Mathematics and Statistics**, 48 (6), 1706–1711.
  10. Milovanović G. V., Rathie A. K., 2019: A new proof of a reduction formula for the Appell series F3 due to Bailey. **Facta Universitatis, Series Mathematics & Informatics**, 34 (5), 849–854.
  11. Kim I., Milovanović G. V., Rathie A. K., 2019: Evaluation of a new class of Eulerian's type integrals involving generalized hypergeometric functions. **Facta Universitatis, Series Mathematics & Informatics**, 34 (5), 855–869.
  12. Jun S., Milovanović G. V., Kim I., Rathie A. K., 2019: A note on sums of a class of series. **Miskolc Mathematical Notes**, 20, 985–996.
  13. Kim I., Milovanović G. V., Rathie A. K., 2019: A note on two results contiguous to a quadratic transformation due to Gauss with applications. **Advanced Mathematical Models & Applications**, 4 (3), 181–187.
  14. Milovanović G. V., 2019: Special cases of orthogonal polynomials on the semicircle and applications in numerical differentiation. **Bulletin. Classe des Sciences Mathématiques et Naturelles. Sciences Mathématiques**, 44, 1–28.
- 

## Project: SPECIAL PROBLEMS OF COMPLEX ANALYSIS AND APPLICATIONS

(Academician Miodrag Mateljević)

Miodrag Mateljević has worked on the SASA project “Special chapters of complex analysis and applications” (project CA) since 2013. In 2019, according to our plan, we continued to study some questions related to the geometric analysis: harmonic quasiconformal (hqc) mappings and the Schwarz lemma.

Several results related to the bi-Lipschicity of quasiconformal harmonic (qch) mappings with respect to quasi-hyperbolic and Euclidean metrics, are proved in [2]. In connection with the subject, we announce a few results concerning the so called interior estimate.

In [1,3,4,5,6] we mainly consider the Schwarz lemma for harmonic functions and contraction properties of holomorphic functions with respect to Kobayashi distances including complex Banach spaces and hyperbolic Riemann surfaces.

M. Mateljević delivered his accession speech on the occasion of his election to the fellowship of the Serbian Academy of Sciences and Arts: M. Mateljević, “Some Aspects of Potential Theory, Visualization, Variational Calculus and Applications”, wherein he presented the results related to the project.



We also studied the Dirichlet problem for harmonic maps and qc maps, which was the main subject of the 10th Symposium “Mathematics and Applications”, which was held on 6 and 7 December 2019, and organized by the Faculty of Mathematics, University of Belgrade. The symposium was organized to honor Academician Miodrag Mateljević on his 70<sup>th</sup> birthday.

---

Mateljević M., 2018: Schwarz type inequalities for harmonic and related functions in the disk and the ball. **IV Conference of Mathematics and Computer Science (Konferencja Matematyczno-Informatyczna) Congressio-Mathematica**, September 20-23, 2018, at Mierki, <http://wmii.uwm.edu.pl/congressiomath>, **Current Research in Mathematical and Computer Sciences II**, Publisher UWM, Olsztyn 2018, 157–194.

---

### Project: **FIXED POINTS FOR MAPS ON DIFFERENT SPACES**

(Corresponding Member Vladimir Rakočević)

We have obtained results in fixed point theory for contractive maps on generalized metric spaces. Those results generalize known results, and many examples show the relations between our results and known results. Furthermore, one book was published.

---

Umit A., Erdal K., Inci M. E., Rakočević V. R., 2018: Meir-Keeler Type Contractions on Modular Metric Spaces. **Filomat**, 32, 10, 3697–3707.

Ravindra K. B., Rakočević V. R., 2018: Generalized Meir-Keeler Type Contractions and Discontinuity at Fixed Point. **Fixed Point Theory**, vol. 19, 57–64.

Hossein L., Rakočević V. R., Hassen A., 2019: Extensions of Kannan contraction via  $w$ -distances. **Aequationes Mathematicae**, 93, 6, 1231–1244.

Abhijit P., Rajendra P. P., Rakočević V. R., 2019: Meir-Keeler Type and Caristi Type Fixed Point Theorems. **Applicable Analysis and Discrete Mathematics**, vol. 13, 3, 849–858.

Ravindra K. B., Rajendra P. P., Rakočević V. R., 2019: Proinov Contractions and Discontinuity at Fixed Point. **Miskolc Mathematical Notes**, 20, 1, 131–137.

Kostić A. S., Erdal K., Rakočević V. R., 2019: Best Proximity Points and Fixed Points with  $R$ -Functions in the Framework of  $W$ -Distances. **Bulletin of the Australian Mathematical Society**, 99, 3, 497–507.

Kostić A., Rakočević V., Radenović S., 2019: Best proximity points involving simulation functions with  $w_0$ -distance. **Revista de la Real Academia de Ciencias Exactas Fisicas y Naturales Serie A - Mathematicas**, 113, 2, 715–727.

Kocev D., Erdal K., Rakočević V., 2019: On quasicontraction mappings of Ćirić and Fisher type via  $\omega$ -distance. **Questiones Mathematicae**, 42, 1, 1–14.

Rameshwar P., Rajendra P. P., Rakočević V. R., Rahul S., 2019: Approximating Fixed Points of a General Class of Nonexpansive Mappings in Banach Spaces with Applications. **Results in Mathematics**, 74, 1.



Petrović M. J., Rakočević V., Valjarević D., Ilić D., 2019: A note on hybridization process applied on transformed double step size model. **Numerical Algorithms**, 1–17.

Pant A., Pant R. P., Rakočević V., Bisht R. K., 2019: Generalized Meir-Keeler type contractions, and discontinuity at fixed point II. **Mathematica Slovaca**, 69, No. 6, 1501–1507.

Erdal K., Kenan T., Rakočević V., 2019: Advances on fixed point results on partial metric spaces. In K. Tas (Editor), **Mathematical Methods in Engineering, Theoretical Aspects**, Springer (Nonlinear Systems and Complexity Series, Editor: Albert C. J. Luo 23), 3–66.

Aydi H., Karapinar E., Rakočević V., 2019: Nonunique fixed point theorems on b-metric spaces via simulation functions. **Jordan Journal of Mathematics and Statistics (JJMS)**, 12 (3), 265–288.

Abbas M., Nazir T., Rakočević V., 2019: Common Fixed Points of Family of Multivalued F-Contraction Mappings on Ordered Metric Spaces. **Vietnam Journal of Mathematics**. <https://doi.org/10.1007/s10013-019-00341-x>

Izhar U., Javid A., Rakočević V. R., 2019: Some Convergence Theorems for New Iteration Scheme in  $\text{Cat}(0)$  Spaces. **Miskolc Mathematical Notes**, vol. 20, 2, 1285–1297.

Malkowsky E., Rakočević V., 2019: **Advanced Functional Analysis**. CRC Press, Taylor and Francis Group, Boca Raton, London, New York.

## PHYSICS AND METEOROLOGY

### Project: STATISTICALITY AND CAUSALITY IN QUANTUM MECHANICS

(Academician Fedor Herbut)

I have completed a comprehensive research-review article and published it in the leading electronic (internet) journal *QUANTA*.

I have begun a research in quantum measurement theory.

### Project: NUMERICAL SIMULATION OF WEATHER AND CLIMATE

(Academician Fedor Mesinger)

Continuing work on the topic of the large scale skill of the cut-cell Eta members driven by the ECMWF (EC later on) ensemble members that were supplying their lateral boundary conditions, yet another skill score was used to measure the relative skill of the two ensembles. This was the so-called “symmetric extreme dependency score” (SEDS), chosen because of its improved

properties compared to the EDS score used previously (e.g., Wilks, Stat. Meth. Atmos. Sci., 2011). Checking the accuracy of winds of speeds greater than 45 m/s in the upper troposphere, at the elevation of 250 hPa, SEDS score showed once again at the lead times beyond about 2 and even as long as day 18 at almost each verification accuracy of the Eta members higher than that of their EC driver members. This difference was particularly prominent while an upper tropospheric system was crossing the Rocky Mountains, during days about 2 to 5 of the experiment, with almost all of the 21 Eta members displaying higher scores than the corresponding EC members, and in fact all of them at the 4.5 day time. The experiment with the Eta members switched to use the standard terrain-following coordinate, “sigma”, showed some advantage of the Eta over the EC members according to the SEDS scores as well, but no advantage any more during this critical period of about 2 to 5 days.

Results of the work on this topic were presented in 2019 at several international conferences, and were reported upon in a manuscript submitted to the *Journal of the Meteorological Society of Japan*, reviewing methods of the representation of topography in atmospheric numerical models.

Results of the research on the wet deposition of toluene, ethylbenzene and xylene, depending on the concentrations and water solubility of the compounds, Henry’s law, physico-chemical properties of water, as well as the frequency and intensity of precipitation events, were published in *Science of the Total Environment* (Lazić).

---

Kovačević N., 2019: Hail suppression effectiveness for varying solubility of natural aerosols in water. **Meteorology and Atmospheric Physics**, 131, 585–599, <https://doi.org/10.1007/s00703-018-0587-4>

Stojić A., Stanić N., Vuković G., Stanišić S., Perišić M., Šoštarić A., Lazić L., 2019: Explainable extreme gradient boosting tree-based prediction of toluene, ethylbenzene and xylene wet deposition. **Science of the Total Environment**, 653, 140–147. <https://www.sciencedirect.com/science/article/pii/S0048969718342682> <https://doi.org/10.1016/j.scitotenv.2018.10.368>

Veljovic K., Mesinger F., 2019: Reasons for the cut-cell Eta skill vs. ECMWF in ensemble experiments. **Research Activities in Atmospheric and Oceanic Modelling**, World Meteorological Organization, 3-09-3-10. [[http://bluebook.meteo-info.ru/index.php?year=2019&ch\\_=2](http://bluebook.meteo-info.ru/index.php?year=2019&ch_=2)]

Mesinger F., Veljovic K., 2019: Topography in NWP models: cut-cell Eta large scale skill vs. ECMWF—where does it come from? Annual Assembly of the European Geosciences Union, Vienna, Austria, April 7-12, 2019. In: **Geophysical Research Abstracts**, <sup>SEP</sup>Vol. 21, EGU2019-10509-2, 2019. Available at <https://meetingorganizer.copernicus.org/EGU2019/EGU2019-10509-2.pdf>

Mesinger F., Veljovic K., 2019: Cut-cell Eta large scale skill vs. ECMWF ensemble members—where does it come from? **Partial Differential Equations on the Sphere (PDEs)**, Montreal, Canada, April 29-May 3, 2019. Available at <https://collaboration.cmc.ec.gc.ca/science/pdes-2019/pdfs/Fedor-Mesinger.pdf>

Veljović K., Koračin D., Mesinger F., 2019: Improvement of radiation fog prediction using recent development of turbulence closure parameterizations. Annual Assembly of the European Geosciences Union, Vienna, Austria, April 7-12, 2019. In: **Geophysical Research Abstracts**, Vol. 21, EGU2019-16626, 2019. Available at <https://meetingorganizer.copernicus.org/EGU2019/EGU2019-16626.pdf>

---

Project: **DYNAMICS OF THE SOLAR SYSTEM BODIES**

(Academician Zoran Knežević)

Topic: **Dynamical and physical properties of small solar system bodies**

(Academician Zoran Knežević)

In 2019, we completed development of a new synthetic method for precise determination of the positions of secular resonances in the phase space of asteroid proper elements. In the framework of the analysis of the obtained positions we first addressed the problem of identification of the nonlinear secular resonances of degree 6 and of their location in the space of frequencies, to subsequently focus on the precise determination of the position of the most important linear secular resonance in the longitude of perihelion between an asteroid and the Jupiter, located at the extremely high orbital inclinations. For this purpose we developed a specific approach which makes use of the local dynamical parameters. For a selected nearby asteroids we then carried out a detailed dynamical analysis of their resonant status. The cause of the “cycle slip” problem occurring in the computation of proper frequency of the longitude of perihelion of asteroids has been identified, and a solution found for this problem which gave rise to large uncertainties of the computed frequencies of asteroids with high orbital inclinations. The paper with the results of this investigations is prepared for publication.

We finished the analysis of the dynamics of small bodies and of their role in the transport of water in the extrasolar planetary system TRAPIST-1. The paper with the results is submitted for publication.

In 2019, we commenced an investigation of the relationship of Themis family asteroids and of Jupiter family comets, as well as of the dynamical evolution of Karma asteroid family.

In the framework of this project topic 3 papers were published in the leading international journals, 1 paper in the international journal, and 3 abstracts of presentations at international and national scientific conferences.

Topic: **Observations of quasars and of double and multiple stars**

(Dr. Goran Damljanović)

In the first and second halves of 2019, we had observing time on the 2 m telescope of Rozhen Observatory (Bulgaria) for CCD observations: from 28 March to 1 April (2019A) and from 31 October to 3 November (2019B). Each month, we also carried out regular observations using the 60 cm and 1.4 m telescopes at the Astronomical Station Vidojevica (ASV). We observed the following objects: double and multiple stars, extragalactic radio sources (ERS), that is quasars (QSOs) from the ICRF (International Celestial Reference Frame) list, visible also in optical wavelength range, for Gaia astrometry, Gaia Alerts (Gaia-FUN-TO, Gaia-Follow-Up Network for Transient Objects), and WEBT (Whole Earth Blazar Telescope) objects. We continued collaboration with the international center INAF-OATo in Turin on the investigation of Active Galactic Nuclei (AGN), with the Paris Observatory on Gaia astrometry, with a colleague from Bulgaria on astronomical observation and reduction of the data, etc. Results of these investigations were presented in several invited lectures, contributed papers and posters at two conferences. Observational data reduction was completed for about 100 double and multiple stars, 20 quasars, nearly 10 Gaia Alerts and 10 WEBT objects.

---

Paolicchi P., Spoto F., Knežević Z., Milani A., 2019: Age of families with the YORP-eye method. **Monthly Notices of the Royal Astronomical Society**, 484, 1815.

Milani A., Knežević Z., Spoto F., Paolicchi P., 2019: Asteroid cratering families: recognition and collisional interpretation. **Astronomy and Astrophysics**, 622, A47.

Knežević Z., Milani A., 2019: Are the analytical proper elements of asteroids still needed? **Celestial Mechanics and Dynamical Astronomy**, 131, 27.

Novaković B., Radović V., 2019: Discovery of Four Young Asteroid Families. **Research Notes of the American Astronomical Society**, 3, 105.

Raiteri C. M., Villata M., Carnerero M. I., ... , Damljanovic G., ... , 2019, The beamed jet and quasar core of the distant blazar 4C 71.07. **Monthly Notices of the Royal Astronomical Society**, 489, 1837. 64 co-authors.

D'Ammando F., Raiteri C. M., Villata M., ... , Damljanovic G., ... , 2019: Investigating the multiwavelength behaviour of the flat spectrum radio quasar CTA 102 during 2013-2017. **Monthly Notices of the Royal Astronomical Society**, 490, 5300. 99 co-authors.

Vercellone S., Romano P., Piano G., ... , Damljanović G., ... , 2019: AGILE, Fermi, Swift, and GASP/WEBT multi-wavelength observations of the high-redshift blazar 4C +71.07 in outburst. **Astronomy and Astrophysics**, 621, A82. 59 co-authors.

Gupta A. C., Gaur H., Wiita P. J., ... , Damljanić G., ..., 2019: Characterizing Optical Variability of OJ 287 in 2016-2017. **Astronomical Journal**, 157, 95. 25 co-authors.

Gaur H., Gupta A. C., Bachev R., ... , Damljanić G., ... , 2019: Optical variability of TeV blazars on long time-scales **Monthly Notices of the Royal Astronomical Society**, 484, 5633. 15 co-authors.

---

Project: **SHAPES AND SHIFTS OF SPECTRAL LINES IN GAS PLASMAS AND ELECTRIC GAS DISCHARGES**

(Academician Nikola Konjević)

We presented the progress report of an iterative kinetic model of the cathode-fall region in an abnormal glow discharge of pure neon, which enables prediction of the electric field strength, distribution, distribution of the number densities of Ne atoms and Ne<sup>+</sup> ions together with the spectral shapes of Ne I and Ne II lines recorded end-on and side-on at various distances from the cathode. We compared successfully our model predictions with corresponding experimental electric field strength distributions determined from Ne I line shifts recorded side-on under same experimental conditions.

---

Spasojević Dj., Ivanović N., Šišović N., Nedić N., Konjević N., 2019: On the spectral shapes of Ne II lines recorded from the cathode glow region of an abnormal glow discharge. **12th Serbian conference on spectral line shapes in astrophysics**, Vrdnik, Serbia, 2-7, June 2019, **Book of Abstracts**, Eds. D. Ilić, E. Stambulchik, A. Kovačević and L. Č. Popović, Faculty of Mathematics, University of Belgrade, p. 62.

---

Project: **AFFINE SYMMETRY OF PHYSICAL LAWS**

(Academician Đorđe Šijački)

Our 2019 research activities within the ATLAS experiment project at the CERN Large Hadron Collider (LHC), predominantly at the energies of 13 TeV, were focused on three topics: 1. The Standard model (SM) parameters; 2. A search of the new particles predicted by the beyond the SM theories; and 3. The ATLAS detector upgrade. These research activities are in accordance with the fact that the LHC experiments are long-term activities at the frontier

of the fundamental research in physics to last for some twenty more years, yielding a complete understanding of all open questions about the properties and nature of the Higgs boson discovered in 2012. A huge amount of new collected experimental data resulted in setting new limits, especially as for the search of new particles and phenomena predicted by physics beyond the SM in the TeV region. An investigation of the predictions of the theories in more than 4 dimensions, and especially the Supersymmetry theory, the most prominent one beyond the SM framework, focused primarily on searches for newly predicted particles, i.e. squarks and gluinos. The previously set, so-called, most stringent limits on the newly predicted particle masses were further improved, as for a wide range of supersymmetric models. A notable contribution to searches for the beyond SM phenomena that we achieved, in particular an important role in setting and further improving the lower limits on the masses of new heavy gauge bosons  $W'$  and  $Z'$ , resulted in an annual CERN ATLAS Standard Model Workshop for 2019 in Belgrade at the SASA.

### Project: N-REPRESENTABILITY PROBLEM

(Academician Milan Damnjanović)

The topological and algebraic analysis of the appearance of the Dirac-like points in quasi-one- and quasi-two-dimensional crystals was performed by singling out all high-symmetry points in the irreducible domains (of these groups) hosting energy bands crossing (touching). The results indicated the appearance of the strange dispersions with noncyclic equienergetic yielding high density of states. Considerations refer to bosonic and fermionic systems, without and with time reversal symmetry, for which description single and double, ordinary and gray groups are needed. Research on the classification of the topological phases of quasi-one- and quasi-two-dimensional crystals began, and first results of this long-term task have been successfully achieved and in the phase of publishing.

---

Popović Z. P., Nikolić B., Milošević I., Damnjanović M., 2019: Symmetry of rigid-layer modes: Raman and infrared activity. **Physica E: Low-dimensional Systems and Nanostructures**, 114, 113613.

Milošević I., Nikolić B., Damnjanović M., 2019: Symmetry-Based Electron–Phonon Decoupling and Jahn–Teller Theorem Violation in Specific Crystalline Structures. **Physica Status Solidi B**, 256, 1900242.

---

Project: **PHYSICS OF SUPERCONDUCTIVITY**

(Academician Zoran Radović)

1. Research of high-temperature superconductivity in cuprates in collaboration with the group of I. Bozovic (Brookhaven National Laboratory, USA).

2. Theoretical investigation of spin triplet superconducting correlations in Josephson junctions with inhomogeneous ferromagnet: phase dependence of Josephson current and mutual relation of resonantly amplified first harmonic and dominant second harmonic. In collaboration with M. Vanević from the Faculty of Physics, University of Belgrade, and A. Buzdin, Universite de Bordeaux, France.

Project: **BIOPHYSICS OF PROTEINS IN THE LIVING CELLS**

(Academician Miljko Satarić)

The project leader, academician Miljko Satarić, with collaborators, realized the activities in accordance with the proposed plan. An original concept based on the role of calcium signaling within the axoneme of cilia and flagella was developed. In other segment, the biophysical insight into the regulation of cellular traffic by tubulin post-translational modifications was considered. These contributions were published as follows:

---

Satarić M. V., Nemeš T., Sekulić D., Tuszynski J. A., 2019: How signals of calcium ions initiate the beats of cilia and flagella. **BioSystems**, doi: <https://doi.org/10.1101/585034>

Satarić M. V., Sekulić D. L., Satarić B. M., Ilić D., 2019: Post-translational Modifications of C-Terminal Tails of Microtubules Tune Bi-Directional Intracellular Transport. **Advanced Science, Engineering and Medicine**, 11 (7), 621–624.

---

The participations at International Conferences:

- Miljko Satarić was the invited speaker at the “International Conference on Sustainable Sciences”, from July 05-07, 2019 held in Istanbul, Turkey. The title of his presentation was: “Calcium Signaling Regulates the Beating of Cilia and Flagella“. He was the member of Scientific committee of Conference and chair of the session in biophysics.
- On October 07-11, 2019 he took part at International Conference “The 20-th Symposium on Condensed Matter Physics-SCMP“, which was held in Serbian Academy of Sciences and Arts, Belgrade. He presented the contribution entitled “Multy-Functional Roles of Microtubules in Living Cells”.



Project: **DEVELOPMENT OF NONLINEAR MICROSCOPE**

(Corresponding Member Branislav Jelenković)

Optical properties of biomaterials were investigated after having generated multilayered photonic structures in such materials. The influence of temperature on the metamaterial was investigated using optical properties of this structure. We revealed that a temperature-sensitive response of the metamaterials, made from temperature-insensitive materials, was the consequence of the structuring that alters its mechanical properties. Temperature variation leads to a dimension change at the nanoscale, which makes the structure exhibit negative thermal expansion on the macroscopic scale. A mechanism is based on air permeability through the biopolymer nanolayers which results in the contraction of the entire structure. Such NTE materials have important applications, because they can control the thermal expansion of materials. NTE allows the adjustment of the thermal expansion of a material by forming composites.

In collaboration with the State Key Laboratory of Metal Matrix Composites, Shanghai Jiao Tong University, through a bilateral project, natural materials were used for biomimetic investigations. Inspired by natural young sunflower heads' property – increasing the temperature of dish-shaped flowers by tracking the sun, we used 3D-structured carbonized sunflower heads as an effective solar steam generator. The evaporation rate and efficiency of these materials under 1 sun are beyond the theoretical limit of 2D materials.

Investigations in nonlinear optics include experimental set-up for efficient parametric gains of probe and conjugate photons in a four-wave mixing process, and first results on amplitude squeezed lights in thermal potassium vapor. Spectral noise density of signal from the balance detector (proportional to difference in photon numbers of the probe and conjugate) was shown to be below standard quantum limit by -4dB in the spectral range around 1MHz.

---

Pavlović D. et al., 2019: Naturally safe: Cellular noise for document security. **Journal of Biophotonics**, <https://doi.org/10.1002/jbio.201900218>.

Dimitrijević J., Arsenović D., Jelenković B. M., 2019: Spectral method for numerical solution of the electric field envelope propagation equation. **Communication in nonlinear science and numerical simulation**, 67, 264.

Ćurčić M., Jelenković B., 2019: Squeezed States of Light Generated by Four Wave Mixing in Potassium Vapor. Invited talk, **21st International Conference on Transparent Optical Networks, ICTON'2019**, Angers, France, July 9-13, 2019 Published IEEEExplore <https://ieeexplore.ieee.org/document/8840490>.

---



Project: **NUMERICAL MODELING IN PHYSICS OF MATERIALS**

(Corresponding Member Željko Šljivančanin)

Using several experimental methods, combined with ab-initio calculations based on density functional theory, we investigated the effect of adsorbed salicylic acid and 5-aminosalicylic acid on the optical properties of TiO<sub>2</sub> nanoparticles, and demonstrated that the adsorbates can be used to modify these properties in a controllable manner.

---

Božanić D. K., Garcia G. A., Nahon L., Sredojević D., Lazić V., Vukoje I., Phillip Ahrenkiel S. Ph., Djoković V., Šljivančanin Ž., Nedeljković J. M., 2019: Interfacial Charge Transfer Transitions in Colloidal TiO<sub>2</sub> Nanoparticles Functionalized with Salicylic acid and 5-Aminosalicylic acid: A Comparative Photoelectron Spectroscopy and DFT Study. **Journal of Physical Chemistry C**, 123, 29057.

---

**COMMITTEE FOR KARST OF AND SPELEOLOGY**

(Corresponding Member Slobodan B. Marković)

During 2019, the Committee for Karst and Speleology of the Serbian Academy of Sciences and Arts (SASA) continued its long tradition of successful activities. The majority of Committee members participated at these meetings. The annual meeting of the Committee took place on 18 October (Prof. Dr. Vesna Dimitrijević, Prof. Dr. Katarina Bogičević, Prof. Dr. Dušan Mihajlović, Prof. Dr. Rajko Dimitrijević, Dr. Jelena Čalić (secretary), Prof. Dr. Zoran Stevanović (Vice-President) and Slobodan Marković (President)). In addition, during the meeting Prof. Binggui Cai from Fujian Normal University, China, delivered a lecture about speleothem research in China and Thailand.

In October we organized field investigations with colleagues from China led by Prof. Binggui Cai. We collected several speleothem samples from Cerjanska, Bogovinska and Lazareva caves. These samples were transported to China to be analyzed in the laboratory led by Prof. Binggui Cai. On the Serbian side, the following members of the Committee: Dr. Dragan Nešić, Dr. Jelena Čalić and Slobodan Marković, participated in these investigations.

From 1 to 3 November, the traditional “9<sup>th</sup> Symposium About Karst Protection and Conservation” took place in Belgrade. Many members of our Committee participated at this scientific meeting.

Preparations of Volume 11 of the Proceedings of the Committee for Karst and Speleology of the SASA are in progress. Volume 11 will in all probability be published in 2020. Members of the Committee published numerous articles and presented many lectures at international and domestic conferences.

**ACADEMIC COMMITTEE FOR THE DYNAMICS  
OF THE EARTH'S CLIMATE SYSTEM AND THE OPUS  
OF MILUTIN MILANKOVIĆ**

(Academician Fedor Mesinger)

In 2019, the Committee's most significant activity was the organization of André Berger's visit to Belgrade, who is an International Member of the Academy, Professor Emeritus and Senior Scientist at the Université catholique de Louvain, Earth and Life Institute, Georges Lemaître Center for Earth and Climate Research, Louvain-la-Neuve, Belgium, who delivered an invited lecture as a guest of the Academy, and at the same time his visit to the "Milutin Milanković" Scientific and Cultural Center, in Dalj, Croatia. Professor Berger delivered the lecture titled "Past climates – a lesson for the future" on 27 May, at the Academy's Grand Hall in Belgrade, and in Dalj Professor Berger participated in their regular the end of May event, "Milanković cycles", which commemorates Milanković's birth anniversary. On that occasion he was awarded a plaque and Milanković Gold Metal in recognition of his cutting-edge contributions to advancing the opus of Milanković and to understanding the paleoclimate and global climate change.

The Committee's other activities included cooperation on several other events, one of which was organized by the Institute for Mathematics of the Academy, as its traditional manifestation "May – the Month of Mathematics". Within the manifestation, on 28 May, the "Milanković Day" colloquium was held, with two keynote lectures given by the Committee members academicians Zoran Knežević ("About the research contributions of Milutin Milanković: Theory and practice") and Fedor Mesinger ("Challenges in atmospheric modeling: Examples from the Eta model large scale skill vs. ECMWF").

Academician Zoran Knežević promoted the opus of Milanković via several other lectures: at the SASA Branch in Novi Sad (November 27: "Milutin Milanković: Canon of Insolation of the Earth"), Students' Center of Culture in Belgrade (December 20: "Scientific Contributions of Milutin Milanković"), at the Institute of Physics, Belgrade (December 23: "Milutin Milanković and the Reform of the Calendar") and at the Kolarac People's University (December 26: "Milutin Milanković: Canon of Insolation of the Earth").

The composer Vera Milanković authored, and directed, on 2 July, at the Solemn Hall of the Army of Serbia in Belgrade a musical cantata "Through Distant Worlds and Times". Faculties of Architecture and Civil Engineering, and the "Milutin Milanković" Association organized the international conference "Life and Opus of Milutin Milanković: Past, Present and the Future"

at the Faculty of Civil Engineering on 19 July, where Academician Fedor Mesinger gave a lecture titled "Challenges in numerical weather prediction, as seen by Milutin Milanković, and as they are today: What can we do?"

### **ACADEMIC COMMITTEE DEFICIENCY OF SELENIUM AND MAGNESIUM IN SERBIA**

(Academician Vidojko Jović)

After the statistical processing of the results showing the magnesium and selenium levels in Serbia's residual soils, there followed the processing of the results obtained for other analyzed trace and major elements. The aim of these investigations is to compare the behaviour of the chemical elements in the soils in order to determine their status in the environment and possible impact on the living world.

The geochemical, mineralogical and sedimentological investigations of contemporary sediments collected from the lower course of the Danube in Serbia were continued and significant results were obtained for environmental impact assessment. The investigated elements also included magnesium and selenium. The processing of the results is finished.

### **ACADEMIC COMMITTEE FOR COOPERATION WITH OUR SCIENTISTS AND ARTISTS IN THE WORLD**

(Academician Zoran Radović)

During 2018, the members of the Committee continued to work on forming a database of our scientists and artists around the world, each for their field. So far, data have been completed for the fields: Physics and Astronomy (Zoran Radović) and Medicine (Ljubisav Rakić). Contact with societies: Organization of Serbian Students Abroad (President Aleksandar Jakovljević), and Prof. Dr. Slavka Drasković from the American-Serbian Foundation Studenica.

It is planned to complete the database in 2020 and to invite our scientists and artists worldwide for cooperation. The idea is to organize a committee of the most prominent scientists and artists who want to engage in programs of relevance to our country.

## **ACADEMIC COMMITTEE FOR HIGHER EDUCATION**

(Corresponding Member Vladica Cvetković)

In the period January–June 2019, academician Dušan Teodorović served as president of the Academic Committee for Higher Education (ACHE). After he resigned as president of the Committee, the SASA Executive Board decided (XIV Board meeting held on 12 June 2019) to propose to the SASA Presidency to appoint SASA Corresponding Member Vladica Cvetković as a new member and president of the ACHE. At its third meeting held on 19 September 2019, the SASA Presidency approved the resignation of the former ACHE president academician D. Teodorović and appointed SASA Corresponding Member Vladica Cvetković as the next president of the ACHE.

On 29 June, the ACHE sent an official letter to the Ministry of Education, Science and Technological Development (MESTD) of the Republic of Serbia, wherein several negative aspects of the current Draft Law on Science and Research were underlined. The ACHE expressed serious concerns over the implementation of such a regulatory document, which might put in danger the entire system of project funding that had already been planned within the frame of the recently established Science Fund. For resolving these negative elements, the ACHE offered its expertise and all other assistance. Prof. Dr. Vladimir Popović, State Secretary at the MESTD, replied to this letter (official letter No. 011-00-267/2019-14 of 4 July 2019), providing certain clarifications; notwithstanding, the mentioned Draft Law was subsequently approved without making any substantial changes (8 July 2019). On November 5, the ACHE sent a letter both to the Senate and to the Statute Commission of the University of Belgrade, wherein the ACHE warned that the Statute of the Faculty of Orthodox Theology and the Statute of the University of Belgrade were not appropriately harmonized, which was especially evident in reference to the notion “blessing”. It was emphasized that the notion was recently arbitrarily applied, which endangered the normal functioning of the Faculty of Orthodox Theology and seriously threatened the autonomy of the University of Belgrade.

After holding an electronic meeting on 1 and 2 December, the ACHE issued a public announcement regarding several offensive acts against the University of Belgrade, in reference to the case of plagiarism of Serbia’s finance minister Siniša Mali. In the announcement, the ACHE provided full support to the Professional Ethics Board of the University of Belgrade, as well as to other university entities that were included in establishing and

implementing the procedures for regulating non-academic misconduct at the university.

The ACHE also discussed the initiative of Prof. Aleksandar Baucal (Faculty of Philosophy) and Prof. Branko Urošević (Faculty of Economy) for the organization of a thematic round table about the future prospects of education and science in Serbia. The ACHE found the initiative as very useful and suggested that it should be carried out in the period spring-summer of the next year as a series of round table discussions.

# DEPARTMENT OF CHEMICAL AND BIOLOGICAL SCIENCES

## PHYSICAL CHEMISTRY

### Project: **THEORETICAL INVESTIGATION OF THE VIBRONIC INTERACTION IN TETRA-ATOMIC MOLECULES**

(Academician Miljenko Perić)

A variational method for quantum chemical *ab initio* handling of the vibronic and spin–orbit coupling in molecules with linear equilibrium geometry has been developed.

### Project: **ELECTROCATALYSIS IN CONTEMPORARY PROCESSES OF ENERGY CONVERSION**

(Academician Slavko Mentus)

The scientific investigations were carried out in the laboratories of the Faculty of Physical Chemistry, with the participation of the researchers working on the project “Lithium-ion batteries and fuel cells-research and development”, mediated by the Faculty of Physical Chemistry, and headed by Prof. S. Mentus. According to the working plan for 2018, investigations were carried out of the intercalation processes from aqueous solutions, suitable for both cathode and anode materials. The investigations were expanded towards the nanodispersed carbon materials including metal-doped graphenes catalytically active in fuel cells, as well as towards nanodispersed carbon with high double layer capacitance.

---

Georgijević R., Vujković M., Gutić S., Alifendić M., Jugović D., Mitrić M., Mentus S., 2019: The influence of synthesis conditions on the redox behavior of LiFePO<sub>4</sub> in aqueous solution. **Journal of Alloys and Compounds**, 776, 475–485.

B. Kuzmanović, Vujković M., Tomic N., Bajuk-Bogdanović D., Lazović V., Šljukić B., Ivanović N., Mentus S., 2019: influence of oxygen vacancy concentration in nanodispersed non-stoichiometric  $\text{CeO}_{2\delta}$  oxides on the physico-chemical properties of conducting polyaniline/ $\text{CeO}_2$  composites. **Electrochimica Acta**, 306, 506–515.

Gutić S. J., Šabanović M., Metarapi D., Pašti I. A., Korać F., Mentus S. V., 2019: Electrochemically Synthesized Ni@reduced Graphene Oxide Composite Catalysts for Hydrogen Evolution in Alkaline Media – the Effects of Graphene Oxide Support. **International Journal of Electrochemical Science**, 14, 8532–8543.

Pašti I. A., Dobrota A. S., Gavrilov N. M., Ćirić-Marjanović G., Mentus S. V., 2019: Effects of alkali metal cations on oxygen reduction on N-containing carbons viewed as the interplay between capacitive and electrocatalytic properties: Experiment and theory. **Journal of the Serbian Chemical Society**, 84 (8), 901–914.

---

## CHEMISTRY

### Project: **CHEMICAL REACTIVITY AND BIOACTIVITY OF NATURALLY OCCURRING QUINONES AND HYDROQUINONES AND THEIR DERIVATIVES**

(Academician Miroslav J. Gašić)

The project of Academician Miroslav Gašić was not operative due to his health condition. Therefore, pursuant to the project leader's decision, the earmarked funds were rechannelled into the strategic project "The Synthesis and Application of New Chemotherapeutics Based on Natural Products and Metal Complexes" (project leader: Academician Bogdan Šolaja) and completely and adequately used.

## RESEARCHES IN MATHEMATICAL CHEMISTRY

(Academician Ivan Gutman)

In the plan for the year 2019, we pointed out four directions of intended research. Due to health issues, mainly earlier started works were completed and published. Here we mention those results that were published in 2019.

a) Papers 4, 8, and 9 are studies of graph energy and related graph-spectrum-based quantities. Reference 1 is a book on graph energies.

b) Papers 2, 3, 6, 7, and 8 are concerned with investigations of chemically interesting graph invariants, especially those related to distance and vertex degrees.

c) Paper 5 is concerned with a certain graph-theoretical topic.

1. Gutman I., Furtula B., 2019: **Energies of Graphs - Survey, Census, Bibliography**. Centar za naučno-istraživački rad SANU, Univerzitet u Kragujevcu, Kragujevac.
2. Gutman I., Rodrigues J. M., Sigarreta J. M., 2019: Linear and non-linear inequalities on the inverse sum indeg index. **Discrete Applied Mathematics**, 258, 123–134.
3. Furtula B., Gutman I., Matejić M., Milovanović E., Milovanović I., 2019: Some new lower bounds for augmented Zagreb index. **Journal of Applied Mathematics and Computing**, 61, 405–415.
4. Gutman I., 2019: Oboudi-type bounds for graph energy. **Mathematics Interdisciplinary Research**, 4, 151–155.
5. Abdo H., Dimitrov D., Gutman I., 2019: Graph irregularity and its measures. **Applied Mathematics and Computation**, 357, 317–324.
6. Yurtas A., Togan M., Loksha V., Cangul I. N., Gutman I., 2019: Inverse problem for Zagreb indices. **Journal of Mathematical Chemistry**, 57, 609–615.
7. Ali A., Zhong L., Gutman I., 2019: Harmonic index and its generalizations: Extremal results and bounds. **MATCH Communications in Mathematical and in Computer Chemistry**, 81, 249–311.
8. Das K. C., Gutman I., 2019: Comparing Laplacian energy and Kirchhoff index. **MATCH Communications in Mathematical and in Computer Chemistry**, 81, 419–427.
9. Akbari S., Ghodrati A. H., Gutman I., Hosseinzadeh M. A., Konstantinova E. V., 2019: On path energy of graphs. **MATCH Communications in Mathematical and in Computer Chemistry**, 81, 465–470.

### Project: **VIEW INTO MOLECULES THAT CHANGE THE WORLD**

(Academician Živorad Čeković)

In this project we work on the popularization of chemical sciences, chemical products and materials which have wide applications in industry and everyday life. We focus on pharmaceutical products and drugs, as well as on methods of their production by synthetic procedures or isolation from the natural materials.

### Project: **NEW BIOACTIVE MOLECULES BASED ON NATURAL PRODUCTS**

(Academician Bogdan Šolaja)

In 2019, studies aimed at finding inhibitors of *Leishmania infantum* and *L. tropica* were extensively studied, as well as MOA of our own Ebola inhibitor.



The activity of 30 compounds of aminoquinoline origin was analyzed in detail regarding their potential as a possible anti-leishmania drug. Ten compounds showed IC<sub>50</sub> values <1  $\mu$ M against the promastigote phase of *L. infantum* and *L. tropica*, and five compounds showed IC<sub>50</sub> values <1  $\mu$ M against the intramacrophage of *L. infantum* amastigote. The two compounds showed remarkable reduction of the parasite *in vivo*, with the demonstrated advantage of short drug action (which reduced the possibility of resistance). These are the first examples of 4-amino-7-chloroquinoline derivatives active against mice infected with the *Leishmania infantum* parasite.

There is currently no approved vaccine or cure for Ebola virus. Based on our previous research results, we have synthesized two groups of compounds that could reasonably be assumed to have antiviral activity – 4,10-diazahrizene derivatives and 1,5-naphthyridine. In initial *in vitro* screening, two compounds, ZS48 and ZSML08, stood out in particular. These two diazachrysene derivatives also protected 9/10 and 10/10, respectively, infected mice at a dose of 10 mg / kg in an *in vivo* assay. Furthermore, we have found that the compounds inhibit the virus entry into the cell by affecting the host cell itself, in a manner not previously known in the literature.

Examining MOA, among other details, using electron microscopy, we found that our inhibitors ZSML08 and ZS48 have two effects on the acidic compartments of the host cell of the virus. Treatment of cells with diazachrysene leads to increase in the number and volume of endosomes / lysosomes compared to controls. In the early stages of infection in the presence of ZSML08, the VSV-EBOV-GFP virus surrogate accumulates, indicating that the presence of the compound leads to the “capture” of the virus.

Our Ebola inhibitors have proven to be valuable and unique.

---

Selaković Ž., Tran J. P., Kota K. P., Lazić M., Retterer C., Besh R., Panchal R. G., Soloveva V., Sean V. A., Jay W. B., Pavić A., Verbić T., Vasiljević B., Kuehl K., Duplantier A. J., Bavari S., Mudhasani R., Šolaja B. A., 2019: Second generation of diazachrysenes: Protection of Ebola virus infected mice and mechanism of action. **European Journal of Medicinal Chemistry**, 162, 32–50.

Manzano J. I., Konstantinović J., Scaccabarozzi D., Perea A., Pavić A., Cavicchini L., Basilico N., Gamarro F., Šolaja B. A., 2019: 4-Aminoquinoline-based compounds as antileishmanial agents that inhibit the energy metabolism of *Leishmania*. **European Journal of Medicinal Chemistry**, 180, 28–40.

---

Project: **CHEMICAL CHARACTERISATION AND BIOLOGICAL ACTIVITY OF SECONDARY METABOLITES OF WILD-GROWING MEDICINAL PLANTS FROM THE CENTRAL BALKANS**

(Academician Slobodan Milosavljević)

Analysis of composition of  $\text{CH}_2\text{Cl}_2$  surface extract of leaves of *Amphoricarpos neumayeri* Vis. revealed 16 sesquiterpene lactones with guaianolide skeleton, so called amphoricarpolides, typical for the genus. Four of them were new derivatives and their structures were elucidated by detailed analyses of IR, NMR and MS data.

Enzymatic catalysed biotransformations (oxidations) of chalcone butein and aurone sulfuretin, isolated from *Cotinus coggygria* heartwood, using *Trametes versicolor* laccase revealed interesting dimeric products. Their structural study and evaluation of biological activities are in progress.

---

Novakovic M., Djordjevic I., Todorovic N., Trifunovic S., Andjelkovic B., Mandic B., Jadranin M., Vuckovic I., Vajs V., Milosavljevic S., Tesevic V., 2019: New aurone epoxide and auronolignan from the heartwood of *Cotinus coggygria* Scop. **Journal of Natural Products Research**, 33, 2837–2844.

---

Project: **THE DEVELOPMENT OF NEW SYNTHETIC METHODS AND THEIR APPLICATION IN SYNTHESIS OF NATURAL PRODUCTS AND BIOLOGICALLY ACTIVE COMPOUNDS**

(Academician Radomir N. Saičić)

The paper on the newly-developed cyclization of oxyallyl cation was submitted for publishing. The reviewers' opinion was positive, but they suggested acquiring some additional data, in order to clarify the reaction mechanism. Therefore, within a time-frame granted by the editor, we performed a series of experiments and fulfilled the reviewers' requests. After this additional effort, the paper was accepted for publishing in the top international scientific journal (*Organic Letters*, Organic chemistry 2/52).

In the report for 2018, I stated to have successfully accomplished the total synthesis of hippolachnin A, as well as of another natural product with a similar structure – (-)-gracilioether F. Unfortunately, it turned out that these results were not valid. Namely, we found out that Luka Novković, a teaching assistant at the Faculty of Chemistry and a PhD student in charge of this project, falsified the results, and that he actually did not accomplish the syntheses of any of the two compounds. We started working on the enantioselective synthesis of cedrene – a natural sesquiterpene representing the odoral principle of

the cedaroil. The planned synthesis should be one of the shortest (i. e. most efficient) enantioselective syntheses of this compound, and could be applicable in the synthesis of the structural analogues.

We continued our work on the synthesis of waihoensene – a tetracyclic terpene of complex structure, isolated from a New Zealand conifer, a compound that has been indicated as one of the ultimate contemporary synthetic challenges. We made an advancement in the construction of the precursor for the sequential cyclization – a pivotal step that was poised to allow a highly efficient construction of the tetracyclic core, with the control of stereochemistry of the four contiguous quaternary centers.

---

Trajkovic M., Ferjancic Z., Saicic R. N., Bihelovic F., 2019: Enantioselective synthesis of the platensimycin core by silver(I)-promoted cyclization of  $\Delta^6$ - $\alpha$ -Iodoketone. **Chemistry – A European Journal**, 25, 4340–4344.

Vulovic B., Trmcic M., Matovic R., Saicic R. N., 2019: Cyclization reactions of oxyallyl cation. A method for cyclopentane ring formation. **Organic Letters**, 21, 9618–9621.

---

## Project: METAL COMPLEXES AS POTENTIAL THERAPEUTIC AGENTS

(Corresponding Member Miloš I. Đuran)

The influence of different silver(I) salts and reaction conditions (molar ratio of reactants, time, temperature and solvent) on the nature of silver(I) complexes containing 4,7-phenanthroline ligand (4,7-phen) were investigated. It was found that the reactions between AgX (X = NO<sub>3</sub><sup>-</sup>, CF<sub>3</sub>COO<sup>-</sup> and BF<sub>4</sub><sup>-</sup>) and 4,7-phen in a 2 : 1 mole ratio and methanol/acetone solvent at room temperature resulted in the formation of the following polynuclear complexes, [Ag(NO<sub>3</sub>)(4,7-phen)]<sub>n</sub>, [Ag(CF<sub>3</sub>COO)(4,7-phen)]<sub>n</sub> and {[Ag<sub>2</sub>(H<sub>2</sub>O)(4,7-phen)<sub>2</sub>](BF<sub>4</sub>)<sub>2</sub>]<sub>n</sub>. However, the reactions of 4,7-phen with AgClO<sub>4</sub> and AgSbF<sub>6</sub>, performed by mixing equimolar amounts of the reactants in ethanol at room temperature, produced polynuclear [Ag(ClO<sub>4</sub>)(4,7-phen)]<sub>n</sub> and dinuclear [Ag<sub>2</sub>(H<sub>2</sub>O)<sub>0.58</sub>(4,7-phen)<sub>3</sub>](SbF<sub>6</sub>)<sub>2</sub> complexes. All these complexes were characterized by different spectroscopic and electrochemical measurements. The molecular structure of these complexes was confirmed with single-crystal X ray diffraction analysis. *In vitro* antimicrobial activity of these complexes was evaluated against a panel of microbial strains. The investigated complexes showed selectivity towards *Candida* spp. in comparison to the tested bacteria and effectively inhibited the growth of four different *Candida* species, particularly of *C. albicans*.

strains. In order to evaluate the therapeutic potential of the complexes, *in vivo* toxicity studies have been conducted in the zebrafish model.

The reaction between AgX salt ( $X = CF_3SO_3^-$  and  $PF_6^-$ ) and 4,7-phen in 1 : 2 molar ratio, respectively, in methanol/acetone at room temperature leads to the formation of new polynuclear silver(I) complexes,  $[Ag(CF_3SO_3)(4,7-phen)(CH_3CN)]_n$  and  $[Ag(PO_2F_2)(4,7-phen)]_n$ . The characterization of the complexes was established on the basis of IR and NMR ( $^1H$  and  $^{13}C$ ) spectroscopic techniques, while their crystal structures were determined by single-crystal X-ray diffraction analysis.

Three new dinuclear Pd(II) complexes with general formula  $[ \{ Pd(en)Cl \}_2(\mu-L)](NO_3)_2$  (L is bridging ligand quinoxaline, quinazoline and phthalazine) were synthesized and characterized by different spectroscopic techniques. The interaction of the investigated dinuclear complexes with calf thymus DNA has been monitored by viscosity measurements, UV-Vis and fluorescence emission spectroscopy. *In vitro* antiproliferative and apoptotic activities of the dinuclear Pd(II) complexes have been tested on colorectal and lung cancer cell lines.

The reactions of two aromatic nitrogen-containing heterocyclic ligands differing in the position of nitrogen atoms, 4,7- and 1,7-phenanthroline (1,7-phen), with  $CuX_2$  salts ( $X = NO_3^-$  and  $CF_3SO_3^-$ ) have been investigated. In the reactions between  $CuX_2$  and 4,7-phen two copper(II) complexes,  $[Cu(NO_3)_2(4,7-Hphen)_2](NO_3)_2$  and  $[Cu(CF_3SO_3)(4,7-phen)_2(H_2O)_2]CF_3SO_3$  have been synthesized and characterized. However, in the reactions between 1,7-phen and these two copper(II) salts, only 1,7-Hphen $NO_3$  and 1,7-Hphen $CF_3SO_3$  products were obtained. The final products of these reactions were characterized by different spectroscopic methods and X-ray crystallography. *In vitro* antimicrobial and cytotoxic properties of 4,7-phen-Cu(II) complexes were evaluated against a panel of microbial strains and healthy human lung fibroblast cell line (MRC-5).

---

Pavic A., Savić N. D., Glišić B. Đ., Crochet A., Vojnovic S., Kurutos A., Stanković D. M., Fromm K. M., Nikodinovic-Runic J., Djuran M. I., 2019: Silver(I) complexes with 4,7-phenanthroline efficient in rescuing the zebrafish embryos of lethal *Candida albicans* infection. **Journal of Inorganic Biochemistry**, 195, 149–163. doi: 10.1016/j.jinorgbio.2019.03.017

Stanojević I. M., Savić N. D., Crochet A., Fromm K. M., Djuran M. I., Glišić B. Đ., 2019: Synthesis and structural analysis of polynuclear silver(I) complexes with 4,7-phenanthroline. **Journal of the Serbian Chemical Society**, 84 (7), 689–699. doi: 10.2298/JSC190226024S

Franich A. A., Živković M. D., Čočić D., Petrović B., Milovanović M., Arsenijević A., Milovanović J., Arsenijević D., Stojanović B., Djuran M. I., Rajković S., 2019: New dinuclear palladium(II) complexes with benzodiazines as bridging ligands:

interactions with CT-DNA and BSA, and cytotoxic activity. **Journal of Biological Inorganic Chemistry**, 24, 1009–1022. doi: 10.1007/s00775-019-01695-w

Stevanović N. Lj., Andrejević T. P., Crochet A., Ilic-Tomic T., Drašković N. S., Nikodinovic-Runic J., Fromm K. M., Djuran M. I., Glišić B. Đ., 2019: Different coordination abilities of 1,7- and 4,7-phenanthroline in the reactions with copper(II) salts: structural characterization and biological evaluation of the reaction products. **Polyhedron**, 173, 114112. doi: 10.1016/j.poly.2019.114112

## Project: **DEVELOPMENT AND BIOMEDICINAL EVALUATION OF POTENTIAL ANTITUMOUR AGENTS**

(Corresponding Member Velimir Popsavin)

The influence of different silver(I) salts and reaction conditions (molar ratio of reactants, time, temperature and solvent) on the nature of silver(I) complexes containing 4,7-phenanthroline ligand (4,7-phen) were investigated. It was found that the reactions between AgX ( $X = \text{NO}_3^-$ ,  $\text{CF}_3\text{COO}^-$  and  $\text{BF}_4^-$ ) and 4,7-phen in a 2 : 1 mole ratio and methanol/acetone solvent at room temperature resulted in the formation of the following polynuclear complexes,  $[\text{Ag}(\text{NO}_3)(4,7\text{-phen})]_n$ ,  $[\text{Ag}(\text{CF}_3\text{COO})(4,7\text{-phen})]_n$  and  $\{[\text{Ag}_2(\text{H}_2\text{O})(4,7\text{-phen})_2](\text{BF}_4)_2\}_n$ . The reaction between AgX salt ( $X = \text{CF}_3\text{SO}_3^-$  and  $\text{PF}_6^-$ ) and 4,7-phen in 1 : 2 molar ratio, respectively, in methanol/acetone at room temperature leads to the formation of new polynuclear silver(I) complexes,  $[\text{Ag}(\text{CF}_3\text{SO}_3)(4,7\text{-phen})(\text{CH}_3\text{CN})]_n$  and  $[\text{Ag}(\text{PO}_2\text{F}_2)(4,7\text{-phen})]_n$ . The characterization of the complexes was established on the basis of IR and NMR ( $^1\text{H}$  and  $^{13}\text{C}$ ) spectroscopic techniques, while their crystal structures were determined by single-crystal X-ray diffraction analysis.

Three new dinuclear Pd(II) complexes with general formula  $[\{\text{Pd}(\text{en})\text{Cl}\}_2(\mu\text{-L})](\text{NO}_3)_2$  (L is bridging ligand quinoxaline, quinazoline and phthalazine) were synthesized and characterized by different spectroscopic techniques. The interaction of the investigated dinuclear complexes with calf thymus DNA has been monitored by viscosity measurements, UV-Vis and fluorescence emission spectroscopy.

The reactions of two aromatic nitrogen-containing heterocyclic ligands differing in the position of nitrogen atoms, 4,7- and 1,7-phenanthroline (1,7-phen), with  $\text{CuX}_2$  salts ( $X = \text{NO}_3^-$  and  $\text{CF}_3\text{SO}_3^-$ ) have been investigated.

---

Kovačević I., Popsavin M., Rodić M. V., Kojić V., Popsavin V., 2019: Asymmetric synthesis of the cytotoxic lactone (+)-cardiobutanolide and two novel analogues. **Tetrahedron Letters**, 60, 689–692. doi: <https://doi.org/10.1016/j.tetlet.2019.01.059>

Kojić V., Popsavin M., Spaić S., Jakimov D., Kovačević I., Svirčev M., Aleksić L., Srećo Zelenović B., Popsavin V., 2019: Structure based design, synthesis and in vitro antitumour activity of tiazofurin stereoisomers with nitrogen functions at the C-2' or C-3' positions. **European Journal of Medicinal Chemistry**, 183, 111712. doi: <https://doi.org/10.1016/j.ejmech.2019.111712>

---

**Project: EFFECTS OF ENVIRONMENTAL POLLUTION  
ON FOOD PROTEIN EXPRESSION AND MODIFICATIONS**

(Corresponding Member Tanja Ćirković Veličković)

Environmental molecules, such as, for example, heavy metals, organic pollutants and microplastics, are present in water, soil and air, and come into contact with food or particles we breathe in. In this way, environmental pollutants can indirectly or directly affect human health. This project is dedicated to environmental pollution effects on food quality and safety, as well as contemporary Omix analytical methods that can be applied to the characterization of changes caused by environmental pollutants in food molecules (proteins). The research was also focused on the development of proteomic methods that enable the monitoring of changes in protein profiles as well as food protein modifications in correlation with pollutant type and concentration.

During 2019, the research results showed that the heavy metal content in pollen could have a significant impact on protein profiles and protein and grass pollen allergen modifications.

Protein profile changes during thermal treatment also have an impact on protein treatment by digestive enzymes, which was shown by a peanut protein study. The impact of the presence of non-covalent interactions of food polyphenols with milk proteins (alpha-lactalbumin) on the protein structure and stability was shown in a study published in a highly reputed international journal (Al-Hanish A. et al.). This study was also selected to be published as a chapter in the *Encyclopedia of Food Chemistry* (Ćirković Veličković T. et al.). The results were also presented at the meeting of the Italian Proteomics Association and the GMBP conference in London in an invited lecture form.

---

Ćirković Veličković T., Stanić-Vucinić D., Al-Hanish A., Mihailović J., Prodić I., Minić S., Stojadinović M., Radibratović M., Milčić M., 2019: Delivery of Epigallocatechin-3-Gallate by Bovine Alpha-Lactalbumin Based on Their Non-covalent Interactions. In: **Encyclopedia of Food Chemistry**, Vol. 3, 118–124, Elsevier, Melton L., Shahidi F., Varela P. (Eds.). doi: 10.1016/B978-0-08-100596-5.22425-6

Prodić I., Smiljanić K. T., Simović A., Radosavljević J., Ćirković Veličković T. D., 2019: Thermal Processing of Peanut Grains Impairs Their Mimicked Gastro-

intestinal Digestion While Downstream Defatting Treatments Affect Digestomic Profiles. **Foods**. Vol. 8, 10. doi: 10.3390/foods8100463

Radibratovic M., Al-Hanish A., Minic S., Radomirovic M., Milcic M., Stanic-Vucinic D., Cirkovic Velickovic T., 2019: Stabilization of apo  $\alpha$ -lactalbumin by binding of epigallocatechin-3-gallate: Experimental and molecular dynamics study. **Food Chemistry**, 278, 388–395. doi: 10.1016/j.foodchem.2018.11.038

Smiljanic K. T., Prodic I., Apostolovic D., Cvetkovic A., Veljovic Dj. N., Mutic J. J., van Hage M., Burazer L. M., Cirkovic-Velickovic T. D., 2019: In-depth quantitative profiling of post-translational modifications of Timothy grass pollen allergome in relation to environmental oxidative stress. **Environment International**, 126, 644–658. doi: 10.1016/j.envint.2019.03.001

---

## BIOLOGY

### Project: **ADAPTIVE LIMITS OF POPULATION-GENETIC POLYMORPHISM**

(Academician Dragoslav Marinković)

The allozymic electrophoretical variation in 10-loci complex from the 2nd and 3rd chromosomes of *Drosophila melanogaster*, provides detailed information about a process that reduces a huge potential variability to a modest adaptive biological variation during the life cycle of individuals. The greatest reduction occurs as a selection for highly specific combinations of chromosomes that separate in anaphase of meiotic divisions giving to future gametic cells ( $< .01\%$ ). A great, though much smaller reduction occurs at the level of gametic selection that successfully produces viable zygotes ( $< 0.1\%$ ), and the lowest level of adaptive specialization occurs during ontogenesis to produce adult individuals. There is every reason to exist that gametes, not zygotes, should be assigned as the start of a new generation and the genomic basis of its formation, growth and development.

Additional data are accumulated (Marinković 1977, 2016, 2017, 2019) that support our new model explaining the variation of quantitative traits, compared to classical papers of Nilson-Ehle (1909), Emerson and East (1913), and others from the last century.

Our studies in the field of biomedicine are directed at the discovery of positive and deleterious effects of medicaments and chemical substances that are used in common practice, especially from developmental and genetic aspects. Pioneering work to spread and convey the basic principles of both in our scientific and educational environment is permanently ongoing.



Marinković D., 2019: A new model explaining the variation of quantitative traits. In: **Passion of Life** (Diego Bermejo, Coord.), Alianza editorial, Madrid, 105-118, 595–596.

Tubić J., Grujičić D., ..., Milošević-Djordjević O., 2019: Investigation of biological activities and secondary metabolites of *Hydnum repandum* acetone extract. **Farmacia**, Vol 67, 174–183.

Radović-Jakovljević M., Grujičić D., ..., Milošević-Djordjević O., 2019: Ethyl acetate extracts of two *Artemisia* species: Analyses of phenolic profile and anticancer activities against SW-480 colon cancer cells. **Natural Product Communications**, Vol 14 (5), doi: 10.1177/1934578X19843011

Kosanić M., ..., Grujičić D., Milošević-Djordjević O., 2019: *Craterellus cornucopioides* edible mushroom as source of biologically active compounds. **Natural Product Communications**, Vol 14 (5), doi: 10.1177/1934578X19843610

---

Project: **STUDY OF THE MODE OF INHERITANCE OF  
SUNFLOWER RESISTANCE TO THE NEW RACES OF  
BROOMRAPE (*OROBANCHE CUMANA* WALL)**

(Academician Dragan Škorić)

The program took place in two localities:

- Experimental field of VNIIMK, Rostov-on-Don, Russia,
- Laboratory of EDUCONS in Sremska Kamenica, Serbia.
- The area of Rostov-on-Don experienced a period of expressed drought, which negatively affected sunflower growth and caused broomrape emergence. For the mentioned reasons, the obtained results were not reliable. The trial will therefore be repeated next year.

**RAPD MARKER ANALYSES**

The DNA research previously conducted on sunflower plants continued in 2019. Sunflower broomrape resistance was tested in the trial conducted in 2016. Broomrape seeds (CO14) were collected in the area of Sombor.

Two phases of research are planned within the scope of the project:

1. Testing the polymorphism of RAPD primers to the DNA of the line susceptible to broomrape (H), and the hybrid resistant to broomrape (F<sub>1</sub>).



The polymorphism of 20 RAPD primers was analysed using PCR for the DNA of broomrape susceptible lines and the DNA of broomrape resistant hybrids.

2. Testing the polymorphism of RAPD markers in the  $F_2$  population of the hybrid developed by crossing a resistant hybrid and a susceptible line of sunflower ( $F_1 \times H$ ).

Primers 16 and 14, multiplying polymorphic RAPD markers between the susceptible line and the resistant hybrid, were tested in 20  $F_2$  plants, including the plants which exhibited different broomrape resistance levels. Broomrape seed germination was not observed in 15 of the tested  $F_2$  plants.

The scope of the research includes testing of primer 4 which also exhibited polymorphism between the susceptible line and the resistant hybrid. In case when RAPD marker enters cis/trans-isomeric state, further research will be proposed in order to include fragment re-amplification, refinement and sequencing, conversion of RAPD markers into SCAP markers, and verification of validity of sunflower genotypes with different levels of broomrape resistance.

If negative results are obtained using primer 4, further research will be proposed under the title: **Application of *Trichoderma* spp. in breeding for increased sunflower broomrape resistance.**

**Project: ECOLOGICAL AND GENETICAL STUDIES OF  
*DROSOPHILA* POPULATIONS FROM THE CENTRAL BALKANS**

(Academician Marko Anđelković)

Within population genetic studies of mtDNA variability in *D. subobscura* the data obtained from fitness experiments of mito-nucleus lines constructed from natural populations have been analysed. The results reveal that although some of the observed nucleotide differences in mtDNA may affect their host fitness and the observed pattern of variation is mostly influenced by neutral processes. Statistical analysis is done for data from mito-nuclear introgression lines of *D. subobscura* that were assayed for fitness components. Results reveal that sex-specific selection is not responsible for maintaining mito-nuclear variation in this species. Through DrosEU consortium additional specimens of *D. obscura* have been acquired from Finland, Germany and Scotland. Finnish specimens were haplotyped and they show similar pattern of variation as Balkan populations: one frequent haplotype and a series of divergent relict ones. Based on Cyt b sequence several isofemale lines of *D.*

obscura have been selected and the construction of mito-nuclear introgression lines within this species began. In collaboration with Dr. Dimitri Petrov from Stanford University (USA) the complete genome sequencing of two species from *Drosophila* genus was performed: the reference Kusunoki line for *D. subobscura* and the inbred line *D. obscura*. Individuals from natural populations of both species were sent for individual sequencing as well.

Population-eco-toxicology studies have been continued, aiming to reveal particular effects of heavy metals at genetic level in *D. subobscura*. The optimisation of protocols for gene expression was done with RNA samples isolated from *D. subobscura* frozen larvae, experimentally exposed to heavy metals. We tested designed primers through efficiency reactions and melting curves for five metallothionein genes (MtnA, Mtn B, Mtn C, Mtn D and Mtn E) and one reference gene that codes ribosomal protein (rpl32). First results indicate higher levels of Mtn E expression in the majority of short-term treatments, while for Mtn A specificity to copper was confirmed. One Master thesis was done within these studies.

---

Stamenkovic-Radak M., Kenig B., Djuracic M., Jelic M., Eric K., Andjelkovic M., 2019: Associations between environmental variability and inversion polymorphism of *Drosophila subobscura*: meta-analysis of populations from the Central Balkans. **Climate Research**, 77 (3), 205–217.

Erić P., Jelić M., Savić-Veselinović M., Kenig B., Anđelković M., Stamenković-Radak M., 2019: Nucleotide diversity of Cyt b gene in *Drosophila subobscura* Collin. **Genetika**, 51, 213–226.

Savić Veselinović M., Kurbalija Novčić Z., Kenig B., Jelić M., Patenković A., Tanasković M., Pertoldi C., Stamenkovic-Radak M., Andjelković M., 2019: Local adaptation at fine spatial scale through chromosomal inversions and mito-nuclear epistasis: Findings in *Drosophila subobscura* (Diptera: Drosophilidae). **European Journal of Entomology**, 116: 000-000, 2019. doi: 10.14411/eje.2019.proof

---

## Project: CHOROLOGICAL AND ECOLOGICAL PATTERNS OF OROPHYTIC FLORA DIFFERENTIATION IN SERBIA AND ADJACENT TERRITORIES OF THE CENTRAL BALKANS

(Academician Vladimir Stevanović)

This year, researches on the Project has achieved the following results:

1. Description of a new genus of *Hayekia* isolated from the species *Asyneuma comosiforme* from Albania;
2. The first record of the amphidraetic species *Stipa crassiculmis* subsp. *picentina* (Poaceae) for the Balkan Peninsula;

3. Analysis of distribution, ecology and determination of conservation status of steppe flora in Serbia;

4. Determining the taxonomic status and phylogeography of the species *Goniolimon tataricum* (Plumbaginaceae) and its relatives on the Balkan Peninsula.

**Project: STUDYING THE MOLECULAR MECHANISMS INVOLVED  
IN MAINTAINING PLURIPOTENCY AND DIFFERENTIATION  
OF STEM CELLS**

(Academician Milena Stevanović)

As the roles of the SOX genes in the development and regeneration of the peripheral nervous system have not yet been sufficiently investigated, we have analyzed the expression profile of SOXB proteins at the site of peripheral neurogenesis, at tissue sections of the olfactory epithelium isolated from healthy individuals. Immunohistochemical analysis have shown high expression of SOX2 and SOX21 proteins in neural stem cells/progenitors of the olfactory epithelium, whereas SOX3 protein expression was detected in cells at different stages of neural differentiation. The expression analysis of SOXB proteins in olfactory epithelium indicates an important role of these proteins in the regulation of peripheral nervous system neurogenesis.

The effect of hypoxia-induced stress on the properties of pluripotent cells was monitored *in vitro* by culturing NT2/D1 cells in the presence of cobalt chloride, a chemical inducer of hypoxia. The analysis showed time-dependent effect of hypoxia on the expression of SOX2 and OCT4 genes involved in maintaining cell pluripotency.

We have proceeded with the investigation of the roles of SOX genes in glioblastoma which represent the most aggressive and deadly types of malignant brain tumors. Having in mind that SOX18 protein plays significant role in lymphangiogenesis and vasculogenesis, we have analyzed the effects of modulated SOX18 gene expression on the characteristics of glioblastoma cells. Obtained results revealed that SOX18 protein is expressed in all analyzed glioblastoma cell lines.

Cisplatin-induced peripheral neuropathies are pathological conditions in which cells of peripheral nervous system are damaged in patients treated with this drug group. The neuropathies are one of the most common side effects of platinum-based chemotherapeutics, whose mechanisms of action, as well as ways of alleviating symptoms are still poorly understood.

Todorovic N., Micic B., Schwirtlich M., Stevanovic M., Filipovic D., 2019: Sub-region-specific Protective Effects of Fluoxetine and Clozapine on Parvalbumin Expression in Medial Prefrontal Cortex of Chronically Isolated Rats. **Neuroscience**, 396, 24–35. doi:10.1016/j.neuroscience.2018.11.008

Marjanovic Vicentic J., Drakulic D., Garcia I., Vukovic V., Aldaz P., Puskas N., Nikolic I., Tasic G., Raicevic S., Garros-Regulez L., Sampron N., Atkinson M. J., Anastasov N., Matheu A., Stevanovic M., 2019: SOX3 can promote the malignant behavior of glioblastoma cells. **Cellular Oncology**, 42, 41–54. doi: 10.1007/s13402-018-0405-5

Popović J., Klajn A., Paunesku T., Ma Q., Chen S., Lai B., Stevanović M., Woloschak G. E., 2019: Neuroprotective role of selected antioxidant agents in preventing cisplatin-induced damage of human neurons in vitro. **Cellular and Molecular Neurobiology**, 39, 619–636. doi: 10.1007/s10571-019-00667-7

Stanisavljevic D., Popovic J., Petrovic I., Davidovic S., Atkinson M. J., Anastasov N., Stevanovic M., 2019: Radiation effects on early phase of NT2/D1 neural differentiation in vitro. **International Journal of Radiation Biology**, 95 (12), 1627–1639. doi: 10.1080/09553002.2019.1665207. Epub 2019 Sep 16.

Project: **COMPARATIVE MORPHOLOGY AND MOLECULAR PHYLOGENY OF ERIOPHYOID MITES (ACARI: PROSTIGMATA, ERIOPHYOIDEA)**

(Academician Radmila Petanović)

This year, a new vagrant eriophyoid mite species of the archaic genus *Pentasetacus* (Schliesske 1985), *P. novozelandicus* Chetverikov & Petanović, is described with the aid of conventional microscopy, confocal laser scanning microscopy and scanning electron microscopy. It was found on *Araucaria heterophylla*, which is an araucarian that is endemic to Norfolk Island and introduced to New Zealand. Partial sequences of mitochondrial barcode COI gene and D1–D2 domains of nuclear rDNA of two pentasetacid mites, *P. araucariae* and *P. novozelandicus* n. sp. are provided. Molecular phylogenetic analyses of full-length D1–D2 eriophyoid sequences, including GenBank sequences and newly generated sequences of pentasetacids, confirmed the monophyly of Pentasetacidae. Two types of anal lobes are described in Eriophyoidea: (1) Eriophyidae s.l. and Phytoptidae s.l. have bilaterally symmetric lobes; (2) pentasetacids have non-divided lobes. A new vagrant eriophyoid mite species, *Setoptus tsugivagus* Chetverikov (Eriophyoidea, Phytoptidae, Nalepellinae, Nalepellini), was described from the needles of the western hemlock, *Tsuga heterophylla* (Rafinesque) Sargent (Pinaceae) in Vancouver, Canada.

Elements of the anal secretory apparatus (ASA) were observed in adults of *S. tsugivagus*, suggesting that the ASA is present in both major phylogenetic

lineages of Eriophyoidea (Eriophyidae s. l. and Phytoptidae s. l.). Therefore, this structure could be a synapomorphy for all Eriophyoidea. Molecular phylogenetic analyses of D2 28S rDNA sequences of the mites of the subfamily Nalepellinae confirmed monophyly of the tribe Nalepellini and retrieved *Setoptus* and *Nalepella* as polyphyletic.

Supplementary morphological descriptions of five *Cecidophyopsis* species collected in Europe are given: *Cecidophyopsis vermiformis* (Nalepa 1889) from *Corylus avellana* L. (Betulaceae), *C. hendersoni* Keifer, 1954, from *Yucca gigantea* Lem. (Asparagaceae), *C. verilicis* Keifer, 1939, from *Ilex aquifolium* L. (Aquifoliaceae), *C. psilaspis* Nalepa, 1898, from *Taxus baccata* L. (Taxaceae) and *C. malpighianus* Canestrini & Massalongo, 1893, from *Laurus nobilis* L. (Lauraceae). Males of *C. vermiformis*, *C. verilicis*, *C. hendersoni* and *C. malpighianus*, and immatures of *C. hendersoni* and *C. verilicis*, are described for the first time. *C. verilicis* are recorded for the first time in the fauna of Serbia and the European region.

---

Chetverikov P. E., Craemer C., Cvrković T., Efimov P. G., Klimov P. B., Petanović R. U., Sukhareva S. I., 2019: First pentasetacid mite from Australasian Araucariaceae: morphological description and molecular phylogenetic position of *Pentasetacus novozelandicus* n. sp. (Eriophyoidea, Pentasetacidae) and remarks on anal lobes in eriophyoid mites. **Systematic & Applied Acarology**, 24 (7), 1284–1309. <http://doi.org/10.11158/saa.24.7.12>

Chetverikov P. E., Desnitskaya E. A., Efimov P. G., Bolton S. J., Cvrković T., Petanović R. U., Zukoff S., Amrine J. W. Jr., Klimov P. B., 2019: The description and molecular phylogenetic position of a new conifer-associated mite, *Setoptus tsugivagus* n. sp. (Eriophyoidea, Phytoptidae, Nalepellinae). **Systematic & Applied Acarology**, 24 (4), 683–700. <http://doi.org/10.11158/saa.24.4.13> 683

Marinković S., Chetverikov P. E., Cvrković T., Vidović B., Petanović R. U., 2019: Supplementary description of five species from the genus *Cecidophyopsis* (Eriophyoidea: Eriophyidae: Cecidophyinae). **Systematic & Applied Acarology**, 24 (8), 1555–1578. <http://doi.org/10.11158/saa.24.8.15> 1555

---

## ACADEMIC COMMITTEE FOR STUDY OF FLORA AND VEGETATION IN SERBIA

(Academician Vladimir Stevanović)

The manuscript of the new edition of “Flora of Serbia 3” (Flora Srbije 3) was favourably peer-reviewed by MASA Academician Vlade Matevski and MASA Academician Vukić Puljević, so that its preparation for printing will soon begin. The manuscript of “Flora of Serbia 3” underwent small changes relative to the planned contents, which should have followed the previous edi-

tions. This is why the preparation of the manuscript for peer reviewing was prolonged. Namely, changes were made in compliance with a new phylogeny (APG III and IV), which included several new families, positioned in different orders according to the earlier Cronquist phylogeny that was applied in the previous edition of "Flora of SR Serbia I-VIII" (Flora Srbije I-VIII). The new edition of "Flora of Serbia 3" will encompass the following families and genera, including the number of species (given in parentheses) and authors.

Order Caryophyllales, continuation (10 families, 29 genera and 108 species)

Fam. Aizoaceae (genus *Tetragonia* – 1 species)

Fam. Cactaceae (genus *Opuntia* [1])

Fam. Portulacaceae (genus *Portulaca* [1])

Fam. Montiaceae (genus *Montia* [1])

Fam. Amaranthaceae – subfam. Amaranthoideae (genus *Amaranthus* [10])

Fam. Chenopodiaceae = Amaranthaceae – subfam. Chenopodioideae (genera *Polycnemum* (4), *Camphorosma* (2), *Salsola* (2) and *Sueda* (2)); *Beta* (1), *Bassia* (4) and *Corispermum* (2); *Dysphania* (4) and *Atriplex* (8); *Blitum* (2) and *Chenopodium* (13); *Salicornia* (1) –

Fam. Polygonaceae (genera *Koenigia* (1), *Persicaria* (7), *Bistorta* (2), *Polygonum* (6); *Rumex* (23); *Oxyria* (1); *Fallopia* (3) –; *Reynoutria* (2); *Fagopyrum* (2)

Fam. Plumbaginaceae – In the previous edition it was presented within the Plumbaginales order.

Fam. Droseraceae (genera: *Drosera* (1) and *Aldrovanda* (1). In the previous edition this family was included in the Saxifragales order – Flora of SR Serbia IV (Flora SR Srbije IV), 1972.

Fam. Tamaricaceae (*Tamarix* (2), *Myricaria* (1)). In the previous edition this family was included in the Tamaricales order – Flora of SR Serbia III (Flora SR Srbije III), pp. 400-405, 1972, B. Jovanović.

Thus, in the third volume of the new edition, the Caryophyllales order was completed according to the new phylogeny. After the Caryophyllales order there began the presentation of the Malpighiales order with two families - Hypericaceae and Elatinaceae.

Order Malpighiales

Fam. Elatinaceae (*Elatine* (6)

Fam. Hypericaceae (*Hypericum* (18)

The manuscript of the new edition of "Flora of Serbia 3" has 272 pages of text, 54 tables with drawings and distribution maps. Altogether, "Flora of Serbia 3" presents 132 species within 31 genera and 12 families.

The SASA published “A Critical List of Vascular Flora 1 – Lycopodiopsida, Equisetopsida, Polypodiopsida, Gnetopsida, Pinopsida and Liliopsida” (Kritička lista vaskularne flore 1 – Lycopodiopsida, Equisetopsida, Polypodiopsida, Gnetopsida, Pinopsida i Liliopsida), authored by Marjan Niketić and Gordana Tomović et al. The publication has 289 pages.

The SASA Committee for Serbia’s Flora and Vegetation and the SASA Branch in Niš organized a one-day scientific meeting to mark the 180th birth anniversary and 130th death anniversary of Sava Petrović, a full member of the Serbian Learned Society and corresponding member of the Serbian Royal Academy. On this occasion 6 invited lectures were delivered.

At the 13th Symposium on the Flora of Southeastern Serbia and Neighbouring Regions, Stara planina Mt., Serbia (Randelović V., Stojanović-Radić Z., Nikolić D. (eds.), held from 20 to 23 June 2019, the Committee members and their associates presented 13 statements, which were published in a summary form.

---

Koopman J., Niketić M., Więclaw H., Govaerts R., 2019: Nomenclatural and taxonomic notes on *Carex lazarei* nom. nov. (Cyperaceae). **Phytotaxa**, 422 (3), 295–297.

Raca I., Jovanovic M., Ljubisavljevic I., Juskovic M., Randelovic V., 2019: Morphological and leaf anatomical variability of *Crocus cf. heuffelianus* Herb. (Iridaceae) populations from the different habitats of the Balkan Peninsula. **Turkish Journal of Botany**, 43 (5), 645–658.

Nikolić D., Gocić D. J., Jušković M., Randelović V., 2019: Morphological differentiation of populations of *Bolboschoenus* taxa in Serbia. **Plant Biosystems - An International Journal Dealing with all Aspects of Plant Biology**, 1–15.

Gavrilović M., Jacas N. G., Susanna A., Marin P. D., Janačković P., 2019: How does micromorphology reflect taxonomy within the *Xeranthemum* group (Cardueae-Asteraceae)? **Flora**, 252, 51–61.

Janačković P., Gavrilović M., Rančić D., Dajić-Stevanović Z., Giweli A. A., Marin P. D., 2019: Comparative anatomical investigation of five *Artemisia* L. (Anthemideae, Asteraceae) species in view of taxonomy. **Brazilian Journal of Botany**, 42, 135–147.

Janković I., Šatović Z., Liber Z., Kuzmanović N., Di Pietro R., Radosavljević I., Nikolov Z., Lakušić D., 2019: Genetic and morphological data reveal new insights into the taxonomy of *Campanula versicolor* s.l. (Campanulaceae). **Taxon**, 68 (2), 340–369.

Novakovic M., Djordjevic I., Todorovic N., Trifunovic S., Andjelkovic B., Mandic B., Jadranin M., Vuckovic I., Vajs V., Milosavljevic S., Tesevic V., 2019: New aurone epoxide and auronolignan from the heartwood of *Cotinus coggygria* Scop. **Journal of Natural Products Research**, 33, 2837–2844.

Vestek A., Slovak M., Weiss-Schneeweiss H., Temsch E., Luković J., Kučera J., Anačkov G., 2019: Morpho-anatomical differentiation and genome size variation in three ploidy levels within the B<sup>7</sup> cytotype of *Prospero autumnale* (Hyacintha-



ceae) complex from the Balkan Peninsula and Pannonian Basin. **Plant Systematics and Evolution**, 305 (8), 597–609.

Radak B., Vliku A., Peškanov J., Matevski V., Anačkov G., 2019: Morphological characterization of three natural hybrid orchid taxa, new for Serbia, Montenegro and North Macedonia. **Archives of Biological Sciences**, 71 (4), 597–607.

Sabovljevic M. S., Vujicic M. M., Zivkovic S., Neric V., Sinzar-Sekulic J., Lang I., Sabovljevic A. D., 2019: Genetic diversity within selected European populations of the moss species *Atrichum undulatum* as inferred by the isozymes. **Wulfenia**, 26, 208–216.

Pantović J., Grdović S., Veljić M., Sabovljević M., 2019: Biogeographic traits of the bryophyte flora of Serbia. **Botanica Serbica**, 43 (2), 143–150. doi: 10.2298/BOTSERB1902143P

Papp B., Pantovic J., Sabovljevic M. S., 2019: Additions to the bryophyte flora of the Republic of Northern Macedonia. **Cryptogamie, Bryologie**, 40 (16), 197–204. doi: 10.5252/cryptogamie-bryologie2019v40a16<

Papp B., Pantovic J., Sabovljevic M. S., 2019: New additions to the bryophyte flora of Serbia. **Herzogia**, 32 (1), 154–158.

Stanković V., Kabaš E., Kuzmanović N., Vukojičić S., Lakušić D., Jovanović S., 2019: A suitable method for assessing invasibility of habitats in the Ramsar sites - an example of the southern part of the Pannonian Plain. **Wetlands**. doi: 10.1007/s13157-019-01227-x

## ACADEMIC COMMITTEE FOR THE STUDY OF THE FAUNA OF SERBIA

(Academician Radmila Petanović)

In 2019, the Proceedings from the scientific conference commemorating the 50<sup>th</sup> anniversary from the death of Academician Milutin Radovanović, held in 2018 at the SASA, were published. The papers presented the biography and extensive scientific work of academician Milutin Radovanović, which in various aspects was linked to contemporary research conducted by Serbian herpetologists and batrachologists. Matica Srpska published *Batrahološko-herpetološki rečnik srpskoga jezika – nazivi vodozemaca i gmizavaca* (*Batrachological and Herpetological Dictionary of the Serbian Language – Names of Amphibians and Reptiles*). The work of the Committee members in 2019, contributed, as in previous years, to the improvement of knowledge of the fauna of Serbia, systematization of several years of research of some groups and the popularization of the work on the study of the fauna. A research was carried out in the field of macroinvertebrates (macrozoobenthos) of aquatic ecosystems, as well as in the field of fisheries and aquaculture; the realization of the program of scientific educational polygon – “Mali Dunav” –



Centre for Fishery and Applied Hydrobiology within the Experimental Station “Radmilovac” (Faculty of Agriculture, University of Belgrade), within which a new part of the Center “The Settlement of Prehistoric Fishermen” was constructed. In 2019, the study of the ground beetles fauna of the Đerdap National Park and its surroundings continued, in connection with the project “Diversity of the beetle fauna of the Đerdap National Park and its surroundings”. A large part of the material for the monograph titled “The Fauna of Lepidoptera of the Republic of Serbia” has been prepared. This year, the realization of an extensive research plan for the insect fauna of high mountainous areas of the Republic of Serbia (Stara planina, Golija, Kopaonik, Tara, Beleg, Besna Kobila, Suva planina, Rtanj) continued.

---

Stojanović K., Živić M., Marković Z., Đorđević J., Jovanović J., Živić I., 2019: How changes in water quality under the influence of land-based trout farms shape chemism of the recipient streams – case study from Serbia. **Aquaculture International**, 27 (6), 1625–1641.

Božanić M., Marković Z., Živić M., Dojčinović B., Perić A., Stanković M., Živić I., 2019: Mouthpart Deformities of *Chironomus plumosus* Larvae Caused by Increased Concentrations of Copper in Sediment from Carp Fish Pond. **Turkish Journal of Fisheries and Aquatic Sciences**, Vol. 19, 3, 251–259.

Van Steenis J., Nedeljković Z., Tot T., Van der Ent L.-J., Van Eck A., Mazánek L., Šebić A., Radenković S., Vujić A., 2019: New records of hoverflies (Diptera: Syrphidae) and the rediscovery of *Primocerioides regale* Violoovitsh for the fauna of Serbia. **Biologica Serbica**, 41 (1), 94–103.

Ćurčić S., Vesović N., Lazović V., Pantelić D., Rađa T., 2019: A new troglobitic species of the genus *Leptomeson* Jeannel, 1924 (Coleoptera: Leiodidae: Cholevinae: Leptodirini) from the Island of Šolta (middle Dalmatia, Croatia). **Zootaxa**, 4711 (1), 193–200.

Ćurčić S., Pavićević D., Radović D., Vesović N., Bekchiev R., Ćurčić N., Guéorguiev B., 2019: Current and predicted distribution of the rare and threatened beetle *Bolbelasmus (Bolbelasmus) unicornis* (Coleoptera: Geotrupidae) in Serbia. **European Journal of Entomology**, 116, 413–424.

Mammola S., Cardoso P., Angyal D., Balázs G., Blick T., Brustel H., Carter J., Ćurčić S., Danflous S., Dányi L., Déjean S., Deltchev C., Elverici M., Fernández J., Gasparo F., Komnenov M., Komposch C., Kováč L., Kunt K. B., Mock A., Moldovan O., Naumova M., Pavlek M., Prieto C. E., Ribera C., Rozwálka R., Růžicka V., Vargovitsh R. S., Zaenker S., Isaia M., 2019: Continental data on cave-dwelling spider communities across Europe (Arachnida: Araneae). **Biodiversity Data Journal**, 7, e38492.

Petrović A., Tomanović Ž., Ferrer-Suay M., (2019) Charipinae (Hymenoptera: Figitidae) of Serbia – Distribution and trophic interactions. **Acta entomologica serbica**, 24 (1). doi: 10.5281/zenodo.3266840

Marinković S. Chetverikov P. E., Cvrković T., Vidović B., Petanović R. U., 2019: Supplementary description of five species from the genus *Cecidophyopsis* (Eriophyoidea: Eriophyidae: Cecidophyinae). **Systematic & Applied Acarology**, 24 (8), 1555–1578. <http://doi.org/10.11158/saa.24.8.15>

---

## ACADEMIC COMMITTEE “MAN AND THE ENVIRONMENT”

(Academician Marko Anđelković)

The most significant activity of the SASA Committee on “Man and the Environment” was the organization of a symposium on “The Environmental Impact of Small Hydropower Plants in Serbia” (Uticaj malih hidroelektrana na životnu sredinu u Srbiji).

The use of renewable energy sources began in accordance with the Energy Law. Small hydropower plants are also such an energy source. Due to their popularity, they will be widely used for power generation. The Committee members pointed to the real danger of the negative environmental impacts of small hydropower plants. Therefore, the symposium was held with an aim to more realistically and more precisely assess the direct and indirect environmental impacts of the extensive use of this energy source in Serbia and propose adequate solutions.

The Symposium was held at the SASA Grand Hall on 5 June 2019. At the opening ceremony the speeches were delivered by the President of SASA, Academician Vladimir Kostić, Dr. Goran Trivan, Minister of Environmental Protection, and the President of the Committee, Academician Marko Anđelković. Eight papers were presented and the lecturers were experts in the relevant engineering and biological disciplines. This gathering was open to the public, so that the presentation of papers was followed by a discussion. All papers were peer reviewed and, together with discussion texts, submitted for publication. The Organizing Committee formulated the conclusions of the Symposium that will also be printed.

The Committee members carried out research and expert work dealing with the Committee issues in their parent scientific institutions.

**ACADEMIC COMMITTEE FOR THE RESEARCH  
ON LIVES AND WORK OF SERBIAN SCIENTISTS IN SERBIA  
AND OF SERBIAN ORIGIN SCIENTISTS OUTSIDE SERBIA**

(Academician Vladan Đorđević)

The 17th volume of the Series including the essays about 12 scientists was prepared and submitted to the SASA Publishing Section for further action:

1. Vladimir Jakšić (1824–1899)
2. Milan Jovanović Morski (1843–1896)
3. Jovan Danić (1854–1924)
4. Dobrivoje Božić (1885–1967)
5. Dragoljub Jovanović (1891–1970)
6. Simo Milošević (1896–1943)
7. Živojin Bumbaširević (1920–2008)
8. Ivan Draganić (1924–2012)
9. Mileva Prvanović (1929–2016)
10. Mirko Milić (1932–1993)
11. Sava Perović (1937–2010)
12. Marko Vukobrat Jarić (1952–1997)

The authors enjoyed continuous support from the Committee in collecting the relevant materials. The consultations with the authors and peer reviewers were also continuously held.

New authors were also engaged in order to contribute to the following books of the Series.

**ACADEMIC COMMITTEE ON VILLAGE**

(Academician Dragan Škorić)

In 2019, the activities of the SASA Committee on Village included the organization of scientific and expert meetings with an aim to publicly promote rural and agricultural development.

At the Committee's initiative, an action project was launched in order to create the systemic conditions for the economic sustainability of family farms and the demographic revival of Serbian villages. It is realized by the Cabinet Office of the Minister in Charge of Regional Development and Coordination of Public Enterprises. The National Team for Rural Revival in Serbia was also formed. It is headed by Minister Milan Krkobabić and Academician Dragan

Škorić. The National Team includes all Committee members who actively participate in developing the National Rural Revival Strategy.

The activities related to the project titled “500 Cooperatives in 600 Villages” (500 zadruga u 500 sela) were continued. Together with Minister Milan Krkobabić, 54 settlements in Serbia were visited and, as a result, more than 600 cooperatives were formed.

The Committee organized a round table on “The System of Cooperatives and Rural Self-Government in Serbia” at the SASA on 23 May 2019. The invited participants gave an expert opinion on the significant aspects of the “500 Cooperatives in 500 Villages” action project.

From 28 to 29 October, Banja Koviljača hosted the scientific meeting on “Rational Land and Water Use in Serbia” where 16 papers were presented. Their aim was to present lands and waters as the lasting value for all generations (past, present and future) and point to the models of their rational use in renewable form.

In 2019, the scientific meeting proceedings were also published and solemnly presented:

- On 19 February, “Water Supply of the Population in Hilly and Mountainous Regions” and “Ethno-Villages and Rural Environmental Entities in the Republic of Serbia and the Republic of Srpska”.
- On 24 September, “Renewable Use of Natural Resources in the Rural Regions in Serbia”.



# DEPARTMENT OF TECHNICAL SCIENCES

## Project: **NUMERICAL TECHNIQUES AND DATA BASES FOR DEVELOPMENT OF PLASMA TECHNOLOGIES WITH APPLICATIONS IN MICROELECTRONICS AND NANOTECHNOLOGIES**

(Academician Zoran Petrović)

We finalized a paper on the transport theory of a higher order in 2019, which was submitted and accepted. We continued working on cross sections and transport data for ions  $\text{CF}_3^+$ , in  $\text{CF}_4$ . The paper was published in 2019 in a leading journal. We finalized the work on the transport of electrons and positrons in liquid xenon.

During 2019 we modelled the cooling of the surrounding vessel on thermalization of positrons in a Surko trap. This was extended by the initiation of the work on diffusion heating during thermalization of positrons in neon due to the Ramsauer -Townsend minimum.

Five papers were published in total, and two papers were funded by the project, as well as five invited lectures, although participants delivered a much larger number of presentations at conferences.

---

Jovanović J. V., Stojanović V., Raspopović Z. M., de Urquijo J., Petrović Z. Lj., 2019: A set of cross sections and transport coefficients for  $\text{CF}_3^+$  ions in  $\text{CF}_4$ . **Plasma Sources Science and Technology**, 28, 045006.

Simonović I., Garland N. A., Bošnjaković D., Petrović Z. Lj., White R. D., Dujko S., 2019: Electron transport and negative streamers in liquid xenon. **Sources Science and Technology**, 28, 015006

<https://doi.org/10.1088/1361-6595/aaf968>

Puač M., Marić D., Petrović Z. Lj., 2019: The Effect of Attachment on RF Break-down. **22nd Symposium on Applications of Plasma Processes (SAPP XXII) and the 11th EU-Japan Joint Symposium on Plasma Processing**, 110–113.

---

Project: **PROBLEMS OF FORMULATING AND SOLVING  
MATHEMATICAL MODELS OF MOTION AND STABILITY  
AND SHAPE OPTIMIZATION OF ELASTIC  
AND VISCO-ELASTIC RODS**

(Academician Teodor Atanacković)

During 2019, we worked on the problems of heat conduction and motion of viscoelastic bodies described by constitutive equations containing fractional derivatives or real and complex order. We published the following papers:

---

Atanackovic T. M., Konjik S., Pilipovic S., 2019: Variational problems of Her-  
glotz type with complex order fractional derivatives and less regular Lagrangian.  
**Acta Mechanica**, 230, 4357–4365. doi: 10.1007/s00707-019-02521-9

Atanackovic T. M., 2019: The tallest column problem: New first integrals and  
estimates. **Comptes Rendus Mechanique**, 347, No. 9, 626–631.

Atanackovic T. M., Oparnica Lj., Zorica D., 2019: Bifurcation analysis of the ro-  
tating axially compressed nano-rod with imperfections. **ZAMM, Zeitschrift für  
Angewandte Mathematik und Mechanik**, 99, No. 7, 1–20.

Atanackovic T. M., Janev M., Pilipovic S., 2019: Wave equation in fractional  
Zener-type viscoelastic media involving Caputo–Fabrizio fractional derivatives.  
**Meccanica**, 54, 155–167.

Atanackovic T. M., Konjik S., Pilipovic S., 2019: Variational principles with frac-  
tional derivatives. **Handbook of fractional calculus with Applications. Volume  
1: Basic Theory**. Series edited by J. A. Tenreiro Machado, 361–383, De Gruyter,  
Berlin/Boston.

Atanackovic T. M., Konjik S., Pilipovic S., 2019: Wave equation involving frac-  
tional derivatives of real and complex fractional order. **Handbook of fractional  
calculus with Applications. Volume 2: Fractional differential equations**. Series  
edited by J. A. Tenreiro Machado, 327–351, De Gruyter. Berlin/Boston.

---

Project: **DEVELOPMENT OF STRONGLY CORRELATED  
ELECTRON MATERIALS AND STRUCTURES**

(Academician Zoran V. Popović)

We studied the properties of a new class of iron-based materials with  
strongly correlated electrons. The research was primarily focused on the study  
of lattice dynamics, electron-phonon and spin-phonon interactions in FeSe  
[1],  $\text{Fe}_{3-x}\text{GeTe}_2$  [2] and  $\text{BaFe}_2\text{Se}_2\text{O}$  [3]. Of experimental techniques, Raman  
spectroscopy was used primarily in a wide range of temperatures. Samples

for these researches were provided by cooperation with Dr. Čedomir Petrović from the Brookhaven National Laboratory (USA), a foreign member of the SASA.

- 
1. Baum A., Ruiz H. N., Lazarević N., Wang Y., Böhm T., Ahangharnejhad R., Adelmann P., Wolf T., Popović Z. V., Moritz B., Devereaux T. P., Hackl R., 2019: Frustrated spin order and stripe fluctuations in FeSe. **Communications physics**, 4, 14. <https://doi.org/10.1038/s42005-019-0107-y> | [www.nature.com/commsph](http://www.nature.com/commsph)
  2. Milosavljević A., Šolajić A., Djurdjić-Mijin S., Pešić J., Višić B., Liu Y., Petrović C., Lazarević N., Popović Z. V., 2019: Lattice dynamics and phase transitions in  $\text{Fe}_{3-x}\text{GeTe}_2$ . **Physical Review B**, 99, 214304.
  3. Jin F., Lazarević N., Liu Ch., Ji J., Yi. W., He Sh., Lei H., Petrovic C., Yu R., Popović Z. V., Zhang Q., 2019: Phonon anomalies and magnetic excitations in  $\text{BaFe}_2\text{Se}_2\text{O}$ . **Physical Review B**, 99, 144419.
- 

## Project: NUMERICAL SIMULATION OF ELECTROMAGNETIC FIELDS

(Academician Antonije Đorđević)

The first topic of investigation was the optimization of nonuniform helical antennas. Various dependencies of the turn radius and pitch angle on the axial coordinate were considered. The simplest, linear dependencies were found to be sufficient for most practical applications. The second topic was measurement of dielectrics using a proprietary coaxial chamber. The construction of the chamber and the data processing were improved. The method was used to investigate the influence of mechanical activation on properties of ceramic materials. The third topic was the localization of field sources using sparse imaging. The method was applied to combined point sources, whereby the electric and magnetic fields were measured on the line bounding the area of possible source locations.

- 
- Dinkić J., Olćan D., Đorđević A., 2019: Comparison of various geometries of nonuniform helical antennas. **IcETRAN 2019**, Srebrno jezero, Serbia, June 3–6, 2019, 89–92.
- Obradović N., Đorđević A., 2019: Influence of mechanical activation on electrical properties of ceramic materials in VHF band (invited paper). **IcETRAN 2019**, Srebrno jezero, Serbia, June 3–6, 2019, 636–645.
-



Project: **MICRO- AND NANOSENSORS BASED ON RESONANT STRUCTURES OR RESISTANT THIN-LAYERED STRUCTURES AND ADSORPTION-DESORPTION PROCESSES**

(Academician Zoran Đurić)

We performed research of chemical/biological adsorption sensors and perovskite solar cells. Expressions for the signal-to-noise ratio and the minimum detectable concentration as a function of the mass transfer coefficient in the sensors microfluidic chamber were derived. The analysis showed that slow mass transfer can significantly degrade sensor performance. As part of the theoretical modeling and analysis of solar cells based on perovskite materials, expressions have been derived for the conversion efficiency, taking into account interference effects. The expressions for optical flux and quantum efficiency of perovskite solar cells with resonant structure have been also derived. The aim is to achieve high efficiency of solar cells with reduced thickness of the active layer.

---

Jokić I., Radulović K., Frantlović M., Djurić Z., Cvetanović Zobenica K., Krstajić P. M., 2019: Analysis of the Fundamental Detection Limit in Microfluidic Chemical and Biological Sensors. **Proceedings 6th International Conference on Electrical, Electronic and Computing Engineering (IcETRAN 2019)**, June 3–6, 2019, Srebrno jezero, Serbia.

Jokić I., Djurić Z., Radulović K., Frantlović M., Krstajić P. M., 2019: Analysis of Intrinsic Stochastic Fluctuations of the Time Response of Adsorption-Based Microfluidic Bio/Chemical Sensors: the Case of Binary Mixtures. **Proceedings 31st International Conference on Microelectronics (MIEL 2019)**, September 16–18, 2019, Niš, Serbia.

---

Project: **COMPUTATIONAL INTELLIGENCE TECHNIQUES IN TRANSPORTATION ENGINEERING**

(Academician Dušan Teodorović)

One of the most important results of the project is the book *Quantitative Methods in Transportation*, written by Dušan Teodorović and co-authored by Assistant Professor Miloš Nikolić. The book will be published in 2020 by CRC Press/Taylor & Francis. The BCO technique was used for the development of the urban traffic control systems. The Multi-Criteria Model for traffic control at the isolated intersection was developed.

Project: **DEVELOPMENT OF SYSTEMS FOR ADVANCED  
REHABILITATION OF PERSONS WITH DISABILITY**

(Academician Dejan B. Popović)

The main activity was dedicated to the development and evaluation of a new gait assessment system. A prototype of shoe insoles with sensors has been developed. The characteristics of the sensors allow the recording results to be fully comparable to the results of measurements in professional gait laboratories. We continued studying the new methods for processing of signals from muscles (EMG), in relation with the doctoral dissertation of Ivan Topalović. We continued to improve the model and simulation of the movement of the lower leg in the so-called Pendulum test in relation with the doctoral dissertation of Antonina Aleksić. We combined the resources and intellectual capacity through the bilateral cooperation between Serbia and France (the Pavle Savić project) for further testing of the new sensory system (the results will be presented at the International conference and in a journal paper) The project included work on innovation, and this work was particularly advanced due to the efforts of Lana Popović Maneski.

---

Topalović I., Graovac S., Popović D. B., 2019: EMG map image processing for recognition of fingers movement. **Journal of Electromyography and Kinesiology**, 49, 102364.

Popović D. B., Popović Maneski L., 2019: The instrumented shoe insole for rule-based control of gait in persons with hemiplegia. **EasyChair Preprint**, 1345, <http://dais.sanu.ac.rs/handle/123456789/6981>

Džepina V., Gogić A., Popović D. B., 2019: Rules for Estimation of Gait Phases from Data Acquired by the Gait Teacher Insoles. **Proceedings 6<sup>th</sup> International Conference on Electrical, Electronic and Computing Engineering IcETRAN 2019**, Silver Lake, June 2019, 231–234.

---

Project: **PROPERTIES OF THIN AND ULTRATHIN OXIDE LAYERS**

(Academician Ninoslav Stojadinović)

The effect of  $\gamma$  radiation on the charge trapping and oxide properties of MIS capacitors with  $\text{HfO}_2/\text{Al}_2\text{O}_3$  dielectrics has been researched. The radiation doses applied (1 and 10 Mrad) increased the positive oxide charge of the structures, but did not affect changes in the density of interface states and leakage currents. Also, analytical model for NBT instabilities in p-channel power VDMOSFETs has been proposed. Because of the differences between static and pulsed NBT stress proposed model intent to apply to specific stress

signal, but also to be adaptable to different types of stress signal. Finally, the electrical characteristics and parameters of p-channel VDMOS power transistors, subjected to NBT and radiation stresses, have been analyzed depending on the applying of different measurement procedures.

---

Spasov D., Paskaleva A., Davidović V., Djorić-Veljković S., Stanković S., Stojadinović N., Ivanov Tz., Stanchev T., 2019: Impact of  $\gamma$  Radiation on Charge Trapping Properties of Nanolaminated  $\text{HfO}_2/\text{Al}_2\text{O}_3$  ALD Stacks. **Proceedings 31<sup>th</sup> International Conference on Microelectronics (MIEL)**, Niš, Serbia, September 16-18, 2019, 59–62. doi: 10.1109/MIEL.2019.8889600

Mitrović N., Danković D., Prijić Z., Stojadinović N., 2019: Modelling of  $\Delta V_T$  in NBT Stressed P-Channel Power VDMOSFETs. **Proceedings 31<sup>th</sup> International Conference on Microelectronics (MIEL)**, Niš, Serbia, September 16-18, 2019, 177–180. doi: 10.1109/MIEL.2019.8889584

---

## Project: NANOSTRUCTURES UNDER ENVIRONMENTALLY CONSTRAIN CONDITIONS

(Corresponding Member Velimir Radmilović)

Research in 2019. was focussed on: a) Pt based nanoparticles and Pt-Au alloys for electrocatalytic applications; The Pt-Au catalyst solid solution containing only ~4 at% of Au significantly influences oxidation of formic acid promoting direct path and suppressing indirect path, due to fine dispersioion of gold and small size of Pt-Au nanoparticles. b) Fabrication of organic-based perovskite solar cells, with Ag nanowires electrode, at low processing temperatures; The efficient infiltration of organic porous structures based on crystalline nanoparticles allows engineering efficient perovskite solar cells with enhanced thermal stability, good performance, and excellent lateral homogeneity. c)  $\text{Cu}^{2+}$  removal from aquatic solutions using electric arc furnace slag (EAFS) and alkali activated slag (AAS); It was found that alkali activation of EAFS leads to an increase in the specific surface and thus improves the sorption properties. The adsorption of  $\text{Cu}^{2+}$ , which occurs through formation of a Cu-complexes, proceeds via pseudo-second-order adsorption mechanism, and Langmuir isotherm model fits well the experimental data.

---

Hou Y., Xie C., Radmilović V. V., Puscher B., Wu M., Heumüller T., Karl A., Li N., Tang X., Meng W., Chen S., Osvet A., Guldi D., Spiecker E., Radmilović V. R., Brabec C. R., 2019: Assembling Mesoscale Structured Organic Interfaces in Perovskite Photovoltaics. **Advanced Materials**, 31, 1806516; doi.org/10.1002/adma.201806516

Krstajić Pajić M. N., Stevanović S. I., Radmilović V. V., Gavrilović-Wohlmuther A., Zabinski P., Elezović N. R., Radmilović V. R., Gojković S. Lj., Jovanović V.

M., 2019: Pt-Au/C Nanocatalyst Prepared by Water-In-Oil Microemulsion Method. **Applied Catalysis B: Environmental**, 243, 585–593. doi: 10.1016/j.apcatb.2018.10.064

Nikolić I., Marković S., Veselinović Lj., Radmilović V. V., Janković-Častvan I., Radmilović V. R., 2019: Enhanced sorption of  $\text{Cu}^{2+}$  from sulfate solutions onto modified electric arc furnace slag. **Materials Letters**, 235, 184–188. doi: 10.1016/j.matlet.2018.10.027

Radmilović V. V., Radmilović V. R., 2019: Defect Formation During Synthesis and Welding of Silver Nanowires For Solar Cell Applications. **Metallurgical and Materials Engineering**, 25, 287–299. doi: 10.30544/452

Nikolić I., Đurović D., Milašević I., Marković S., Veselinović Lj., Janković-Častvan I., Radmilović V. V., Radmilović V. R., 2019: Adsorption kinetics, equilibrium and thermodynamics of  $\text{Cu}^{2+}$  on pristine and alkali activated steel slag. **Chemical Engineering Communications**, 206. doi: 10.1080/00986445.2019.1685986

## Project: EFFICIENCY IMPROVEMENT IN WIND POWER PLANTS

(Corresponding Member Slobodan N. Vukosavić)

Wind power plants use electric generators, which are mostly synchronous permanent magnet machines or asynchronous machines. In order to increase efficiency and reliability, it is necessary to carry out an assessment of the state variables of the system. State variable can be obtained from the reference model and from the available measurements. Sufficient accuracy is feasible in cases where the transient phenomena satisfy PE-condition (*persistent excitation*), unavailable in many operating regimes. A new state estimator was developed, which allows operation in previously inaccessible regimes. Proposed estimator is accurate in all the regimes where the functions describing transient phenomena are *not* square integrable. This condition can also be fulfilled in cases where the PE condition is not satisfied. Developments of [1,2] have been applied on the DW2020 platform (industrial control system intended for wind turbines).

1. Yi B., Vukosavic S. N., Ortega R., Stankovic A. M., Zhang W., 2019: A Frequency Domain Interpretation of Signal Injection Methods for Salient PMSMs. 2019 **IEEE Conference on Control Technology and Applications (CCTA)**, Hongkong, August 19-21, 2019, 517–522.

2. Yi B., Vukosavic S. N., Ortega R., Stankovic A. M., Zhang W., 2019: A New Signal Injection-based Method for Estimation of Position in Salient Permanent Magnet Synchronous Motors. eprint **arXiv:1902.02430**, Feb. 2019, Bibcode: 2019arXiv190202430Y.

3. Petric I., Vukosavic S. N., 2019: High-performance speed estimation of induction machines based on adaptive filtering. **IET Electric Power Applications**, 10 pp, doi: 10.1049/iet-epa.2019.0609. Available online: 17 December 2019.

Project: **DEVELOPMENT OF TECHNOLOGICAL PROCEDURES  
FOR BIODIESEL PRODUCTION FROM BIORENEWABLE  
AND WASTE RAW MATERIALS**

(Corresponding Member Vlada Veljković)

In accordance with the planned activities, bio-renewable, natural and waste raw materials were applied as sources of glycerides or for the preparation of catalysts, which were then used for biodiesel production. Sunflower, white mustard, hemp, cotton thistle and sorghum seed oils, as well as plum kernel oil and waste lard, were used as glyceride sources for biodiesel production. It has been shown that these feedstocks can be significant for biodiesel production. Quicklime and ashes obtained from the combustion of corn cobs and cherry stones were used as catalysts in these reactions. All three catalysts were obtained from low-cost raw materials, which will have a positive impact on the cost of biodiesel production. The research of biodiesel production from waste lard using quicklime as a catalyst was the basis for the development of the process of biodiesel production at the laboratory level. Significant results were also achieved by using crude biodiesel and triethanolamine as cosolvents in the synthesis of fatty acid methyl and ethyl esters. In addition, the production of lactic acid by a *Enterococcus faecalis* strain and the extraction of polyphenols from black mustard seeds and lipids from the algal biomass by eutectic solvents were investigated. In total, four papers were published in international journals and one paper in a national journal of international importance, three papers were presented at an international conference and six papers at national conferences, of which two were published as a whole. Also, a technical solution was accepted by the Ministry of Education, Science and Technological Development.

---

Todorović Z. B., Troter D. Z., Đokić-Stojanović D. R., Veličković A. V., Avramović J. M., Stamenković O. S., Veselinović Lj. M., Veljković V. B., 2019: Optimization of CaO-catalyzed sunflower oil methanolysis with crude biodiesel as a cosolvent. **Fuel**, 237, 903–910. <https://doi.org/10.1016/j.fuel.2018.10.056>

Veljković V. B., Veličković A. V., Avramović J. M., Stamenković O. S., 2019: Modeling of biodiesel production: Performance comparison of Box–Behnken, face central composite and full factorial design. **Chinese Journal of Chemical Engineering**, 27, 1690–1698. <https://doi.org/10.1016/j.cjche.2018.08.002>

Ćirić J., Joković N., Ilić S., Konstantinović S., Savić D., Veljković V., 2019: Production of lactic acid by *Enterococcus faecalis* on waste glycerol from biodiesel production. **Chemical Industry and Chemical Engineering Quarterly**. <https://doi.org/10.2298/CICEQ191010033C>

Đokić-Stojanović D. R., Todorović Z. B., Troter D. Z., Stamenković O. S., Veselinović Lj. M., Zdujić M. V., Manojlović D. D., Veljković V. B., 2019: Tri-

ethanolamine as an efficient cosolvent for biodiesel production by CaO-catalyzed sunflower oil ethanolysis: An optimization study. **Hemijska Industrija**, 73 (6), 351–362. <https://doi.org/10.2298/HEMIND190822033D>

Avramović J. M., Veličković A. V., Veljković V. B., 2019: Challenges in biodiesel industry: Socio-economic, occupational health, and policy issues. **Safety Engineering**, 8 (2), 79–83. <https://doi.org/10.7562/SE2018.8.02.03>

---

## ACADEMIC COMMITTEE ON THE NATURAL AND TECHNICAL-TECHNOLOGICAL RESOURCES OF SERBIA

(Academician Zoran Đurić)

In 2019 the work on the development of the program document of the project entitled *Support to Science and Resource Development of Serbia* has been completed. This document currently defines water and energy resources of Serbia as priority areas.

Within the first priority area prof. Dr. Milan Dimkić held a lecture on December 10, 2019 in Hall 2 of the Palace of SASA on the topic “Water resources in Serbia: the state, processes, management and prospects.” The lecture was extremely well attended, and the presentation of prof. Milan Dimkić was attended by members of SASA, professors from the University of Belgrade and Novi Sad and two assistant ministers of the Ministry of Environmental Protection.

Link to this lecture is available at: <https://www.youtube.com/watch?v=qa7OE3UxB0A>.

Within the second area, special attention is paid to photovoltaic energy and its resources in Serbia. This is because European studies on the future energy and the unique European energy supply network predict that the share of photovoltaic installed power in Serbia will be higher than 50%. Appreciating the importance and perspective of this area, the Institute of Technical Sciences of SASA has formed a department for photovoltaic energy, and the laboratory is being equipped for modern technologies for making solar cells and for the characterization of solar cells and solar panels.

## COMMITTEE FOR ENERGY

(Corresponding Member Slobodan N. Vukosavić)

The Committee was engaged in advancing the integration of renewable sources in the national grid, studying and comparing wind-power and solar op-

tions, considering solutions for energy storage and analyzing the role nuclear power in transition of energy sector. Several well-attended lectures were organized, dedicated to energy transition, prospective of information technologies in power engineering, e-mobility, energy storage and the role of power electronics in electrical power systems. Lecturers from Serbia and abroad gave their considerations on energy transition, renewable sources, electric vehicles, power system stability and other problems related to Serbian energy sector.

Members of the Committee edited and published contributions and conclusions reached at the *Energy and Climate Change* conference, participated in organization of symposia and conferences *Energy, Power electronics* and *ETRAN*, participated in the *World Energy Congress* held in Abu Dhabi, provided consultancy assistance in drafting the *Fiscal Council Report of the Republic of Serbia* and made the first steps towards international cooperation of the Board with corresponding international organizations.

The Committee conceived the concept of the internet portal aimed to outline the relevant activities and standpoints. The main goal is providing a summary of the current status, prospective, problems and dilemmas of the national energy sector and making the relevant information apprehensible to the readers. Developments will begin with publishing relevant position papers, programs, outcomes and conclusions of the meetings, reports on recent activities, lecture abstracts and recommendations reached at the Board meetings and round tables. The Board took steps to organizing the round table on nuclear energy, envisaged to outline its role in energy transition, to gather the experts from Serbia, from the region and the world with the goal of identifying the knowledge and professional expertise required to consider the impact of nuclear power plants on population, environment and economy, and to draw some relevant conclusions related to specific issues in Serbia.



# DEPARTMENT OF MEDICAL SCIENCES

## Project: **PATHOLOGIC MORPHOLOGY AND MORPHOLOGIC-CLINICAL CORRELATIONS IN CARDIOVASCULAR DISEASES (INCLUDING HISTORICAL ASPECTS)**

(Academician Vladimir Kanjuh)

With 31 multidisciplinary associates in 2019, the following was published: 20 bibliographic units, of which 16 scientific papers; 2 articles about the XI International Summer School of Cardiology ECPD and the SASA Committee on Cardiovascular Pathology, 2 relevant inaugural words for great Cardiology meetings; printed 15 times abroad and 5 times in Serbia; first author 16 times; held 18 lectures ( 13 abroad and 5 in Serbia).

The following problems were studied: heart transplantation; heart failure in cardiomyopathies; tumors of the hearts – benign (biologically benign, semimalignant and malignant by localization), malignant and secondary (metastases, permeation of carcinomas into the drainage veins spreading to the heart and others); congenital heart anomaly; tetralogy of Fallot; pathogenesis of the accelerated atherosclerosis in smokers. For the history of cardiology: A. Margulis, a world pioneer of imaging and a foreign member of the SASA Department of Medical Sciences; Ignác Semmelweis and 250 years of his University in Budapest; and TV Vojvodina movie “Guardian of the heart” about V. Kanjuh.

---

Seferović P. M., ..., Kanjuh V., ... Seferović J. P., ..., Tschöpe C., 2019: Heart failure in cardiomyopathies: a position paper from the Heart Failure Association of the European Society of Cardiology **European Journal of Heart Failure**, 2019 May, 21 (5), 553–576.

Kanjuh V., Lalić N. M., Burazor I., Kanjuh S., 2019: Benign tumors of the heart. Biologically: benign, semimalignant and malignant by localization (morphologic-clinical correlations and clinical diagnostics errors). In Serbian with abstract in English. *Aktuelnosti u kardiologiji* 7. Niška Banja 16. – 18.april 2019. **Balneoclimatologia**, 43 (1), 3–18.



Kanjuh V., Lalić N. M., Pušac M., Burazor I., Kanjuh S., 2019: A review of benign heart tumors pathologic morphology and correlation with their clinical manifestations. In Serbian with abstract in English. **Medici.com** (Banja Luka, RS), XVI (93), 68–77.

Kanjuh V., Lončar Z., 2019: A plea for revitalization of clinical autopsies. Part One: General Review. (Bilingual Serbian – English). **Medici.com** (Banja Luka, RS), XVI (96), 78–83.

Burazor I., Kovačević A., Morača M., Jovović Lj., Tomić B., Bojić M., Gijamberti A., Kanjuh S., Kanjuh V., 2019: Cardiological rehabilitation of the operated patients with Tetralogy of Fallot. Presentation of case. In Serbian with abstract in English. *Aktuelnosti u kardiologiji* 7. Niška Banja 16–18 april 2019. **Balenoclinmatologia**, 43 (1), 405–413.

Kanjuh V., Lapis K., Merkely B., Kanjuh S., Pušac M., 2019: Life and achievement of Ignác Semmelweis and 250 years of Semmelweis University in Budapest (1769-2019). (Bilingual Serbian – English). **Medici.com** (Banja Luka, RS), XVI (96), 83–86.

---

Project: **EXPRESSION OF THE NEOPLASTIC PROGRAMME  
OF THE CELL**

(Academician Zoran Kovačević)

Theoretical work on the project was continued, focused on the study of aging, degenerative and malignant diseases on molecular and cellular level.

In relation to this topic the following papers were published:

---

Kovacevic Z., 2019: Cancer as paradigm of complex diseases. **Symposium on Complexity and integration in nature and society Organized by European Academy of Sciences and Arts**, Salzburg, abstract p4, 1<sup>st</sup> March 2019.

Kovacevic Z. L., 2019: **Medicine facing enigm of complex diseases**. SANU Ogranak u Novom Sadu and Zavod za udžbenike Beograd (in Serbian).

---

Project: **ESTIMATION OF INFARCT SIZE USING  
TRANSTHORACIC DOPPLER ECHOCARDIOGRAPHIC  
MEASUREMENT OF CORONARY FLOW RESERVE IN INFARCT  
RELATED AND REFERENCE CORONARY ARTERY**

(Academician Miodrag Ostojić)

The potential of angiography to evaluate the hemodynamic severity of a left main coronary artery (LM) stenosis is limited. Noninvasive transthoracic Doppler echocardiographic coronary flow velocity reserve (CFVR) evaluation of intermediate coronary stenosis has demonstrated remarkably high negative

prognostic value. The aim of this study was to assess clinical outcomes in patients with angiographically intermediate LM stenosis and preserved CFVR ( $>2.0$ ) as evaluated by transthoracic Doppler echocardiographic CFVR.

The initial study population included 102 patients with intermediate coronary stenosis of the LM referred for transthoracic Doppler echocardiographic CFVR assessment. Peak diastolic CFVR measurements were performed in the distal segment of the left anterior descending coronary artery after intravenous adenosine (140 mg/kg/min), and CFVR was calculated as the ratio between maximal hyperemic and baseline coronary flow velocity. Nineteen patients had impaired CFVR ( $\leq 2.0$ ) and were excluded from further analysis, as well as two patients with poor acoustic windows. The final group consisted of 81 patients (mean age, 60.6  $\pm$  9 years; 76 men) evaluated for adverse cardiac events including death, myocardial infarction, and revascularization.

Mean follow-up duration was 62.6  $\pm$  26 months. Mean CFVR was 2.4  $\pm$  0.4. Total event-free survival was 75 of 81 (92.6%), as six patients were referred for revascularization (five patients with coronary artery bypass grafting, one patient with percutaneous coronary intervention). There were no documented myocardial infarctions or cardiovascular deaths in the follow-up period.

In patients with angiographically intermediate and equivocal LM stenosis and preserved CFVR values of  $>2.0$ , revascularization can be safely deferred.

---

Osmanovic E., Ostojic M., Avdic S., Djedovic S., Delic A., Kadric N., Terzic A., Avdic-Salihovic A., 2019: Pharmacological Prophylaxis of Atrial Fibrillation After Surgical Myocardial Revascularization. **Medical Archives**, 2019 Feb, 73 (1), 19–22. doi: 10.5455/medarh.2019.73.19-22

Popovic D., Guazzi M., Jakovljevic D. G., Lasica R., Banovic M., Ostojic M., Arena R., 2019: Quantification of coronary artery disease using different modalities of cardiopulmonary exercise testing. **International Journal of Cardiology**, 2019 Jun 15, 285, 11–13. doi: 10.1016/j.ijcard.2019.03.012. Epub 2019 Mar PMID: 30879940

Räber L., Yamaji K., Kelbæk H., ..., Ostojic M., ..., Windecker S., 2019: Five-year clinical outcomes and intracoronary imaging findings of the COMFORTABLE AMI trial: randomized comparison of biodegradable polymer-based biolimus-eluting stents with bare-metal stents in patients with acute ST-segment elevation myocardial infarction. **European Heart Journal**, 2019 Jun 21, 40 (24), 1909–1919. doi: 10.1093/eurheartj/ehz074

Ostojic M., Stanetic B. M., Kovacevic-Preradovic T., Boljevic D., Vulic D., 2019: Coronary stenosis and left ventricular function - Major prognostic factors in patients with ischemic heart disease: Has something changed in the era of “precision medicine”? **International Journal of Cardiology**, 2019 Mar 1, 278, 36–37. doi: 10.1016/j.ijcard.2018.12.017. Epub 2018 Dec 5.

Djordjevic Dikic A., ... , Ostojic M., Beleslin B., 2019: Prognostic Value of Preserved Coronary Flow Velocity Reserve by Noninvasive Transthoracic Doppler Echocardiography in Patients With Angiographically Intermediate Left Main Stenosis. **Journal of the American Society of Echocardiography**, 2019 Jan, 32 (1), 74–80. doi: 10.1016/j.echo.2018.09.020. Epub 2018 Nov 17.

Tadic M., Cuspidi C., Celic V., Pencic B., Mancina G., Grassi G., Stankovic G., Ivanovic B., 2019: The Prognostic Effect of Circadian Blood Pressure Pattern on Long-Term Cardiovascular Outcome is Independent of Left Ventricular Remodeling. **Journal of Clinical Medicine**, 2019 Dec 2, 8 (12). pii: E2126. doi: 10.3390/jcm8122126

Cantor W. J., Lavi S., Džavík V., Cairns J., Cheema A. N., Della Siega A., Moreno R., Stankovic G., Kedev S., Natarajan M. K., Levi Y., Yuan F., Jolly S. S., 2019: Upstream anticoagulation for patients with ST-elevation myocardial infarction undergoing primary percutaneous coronary intervention: Insights from the TOTAL trial. **Catheterization and Cardiovascular Interventions**, 2019 Oct 15. doi: 10.1002/ccd.28540. [Epub ahead of print]

Hausenloy D. J., Kharbanda R. K., Möller U. K., ..., Stankovic G., ..., Bøtker H. E.; CONDI-2/ERIC-PPCI Investigators, 2019: Effect of remote ischaemic conditioning on clinical outcomes in patients with acute myocardial infarction (CONDI-2/ERIC-PPCI): a single-blind randomised controlled trial. **Lancet**, 2019 Oct 19, 394 (10207), 1415–1424. doi: 10.1016/S0140-6736(19)32039-2. Epub 2019 Sep 6.

Mehta S. R., Wood D. A. Storey R. F., ..., Stanković G., ..., Cairns J. A.; COMPLETE Trial Steering Committee and Investigators, 2019: Complete Revascularization with Multivessel PCI for Myocardial Infarction. **New England Journal of Medicine**, 2019 Oct 10, 381 (15), 1411–1421. doi: 10.1056/NEJMoa1907775. Epub 2019 Sep 1.

Životić I., Djurić T., Stanković A., Milašinović D., Stankovic G., Dekleva M., Marković Nikolić N., Alavantić D., Živković M., 2019: CDKN2B gene expression is affected by 9p21.3 rs10757278 in CAD patients, six months after the MI. **Clinical Biochemistry**, 2019 Nov, 73, 70–76.

Matic D. M., Asanin M. R., Vukcevic V. D., ..., Stankovic G. R., 2019: Impact on long-term mortality of access and non-access site bleeding after primary percutaneous coronary intervention. **Heart**, 2019 Oct, 105 (20), 1568–1574. doi: 10.1136/heartjnl-2019-314728. Epub 2019 May 25.

Banning A. P., Lassen J. F., Burzotta F., Lefèvre T., Darremont O., Hildick-Smith D., Louvard Y., Stankovic G., 2019: Percutaneous coronary intervention for obstructive bifurcation lesions: the 14th consensus document from the European Bifurcation Club. **EuroIntervention**, 2019 May 20, 15 (1), 90–98. doi: 10.4244/EIJ-D-19-00144

Piccolo R., Bonaa K. H., Efthimiou O., ..., Stankovic G., ..., Valgimigli M.; Coronary Stent Trialists' Collaboration, 2019: Drug-eluting or bare-metal stents for percutaneous coronary intervention: a systematic review and individual patient data meta-analysis of randomised clinical trials. **Lancet**, 2019 Jun 22, 393 (10190), 2503–2510. doi: 10.1016/S0140-6736(19)30474-X. Epub 2019 May 2. Erratum in: **Lancet**, 2019 Jun 22, 393 (10190), 2492.

Kario K., Rumoroso J. R., Okawara Y., Pérez de Prado A., Garcia Fernandez E., Kagitani H., Goicolea Gómez F. J., Rodríguez Leor O., Stankovic G., 2019: Renal Sympathetic Denervation in Patients with Resistant Hypertension: A Feasibility

Study. **Pulse** (Basel). 2019 Apr, 6 (3-4), 137–143. doi: 10.1159/000490620. Epub 2018 Jul 25.

Frigoli E., Smits P., Vranckx P., ..., Stankovic G., ..., Valgimigli M., 2019: Design and rationale of the Management of High Bleeding Risk Patients Post Bioresorbable Polymer Coated Stent Implantation With an Abbreviated Versus Standard DAPT Regimen (MASTER DAPT) Study. **American Heart Journal**, 2019 Mar, 209, 97–105. doi: 10.1016/j.ahj.2018.10.009. Epub 2018 Nov 22.

Zimarino M., Briguori C., Amat-Santos I. J., ..., Stankovic G; EuroBifurcation Club, 2019: Mid-term outcomes after percutaneous interventions in coronary bifurcations. **International Journal of Cardiology**, 2019 May 15, 283, 78–83. doi: 10.1016/j.ijcard.2018.11.139. Epub 2018 Dec 2.

Onuma Y., Katagiri Y., Burzotta F., Holm N. R., Amabile N., Okamura T., Mintz G. S., Darremont O., Lassen J. F., Lefèvre T., Louvard Y., Stankovic G., Serruys P. W., 2019: Joint consensus on the use of OCT in coronary bifurcation lesions by the European and Japanese bifurcation clubs. **EuroIntervention**, 2019 Feb 8, 14 (15), e1568–e1577. doi: 10.4244/EIJ-D-18-00391

## Project: **GENETIC BASIS OF CENTRAL NERVOUS SYSTEM DEGENERATIVE DISEASES**

(Academician Vladimir S. Kostić)

During 2019, activities were focused on the investigation of genotype-phenotype correlations in parkinsonism, dystonia and other neurodegenerative disorders, as well as morphological correlates of various phenomena, particularly those associated with parkinsonism and parkinsonism-plus syndromes. Papers related to this topic were presented at 3 international meetings (not cited in this report), with 9 of them being published in peer-reviewed journals.

V. S. Kostić chaired and gave 2 invited lectures during 2019 in Poiana, Brasov and Ohrid. In the course of 2019, V. S. Kostić actively collaborated with research groups from Italy, Germany and Austria.

Dragašević-Mišković N., Petrović I., Stanković I., Kostić V. S., 2019: Chemical management of levodopa-induced dyskinesia in Parkinson's disease patients. **Expert Opinion on Pharmacotherapy**, 20 (2), 219–230.

Stankovic I., Quinn N., Vignatelli L., ..., Kostić V., ..., Wenning G. K.; Movement Disorder Society Multiple System Atrophy Study Group, 2019: A critique of the second consensus criteria for multiple system atrophy. **Movement Disorders**, 2019 Apr 29. doi: 10.1002/mds.27701. [Epub ahead of print]

Tomic A., Agosta F., Sarasso E. Petrovic I., Basaia S., Pesic D., Kostić M., Fontana A., Kostic V. S., Filippi M., 2019: Are there two different forms of functional dystonia? A multimodal brain structural MRI study. **Molecular Psychiatry**, 2018 Aug 17. doi: 10.1038/s41380-018-0222-2. [Epub ahead of print]

Jancic J., Rovcanin B., Djuric V., Pepic A., Samardzic J., Nikolic B., Novakovic I., Kostic V. S., 2019: Analysis of secondary mtDNA mutations in families with Leber's hereditary optic neuropathy: Four novel variants and their association with clinical presentation. **Mitochondrion**, 50, 132–138. doi: 10.1016/j.mito.2019.10.011

Jovanovic-Tucovic M., Harhaji-Trajkovic L., Dulovic M., Tovilovic-Kovacevic G., Zogovic N., Jeremic M., Mandic M., Kostic V., Trajkovic V., Markovic I., 2019: AMP-activated protein kinase inhibits MPP<sup>+</sup>-induced oxidative stress and apoptotic death of SH-SY5Y cells through sequential stimulation of Akt and autophagy. **European Journal of Pharmacology**, 863, 172677. doi: 10.1016/j.ejphar.2019.172677

Radovanović S., Vodopić S., Stanković I., Dragašević-Mišković N., Kostić V., 2019: Spatiotemporal gait characteristics of Huntington's disease during dual-task walking. **International Journal of Neuroscience**, 1–8. doi: 10.1080/00207454.2019.1667781

Svetel M., Tomić A., Dragašević N., Petrović I., Kresojević N., Jech R., Urgošik D., Banjac I., Vitković J., Novaković I., Kostić V. S., 2019: Clinical course of patients with pantothenate kinase-associated neurodegeneration (PKAN) before and after DBS surgery. **Journal of Neurology**, 266, 2962–2969. doi: 10.1007/s00415-019-09499-3

Stanković I., Petrović I., Pekmezović T., Marković V., Stojković T., Dragašević-Mišković N., Svetel M., Kostić V., 2019: Longitudinal assessment of autonomic dysfunction in early Parkinson's disease. **Parkinsonism & Related Disorders**, 2019 Sep, 66, 74–79. doi: 10.1016/j.parkreldis.2019.07.008

Caso F., Canu E., Lukic M. J., Petrovic I. N., Fontana A., Nikolic I., Kostic V. S., Filippi M., Agosta F., 2019: Cognitive impairment and structural brain damage in multiple system atrophy-parkinsonian variant. **Journal of Neurology**, 2019 Sep 26. doi: 10.1007/s00415-019-09555-y

## MOLECULAR MECHANISMS OF PROGRAMMED CELL DEATH

(Academician Vladimir Bumbaširević)

In 2019, the investigations of the molecular mechanisms of programmed cell death were continued with the focus on autophagy and modulation of signaling pathways that regulate intracellular energy balance. In experiments we used C57BL/6J mice on a high fat diet (HFD), as a model for type 2 diabetes mellitus and metabolic syndrome. Also, peripheral blood mononuclear cells of patients with type 2 diabetes mellitus, and hyperlipidemia were analyzed by transmission electron microscopy, where specific nuclear and mitochondrial alterations were detected. In addition, antineuroinflammatory and neuroprotective effects of grapheme quantum dots were investigated in animal models.

Tosic J., Stanojevic Z., Vidicevic S., Isakovic A., Ciric D., Martinovic T., Kravic-Stevovic T., Bumbasirevic V., Paunovic V., Jovanovic S., Todorovic-Markovic B.,

Markovic Z., Danko M., Micusik M., Spitalsky Z., Trajkovic V., 2019: Graphene quantum dots inhibit T cell-mediated neuroinflammation in rats. **Neuropharmacology**, 146, 95–108.

Markovic O., Martinovic T., Ciric D., Trpinac D., Cemerikic Martinovic V., Bumbasirevic V., Bila J., Marisavljevic D., Kravic-Stevovic T., 2019: Ultrastructural and morphometric analysis of enlarged platelets in congenital isolated asplenia. **Vojnosanitetski Pregled**, 76 (7), 740–744.

Kravic-Stevovic T., Martinovic T., Ciric D., Samardzija G., Jovanović S., Djuricic S., Djokic D., Vujic D., Bumbasirevic V., 2019: Electron microscopic analysis of neurosecretory granules in the neuroblastomas of paediatric patients. **14th Multi-national Congress On Microscopy (MCM 2019)**, Belgrade, Serbia, 15-20. September, 2019. **Proceedings**, 180–181.

Martinovic T., Ciric D., Kravic-Stevovic T., Stankovic A., Lalic K., Rasulic I., Bumbasirevic V., 2019: Ultrastructural features of mitochondria in lymphocytes of patients with Diabetes Mellitus type 2. **Ibid**, 190–192.

Ciric D., Martinovic T., Bumbasirevic V., Zivkovic A., Jankovic A., Lalic K., Rasulic I., Kravic-Stevovic T., 2019: Autophagy analysis in lymphocytes of patients with type 2 Diabetes Mellitus and hyperlipidemia. **Ibid**, 197–198.

## Project: IMMUNOBIOLOGY OF DENDRITIC CELLS IN HEALTH AND DISEASE

(Academician Miodrag Čolić)

Within this project financed by the SASA Fund for Research in Science and Arts, the study of the immunomodulatory effect of nanomaterials (nanocellulose, selenium, polymer microspheres and dental materials), functions of dendritic cells, myeloid-derived suppressor cells, T regulatory cells and other cells of the immune system was continued with the aim to use antigens and nanoparticles for immunotherapy of tumors and autoimmune diseases. The chapter titled “Toxicity of nanostructures”, for a book on nanomaterials to be published by the SASA in 2020, was written. From the project 4, full-length papers were published in international journals:

Magic M., Colovic B. M., Jokanovic V. R., Vasilijic S. R., Markovic M., Vucevic D. B., Rudolf R., Colic S., Colic M. J., 2019: Cytotoxicity of a titanium alloy coated with hydroxyapatite by plasma jet deposition. **Vojnosanitetski pregled**, 76 (5), 492–501.

Duka M. V., Erakovic M., Dolicanin Z. C., Stefanovic D., Colic M. J., 2019: Production of Soluble Receptor Activator of Nuclear Kappa-B Ligand and Osteoprotegerin by Apical Periodontitis Cells in Culture and their Modulation by Cytokines. **Mediators of Inflammation**, 2019 (paper on line without pagination).

Tomic S. Z., Joksimovic B. N., Bekic M., Vasiljevic M., Milanovic M., Colic M. J., Vucevic Dragana B., 2019: Prostaglandin E2 Potentiates the Suppressive



Functions of Human Mononuclear Myeloid-Derived Suppressor Cells and Increases Their Capacity to Expand IL-10 –Producing Regulatory T Cell Subsets. **Frontiers in Immunology**, 10, 475. Published online 2019 Mar 18. doi: 10.3389/fimmu.2019.00475

Magic M., Colovic B. M., Filipovic N., Veselinovic Lj. M., Razic S. S., Jeremic S., Filipic M., Zegura B., Tomic S. Z., Colic M. J., Stevanovic M. M., 2019: Poly (epsilon) microspheres for prolonged release of selenium nanoparticles. **Materials Science & Engineering for Biological Applications**, 96, 776–789.

## Project: **CONTROL ENDOCRINE MECHANISMS IN BODY WEIGHT REGULATION AMONG OBESE SUBJECTS**

(Academician Dragan Micić)

In 2019 investigations concerning endocrine disorders in obese subjects were continued. The head of project, Academician Dragan Micić, participated in investigations concerning the mechanism that set up a correlation between the degree of weight loss and cardiovascular parameters, which was published in *Obesity Facts* journal, the official journal of the European Association for the Study of Obesity. The head of project as a member of the European Society of Hypertension Working group of Obesity, Diabetes and the High-risk Patient, participated in publishing of the consensus related to cardiovascular, renal and liver protection with novel antidiabetic agents beyond blood glucose lowering in Type 2 Diabetes, which was published in the *European Journal of Hypertension* in 2019. The head of project participated as a first author in the chapter related to life style and nutrition in the Encyclopedia of Endocrine Diseases published by Oxford Academic Press in 2019.

The results of the investigations are published in two international journals, one chapter in an international monograph, two chapters in national proceedings and three abstracts at international meetings. The head of project delivered 12 invited lectures at national and international meetings.

---

Nedeljković-Arsenović O., Banović M., Radenković D., Rančić N., Polovina S., Micić D., Nedeljković I., 2019: The Amount of Weight Loss Six Months After Bariatric Surgery: It Makes a Difference. **Obesity Facts**, 12 (3), 281–290.

Kotsis V., Jordan J., Stabouli S., Antza C., Micic D., Jelaković B., Schlaich M. P., Nilsson P. M., Kreutz R., Mancina G., Tsioufis K., Grassi G., 2019: Cardiovascular, Renal and Liver Protection With Novel Antidiabetic Agents Beyond Blood Glucose Lowering in Type 2 Diabetes: Consensus Article From the European Society of Hypertension Working Group on Obesity, Diabetes and the High-risk Patient. **Journal of Hypertension**, 2019; doi:10.1097/HJH.0000000000002279

Micić D., Polovina S., 2019: Life Style and Nutrition. In: Ippo Huhtaniemi and Luciano Martini, (Eds.), **Encyclopedia of Endocrine Diseases**, Second Edition,

## Project: **PROSTATE CANCER SCREENING**

(Academician Jovan Hadži-Đokić)

During the 2019, The Committee has continued the work on Prostate Cancer Screening Project.

The Committee modified the objectives of the Prostate Cancer Screening Project according to the latest recommendations of the American Urological Association (AUA) for year 2014.

During the last decade, extensive PSA-based prostate cancer (PCa) screening had at least two negative effects:

1. Unreasonably great number of prostate biopsies, due to elevated PSA which was the consequence of benign prostate hyperplasia (BPH) but not PCa
2. Detection of large number of small, insignificant PCa, in the stage when their treatment is unnecessary.

The Committee accepted the AUA 2014 recommendations that mandatory PSA- based screening should be performed only in men aged 55 to 69 years. In addition, men younger than 55 years should be tested only if they have a family risk for prostate cancer development.

In accordance with these recommendations, three groups of subjects, aged 55 to 69 years, were formed:

1. Men with abnormal digital rectal examination (DRE) of the prostate
2. Men with elevated PSA ( $\text{PSA} \geq 2.5 \text{ ng/mL}$ )
3. Men with abnormal DRE and  $\text{PSA} \geq 2.5 \text{ ng/mL}$

During 2019, cooperation with KO Urology, KBC “Zvezdara” in Belgrade, was intensified. Also, the screening of prostate cancer started in the Belgrade municipality of Vračar. There were made 112 TRUS biopsies of the prostate, and patients had been listed according to the above recommendations. Thereafter, treatment was performed in accordance with the histopathological findings and stage of the disease, according to the protocol for the treatment of prostate adenocarcinoma.



Project: **INSULIN RESISTANCE: COMPARATIVE ANALYSIS OF ITS  
ROLE IN THE ONSET AND DEVELOPMENT  
OF DIABETES, ATHEROSCLEROTIC VASCULAR DISEASE  
AND NEURODEGENERATIVE DISORDERS**

(Academician Nebojša M. Lalić)

During 2019, the results of the relationship between inflammatory cardiovascular (CV) risk markers and acute hyperglycemia in patients with diabetes were completed and published. The investigations have shown that acute hyperglycemic crisis (AHC) in diabetes, both in obese and nonobese patients with diabetes, resulted in significant increase in inflammatory and haemostatic CV risk markers. Additionally, adequate insulin therapy in AHC had more pronounced favorable effect on IL-6 and on homocystein but not on CRP levels, implying strong importance of insulin treatment on CV risk factor modulation in patients with diabetes. The previously mentioned research was part of the doctoral dissertation of Dr. Dragana Popović, whose mentor was Academician Nebojša Lalić. Within the same thematic area, the impact of acute hyperglycaemia on systolic myocardial function in asymptomatic diabetic patients (no previous heart disease) was also investigated. The investigation was conducted using complicated and demanding two-dimensional speckle tracking echocardiography (2D-STE), including multilayer strain analysis for evaluation of global and regional systolic myocardial function. The results have shown that acute hyperglycemia induced significant changes in systolic myocardial function, predominantly in longitudinal and circumferential mechanics, at basal left ventricular level. Observed changes in systolic LV functions did not improve short-term after euglycemia was achieved (after 72 h) and was not reversible even after longer period (three months) of good glycemic control. This study is the first in this field to demonstrate that in asymptomatic diabetic patients, hyperglycemia has potent long-term adverse effects on systolic myocardial function.

---

Popovic D., Lalic K., Jotic A., Milicic T., Bogdanovic J., Dorđević M., Stankovic S., Jeremic V., Lalic N. M., 2019: The Inflammatory and Hemostatic Cardiovascular Risk Markers During Acute Hyperglycemic Crisis in Type 1 and Type 2 Diabetes. **Journal of Medical Biochemistry**, 2019 Mar 3, 38 (2), 126–133.

Schnell O., Standl E., Catrinioiu D., Itzhak B., Lalic N., Rahelic D., Skrha J., Valensi P., Ceriello A., 2019: Report from the 4th Cardiovascular Outcome Trial (CVOT) Summit of the Diabetes & Cardiovascular Disease (D&CVD) EASD Study Group. **Cardiovascular Diabetology**, 2019 Mar 11, 18 (1), 30.

Kotseva K., De Backer G., De Bacquer D., ..., Lalic N., ..., Wood D.; EU-ROASPIRE Investigators\*, 2019: Lifestyle and impact on cardiovascular risk fac-

tor control in coronary patients across 27 countries: Results from the European Society of Cardiology ESC-EORP EUROASPIRE V registry. **European Journal of Preventive Cardiology**, 2019 May, 26 (8), 824–835.

Bogdanović J., Ašanin M., Krljanac G., Lalić N. M., Jotić A., Stanković S., Rajković N., Stošić L., Rasulić I., Milin J., Popović D., Bogdanović L., Lalić K., 2019: Impact of acute hyperglycemia on layer-specific left ventricular strain in asymptomatic diabetic patients: an analysis based on two-dimensional speckle tracking echocardiography. **Cardiovascular Diabetology**, 2019 Jun 3, 18 (1), 68.

Meneghini L. F., Mauricio D., Orsi E., Lalic N. M., Cali A. M. G., Westerbacka J., Stella P., Candelas Dea C., Pilorget V., Perfetti R., Khunti K.; DUNE investigators, 2019: The Diabetes Unmet Need with Basal Insulin Evaluation (DUNE) study in type 2 diabetes: Achieving HbA1c targets with basal insulin in a real-world setting. **Diabetes, Obesity and Metabolism**, 2019 Jun, 21 (6), 1429–1436.

Scherthaner G., Drexel H., Moshkovich E., Zilaitiene B., Martinka E., Czupryniak L., Várkonyi T., Janež A., Ducena K., Lalić K., Tankova T., Prázný M., Smirčić Duvnjak L., Sukhareva O., Sourij H., 2019: SGLT2 inhibitors in T2D and associated comorbidities - differentiating within the class. **BMC Endocrine Disorders**, 2019 Jun 17, 19 (1), 64.

Ceska R., Latkovskis G., Ezhov M. V., Freiburger T., Lalic K., Mitchenko O., Paragh G., Petrulioniene Z., Pojskic B., Raslova K., Shek A. B., Vohnout B., Altschmiedova T., Todorovova V., 2019: The Impact of the International Cooperation On Familial Hypercholesterolemia Screening and Treatment: Results from the ScreenPro FH Project. **Current Atherosclerosis Reports**, 2019 Jun 22, 21 (9), 36.

Scherthaner G., Wanner C., Jurišić-Eržen D., Guja C., Gumprecht J., Jarek-Martynowa I. R., Karasik A., Lalić N., Mankovsky B. N., Prázný M., Tankova T., Tsur A., Wascher T. C., Wittmann I., 2019: CARMELINA: An important piece of the DPP-4 inhibitor CVOT puzzle. **Diabetes Research and Clinical Practice**, 2019 Jul, 153, 30–40.

Scherthaner G., Karasik A., Abraitienė A., Ametov A. S., Gaál Z., Gumprecht J., Janež A., Kaser S., Lalić K., Mankovsky B. N., Moshkovich E., Past M., Prázný M., Radulian G., Smirčić Duvnjak L., Tkáč I., Trušinskis K., 2019: Evidence from routine clinical practice: EMPRISE provides a new perspective on CVOTs. **Cardiovascular Diabetology**, 2019 Aug 31, 18 (1), 115.

Chaturvedi S. K., Manche Gowda S., Ahmed H. U., ..., Lalic N., Lecic-Tosevski D., ..., Sartorius N., 2019: More anxious than depressed: prevalence and correlates in a 15-nation study of anxiety disorders in people with type 2 diabetes mellitus. **General Psychiatry**, 2019 Aug 9, 32 (4), e100076.

Aroda V. R., Rosenstock J., Terauchi Y., Altuntas Y., Lalic N. M., Morales Villagas E. C., Jeppesen O. K., Christiansen E., Hertz C. L., Haluzik M.; PIONEER 1 Investigators, 2019: PIONEER 1: Randomized Clinical Trial of the Efficacy and Safety of Oral Semaglutide Monotherapy in Comparison With Placebo in Patients With Type 2 Diabetes. **Diabetes Care**, 2019 Sep, 42 (9), 1724–1732.

Project: **HISTORY OF SERBIAN MEDICINE**

(Academician Radoje Čolović)

He published 11 project-related publications: 2 books (he was the first author in one book and the second in a three-author book) and 9 articles. He also delivered 17 lectures at several expert and scientific meetings.

---

Fogel N., Čolović, R., Pantelić D., 2019: **Jewish Professors of Faculties of Medicine in Serbia** (Jevreji profesori medicinskih fakulteta u Srbiji). Belgrade: Jevrejska opština Zemun, 112 p.

Čolović R., Činara I., Grubor N., 2019: **Surgical Section of the Serbian Medical Society (1950-2019)** (Hirurška sekcija Srpskog lekarskog društva /1950-2019). Belgrade: Srpsko lekarsko društvo, 471 p.

---

Project: **FETOPLACENTAL DEVELOPMENT IN PREGNANCY FOLLOWING ASSISTED REPRODUCTION**

(Academician Nebojša Radunović)

In 2019, the emphasis was placed on potassium channels in the myometrium as a potential site of action of tocolytics. Myometric contraction is the product of many physiological processes, orchestrated by alteration of uterine excitability through modulation of ion channels. Understanding the role of potassium channels and detecting their subunits/proteins in uterine smooth muscle is important, along with linking these channels' dysfunction to certain diseases and disorders. Thus, changes in the expression or activity of potassium channels can lead to inadequate repolarization of the cell membrane, which can cause aberrant uterine contractility. That is, changes in the expression and function of potassium channels can contribute to certain pathophysiological conditions such as preterm birth, miscarriage or dysmenorrhea. These facts corroborate the importance of potassium channels as a possible site of action for drugs that should prevent or stop unwanted uterine contractility. Potassium channels are key in the contraction-relaxation process of the smooth muscle and a target site for inhibition of contractions, especially undesirable preterm during pregnancy. Why is it important to discover and develop selective potassium channel modulators? These modulators have been found to offer significant therapeutic capabilities in the field of cardioprotection, vascular and nonvascular muscle function correction, neural, immune and secretory systems. In addition, natural polyphenols, represented in many foods, have proven to be modulators of potassium channel activity.

In 2019, the study of contractility of the myometrium of maternity wives who started the pregnancy with the help of assisted reproductive technologies and of the women who started the pregnancy spontaneously continued. Pharmacological experiments were conducted in parallel to investigate the inhibitory effect of natural polyphenols on myometrial contractility.

**Project: PLAQUE TEXTURE ELECTRONIC ANALYSIS IN  
PREVENTION AND TREATMENT OF RESTENOSIS FOLLOWING  
CAROTID ENDARTERECTOMY**

(Academician Đorđe Radak)

The Carotid Database concerning early and late results of the treatment of carotid disease has now come to include more than 8,000 patients. The Carotid Database provides information about the results of different surgical/interventional procedures in the treatment of carotid disease as well as the natural course of carotid atherosclerosis. In addition, any risk factor or comorbidity influencing on early and late outcome of carotid disease treatment could be assessed by univariate and multivariate analysis.

Large multicentric multinational randomized controlled trials have been designed, but for addressing some questions big data are necessary. The aim of the Carotid Database in prospective survey is: to standardize the monitoring of brain ischemia during carotid surgery; to elucidate the link between expression of oxidative stress before, during and after carotid clamping in patients treated with different anesthetics; and to analyze long term results of different treatment modalities of carotid disease.

The results of the best medical treatment, stenting and surgery are analyzed. We are following: demographic data, risk factors, laboratory findings, previous medications, as well as all the details regarding diagnostic (ultrasound, CT angiography) and interventional procedures in the included patient. Mean follow up is 5 years, with clinical and ultrasound examination every 6 months. By analyzing follow-up results, any interventional detail, risk factor or comorbidity influencing on the early and late outcome of carotid disease treatment can be detected and cross linked.

---

De Vries E. E., Mershoek A. J. A., Vonken J. E., den Ruijter H. M., van den Berg J. C., de Borst G. J., on behalf of the ENDORSE Study Group..., Radak Dj..., 2019: A meta-analysis of the effect of stent design on clinical and radiologic outcomes of carotid artery stenting. **Journal of Vascular Surgery**, 69 (6), 1953–1961. doi: 10.1016/j.jvs.2018.11.017

- Meershoek A. J. A., de Vries E. E., Veen D., den Ruijter H. M., de Borst G. J. on behalf of the NEON study group..., Radak Dj..., 2019: Meta-analysis of the outcomes of internal carotid artery near occlusion. **British Journal of Surgery**, 106, 665–671. doi: 10.1002/bjs.11159
- Stankovic M., Ljubic B., Babic S., Maravic-Stojkovic V., Mitrovic S., Arsenijevic N., Radak Dj., Pejnovic N., Lukic M., 2019: IL-33/IL-33R in various types of carotid artery atherosclerotic lesions. **Cytokine**, 120, 242–250. doi: 10.1016/j.cyto.2019.05.010
- Kirienko A., Radak Dj., Maggioli A., 2019: Clinical efficacy of once-daily micronized purified flavonoid fraction 1000 mg tablet in patients with symptomatic chronic venous disease. **Current Medical Research and Opinion**, 35 (3), 553–557. doi: 10.1080/03007995.2018
- Radak Dj., Djukic N., Neskovic M., 2019: Cyanoacrylate Embolisation: A Novelty In The Field of Varicose Veins Surgery. **Annals of Vascular Surgery**, 55, 285–291. doi: 10.1016/j.avsg.2018.06.009
- Babic S., Tanaskovic S., Neskovic M., Gajin P., Nenezic D., Stevanovic P., Alek-sic N., Sevkovic M., Forsyth J., Ilijevski N., Popov P., Matic P., Radak Dj., 2019: Surgical treatment of proximal segmental occlusion of the internal carotid artery. **Surgery Research and Practice**. 2019 Jan 2 [Epub ahead of print]. doi: 10.1155/2019/2976091
- Radak Dj., Neskovic M., Otasevic P., Isenovic E. R., 2019: Renal dysfunction following elective endovascular aortic aneurysm repair. **Current Vascular Pharmacology**, 2019 Jan, 17 (2), 133–140. doi: 10.2174/1570161115666171116163203
- Obradovic M., Bogdanovic J., Stanimirovic D., Radak Dj., Isenovic E., 2019: Hypothesis related to the regulation of inducible nitric oxide synthase during carotid endarterectomy. **Medical Hypotheses**. 2019 Jan, 122, 16–18. doi: 10.1016/j.mehy.2018.10.011. Epub 2018 Oct 17.
- Bajic V. P., Van Neste C., Obradovic M., Zafirovic S., Radak Dj., Bajic V. B., Es-sack M., Isenovic E. R., 2019: Glutathione “Redox Homeostasis” and Its Relation to Cardiovascular Disease. **Oxidative Medicine and Cellular Longevity**, 2019 May 9, 5028181. doi:10.1155/2019/5028181
- Radak Dj., Tanaskovic S., Neskovic M., 2019: The Obesity-associated Risk in Open and Endovascular Repair of Abdominal Aortic Aneurysm. **Current Pharmaceutical Design**, 25 (18), 2033–2037. doi: 10.2174/1381612825666190710112844
- Cvetic V., Sagic D., Koncar I., Kovacevic V., Radmili O., Lukic B., Aleksic N., Davidovic L., Radak Dj., 2019: Endovascular treatment of different types of iliac occlusions – results from observational study (reference number: SREP-19-06958), which was recently submitted to Scientific Reports. **PLOS ONE**. <https://doi.org/10.1371/journal.pone.0222893>

**Project: COMORBIDITY OF DEPRESSION AND DIABETES –  
INTERNATIONAL STUDY OF CLINICAL MANIFESTATIONS  
AND CLINICAL PATHWAYS**

(Academician Dušica Lečić-Toševski,  
Academician Nebojša M. Lalić)

Multicentric, international study

Principal investigator for Serbia: Academician Dušica Lečić-Toševski

Co-investigator: Academician Nebojša Lalić

Collaborators: clinical doctors and postraduate students of the Institute of Mental Health and the Clinic for Endocrinology, Clinical Centre of Serbia

Collaborating countries (study partners): Argentina, Bangladesh, Brazil, China, Germany, India, Italy, Kenia, Mexico, Pakistan, Poland, Russia, Serbia, Thailand, Uganda, Ukraine, Switzerland, Egypt, Croatia, Saudi Arabia; Great Britan has the role of the secretariat.

---

Title of international study: The INTERPRET-DD study of diabetes and depression: improved clinical pathways for better outcomes (2013-2017)

---

Study is noncomercial.

INTERPRET-DD is a two-year longitudinal study in 21 countries – in diabetes out-patients services, which investigates the recognition and management of depressive disorders in people with type 2 diabetes, with the aim to obtain in-depth knowledge of the pathways to care and the impact of treatment of previously unrecognised depression on clinical outcomes of diabetes. It is expected that the data collected will influence policy making decisions and help to improve care for people with this frequently prevalent comorbid conditions. The pilot study and follow up after one year was followed by the main study consisting of two parts – baseline study including 200 patients in each centre and the follow up on the same patients one year later. At the initiative of the study secretariat, the WPA Section on Comorbidity was established, with the involvement of investigators from our country.

Three joint manuscripts of the study group were published. Two books are under preparation – the first book will be clinically oriented, the second book will be focused on the patient's personal view on diabetes-depression comorbidity and health care system. The case reports from our centre are included in both books. As part of the project the doctoral dissertation titled "Influence of D personality type on behaviour related to health, depression and distress in patients with diabetes type 2" was completed (mentor is Dušica Lečić-Toševski, co-mentor Nebojša Lalić).

Pesic D., Adzic T., Vukovic O., Kalanj M., Lecic Tosevski D., 2019: Analysis of personality profiles obtained by five-factor personality model. **Vojnosanitetski preglad**, doi: 10.2298/VSP189424175p, Vol. 77 (No. 09), online first.

Fountoulakis K, ..., Lecic-Tosevski D., 2019: Staging of schizophrenia with the use of PANSS: An international multicenter study. **International Journal of Neuropsychopharmacology**, 2019, Nov 1, 22 (11), 681–697. doi: 10.1093/ijnp/pyz053 (Epub ahead of print)

Mandic-Maravic V., Mitkovic-Voncina M., Pljesa-Ercegovac M., Savic-Radojevic A., Djordjevic M., Pekmezovic T., Grujicic R., Ercegovac M., Simic T., Lecic-Tosevski D., Pejovic-Milovancevic M., 2019: Autism spectrum disorders and perinatal complications – isoxidative stress the connection? **Frontiers in Psychiatry**, 2019 Sept 25, 10,675. doi:10.3389/fpsy.2019.00675

Volpe U., Ayinde O., Burns A., Eraslan D., Gracia-Gracia P., ..., Lecic-Tosevski D., ..., Sartorius N., 2019: Pathways to care for people for dementia: an international multi-center study. **International Journal of Geriatric Psychiatry**, 27 October 2019. doi/org/10.1002/gps.5223

Chaturvedi S. K., Hellal Udin A., ..., Lecic-Tosevski D. et al., 2019: More anxious than depressed a 15-nation study of anxiety disorders in people with type 2 diabetes mellitus: prevalence and correlates. **General Psychiatry**, 32:e100076. doi:10.1136/gpsych-2019-100076

Mandic-Maravic V., Coric V., Mitkovic-Voncina M., Djordjevic M., Savic-Radojevic A., Ercegovac M., Matic M., Simic T., Lecic-Tosevski D., Toskovic O., Pekmezovic T., Plesa-Ercegovac M., Pejovic-Milovancevic M., 2019: Interaction of glutathione S-transferase polymorphisms and tobacco smoking during pregnancy in susceptibility to autism spectrum disorders. **Scientific Reports**, 2019 Mar 1, 9 (1), 3206. doi: 10.1038/s41598-019-39885-w

Lecic-Tosevski D., 2019: Is urban living good for mental health? **Current Opinion in Psychiatry**, May 2019, 32, 3, 204–209. doi: 10.1097/YCO.0000000000000489

Pesic D., Lecic-Tosevski D., Kalanj M., Vukovic O., Mitkovic-Voncina M., Peljto A., Mulder R., 2019: Multiple faces of personality domains: Revalidating the proposed domains. **Psychiatria Danubina**, 2, 182–188.

Košutić Ž., Mitković Vončina M., Lazarević M., Raković Dobrosavić I., Šoljaga M., Peulić A., Đurić M., Pešić D., Bradić Z., Lečić Toševski D., 2019: Attachment and emotional regulation in adolescents with depression. **Vojnosanitetski preglad**, 76, 2, 129–135.

Colovic O., Munjiza A., Lecic-Tosevski D., 2019: Psychotherapy – necessary component of integrative mental health care in an institution - a case study of the Institute of Mental Health, Belgrade, Serbia. **International Voices Section, Faculty Newsletter**, Royal College of Psychiatrists, London, 18–23.



**Project: SIGNIFICANCE OF ANTIREFLUX SURGERY AFTER  
THE ENDOSCOPIC RADIO-FREQUENT ABLATION IN  
TREATMENT OF PATIENTS WITH BARRETT'S ESOPHAGUS**

(Academician Predrag Peško)

Current activities on the project include follow-up of existing and inclusion of new patients, and special interest was given to concomitant laparoscopic fundoplication and RFA for Barrett's esophagus. The results of the project were presented at the OESO conference, which was held in Beijing, November 2019, through the lecture of Dr. Ognjan Skrobić, who is a project participant. A new strictly formed protocol upon the concomitant RFA and antireflux surgery has been established.

**Project: OPTIMIZATION (INDIVIDUALIZATION) OF RECTAL  
CANCER TREATMENT USING MOLECULAR AND GENETIC  
PREDICTIVE MARKERS**

(Academician Zoran Krivokapić)

The aim in the past year was to get new insights into molecular characterization of colorectal cancer with state-of-the-art methods, as well as into the prediction of therapy outcomes using emerging molecular biomarkers that could ultimately help define the optimal treatments for patients in routine clinical practice. The focus was on locally advanced rectal cancer and implementation of watch-and-wait protocol as a therapeutic strategy and further research and validation of potential biomarkers for better nonoperative management of disease. Molecular profiling of tumor tissue before neoadjuvant chemoradiotherapy has been initiated, with the objective to characterize new prognostic biomarkers using proteomics approach. Extensive biobank with diverse samples – serum, tumor and healthy mucosal tissue samples, was established for this purpose. Tissue samples have been additionally collected for *ex vivo* stimulation of tumor as a means to determine targeted genes expression and oxidative and inflammatory stress after chemoradiotherapy. The zebrafish patient-derived xenograft (zPDX) system was also established in order to provide insights into the molecular components that are key for tumor growth, invasion, and metastasis, as well as promising clinical tool for testing the efficacy of drugs on patient samples *in vivo*.



---

Markovic V., Stojakov D., Micev M., Kmezic S., Saponjski D., Krivokapic Z., 2019: Castleman's disease presented as a rare unicentric pancreatic mass. **Hepatobiliary & pancreatic diseases international: HBPDI**. 2019.

Pavlović-Marković A., Barišić G., Ninčević J., Milovanović T., Garalejić E., Stojković-Lalošević M.,..., Krivokapic Z., 2019: Efficacy of transrectal ultrasonography (TRUS) in preoperative staging of rectal cancer. **Vojnosanitetski preglod**, 76 (1), 67–71.

Stojkovic Laloševic M., Pavlovic Markovic A., Stankovic S., Stojkovic M., Dimitrijevic I., Radoman Vujacic I.,..., Krivokapic Z., 2019: Combined Diagnostic Efficacy of Neutrophil-to-Lymphocyte Ratio (NLR), Platelet-to-Lymphocyte Ratio (PLR), and Mean Platelet Volume (MPV) as Biomarkers of Systemic Inflammation in the Diagnosis of Colorectal Cancer. **Disease markers**, 2019.

---

**Project: DEFINITION OF THE OPTIMAL BIOMECHANICAL  
CONDITIONS FOR BONE REGENERATION DURING  
CORRECTION OF LONG BONES DEFORMITIES AND  
CONSTRUCTION OF NEW SURGICAL CORRECTION DEVICE**

(Academician Milorad Mitković)

The clinical study started in 2018 has been continued. The results obtained are very encouraging. Bone tissue formation in all patients occurred without any visible radiological problems and in sufficient quantity. One patient underwent slow bone callus formation and also a small amount of bone callus on one of the operated legs (simultaneous bilateral surgical correction has been done). He previously had an open injury with scars in the area of hemicorticotomy on that leg, so a decrease in microcirculation at the scar site was a probable cause of poorer vascularization of the periosteum at that site.

Attention is still focused on risk analysis, and it has already been suggested that the risk of using this device and method is lower in comparison to other methods in the surgical treatment of these deformities. Risk reduction has also been shown in terms of possible complications such as infection and mechanical complications. In a total of 25 clinical applications, there were no cases of deep infection. Two minor pin tract infection were detected and easily resolved by frequent changing dressings during 7 to 10 days. The mechanical complications of using this device are less frequent than those of other devices, probably because of the good definition of optimal system elasticity. Patients were allowed to walk at full weight bearing immediately after the surgery and to maintain full range of motion in the knee joint with active exercise. Patient satisfaction was rated excellent. The average length of treat-

ment for patients was 10 weeks and at the end of treatment the removal of the apparatus did not require any anesthesia.

---

Mitković M. B., 2019: **External fixation of tibial fractures**. Monograph in English language. Faculty of Medicine, University of Niš.

Milenković S., Mitković M. M., Mitković M. B., 2019: Unilateral external fixation of the tibial shaft malunion. **Srpski arhiv za celokupno lekarstvo**. doi: 10.2298/SARH190908119M

Grubor P., Mitković M. B., Mitković M. M., Grubor M., 2019: Comparison of biomechanical stability of osteosynthesis materials in long bone fractures. **Medicinski glasnik** (Zenica). 16 (1), 88–92.

---

### Project: **HEART FAILURE: IMPROVEMENT IN PREVENTION, DIAGNOSTIC APPROACH, TREATMENT AND REHABILITATION**

(Academician Petar M. Seferović)

In 2019, the activities within the frame of the project reported last year continued. Besides this cooperations, the new projects with the following experts began: 1. Evaluation of kidney function throughout the heart failure trajectory (in cooperation with Prof. Mullens W. from University Hasselt, Genk, Belgium), 2. Sex- and age-related differences in the management and outcomes of chronic heart failure (in cooperation with Prof. Lainščak M. from University Golnik, Slovenia), 3. Role and safety of new glucose-lowering drugs in patients with heart failure (in cooperation with Prof. Coats AJS from the Centre of Clinical and Experimental Medicine, IRCCS San Raffaele Pisana, Rome, Italy), 4. Imaging in patients with suspected acute heart failure (in cooperation with Prof. Čelutkienė J. from Vilnius University, Vilnius, Lithuania), 5. Frailty in patients with heart failure (in cooperation with Prof. Vitale C. from IRCCS San Raffaele Pisana, Rome, Italy), 6. Diagnosis of heart failure with preserved ejection fraction (in cooperation with Prof. Pieske B. from the German Heart Institute, Berlin, Germany), 7. Guidelines on diabetes, pre-diabetes, and cardiovascular diseases (in cooperation with Cosentino F. from the Karolinska Institute and Karolinska University Hospital, Stockholm, Sweden), 8. Angiotensin-Nepriylsin Inhibition in Heart Failure with Preserved Ejection Fraction ( in cooperation with Prof. Solomon S. D. from Harvard Medical School, Boston, USA), 9. Regional differences in exercise training implementation in heart failure (in cooperation with Prof. Piepoli M. F. from G. da Saliceto Polichirurgico Hospital, Piacenza, Italy), 10. Pathophysiology, diagnosis and management of peripartum cardiomyopathy (in cooperation with Prof. Bauersachs J. from the Hannover Medical School, Hannover,

Germany), 11. Practical guidance on the use of natriuretic peptide concentrations (in cooperation with Prof. Mueller C. from the University of Basel, Basel, Switzerland), 12. Reporting checklist for quantification of pulmonary congestion by lung ultrasound in heart failure (in cooperation with Prof. Platz E. from Harvard Medical School, Boston, MA, USA ), 13. Pulmonary hypertension and right ventricular remodeling in HFpEF and HFrEF (in cooperation with Prof. Ghio S. from Policlinico San Matteo, Pavia, Italy ), 14. Trimetazidine in cardiovascular medicine (in cooperation with Prof. Marzilli M. from Cardiothoracic Department, via Paradisa 2, 56124 Pisa, Italy ), 15. Acute heart failure congestion and perfusion status – impact of the clinical classification on in-hospital and long-term outcomes (in cooperation with Prof. Chioncel O. from the University of Medicine Carol Davilla, Bucuresti, Romania), 16. Treatment of cardiac transthyretin amyloidosis (in cooperation with Prof. Emdin M. from Scuola Superiore Sant’ Anna, Pisa, Italy ), 17. Opportunities and challenges of a novel cardiac output response to stress (CORS) test to enhance diagnosis of heart failure in primary care (in cooperation with Prof. Charman S. from Newcastle University, Newcastle, UK), 18. The role of ventricular-arterial coupling in cardiac disease and heart failure: assessment, clinical implications and therapeutic interventions (in cooperation with Prof. Ikonomidis I. from Athens University Hospital Attikon, National and Kapodistrian University of Athens, School of Medicine, Athens, Greece), 19. Association between heart rate variability and hemodynamic response to exercise in chronic heart failure (in cooperation with prof. Koshy A. from Newcastle University, and Newcastle upon Tyne Hospitals, Newcastle upon Tyne, UK), 20. The use of diuretics in heart failure with congestion (in cooperation with Prof. Mullens W. from University Hasselt, Genk, Belgium), 21. Exercise training in patients with ventricular assist devices (in cooperation with Prof. Adamopoulos S. from Onassis Cardiac Surgery Center, Athens, Greece), 22. Innovative imaging methods in heart failure (in cooperation with Prof. Čelutkienė J. from Vilnius University, Vilnius, Lithuania) and 23. Treatments targeting inotropy (in cooperation with Prof. Maack C. from University Clinic Würzburg, Germany).

---

Seferović P. M., Jhund P. S., 2019: Physiological monitoring of the complex multi-morbid heart failure patient - diabetes and monitoring glucose control. **European Heart Journal Supplements**, 2019 Dec, 21 (Suppl M), M20–M24.

Rosano G. M. C., Seferović P. M., 2019: Physiological monitoring in the complex multi-morbid heart failure patient - Introduction. **European Heart Journal Supplements**, 2019 Dec, 21 (Suppl M), M1–M4.

Seferović P. M., 2019: Introduction to the special issue entitled 'Heart failure management of the elderly patient: focus on frailty, sarcopenia, cachexia, and dementia'. **European Heart Journal Supplements**, 2019 Dec, 21 (Suppl L), L1–L3.

Pieske B., Tschöpe C., de Boer R. A., ..., Seferovic P., Filippatos G., 2019: How to diagnose heart failure with preserved ejection fraction: the HFA-PEFF diagnostic algorithm: a consensus recommendation from the Heart Failure Association (HFA) of the European Society of Cardiology (ESC). **European Heart Journal**, 2019 Oct 21, 40 (40), 3297–3317.

Krljanac G., Polovina M., Ašanin M., Seferović P. M., 2019: Cutting the Gordian knot of left ventricular diastolic dysfunction: Role of opportunistic screening models. **European Journal of Preventive Cardiology**, 2019 Oct, 26 (15), 1666–1669.

Kwok C. S., Seferovic P. M., ..., Mamas M. A., 2019: Early Unplanned Readmissions After Admission to Hospital With Heart Failure. **American Journal of Cardiology**, 2019 Sep 1, 124 (5), 736–745.

Bauersachs J., König T., van der Meer P., ..., Seferovic P. M., ..., Sliwa K., 2019: Pathophysiology, diagnosis and management of peripartum cardiomyopathy: a position statement from the Heart Failure Association of the European Society of Cardiology Study Group on peripartum cardiomyopathy. **European Journal of Heart Failure**, 2019 Jul, 21 (7), 827–843.

Mueller C., McDonald K., de Boer R. A., ..., Seferovic P. M., ..., Januzzi J. L. Jr; Heart Failure Association of the European Society of Cardiology, 2019: Heart Failure Association of the European Society of Cardiology practical guidance on the use of natriuretic peptide concentrations. **European Journal of Heart Failure**, 2019 Jun; 21 (6), 715–731.

Marzilli M., Vinereanu D., Lopaschuk G., ..., Seferovic P., Rosano G. M. C., 2019: Trimetazidine in cardiovascular medicine. **International Journal of Cardiology**, 2019 Oct 15, 293, 39–44.

Seferovic P. M., ..., Coats A. J. S., 2019: Clinical practice update on heart failure 2019: pharmacotherapy, procedures, devices and patient management. An expert consensus meeting report of the Heart Failure Association of the European Society of Cardiology. **European Journal of Heart Failure**, 2019 Oct, 21 (10), 1169–1186.

Seferović P. M., Seferović J. P., Polovina M. M., 2019: Diving into the unknown: sodium-glucose cotransporter-2 inhibitors in heart failure without diabetes. **European Journal of Heart Failure**, 2019 Jul, 21 (7), 874–876.

Emdin M., Aimo A., Rapezzi C., ..., Seferović P. M., ..., Merlini G., 2019: Treatment of cardiac transthyretin amyloidosis: an update. **European Heart Journal**, 2019 Dec 1, 40 (45), 3699–3706.

Seferović P. M., ..., Kanjuh V., ... Seferović J. P., ..., Tschöpe C., 2019: Heart failure in cardiomyopathies: a position paper from the Heart Failure Association of the European Society of Cardiology **European Journal of Heart Failure**, 2019 May, 21 (5), 553–576.

Triposkiadis F., Butler J., Abboud F. M., ..., Seferovic P. M., ..., De Keulenaer G. W., 2019: The continuous heart failure spectrum: moving beyond an ejection fraction classification. **European Heart Journal**, 2019 Jul 1, 40 (26), 2155–2163.

Koshy A., Okwose N. C., Nunan D., ..., Seferovic P., Ristic A., ..., Jakovljevic D. G., 2019: Association between heart rate variability and haemodynamic response

to exercise in chronic heart failure. **Journal Scandinavian Cardiovascular**, 2019 Apr, 53 (2), 77–82.

Parovic M., Okwose N. C., Bailey K., ..., Seferovic P. M., MacGowan G. A., Jakovljevic D. G., 2019: NT-proBNP is a weak indicator of cardiac function and haemodynamic response to exercise in chronic heart failure. **ESC Heart Failure**, 2019 Apr, 6 (2), 449–454.

Neumann F. J., Sousa-Uva M., Ahlsson A., ..., Seferović P. M., ..., Zembala M. O., 2019: 2018 ESC/EACTS Guidelines on myocardial revascularization. **EuroIntervention**, 2019 Feb 20, 14 (14), 1435–1534.

Veljić I., Polovina M., Milinković I., Seferović P. M., 2019: Lipoprotein apheresis and proprotein convertase subtilisin/kexin type 9 inhibitors: Do we have a vanquishing new strategy? **European Journal of Preventive Cardiology**, 2019 May, 26 (7), 739–742.

Senni M., Iorio A., Seferović P., 2019: Heart failure with preserved ejection fraction in Asia: the far side of the moon? **European Journal of Heart Failure**, 2019 Jan, 21 (1), 37–39.

Pavlović A., Polovina M., Ristić A., Seferović J. P., Veljić I., Simeunović D., Milinković I., Krljanac G., Ašanin M., Oštrić-Pavlović I., Seferović P. M., 2019: Long-term mortality is increased in patients with undetected prediabetes and type-2 diabetes hospitalized for worsening heart failure and reduced ejection fraction. **European Journal of Preventive Cardiology**, 2019 Jan, 26 (1), 72–82.

Maack C., Eschenhagen T., Hamdani N., ..., Seferović P. M., ..., Mebazaa A., 2019: Treatments targeting inotropy. **European Heart Journal**, 2019 Nov 21, 40 (44), 3626–3644.

Sousa-Uva M., Neumann F. J., Ahlsson A., ..., Seferovic P. M., ..., Zembala M. O.; ESC Scientific Document Group, 2019: 2018 ESC/EACTS Guidelines on myocardial revascularization. **European Journal of Cardio-Thoracic Surgery**, 2019 Jan 1, 55 (1), 4–90.

Project: **INVESTIGATION OF REDOX HOMEOSTASIS  
MECHANISMS IN NON-MALIGNANT AND MALIGNANT  
DISEASES OF GENITOURINARY TRACT**

(Corresponding Member Tatjana Simić)

During 2019, activities at the project were focused on the investigation of redox homeostasis mechanisms in chronic renal failure, Balkan endemic nephropathy and renal cell carcinoma patients. Papers dealing with these topics were presented at three international meetings (not cited in this report), with five of them being published in peer-reviewed journals.

Tatjana Simić presented two plenary lectures at national congresses and two invited lectures at international meetings. In the course of 2019, Tatjana Simić collaborated with research groups from the USA and Australia.

Radic T., Coric V., Bukumiric Z., Pljesa-Ercegovac M., Djukic T., Avramovic N., Matic M., Mihailovic S., Dragicevic D., Dzamic Z., Simic T., Savic-Radojevic A., 2019: GSTO1\*CC Genotype (rs4925) Predicts Shorter Survival in Clear Cell Renal Cell Carcinoma Male Patients. **Cancers** (Basel), 11 (12).

Pljesa-Ercegovac M., Savic-Radojevic A., Coric V., Radic T., Simic T., 2019: Glutathione transferase genotypes may serve as determinants of risk and prognosis in renal cell carcinoma. **Biofactors**. doi: 10.1002/biof.1560

Dragicevic B., Suvakov S., Jerotic D., Reljic Z., Djukanovic L., Zelen I., Pljesa-Ercegovac M., Savic-Radojevic A., Simic T., Dragicevic D., Matic M., 2019: Association of SOD2 (rs4880) and GPX1 (rs1050450) Gene Polymorphisms with Risk of Balkan Endemic Nephropathy and its Related Tumors. **Medicina** (Kaunas), 55 (8).

Jerotic D., Matic M., Suvakov S., Vucicevic K., Damjanovic T., Savic-Radojevic A., Pljesa-Ercegovac M., Coric V., Stefanovic A., Ivanisevic J., Jelic-Ivanovic Z., McClements L., Dimkovic N., Simic T., 2019: Association of Nrf2, SOD2 and GPX1 Polymorphisms with Biomarkers of Oxidative Distress and Survival in End-Stage Renal Disease Patients. **Toxins** (Basel), 11 (7).

Suvakov S., Jerotic D., Damjanovic T., Milic N., Pekmezovic T., Djukic T., Jelic-Ivanovic Z., Savic Radojevic A., Pljesa-Ercegovac M., Matic M., McClements L., Dimkovic N., Garovic V. D., Albright R. C., Simic T., 2019: Markers of Oxidative Stress and Endothelial Dysfunction Predict Haemodialysis Patients Survival. **American Journal of Nephrology**, 50 (2), 115–125.

## ACADEMIC COMMITTEE FOR BIOMEDICAL RESEARCH

### Project: HOMEOSTATIC MECHANISMS AND THE REGULATION SYSTEM OF BEHAVIOR

(Academician Ljubiša Rakić)

Within the project, experimental research included: a) studying different models of neurodegenerative diseases and the effects of dietary supplements and b) investigation of the effects of pharmacological substances on animal behavior. a) In the model of experimental autoimmune encephalomyelitis (EAE), the expression profiles of the enzyme NTPDase1/CD39 and Kv1.3 potassium channels during different stages of the disease has been described (1,5). In the peripheral nerve injury, the administration of B (B1, B2, B3, B5, B6, B12) vitamins reduced inflammation and enhanced regeneration processes, and highlighted the important role of calcium channels in these processes (6). In the animal model of Alzheimer's disease, short-term supplementation with omega 3 fatty acids reduced neurodegeneration, by stimulating microglia/macrophages to form a barrier around amyloid plaques (2), while changes in sleep stages in the Parkinson's disease model indicated the



dynamics of degenerative processes (3). b) Examination of pharmacological substances, propofol anesthetic, have indicated significant changes in the behavior of experimental animals at the sensitive stage of development, pre-puberty (4). Also, low doses of the nucleoside analogue of ribavirin have been found to positively affect the psychomotor activity and weight of experimental animals (7).

Particularly important activity of the project members was the organization of the International Congress of Neurosciences (FRM2019) in Belgrade (July 10–13), the most important European congress of neurosciences in 2019. The Congress was organized by the Societies for Neurosciences of Serbia, Romania and Turkey under the auspices of FENS (Federation of European Neuroscience Societies). The Congress was attended by 857 researchers from 52 countries, 160 of whom were researchers from Serbia, and the plenary lecturers were esteemed researches awarded with the prestigious awards in Neuroscience (Brain Prize). Project associates and members of the Serbian Neuroscience Society were the Chairs and members of the Scientific and Organizing Committee, as well as the chairs of certain scientific sessions. President of the Serbian Neuroscience Society, Academician Lj. Rakić opened the Congress and in a plenary lecture presented the history of neuroscience in Serbia.

1. Jakovljevic M., Lavrnja I., Bozic I., Milosevic A., Bjelobaba I., Savic D., Sévigny J., Pekovic S., Nedeljkovic N., Laketa D., 2019: Induction of NTPDase1/CD39 by Reactive Microglia and Macrophages Is Associated With the Functional State During EAE. **Frontiers in Neuroscience**, 13, 410. doi: 10.3389/fnins.2019.00410
2. Jović M., Lončarević-Vasiljković N., Ivković S., Dinić J., Milanović D., Zlokovik B., Kanazir S., 2019: Short-term fish oil supplementation applied in presymptomatic stage of Alzheimer's disease enhances microglial/macrophage barrier and prevents neuritic dystrophy in parietal cortex of 5xFAD mouse model. **PLoS One**, 2019 May 16, 14 (5), e0216726. doi: 10.1371/journal.pone.0216726
3. Ciric J., Kapor S., Perovic M., Saponjic J., 2019: Alterations of Sleep and Sleep Oscillations in the Hemiparkinsonian Rat. **Frontiers in Neuroscience**, 2019 Feb 25, 13, 148. doi: 10.3389/fnins.2019.00148
4. Pavković Ž., Potrebić M., Kanazir S., Pešić V., 2019: Motivation, risk-taking and sensation seeking behavior in propofol anesthesia exposed peripubertal rats. **Progress in Neuro-Psychopharmacology and Biological Psychiatry**. doi: 10.1016/j.pnpbp.2019.109733. Epub 2019 Aug 13.
5. Bozic I., Savic D., Milosevic A., Janjic M., Laketa D., Tesovic K., Bjelobaba I., Jakovljevic M., Nedeljkovic N., Pekovic S., Lavrnja I., 2019: The Potassium Channel Kv1.5 Expression Alters During Experimental Autoimmune Encephalomyelitis. **Neurochemical Research**, 44 (12), 2733–2745. doi: 10.1007/s11064-019-02892-4
6. Ehmedah A., Nedeljkovic P., Dacic S., Repac J., Draskovic Pavlovic B., Vucevic D., Pekovic S., Bozic Nedeljkovic B., 2019: Vitamin B Complex Treatment

Attenuates Local Inflammation after Peripheral Nerve Injury. **Molecules**, 24 (24), 4615. doi: 10.3390/molecules24244615

7. Petković B., Stojadinović G., Kesić S., Ristić S., Martać Lj., Podgorac J., Pešić V., 2019: Psychomotor activity and body weight gain after exposure to low ribavirin doses in rats: Role of treatment duration. **Archives of Biological Sciences**, 71, 357–368.

8. Zivgarević Lj., Kozarević N., Žunić S., 2019: 18F-FDG PET/CT “Hepatic Superscan” in incomplete Carney’s triad. **Srpski arhiv za celokupno lekarstvo**, Online first. doi10.2298/SARH190912117Z

---

## Project: **BIOMEDICAL RESEARCH IN DENTISTRY**

(Academician Vojislav Leković)

During 2019, through the Serbian Academy of Science and Arts (SASA), Professor Leković actively participated in further complex multidisciplinary research on the etiology and pathogenesis of both periodontal and peri-implant diseases.

The complex laboratory-molecular research of the certain signaling pathways role in bone resorption in periodontal disease has been conducted. Additionally, studies on the role of such mechanisms, as well as of some viruses and proinflammatory mediators in peri-implant pathology has been initiated. In addition, local antimicrobial therapy as adjunctive therapy in non-surgical periodontal treatment has been thoroughly studied.

The achieved results of the previously defined and realized studies were published in referent scientific journals and were presented at national and international expert meetings. A number of researches has been developed into original scientific papers, which are currently in the process of the journals’ review. In addition, the majority of the already published and presented researches has been further continued. New research has been launched, with defined goals that have been derived from the existing project goals, as a necessary follow-up.

## **COMMITTEE ON CARDIOVASCULAR PATHOLOGY**

(Academician Vladimir Kanjuh)

The Committee held its Annual Meeting on 17 December 2019 at the Serbian Academy of Sciences and Arts in the presence of its members, as-



sociates and invited guests (120 in total). The Meeting was welcomed on behalf of the SASA by its President academician V. S. Kostić and academician D. Micić, Secretary of the Department of Medical Sciences (to which the Committee belongs), President of the Health Council of the Republic of Serbia, and Committee member. They pointed out that the Committee was the oldest, cherishing a long tradition, and one of the best committees under the auspices of the Serbian Academy of Sciences and Arts. Then, state secretary of the Ministry of Health, Professor Dr. R. Ščepanović praising the efforts of the Committee highlighted that not only did the Committee deal with medical education and science, but that it also cared about the organization of the health service and medicine as a profession in Serbia.

The representatives of the Committee on Cardiovascular Pathology of the ASA RS (with whom the Committee has been successfully cooperating for years) also participated, headed by academician D. Šećerov Zečević, ASA RS corresponding member Prof. Dr. D. Vulić, Prof. Dr. A. Lazarević (all members of the SASA Committee on CVP), as well as the editor-in-chief of the best informative and professional medical journal of Serbian countries “Medici.com” (Banja Luka, Republic of Srpska) Dr. M. Pušac. The Committee has been successfully cooperating with this Institution for years in the organization of the I to XI International Summer Cardiology School on the Montenegrin Coast and in the publication of the first cardiology textbook of the School titled “New Trends in the Prevention, Diagnosis and Treatment of Cardiovascular Diseases”, edited by D. Vulić, V. Kanjuh, M. Ostojić, N. D. Wong. Belgrade, 2015 and 2017.

The Committee work report (V. Kanjuh, M. Ostojić, S. Kanjuh) stated, among other things, that the Committee was the co-organizer of 20 cardiology meetings in Serbia and the Republic of Srpska.

## COMMITTEE FOR UROGENITAL TUMORS

(Academician Jovan Hadži-Đokić)

During 2019, the members of the Committee continued their work on various projects and investigations, such as:

- prostate cancer screening in Serbia,
- prostate cancer epidemiology in Serbia,
- the changes and shifts of clinical and pathological stages of urogenital tumors in the recent decade,
- the diagnostics and the management of the urinary bladder cancer,
- radical cystectomy and the urinary derivations,

- epidemiological studies of bladder cancer in Serbia,
- the impact of blood volume and Body Mass Index (BMI) on serum PSA level,
- urinary PSA: potential marker for BPH,
- salivary PSA: potential marker for late onset hypogonadism,
- renal tumors with the invasion of v. renalis and v. cava inferior,
- prostate cancer screening in Municipality of Vračar.

The members of the Committee published numerous issues and took part in many domestic and international congresses during 2018 (Sofia, Skopje, Belgrade, Istanbul).

The Committee members participated in the writing of the chapters for the book “Selected Chapters of Urology”, which is supposed to be printed in early 2020 and whose promotion is scheduled for 7 April 2020, sponsored by the SASA Library.

## **COMMITTEE ON IMMUNOLOGY AND ALLERGOLOGY**

(Academician Miodrag Čolić)

The most important activity of the Committee is the continuation of the promotion of scientific research in the field of immunology and allergology. To reach this goal, the Committee organized a scientific meeting at the Serbian Academy of Sciences and Arts (25 April 2019), on the occasion of the World Immunology Day, in cooperation with the Immunology Society of Serbia. During the Meeting the most important results in the field of basic immunology, published in international high-ranking journals, were presented. The members of the Committee participated in different international meetings and thus promoted our science. In addition, the members took part in several COST actions and were actively involved in the preparation of the next European Immunology Congress (Belgrade, 2021).

## **COMMITTEE FOR MULTIDISCIPLINARY STUDIES OF DIABETES**

(Academician Nebojša M. Lalić)

The Committee for Multidisciplinary Studies of Diabetes during the year 2019 continued its activities on initiating and developing a multidisciplinary approach in diabetes research. In this context, the Committee promoted joint activities with other associations focusing on the diabetes complica-

tions, the co-morbidities of this disease as well as the diseases showing similar impact to the public health.

During 2019, the Committee was the co-organizer of the 11<sup>th</sup> Serbian Congress on Diabetes, which was held in Belgrade, November 24–27, 2019, and which brought together more than 1,000 participants from the region and numerous experts involved in diabetes research from the country as well as from abroad.

The members of the Committee have continued their collaboration within the project “Insulin resistance: comparative analysis of its role in the onset and development of diabetes, atherosclerotic vascular disease and neurodegenerative disorders”, which is supported by the Serbian Academy of Sciences and Arts, and coordinated by Nebojša Lalić, as well as within other compatible projects. The collaboration based on the project headed by Nebojša Lalić has been developed in three major areas: (a) relationship between insulin resistance in diabetes and the impairments of the central nervous system; (b) the influence of insulin resistance on the onset and development of cardiovascular disorders, (c) the determinants of the early phase of type 2 diabetes. In addition, the successful collaboration has been established with Dušica Lečić Toševski, SASA full member, and her group within the international INTERPRET DD project.

The members of the Committee acted as invited lecturers, chairpersons and presented their original papers from the joint fields of collaboration.

## **COMMITTEE FOR ENDOCRINOLOGY AND ENVIRONMENTAL FACTORS**

(Academician Dragan Micić)

In 2019, the SASA Committee for Endocrinology and Environmental factors coordinated activities on the promotion of prevention of obesity together with the Ministry of Health of the Republic of Serbia, Republic Expert Committee for Chronic Non-infectious Diseases, Republic Expert Committee for Endocrinology, Serbian Association for the Study of Obesity and Board for Obesity of Endocrine Section of the Serbian Medical Society. The Committee participated with its members as the organiser of the scientific meeting titled “Advances in Endocrinology”, which was held on 16 December at the Serbian Academy of Sciences and Arts, with the participation of 16 eminent Serbian experts in the field of endocrinology. During 2019, President of the Committee, Academician Dragan Micić, participated as an invited lecturer in 12 national and international meetings.

In late 2019, the Committee started preparations for the Fifth Serbian Congress on Obesity that is scheduled for 2020.

## COMMITTEE FOR HUMAN REPRODUCTION

(Academician Nebojša Radunović)

The SASA Committee for Human Reproduction and the Association for Human Reproduction of Serbia organized the 13<sup>th</sup> Symposium with international participation entitled “From egg donation to mitochondrial donation. Are there any risks?” on December 5–7, 2019 at the Serbian Academy of Sciences and Arts in Belgrade. The members of the SASA Human Reproduction Committee participated as co-organizers and lecturers, presenting current up-to-date experiences related to: fertility preservation, fertility preservation – oncofertility, oocyte and sperm donation in Serbia – what does the profession, law, patients say, regions experience in dealing with regulatory and practical aspects of donation, legislation in assisted reproduction, quality control/accreditation of assisted reproduction centers, social egg freezing, fetal pathology news and demographic challenges in the Republic of Serbia. The symposium brought together 11 foreign and 18 Serbian lecturers and 132 participants this year. The meeting was welcomed by the SASA President, academician Vladimir Kostić who said: “I wish you every success in this work and I assure you that the SASA is a place for anyone who is curious, who wants to ask questions”. The best confirmation of the success of the symposium, which has been held every year since 2006, is the fact that it was attended by numerous authorities from abroad and the most important experts in these fields from Serbia: 138 foreign lecturers, 199 domestic lecturers, 2,566 participants, 4 presidents of the European Society for Human Reproduction and Embryology (ESHRE) and 8 members of the management of the European Society for Human Reproduction and Embryology (ESHRE). There are also 15 books-collections of works, which have been published.

As a result of the collaboration of the SASA Human Reproduction Committee and the National Association for Perinatal Medicine of Serbia and the National Association for Human Reproduction of Serbia in 2019, the book was published entitled **“From egg donation to mitochondrial donation. Is there a risk?”**. The book contains papers with the latest developments in the full spectrum of research in human reproduction. The editor of this book, as well as the regular editor of the News in Human Reproduction edition since 2006, is academician Nebojša Radunović.



# DEPARTMENT OF LANGUAGE AND LITERATURE

## ONOMASTIC COMMITTEE

(Academician Aleksandar Loma)

1. During 2019, field research in the Nikšić Golija region (J. Jelić) and the region of Završ near Foča (V. Avram) continued. The materials from 8 Golija villages (696 toponymes, 389 surnames, 1,410 names) and Završ villages (140 toponymes) were submitted and paid out of the Committee's funds.

Note: Onomastic field research in Montenegro was not financed by the Committee, but by a special SASA fund created to support the survival of Serbistika in Montenegro.

2. At the end of the year, two volumes of *Onomatological Contributions* (Onomatološki prilozi) were simultaneously submitted for publication, Volume XXV for 2018, 342 p., and Volume XXVI for 2019, 596 p. Collecting papers for Volume XXVII is underway.

3. At the beginning of the year, Mara Tijanić-Vujović's monograph **Onomastics of Župa Pivska** (Onomastika Župe pivske) was published as Volume IV of the "Library of Onomatological Contributions" (Biblioteka Onomatoloških priloga) Series.

4. In the talks with the SASA management and the Director of the Audiovisual Archive and Digitization Centre, it was agreed in principle that in 2020 the Centre would start scanning the cards containing the Committee's materials; priority should be given to the materials from Kosovo and Metohija.

## COMMITTEE FOR CRITICAL EDITIONS OF SERBIAN WRITERS

(Corresponding Member Slobodan Grubačić)

As the President of the Committee for Critical Editions of Serbian Writers, he supervised the work on the completion of a long-term scien-

tific project titled *Old Serbian Chronicles of Djordje Branković* (Hronike Slavenoserbske Djordja Brankovića). In consultation with his colleague, Academician Zlata Bojović, he proposed her to take charge of the Committee.

## COMMITTEE FOR THE DICTIONARY OF THE SERBO-CROATIAN LITERARY LANGUAGE AND VERNACULARS

(Academician Milosav Tešić)

In 2019, the work on the 21st volume of the *SASA Dictionary* was finished. The manuscript was peer reviewed, and the acceptance of peer review comments and technical editing of the manuscript are currently underway. The work on the 22nd and 23rd volumes was also carried out. The manuscript of the 22nd volume underwent the basic processing stage, while slightly less than half of the text underwent the redaction stage; a smaller number of the sections underwent the first and second redaction stage, while the 23rd volume underwent the basic processing stage.

As for the project titled *Preparation of the Digital SASA Dictionary Card Catalogue* (Izrada digitalnog kataloga listića Rečnika SASA), the following work was done: the cards with the entries under P to Š were annotated, while the cards with the entries under A and B started to be annotated.

The Committee held a session where it adopted the proposal of the Editorial Board of the *SASA Dictionary* to make a searchable electronic corpus of new materials for its new volumes, thus speeding up their preparation. The Committee also discussed the issue concerning the ownership of the digitized materials for the *SASA Dictionary*, which was posed by the Editorial Board Chairman. The Editorial Board unanimously concluded the following:

The owner of the digitized materials for the preparation of the *SASA Dictionary* is the Serbian Academy of Sciences and Arts (and it is also the owner of the materials filed in card format);

– In order to ensure safe materials handling, the Editorial Board should write the Rule Book on Access to Materials.

## COMMITTEE FOR RESEARCH IN LITERARY HISTORY

(Academician Zlata Bojović)

The proceedings of the scientific meeting on **The Periodization of New Serbian Literature – On the Occasion of the 150th Anniversary of Pavle Popović's Birth** (Periodizacija nove srpske književnosti – povodom

150. godišnjice rođenja Pavla Popovića), held on 25-26 August 2018, was published in the first half of 2019. The scientific meeting was organized by the Committee for the Study of Literary History. The proceedings include 27 papers: 8 are dedicated to Pavle Popović, while 19 deal with various issues concerning the periodization of new Serbian literature, mostly relating to Pavle Popović's entire work and his place in Serbian literary history.

In 2019, the Committee organized a round table titled *The Development of Poetics in Serbian Literature – Serbian Literary Theory* (Razvoj poetike srpske književnosti – Teorija književnosti u Srba). The round table was held on 4 November 2019. Out of 17 announced papers 16 were presented.

On 23 October 2019, the Committee organized a ceremonial gathering to mark the 50th death anniversary of Jorjo Tadić and Petar Kolendić, together with the Department of Historical Sciences. The appropriate lectures were given by Academicians Desanka Kovačević-Kojić, Mihailo Vojvodić and Zlata Bojović.

In 2019, the Committee was involved in the preparation of two scientific meetings to be held in 2020: a round table titled *Serbian Writers and Serbian Theatre Until the First World War* (Srpski književnici i srpsko pozorište do Prvog svetskog rata), scheduled for 25 March 2020 (the elaboration of the round table concept and rationale, and the sending of invitation letters), and a scientific meeting titled *Serbian Literature in Literary Histories – On the Occasion of the 225th Birth Anniversary of Pavel Jozef Šafarik* (Srpska književnost u istorijama književnosti – povodom 225. godišnjice rođenja Pavla Josifa Šafarika).

ZLATA BOJOVIĆ

---

*Iz naučne korespondencije Petra Kolendića*, **Ricerche slavistiche**, Nuova serie 1(61), Roma, 2018, 41–67.

*La corrispondenza scientifica fra Arturo Cronia e Petar Kolendić*, y 36.: Arturo Cronia, **L' eredità di un Maestro a cinquant'anni dalla scomparsa**, **Atti del convegno di Studi** (Padova, 20-21 novembre 2017), a cura di Rosanna Benacchio e Monica Fin, Padova, 2019, 51–60.

---

## COMMITTEE FOR THE ETYMOLOGICAL DICTIONARY OF THE SERBIAN LANGUAGE

(Academician Aleksandar Loma)

1. Further work on Volume IV of the Etymological Dictionary of the Serbian Language (Etimološki rečnik srpskog jezika /ERSJ/) (*bl-bre*) included the additional excerption of dialectal sources – 0.27 author's sheets, basic en-



try processing – 5.65 author's sheets, first redaction of entries – 5.72 author's sheets, second redaction of entries – 3.58 authors' sheets and third redaction of entries – 1.3 author's sheets.

2. Further work on Volume I of the *Reference Etymological Dictionary of the Serbian Language* (Priručni etimološki rečnik srpskog jezika) (A–O) included the preparation of the primary version of entries – 1.85 author's sheets and the first redaction of entries – 1.02 author's sheets.

3. Work started on the lexicographic processing of the *Mining' Law* (Zakon o rudnicima) enacted by Despot Stefan Lazarević. The electronic entry of both transcripts was completed and 139 entries were prepared.

4. Preparatory work continued on the digitization of dialectal dictionaries that are published on the *Raskovnik* Dictionary Platform.

---

MARTA BJELETIĆ

---

*К изучению происхождения с.-х. ковиље 'stipa pennata', Этнолингвистика. Ономастика. Этимология* : материалы IV Междунар. науч. конф. Екатеринбург, 9–13 сентября 2019 г. Екатеринбург : Изд-во Урал. ун-та, 2019. — 378 с., 29–31.

---

JASNA VLAJIĆ-POPOVIĆ

---

[contributor from Serbia] **Linguistic bibliography/Bibliographie linguistique for the year 2018 (and supplement for previous years)**. Published by: The Permanent International Committee of Linguists under the auspices of the International Council for Philosophy and Humanistic Studies. Leiden / Boston : Brill, 2019, 747–782.

---

MAJA KALEZIĆ

---

*Language globalization versus inner language diversity? An outline of one scalable terminological algorithm*, Chapter in: **The Intricacy of Languages**, Edited by Francesc Feliu and Olga Fullana [IVITRA Research in Linguistics and Literature 20], Johan Benjamins Publishing Company, 2019, 11–22.

*La llengua i la identitat collective* [резюме], **La lengua desitjada**, XI Colloqui Internacional: Problemes i Mètodes de la Història de la Llengua, Institut de Llengua i Cultura Catalanes, Universitat de Girona, 2019, 47.

---

ORSAT LIGORIO

---

*Homeric ἦτορ*, **Lucida intervalla**, 48, 2019, 5–18.

*Proto-Indo-European 'Eat' and 'Mouth'*, **Južnoslovenski filolog**, 75/2, 2019, 23–35.

*Proto-Indo-European 'Turn' and 'Snake'*, **Zbornik Matice srpske za filologiju i lingvistiku**, 62/1, 2019, 7–16.

---

ALEKSANDAR LOMA

---

*Некоторые лингвистические наблюдения о древних славянах и их расселении*, in: I. O. Gavrituhin / St. Trifunović (ur./red.), **Balkan, Podunavlje i istočna Evropa u rimsko doba i u ranom srednjem veku**. Materijali I srpsko-ruske arheološke konferencije “Sudbine naroda Istočne Evrope — pogled kroz vekove” (20–26. maja 2014. g. Novi Sad, Beograd), Novi Sad : Muzej Vojvodine; Moskva : Institut arheologije Ruske akademije nauka, 29–45.

*Оружие, орудие и смешение приставок* [резиме], **Этнолингвистика. Ономастика. Этимология**: материалы IV Междунар. науч. конф. Екатеринбург, 9–13 сентября 2019 г. Екатеринбург : Изд-во Урал. ун-та, 2019, 208–210.

---

## COMMITTEE ON FOLK LITERATURE

(Academician Nada Milošević-Đorđević)

### Project: **DIGITIZATION OF THE ETHNOGRAPHIC COLLECTION OF THE SASA ARCHIVES**

The Committee continued to work on the project involving the digitization (photo scanning) of folk literary texts from the Ethnographic Collection of the SASA Archives, with engineer Branislav Tomić's expert assistance. The scans were entered into the SETNO database. The photographs of individual texts with their titles and paginations were also excerpted. The Committee entrusted five associates (doctoral and master students at the Department of Serbian Language and South Slavic Languages) to decode and retype the material.

The material has 1468 pages and includes Collections Nos. 53, 54, 55 and 56, and one part of Collection No. 60.

Collection No. 53 — Petar Mirković, 1960; 319 p.

Collection No. 54 — Djordje Perin, 1990; 12 p.

Collection No. 55 — Sima Mileusnić, 1900; 788 p.

Collection No. 56 — Stevan Pejić, 1900; 56 p.

Collection No. 60 — Vuk Vrčević, 1900; 293 p.

PROF. DR. NEMANJA RADULOVIC

---

**Studies on Western Esotericism in Central and Eastern Europe**: JATE Press, University of Szeged, 2019 (edit. with Karolina Maria Hess).

“Contemporary Magic Healing and New Age”, **Studies on Western Esotericism in Central and Eastern Europe**: JATE Press, University of Szeged, 2019, 179–190.

---

## OLD SLAVONIC COMMITTEE

(Academician Jasmina Grković-Mejdžor)

The peer reviewed and made-up collection of papers titled “Scala Paradisi. In Memory of Academician Dimitrije Bogdanović (1986-2016)” (Scala paradisi. Akademiku Dimitriju Bogdanoviću u spomen /1986–2016/), whose editors included Anatoly Arkadyevich Turilov, foreign member of SASA, Professor Dr. Tatjana Subotin-Golubović, Professor Dr. Irena Špadijer, Professor Dr. Nataša Dragin, Dušica Grbić, MA, and Katarina Mano-Zisi, was prepared for publication in the first half of the year. This ended a very complex technical editing where the selected high-quality papers and their presentation were harmonized. The book contains 25 papers and, apart from their Serbian colleagues, 13 foreign associates also participated in their writing. The 487-page book was prepared in accordance with the technical principles spelled out in the Rule Book on SASA Publishing Activity. “The Slavic and Serbian Middle Ages” (Slovenski i srpski srednji vek) Series was launched just with this book. Othwise, the book was successfully presented at the SASA Library Forum, held at the Grand Hall on 3 September 2019. During the better part of the year, the book was distributed using the Committee’s resources.

At the end of 2018, the book of the Djordje Zečević Fund for the Protection and Advancement of the Cyrillic Script, “The Serbian Prayer Book. A Festschrift for Milan Rešetar (1512–1942–2012)” (Srpski molitvenik. Spomenica Milanu Rešetaru /1512–1942–2012/), whose publishing was supported by the SASA Old Slavonic Committee and whose editors included Jasmina Grković-Major and Viktor Savić, members of the Old Slavonic Committee, received the “Pavle and Milka Ilić” Award. The Award was handed out on 4 February 2019.

The Old Slavonic Committee again cooperated with the Djordje Zečević Fund in the preparatory work on the “Bibliography of the Cyrillic Script” (Bibliografija ćirilćnog pisma) for which, in an earlier period, Gordana Radojćić (1950–2016), longtime Director of the SASA Bibliographic Section, collected bibliographic data. It is planned to publish this book.

The work continued on *An Introduction to Philology* and *The Philology of the Serbian People, Notes from Ljubomir Stojanović’s Lectures at the Higher School, School Year 1895/96*.

---

Jasmina Grković Majdžor. “Future Tense in South Slavic: Diachrony and Typology.” *Slavia Iaponica*, 22 (2019): 7–30.

Jasmina Grković-Mayor. “Semantic borrowing in the creation of Slavic Christian terminology: The case of OCS *věra*: Gr. πίστις.” Chr. Tzitzilis, G. Papanastassiou

(eds.). **Language Contact in the Balkans and Asia Minor**. Thessaloniki: Institute of Modern Greek Studies, 2019, 61–72.

Душица Грбић. „Рукописи Христофора Рачанина.“ **Тринадцате Загребинске чтения**. Сборник статей по итогам международной научной конференции (3–4 октября 2018). Санкт-Петербург: Российская национальная библиотека, 61–69.

Виктор Савич. „Звуковое значение надстрочных знаков в Святостефанском хрисовуле (1317–1318).“ **Славянское и балканское языкознание. Палеославистика** – 2 (Москва, 2019): 314–348.

Ирена Шпадијер. „‘Молодой Папа’ П. Соррентино как агиографический нарратив. **Девятые Римские Кирилло-Мефодиевские чтения – Slavia Christiana: Язык · Текст · Образ** (Рим – Салерно, 4–9 февраля 2019 г). Москва: Индрик, 2019, 187–192.

Ирена Шпадиер. „Службы святым сербам в рукописной минее № 11 из Свято-Пантелеймонова монастыря.“ **Славянское и балканское языкознание: Палеославистика** – 2 (Москва, 2019): 408–415.

---

## COMMITTEE FOR THE COMPARISON OF THE SERBIAN LANGUAGE WITH OTHER LANGUAGES

(Corresponding Member Ljubinko Radenković)

At the end of 2019, the following project was nearing completion:

Biljana Sikimić, Ana Plotnikova, *Pčinja. Ethnolinguistic Research in the South Slavic Context*. The work on the descriptive part of the monograph is underway.

The launched project: Andrey Bazilevsky, Kornelija Ičin, *Serbian Poetry, 10th– 19th Centuries: An Annotated Anthology. The Comparative Text in the Serbian and Russian Languages* had to be suspended due to the sudden death of Dr. Andrey Bazilevsky.

The following project is underway: Kornelija Ičin (project leader), Nenad Blagojević, Ivana Kojić, *Aleksandar Belić and Russian Émigrés in Interwar Belgrade*.

In 2019, Ivana Kojić, a project associate, published her work titled “The Publishing Commission of the Russian Cultural Committee – Idea, Realization, Liquidation”, Novi Sad: *Zbornik Matice srpske za slavistiku* 96, 2019, pp. 295–306.

The work on the project titled *The Creation of an Electronic Base of Terms from Serbian and Polish Lexicology and Phraseology Within the iSybi-slaw System* is underway.

The project titled *The Parallel Electronic Corpus of the Serbian and Russian Languages* is underway. The project leader on the Serbian side is Dr.

Nenad Ivanović, Scientific Associate at the Institute for the Serbian Language of SASA, while the project leader on the Russian side is Dmitry Sichinava, Senior Scientific Associate at the Vinogradov Russian Language Institute of the Russian Academy of Sciences. During 2019, almost all works, registered as the base of the Serbian-Russian language corpus parallelization project, were collected in electronic form.

In 2019, the Committee launched a new, three-year project titled *The Mythological Fundamentals of Slavic Folklore*.

## COMMITTEE FOR RESEARCH OF SERBIAN LANGUAGE REGARDING CONTEMPORARY LINGUISTIC THEORIES

(Academician Milorad Radovanović)

Academician Milorad Radovanović published or edited:

Gabrijela Šubert (Gabriella Schubert) / **On Serbian Literature and Culture** (O srpskoj književnosti i kulturi) // Editor Milorad Radovanović / Prepared by Boško Suvajdžić and Vesna Matović. – Novi Sad – Belgrade: Matica srpska – Zavod za udžbenike – Vukova zadužbina, 2019 – (Studies on Serbs /Studije o Srbima/, Vol. 24), pp. 1–360.

Jasmina Grković-Major // **Srpska enciklopedija** (Srpska enciklopedija), Vol. III, Tome 1 – Novi Sad – Belgrade: Matica srpska – SASA – Zavod za udžbenike, 2018, 607 p.

Editor: **Complete Works of Pavle Ivić** (Celokupna dela Pavla Ivića), Sremski Karlovci – Novi Sad: Izdavačka knjižarnica Zorana Stojanovića.

He also peer reviewed books and articles for foreign publishers and journals.

## INDIVIDUAL PROJECTS

### Project: **LINGUISTIC SLAVISTICS AS THE OBJECT OF SCIENTIFIC CRITICISM AND HISTORIOGRAPHY**

(Academician Predrag Piper)

In 2019, as part of individual project titled *Serbian Linguistic Slavistics as the Object of Scientific Criticism and Historiography* (Srpska lingvistička slavistika kao predmet naučne kritike i istoriografije), P. Piper published the book **Serbian Linguistic Slavistics of the Second Half of the 20th Century** (Srpska lingvistička slavistika druge polovine XX veka), GobeEdit Publishing.

Printed by Schatungsdienst Lange o. H. G., Berlin, 2019, 312 p., as well as several articles.

The work on this project continues. It is planned to publish three articles in 2020.

Project: **SERBO-GERMAN LITERARY AND CULTURAL TIES**

(Corresponding Member Slobodan Grubačić)

As the Director of the Committee for Comparative Research on Serbian-German Literary, Cultural and Political Relations, I was involved in the study and interpretation of the mentioned relations. It is well known that during the last two centuries of the relations between Serbs and Germans, especially after the unification of Germany into a nation state (1871) and the international recognition of Serbia as a state (1878), abounded in political and cultural influences that can be observed not only in literature, but also in art and science. Although these relations were mostly asymmetrical, since the German influence in these fields was certainly more significant, the influence of Serbian culture on Germans and Germany did not disappear without a trace, especially in the first half of the 19th century. The question that still awaits an unambiguous answer is to what extent these influences were driven by political and geostrategic interests and to what extent they came from an authentic cultural permeation. Therefore, there is need for a comprehensive scientific and culturological approach that will encompass all cultural spheres, but laying special emphasis on literary influences.

---

The tangible result of the last year's work on these relations and influences is the book that just came out – **The Bells of Ivo Andrić (Zvona Ive Andrića)**, Belgrade: Službeni glasnik, 2020, 155 p.

*Andrićs Studie über die Glocke* / Slobodan Grubačić // in : **Andrićs Sonnenseite** / Karl-Franzens-Universität, Graz : 2019, 339–355.

**Le Temps et l'aspect en France et en Serbie**, Veran Stanojević; editor Slobodan Grubačić. – 1. edit. – Beograd: Filološki fakultet, 2019, 430 pp.

Translation: Karl Jaspers: **Die massgebenden Menschen: Sokrates, Buddha, Konfuzius, Jesus** - [2. edit.]. – Beograd, 2019, 250 pp.

---

## ACADEMIC COMMITTEE FOR DIALECTOLOGICAL ATLASES

(Academician Aleksandar Loma)

The main and only task of the SASA Committee for Dialectological Atlases is the elaboration of dialectological atlases, namely the work on the *Serbian Dialectological Atlas* (SDA) (Srpski dijalektološki atlas /SDA/) and the domestic sector of the *European Linguistic Atlas* (ALE) (Evropski lingvistički atlas /SDA/) and the *General Slavic Linguistic Atlas* (OLA) (Opšteslovenski lingvistički atlas /OLA/).

At one time, the Committee formed the ALE, OLA, OKDA and SDA Commissions in order to facilitate the work on the above mentioned projects.

The ALE Commission includes Academician A. Loma (Chairman), Professor Dr. D. Petrović, Professor Dr. M. Pižurica, Professor Dr. N. Bogdanović, ASARS Academician S. Remetić and Dr. Snežana Petrović.

The OLA Commission includes the following experts: Professor Dr. D. Petrović, ASARS Academician S. Remetić (Chairman), Professor Dr. M. Pižurica, Professor Dr. N. Bogdanović, Professor Dr. S. Miloradović, Professor Dr. Gordana Dragin, Professor Dr. Žarko Bošnjaković, Academician Aleksandar Loma, Dr. Marta Bjeletić, Dr. Marina Jurišić, Dr. Mirjana Petrović-Savić, Professor Dr. Dragana Radovanović and Assistant Professor Dr. Danka Urošević.

The SDA Commission includes the members of the OLA Commission and the following experts: Professor Dr. R. Mladenović, Professor Dr. N. Ramić, Professor Dr. Miroslav Nikolić, Professor Dr. Jordana Marković, Dr. R. Stijović and Professor Dr. Mihai N. Radan (Timisoara).

In addition to the Chairman, Professor Dr. D. Petrović, the Commission for OKDA (*General Carpathian Dialectological Atlas*) includes Professor Dr. M. Pižurica and ASARS Academician S. Remetić. Since the last, 7th volume of the *General Carpathian Dialectological Atlas* was published in 2004 as the joint edition of the Serbian Academy of Sciences and Arts, SASA Institute for the Serbian Language and Faculty of Philosophy in Novi Sad, the most important phase of this international scientific project was practically completed.

### General Slavic Linguistic Atlas

In 2019, in pursuing its responsibilities, defined at the regular annual session of the International Commission and International Working Group for OLA within the International Committee of Slavists, which was



held in Belgrade (Serbia) from 28 to 30 August 2018, the Serbian National Commission for OLA did the following:

1. The Serbian National Commission was assigned to prepare several trial cards (different types) for the volume *Горное овцеводство*. This implied the provision of the remaining material and etymological comments from the national commissions.

2. It prepared the material for 99 questions from the volume *Глаголи* (the first part) for the Polish National Commission.

3. It prepared and verified the indices from the second series with 37 questions for the volume *Народная техника. Транспорт и пути сообщения* for the Ukrainian National Commission.

4. It entered the literary names (ekavian and ijekavian variants) into the electronic version of the OLA Questionnaire for the questions related to all thematic fields.

5. It prepared the etymological comments for the Belarusian lexical volume *Метеорология и измерение времени* (Bosnian materials).

From 22 to 29 September 2019, Krakow (Poland) hosted the regular annual session of the International Commission and International Working Group for OLA within the International Committee of Slavists, which was organized by the Polish Academy of Sciences and its Institute of the Polish Language. The session was attended by the representatives of 12 national commissions (except the Croatian Commission). Our representatives included S. Remetić, M. Bjeletić, M. Jurišić and M. Petrović-Savić.

During the session, the relevant work was carried out within the Phonetic-Grammatical and Lexical-Word Formation Commissions, as well as within the Subcommission on Morphological Transcription. The Phonetic Section was involved in the preparation, analysis and cross-checking of the materials for the volume *Рефлексы \*a* (Belarusian National Commission), *Рефлексы \*tort, \*tolt, \*tert, \*telt* (Czech National Commission), and *Рефлексы \*i, \*u, \*y* (Slovenian National Commission).

At its 26 September meeting, the OLA International Commission made several decisions relating to the further work on the Atlas: to create the impressum contents for the Atlas volumes that are published and, in this connection, enter changes/corrections into the list of OLA research points and phonetic transcription; enlarge the OLA International Commission; lay down the uniform principles for the preparation of the OLA grammatical volumes, and form the Subcommission on Morphology within the Phonetic-Grammatical Commission.



### **Serbian dialectological atlas**

In 2019, there was a long-awaited shift in the collection of linguistic materials in the Serbian vernaculars in the territory of Croatia. Linguistic materials for the first lexical volumes were picked up from the refugees' vernacular at seven research points, which was also done at one research point in Bosnia.

### **ACADEMIC COMMITTEE FOR THE STUDY OF REPRESSION (GOLI OTOK AND OTHER CAMPS AND PRISONS)**

(Academician Dragoslav Mihailović)

In 2019, the Committee members held several meetings dedicated to political repression during the period of Yugoslavia's conflict with the Cominform countries.

During the period from 16 January to 22 May 2019, the Committee held a scientific forum where prominent historians from Serbia, Russia and the Czech Republic presented the results of their research and summarized the existing reliable knowledge about the onset of political repression in Yugoslavia from 1948 to 1956. Within the lecture cycle titled "Yugoslavia and the Cominform 1948-1956" (Jugoslavia i Informbiro 1948–1956) 15 lectures were held. This lecture cycle was highly professionally acclaimed.

### **ACADEMIC COMMITTEE FOR THE HISTORY AND PUBLICATION OF ACCESSION SPEECHES**

(Academician Miro Vuksanović)

The SASA Committee for History and Publication of Accession Speeches was established by the decision of the SASA Presidency, brought at its second session on 17 April 2019.

The Committee held its first session on 28 May 2019. On this occasion, it adopted its work plan for 2019, including the launching of a new SASA series titled *Accession Speeches by Serbian Academicians (1886–1947)* (Pristupne besede srpskih akademika /1886-1947/) and the preparation of the first book in the series. Academician Miro Vuksanović was elected as the editor of this series.

The planned activities were finished and the book *Accession Speeches by Serbian Academicians (1886–1947)*, Vol. I, was prepared for publication. It contains the accession speeches and solemn declarations by the first formal

members of the Serbian Royal Academy (16 of them), who were appointed by King Milan, and 5 of them who were elected at the first session. Thus, the book will include:

1. The message by Josif Pančić, the first President of the Serbian Royal Academy;
2. The accession speeches by Dimitrije Nešić, Ljubomir Klerić, Jovan Žujović, Stojan Novaković, Milan Kujundžić, Svetislav Vulović, Svetomir Nikolajević, Čedomilj Mijatović, Milan Dj. Milićević, Ljubomir Kovačević, Pantelija Srećković, Ljubomir P. Nenadović, Matija Ban, Mihailo Valtrović and Davorin Jenko;
3. The solemn declarations by Franc Miklošič, Vatroslav Jagić, Valtazar Bogišić, Ilarion Ruvarac and Pavle (Paja) Jovanović.

## ACADEMIC COMMITTEE ON CULTURE AND ART

(Academician Miro Vuksanović)

In 2019, the SASA Committee on Culture and Art held three sessions. Emphasis was laid on the consideration of the proposed Cultural Development Strategy for 2017–2027. This was the reason for holding a meeting which, in addition to the Committee members, was attended by the President of SASA, Academician Vladimir S. Kostić, and Serbian Minister of Culture and Information, Vladan Vukosavljević, and his associates.

The President of SASA delivered the opening speech, the President of the Committee presented the introductory remarks, while the Minister explained the proposed Strategy. The SASA members in attendance expressed their praises, remarks and proposals. The Committee members emphasized the importance of cherishing the Serbian language and Cyrillic script. They made a number of linguistic remarks on the text of the Strategy and pointed out that some spheres of culture and aspects of cultural identity were not sufficiently elaborated and presented. It was especially pointed to the unresolved issue of cultural centres and lectorships abroad. It was concluded that a cultural strategy was necessary should it have realistic goals and should they be achieved.

The Minister and his associates emphasized that the Strategy had a dual goal: to make the key characteristics of Serbian culture and its main priorities recognizable.

It was especially pointed out that the budgetary funds earmarked for culture were insufficient.



## DEPARTMENT OF SOCIAL SCIENCES

### COMMITTEE ON THE SOURCES OF SERBIAN LAW

(Academician Kosta Čavoški)

During the year, it was worked intensively on the preparation of a study titled “Dušan’s Code and Excerpts from the Later Epitimial Nomocanon in the 18th Century Romanian Translation” (Dušanov zakonik i izvodi iz mladjeg Epitimijinog nomokanona u rumunskom prevodu 18. veka) for publication.

Professor Djordje Bubalo wrote an introductory essay titled “The Romanian Translation of Dušan’s Code and the Later Epitimial Nomocanon and Its Serbian Original” (Rumunski prevod Dušanova zakonodavstva i mladjeg Epitimijinog nomokanona i njegov srpski predložak). The study deals with the historiography of the manuscript, its contents, time and place of translation, the reason for its translation and use by Romanians in the Diocese of Timisoara.

Dr. Biljana Sikimić edited and supplemented the study on the language of the Romanian translation of Dušan’s Code and the Epitimial Nomocanon (especially the section on lexics), co-authored by Monica Hutanu and Adina Cyril.

Dr. Biljana Sikimić and Professor Djordje Bubalo reviewed and edited the translation of Dušan’s Code and Epitimial Nomocanon from Romanian into the contemporary Serbian language, which was done by Biljana Sikimić.

Professor Djordje Bubalo arranged the comparative texts (the Romanian translation and the original Serbian text of Dušan’s Code and the Epitimial Nomocanon, based on the Kovilj transcript) on opposite pages, using the original orthography, Latin transliteration and translation into the contemporary Serbian language.

Dr. Viktor Savić, Assistant Professor, translated the Epitimial Nomocanon of a later redaction needed for the publication of “The Romanian

Version of the Transcript of Emperor Stefan Dušan's Code" (Rumunska verzija prepisa zakonodavstva cara Stefana Dušana).

Since the focus in 2019 was laid on the preparation of the Romanian translation of Dušan's Code and the Epitimal Nomocanon, the preparation of the critical edition of the Abridged Syntagm was confined to the efforts to acquire the photographs of the transcripts of the Abridged and Complete Syntagm.

In 2019, within the scope of the project titled **Two Centuries of Serbian Constitutionality** (Dva veka srpske ustavnosti), the main attention was devoted to an analysis of the Hague Tribunal's verdicts referring to secession from SFR Yugoslavia first by Slovenia and Croatia and then Bosnia and Herzegovina. This was an important constitutional issue of the former SFRY, which disintegrated in an unconstitutional way. The research established that first Slovenia and Croatia and then Bosnia and Herzegovina seceded in an unconstitutional way. All leading Western powers, from the United States to the major members of the then European Community, recognized the independence of Slovenia and Croatia. However, they did not recognize the formation of the Republic of Srpska, because it was allegedly contrary to the Constitution of Bosnia and Herzegovina. These facts provided the basis for determining the guilt for the outbreak of a civil war in the territories of Croatia and Bosnia and Herzegovina. The blame for the war was shifted to the Serbs because they did not want to accept secession by Croatia and Bosnia and Herzegovina without armed resistance, and agree to the formation of an independent Bosnia and Herzegovina without the consent of the Serbs as a constituent people.

---

Виктор Савич, „Звуковое значение надстрочных знаков в Сятостефанском хрисовуле (1317–1318).“ **Славянское и балканское языкознание. Палеославистика** – 2, Москва, 2019, 314–348.

Srđan Šarkić, Die Gründe für die Ehescheidung im serbischen mittelalterlichen Rechts, **Rechtstransfer in der Gesschichte, Internationale Festgabe für Wilhelm Brauner zum 75. Geburtstag**, herausgegeben von Gábor Hamza-Milan Hlavačka –Kazuhiro Takii, Peter Lang GmbH, Berlin 2019, 349–358.

---

## COMMITTEE FOR PHILOSOPHY AND SOCIAL THEORY

(Academician Aleksandar Kostić)

In 2019, the Committee for Philosophy and Social Theory organized two meetings:

The scientific meeting on “State Order: Sovereignty in the Era of Globalization” (Državni poredak: suverenitet u vremenu globalizacije),

which was held at the SASA within the cycle “Strategic Directions of the Development of Serbia in the 21st Century” (Strateški pravci razvoja Srbije u XXI veku) from 8 to 9 February 2019. This was the fifth and last meeting within this cycle.

The scientific meeting dedicated to Dragoljub Jovanović within the cycle titled “Social and Political Thought in Serbia in the 19th and 20th Centuries” (Društvena i politička misao u Srbiji XIX i XX veka), which was held at the SASA on 29 March 2019.

The following proceedings of these scientific meetings were published:

Proceedings of the scientific meeting titled **State Order: Sovereignty in the Era of Globalization Within the Cycle “Strategic Directions of the Development of Serbia in the 21st Century”**, A Word from the Editor (“Državni poredak: suverenitet u vremenu globalizacije” u okviru ciklusa “Strateški pravci razvoja Srbije u XXI veku”. Reč urednika), Serbian Academy of Sciences and Arts, 392 p.

- Proceedings of the scientific meeting titled **Social and Political Thought of Dragoljub Jovanović** (Društveno-politička misao Dragoljuba Jovanovića) within the cycle *Social and Political Thought in Serbia in the 19th and 20th Centuries* (Društvena i politička misao u Srbiji XIX i XX veka), Serbian Academy of Sciences and Arts.

- A 24-page brochure that contains the titles of all papers and names of all participants in all five meetings held within the cycle **Strategic Directions of the Development of Serbia in the 21st Century** (Strateški pravci razvoja Srbije u XXI veku).

## COMMITTEE FOR THE STUDY OF POPULATION

(Academician Časlav Ocić)

The report was not submitted to the department.

## COMMITTEE ON ECONOMIC SCIENCE

(Academician Časlav Ocić)

The report was not submitted to the department.

**COMMISSION FOR THE STUDY OF LIFE AND CUSTOMS  
OF THE ROMA**

(Academician Tibor Varady)

Dr. Aleksandra Mitrović, a long-time associate and member of the Committee, passed away in early June 2019.

This year the Committee marked the 30th anniversary of its formation by holding a ceremonial session on 10 October 2019. The President of SASA, Academician Vladimir S. Kostić, President of the Committee, Academician Tibor Varady, Secretary of the Committee, Dr. Goran Bašić, and Committee members, Professor Dr. Dragan Todorović, Dr. Dragoljub Acković, Dr. Biljana Sikimić and Dr. Zlata Vuksanović-Macura, gave speeches about the work of the Committee, namely the circumstances under which it was formed and developed, the obstacles and challenges it had to overcome, as well as its activities and results achieved so far.

On this occasion, the monograph **Thirty Years of the Committee for the Study of the Life and Customs of the Roma, 1989-2019** (Trideset godina rada Odbora za proučavanje života i običaja Roma 1989–2019) was prepared and published.

As part of the celebration of the 70th anniversary of the Council of Europe, and on the occasion of the International Roma Day, 11 April 2019, a lecture titled *Strengthening Communities Through the Production of Knowledge on Roma History and Culture* (Jačanje zajednica kroz proizvodnju znanja o istoriji i kulturi Roma i Romkinja) was organized in cooperation with the Council of Europe Office in Belgrade. The lecture was delivered by Calin Rus, Director of the Intercultural Institute of Timisoara and Council of Europe expert on intercultural education, education for democratic citizenship, minorities and interethnic cooperation.

On 7 June 2019, as part of the celebration of the 100th birth anniversary of Slobodan Berberski, a lecture on the “Poetry of Slobodan Berberski” (Poezija Slobodana Berberskog) was held.

The Committee also decided to mark its jubilee year by holding a scientific meeting titled “Rade Uhlik’s Contribution to Roma Linguistics and Culture” (Doprinos Radeta Uhluka lingvistici i kulturi Roma). The scientific meeting dedicated to Academician Rade Uhlik’s work was held on 22 November 2019. In this way we wished to point to the importance of Uhlik’s linguistic research of Roma speeches in Yugoslavia (in the fields of dialectology, morphology, syntax, semantics, pragmatics), lexicographic works (*Bosnian Romani: A Vocabulary* (3 vols.) (1941–1943), *Srpskohrvatsko-*

*ciganski rječnik* (Romane Alava) (1947), and *Serb-Croatian-Roma-English Dictionary* (Rječnik srpskohrvatskoromsko-engleski) (1983), translation of *St Luke's Gospel* into the Roma language (1938), as well as extensive work as a collector of Roma folklore and traditional culture.

---

Dragan Todorović, Pentecostalism in Southeastern Serbia, In **Traditional and Non-traditional Religiosity**, edited by Mirko Blagojević and Dragan Todorović, Belgrade and Niš: Institute of Social Sciences and Yugoslav Association for the Scientific Study of Religion, 2019, 54–75.

Dragan Todorović, Tolerance, Multiculturalism and Interculturalism in the Balkans, **Facta Universitatis: series Philosophy, Sociology, Psychology and History** 18, 1, 2019, 1–19.

---

## COMMITTEE FOR THE PREPARATION OF SCIENTIFIC CONFERENCE

### ”PHILOSOPHY BETWEEN THE EAST AND THE WEST”

(Academician Danilo Basta)

The report was not submitted to the department.

## COMMITTEE FOR STUDYING MINORITIES AND HUMAN RIGHTS

(Academician Tibor Varady)

Professor Dimitrije E. Stefanović, a longtime Committee associate and member, passed away on 15 November 2019.

This year the Committee marked its 30th anniversary by organizing a ceremonial session on 28 February 2019. The speeches about its work, the circumstances under which it was formed and developed, the obstacles and challenges it had to face, as well as its activities and results, were delivered by the President of SASA, Academician Vladimir S. Kostić, President of the Committee, Academician Tibor Varady, and Committee members, Professor Marijana Pajvančić and Pera Lastić. The Committee plans to publish a monograph on the occasion of its 30th anniversary in 2020.

In mid-2019, it published the collection of papers titled **The Rights of National Minorities in the Constitutional and Legal System of the Republic of Serbia**.



During the year, preparations were made for publishing the proceedings of the scientific conference on “Human Rights in the 21st Century”. The editors of the conference proceedings will be Academician Tibor Varady and Professor Miodrag Jovanović. The proceedings will be published in cooperation with Eleven International Publishing.

The scientific conference on *Gender Equality – from Equal Rights to Equal Opportunities* was successfully organized on 27 September 2019. It was a one-day meeting held under the SASA auspices.

At the end of October, in cooperation with the Institute of Social Sciences, the Committee held the round table on “*Cultural Autonomy and Minority Self-Government*”. During the year, the Committee continued its work on the topic of “Tzintzars in Serbia, Identity and Cultural Exchanges”, which began in cooperation with the LUNJINA Serb-Tzintzar Society as early as 2015.

In early 2019, the project titled *Family Memory and Cultural Heritage: Aromanians (Tsintsars, Vlachs) in Serbia and Macedonia* was also launched within the scope of the above topic. It should be realized within Inter-Academy Cooperation with the Macedonian Academy of Sciences and Arts over the next few years. The Committee established contact with its Macedonian colleagues, who already started to work on the project.

For years now, the Committee has also dedicated some of its activities to the Serbs living outside their native country. This year, it successfully organized the round table titled “Serbs in Romania – the Current Situation and Perspectives”.

During the year, the Committee also continued its work on the project *Serbs in Romania and Romanian-Yugoslav Relations in the Second Half of the 20th Century*. The project is realized within Inter-Academy Cooperation with the Romanian Academy.

The Committee associates continued to cooperate with the Serbian Institute in Budapest in the realization of a long-term international bilateral project titled *The Ethnology of Serbs in Hungary*. The subproject “The Life of Serbs in Battonya”) is led by Dr. Mladena Prelić, a Committee associate. The Committee also continued to cooperate with the Serbian Institute in Budapest in the realization of the “Image and Remembrance” project.

# DEPARTMENT OF HISTORICAL SCIENCES

## COMMITTEE ON ARCHAEOLOGY

(Corresponding Member Vujadin Ivanišević)

The newly renewed Archaeological Committee focused on late antique and early medieval archaeology research and the study of urbanization and deurbanization processes, spread of Christianity and changes in social, cultural and economic relations.

Research on the legacy of late antiquity was focused on studying the urban plan of Caričin Grad (*Justiniana Prima*) and material culture. The Committee associates participated in the exploration of Caričin Grad and excavation of the structures in the northern part of the Upper City and the Tetraconch in the Lower City. Of particular note is the beginning of the excavation of the Tetraconch and new, sigma-shaped plaza, which should provide the new data on urbanization and the significance of early Christian basilicas in the city architecture and administration. Special attention was devoted to the study of early Christian (7th century) horizons. This is an international project which is carried out by the associates of the Archaeological Institute in Belgrade, École française de Rome, Université de Strasbourg and Centre National de la Recherche Scientifique - UMR 7004. It also includes researchers from the Römisch-Germanisches Zentralmuseum in Mainz, Germany. As part of the project, the École française in Rome and Archaeological Institute in Belgrade published the monograph *Caričin Grad IV*.

Apart from Caričin Grad, the research also included early Christian legacy in the region of northern Illyricum from the 3rd to the 8th century. It is conducted under the international project DANUBIUS "Ecclesiastical Organisation and Christian Topography of the Lower Danube During Late Antiquity (3rd-8th Centuries AD)", under the auspices of the Université de Lille and Centre National de la Recherche Scientifique - UMR 8164 - HALMA - <https://danubius.huma-num.fr/en/about>. Apart from the Archaeological

Institute, a number of South East European scientific institutions also participate in the realization of this project.

The work at the Archaeological Committee implied medieval archaeology research. It is worth mentioning the study about the occupation of late antique fortifications in the 9th and 10th centuries and their significance for early medieval military architecture research.

---

B. Bavant, V. Ivanišević (éds) - **Caričin Grad IV, Catalogue des objets des fouilles anciennes et autres études**, Collection de l'École française de Rome 75/4, École française de Rome ; Institut archéologique de Belgrade, Rome - Belgrade 2019, 368, Pl. I-LXV.

B. Bavant, V. Ivanišević, *Catalogue des objets des fouilles anciennes*, in: B. Bavant, V. Ivanišević (éds), **Caričin Grad IV, Catalogue des objets des fouilles anciennes et autres études**, Collection de l'École française de Rome 75/4, École française de Rome ; Institut archéologique de Belgrade, Rome - Belgrade 2019, 1-298, Pl. I-LXV.

V. Ivanišević, I. Bugarski, Post-antique settlement patterns in the central Balkans: use of Justinianic landscape in the early middle ages, in: **Mediterranean Landscapes in Post Antiquity: New frontiers and new perspectives**, S. Gelichi, L. Olmo-Enciso (eds.), Summertown 2019, 7-17.

V. Ivanišević, I. Bugarski, S. Stamenković, The Outer Forts of Caricin Grad: Visualisation of Digital Terrain Models and Interpretation, **Starinar** LXIX, 2019, 297-317.

R. Scherg, V. Zdravković, V. Ivanišević, A. Stamenković, Iustiniana Prima – Eine der letzten Stadtgründungen der Antike, in: **Auferstehung der Antike, Archäologische Stätten digital rekonstruiert**, Philipp von Zabern, Darmstadt 2019, 106-109.

---

## COMMITTEE ON THE HISTORY OF ART

(Corresponding Member Miodrag Marković)

In 2019, the Committee members worked intensively on the collection and publication of materials for the *Corpus of the Monuments of Serbian Medieval Art*. In the realization of this project they cooperated with scientific associates and researchers at the Institute of Art History, University of Belgrade Faculty of Philosophy. As planned, emphasis was laid on the destroyed, damaged and highly endangered monuments in Kosovo and Metohija. The first volume of the *Corpus*, dedicated to St George's Church in Rečani which was destroyed during the 1999 pogrom, was printed at the beginning of the year. Two volumes of the *Corpus*, one dedicated to the Gradac Monastery frescoes and the other to the wall painting of the Church of St Peter on the Lim, were prepared for publication. The schemes including the arrangement

of the scenes and figures of saints were made; the inscriptions on the frescoes were calqued and all known compositions and figures were drawn. In addition, all available photographic recordings and architectural drawings of the mentioned monuments were digitally processed. At the same time, the monograph on the Jašunja monasteries was prepared for publication (Academician G. Subotić), in addition to the photographing and monographic processing of the wall painting in the narthex of Dečani Monastery.

Some Committee members conducted the field research of medieval art monuments in Serbia, North Macedonia and Greece. The collected data were processed and systematized.

In 2019, the Committee was reinforced by a new associate – Dr. Dubravka Preradović, an art historian. In cooperation with other Committee members, she prepared the exhibition dedicated to the renowned Byzantologist Gabriel Millet and his Serbian medieval architecture research (SASA Gallery of Science and Technology, September 2019). Miodrag Marković prepared the exhibition on *Spiritual and Cultural Heritage of Studenica Monastery. Past, Perseverance. Contemporaneity* in cooperation with Studenica Monastery (SASA Gallery of Visual Arts and Music, December 2019–March 2020).

## CHILANDAR COMMITTEE

(Academician Mirjana Živojinović)

Early this year, the Committee for Chilandar completed the technical preparation of *Chilandar Proceedings* (Hilandarski zbornik), Vol. 14, which was also published in that period. The 307-page volume has 13 contributions, written mostly in Serbian, but they also include four in English. The Editorial Board was expanded by foreign members and the technical instructions for preparation of the manuscript in Serbian and English were defined. In 2019, there began the collection of contributions to Vol. 15.

In cooperation with the SASA Institute for Byzantine Studies, the Committee for Chilandar published the long-prepared monograph *The Inscriptions of Chilandar Monastery*, Vol. I (14th–17th Centuries), 2019. The members of the Committee for Chilandar, who are also the members of the Serbian Committee for Byzantine Studies, participated in the preparation of the jubilee proceedings titled *The Kingdom and the Archbishopric of the Serbian and Maritime Lands of the Nemanjić Dynasty*, 2019. The members of the Committee for Chilandar, who are also the members of the Friends of Mount Athos Society, prepared *Holy Mountain: Thoughts and Studies*, Vol. 10, 2019.

In cooperation with the SASA Committee for Byzantine Studies and SASA Committee for Chilandar, Mount Athos Centre in Tessaloniki, Holy Monastery of Chilandar Foundation and Friends of Mount Athos Society, the Museum of Byzantine Culture in Tessaloniki (8 December) and the Serbian Academy of Sciences and Arts (12 December 2019) held a scientific forum to mark the 800th Anniversary of the Consecration of Saint Sava as the First Archbishop of Serbia.

In cooperation with Chilandar Monastery and its Foundation in Belgrade, work continued on the Serbian charters kept in Chilandar Monastery. The project is led by Academician Mirjana Živojinović.

The members of the Committee for Chilandar actively visited Mount Athos and worked on the topics related to Mount Athos and, in particular, Chilandar Monastery. They also attended national and international scientific meetings and presented the papers relating to the history or heritage of the Holy Mountain of Athos.

---

Mirjana Živojinović. „Ιερομόναχος Δωρόθεος – Ηγούμενος της Ιεράς Μονής Χιλανδαρίου (1355–1360) као Прώτος του Αγίου Όρους (1356–1366).“ **4<sup>ο</sup> Διεθνές Επιστημονικό Εργαστήριο. Ιστορία, Αρχαιολογία, Τέχνη, Θεολογία, Φιλολογία, Δίκαιο, Θεσμοί, Αρχιτεκτονική, Φυσικό περιβάλλον.** 7–8 Δεκεμβρίου 2019, 20–23.

Срђан Пириватрић. „Први преноси моштију светог Ивана Рилског. Неколико запажања о историјском контексту догађаја.“ С. Куюмджиева, В. Велинова, Е. Узунова (ур.). **Рилския манастир – история, памет, духовност**, ред. София, 2018, 18–30.

Aleksandar Fotić. “Coping with Extortion on a Local Level: The Case of Hilandar’s *Metochion* in Zdravikion (Draviskos, Strymon Region) in the Sixteenth Century.” **Balkanica**, L (2019).

Ирена Шпадиер. „Службы святым сербам в рукописной минее № 11 из Свято-Пантелеймонова монастыря.“ **Славянское и балканское языкознание: Палеославистика – 2** (Москва, 2019): 408–415.

Виктор Савич. „Звуковое значение надстрочных знаков в Сятостефанском хрисовуле (1317–1318).“ **Славянское и балканское языкознание. Палеославистика – 2** (Москва, 2019): 314–348.

---

## SZENTENDRE COMMITTEE

(Academician Dinko Davidov, Corresponding Member Miodrag Marković)

In 2019, it was tried to revive the work of the Szententre Committee of the SASA Department of Historical Sciences, which was suspended due the health condition and subsequent death of Academician Dinko Davidov, the

former President of the Committee. In this connection, the Committee organized two meetings with Kosta Vuković, MA, Director of the Museum of the Diocese of Buda in Szentendre. The plans for the future work of the Szentendre Committee were made, including the preparation and realization of several projects dedicated to the artistic achievements of the Serbs in Szentendre and its wider surroundings. It was agreed to expand the Committee's work in Hungary, namely to cover the cultural and social life of the Serbs in Hungary from the 12th century to the present day. Therefore, it will be necessary to include new associates in the work of the Szentendre Committee in order to carry out the planned projects more successfully.

The talks were held with the potential associates in the preparation of the new volume of *Szentendre Proceedings* (Sentandrejski zbornik), whose publishing was delayed for a number of years.

One part of materials from the Legacies of Dr. Vojislav Matić and Professor Miroslav Timotijević, relevant for the study of the life of the Serbs in Szentendre and other parts of Hungary, was scanned. The mentioned legacies are kept at the Institute for Art History, Faculty of Philosophy in Belgrade.

## **COMMITTEE ON THE HISTORY OF THE SERBS IN CROATIA**

(Academician Vasilije Krestić)

In 2019, **Proceedings on Serbs in Croatia** (Zbornik o Srbima u Hrvatskoj), Vol. 12, was published. We intend during 2020 to prepare for publishing Vol. 13.

## **COMMITTEE FOR THE STUDY OF THE CREATION OF THE KINGDOM OF SERBS, CROATS AND SLOVENES 1914–1918**

(Academician Ljubodrag Dimić)

In 2019, the Committee members peer reviewed the scientific papers presented at a scientific meeting titled "The End of the War, the Serbs and the Creation of Yugoslavia" (Kraj rata, Srbi i stvaranje Jugoslavije") and prepared the proceedings for publication.

## COMMITTEE ON THE HISTORY OF THE SERBS IN XIX CENTURY

(Corresponding Member Slavenko Terzić)

In 2019, the Committee on the 19th-Century History of Serbia continued its work on the critical edition of *The Diary of Milan Dj. Milićević* (Dnevnik Milana Dj. Milićevića), whose manuscript is kept in the SASA Archives. The scientific advisors at the Historical Institute, Dr. Petar Krestić and Dr. Aleksandar Ristović, continued to work on the preparation of this manuscript for publication. It is undoubtedly a significant source for the 19th century history of Serbia and its society.

Dr. Petar Krestić is about to finish editing the manuscript of *The Diary of Milan Dj. Milićević*. Thus, the preparation of the final version of the manuscript and additions to certain notes relating to the mentioned persons and certain less known terms are underway. Dr. Aleksandar Rastović began work on the fourth volume of *The Diary* that covers the period from 1 April 1882 to 1 January 1892.

The Committee members presented the scientific statements at the scientific meetings on Serbia's history of the 19th and early 20th centuries, which were organized by the SASA and its Institutes.

## VARDAR COMMITTEE

(Corresponding Member Slavenko Terzić)

In 2019, the work of the Vardar Committee was reduced to a minimum. Most of the former Committee members passed away in recent years. As the new President of the Committee, who was appointed by the Department, I was unable to devote myself to the work of the Committee because I served as Ambassador of Serbia to Russia and, on a nonresidential basis, to Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan until 15 September 2019. After my return from Moscow, I started communicating with the remaining Committee members about the preparation of the new volume of *Vardar Proceedings* (Vardarski zbornik).

## **COMMITTEE ON THE HISTORY OF BOSNIA AND HERZEGOVINA**

(Corresponding Member Slavenko Terzić)

In 2019, the work of the Committee on the 19th- and Early 20th-Century History of Bosnia and Herzegovina was reduced to a minimum. Some members of the Committee passed away in recent years, while the President of the Committee served as Ambassador of Serbia to Russia until 15 September 2019 and was objectively prevented from organizing the Committee's activities. Some of its members participated in national and international scientific meetings and published their papers in the relevant proceedings and scientific journals.

## **COMMITTEE ON THE HISTORY OF THE 20<sup>TH</sup> CENTURY**

(Academician Ljubodrag Dimić)

In 2019, the Committee members worked on the organization of a lecture cycle entitled "Yugoslavia and the Cominform 1948–1956" (Jugoslavija i Informbiro 1948–1956). A total of 15 lectures was delivered from 16 January to 25 May 2019. The lecturers were from Serbia, Russia and the Czech Republic.

In 2020, the Committee members will peer review the scientific lectures delivered within the cycle "Yugoslavia and the Cominform 1948–1956" (Jugoslavija i Informbiro 1948–1956) and prepare the collection of papers bearing the same name for publication.

## **COMMITTEE ON THE HISTORY OF THE SERBIAN-RUSSIAN RELATIONS**

(Corresponding Member Slavenko Terzić)

In 2019, the Committee prepared an international conference titled *Serbian-Russian Relations in the Times of Major Political Changes (from the End of the 18th to the End of the 20th Century)* (Srpsko-ruski odnosi u epohi velikih političkih promena /kraj 18-kraj 20. veka/), which was held at the SASA on 3 October 2019. The Russian participants included six historians from the RAS Institute of Russian History and RAS Institute for Slavic Studies. On the margins of this conference, the President of the Committee and Secretary of the Department of Historical Sciences, Academician Mihailo Vojvodić, met



with the Directors of the RAS Institutes, Professor Yuri Petrov and Professor Konstantin Nikiforov. They talked about the perspectives and possibilities of strengthening cooperation between Serbian and Russian historians.

## ACADEMIC COMMITTEE FOR KOSOVO AND METOHİJA

(Corresponding Member Dragan Vojvodić)

In 2019, the Committee carried out the following activities and achieved the following results:

1. It established cooperation with the Matica Srpska Committee for Kosovo and Metohija. As agreed, the two Committees will coordinate future activities, namely they will jointly carry out research and publishing activities.

2. During June, a systematic digital photographic and 3D laser imaging of four Serbian church monuments in Prizren (the Church of the Holy Virgin of Ljeviš, Church of the Holy Saviour, St Nicholas' Church /also known as Tutić's church/ and St George's Church /also known as Runović's church/) was carried out – in cooperation with the Blago Foundation and SASA Mathematical Institute (materials processing and 3D modelling were carried out at the SASA Mathematical Institute).

3. On 15 October, it organized a scientific conference titled *Results of the Current and Course of Future Studies of Serbian Vernaculars in Kosovo and Metohija* (Rezultati dosadašnjih i pravci budućih istraživanja srpskih narodnih govora Kosova i Metohije) – in cooperation with the SASA Institute for the Serbian Language and Faculty of Philosophy, University of Priština, temporarily located in Kosovska Mitrovica.

4. It started to prepare the proceedings titled *Results of the Current and Course of Future Studies of Serbian Vernaculars in Kosovo and Metohija* (Rezultati dosadašnjih i pravci budućih istraživanja srpskih narodnih govora Kosova i Metohije) – in cooperation with the SASA Institute for the Serbian Language and Faculty of Philosophy, University of Priština, temporarily located in Kosovska Mitrovica (the editorial board was formed and peer reviewers were chosen; the editor is Professor Dr. Radivoje Mladenović; it is planned to publish the proceedings by the autumn of 2020).

5. From 24 October until 2 November, Milun Stijović conducted research at the Kosovo and Metohija Archives in Priština. He studied the following archival holdings: *Collection of Photographs 1896-1961*, *Stojan Zafirović, Gliša Elezović from Vučitrn* (Zbirka fotografija 1896–1961, Stojan Zafirović i Gliša Elezović iz Vučitrna) and *Parlić Family Archive from Vučitrn* (Porodični

fond Parlić iz Vučitrna). Thus, in addition to the archival holdings studied in 2017, all other archival holdings of the Kosovo and Metohija Archives in Priština relating to the history of the Serbian people in Kosmet until its liberation from the Turks, were also studied.

6. In October, it started to work on a systematic digital photographic and 3D laser imaging of the architecture and wall painting of the Dečani Monastery Church of Christ the Pantocrator – in cooperation with the SASA Mathematical Institute and Platoneum d.o.o. from Novi Sad (due to a large volume of work, imaging will take several years).

7. It was precisely determined where the photographs of the miniatures of the Prizren Tetraevangelion were kept in Paris. Thus, the appropriate steps were taken to obtain the photographs of this manuscript destroyed by German bombing of Belgrade in 1941 – in cooperation with the Archaeography Department of the National Library of Serbia, with which it plans to publish a book about this Prizren manuscript.

8. The work began on the monograph *Medieval Cemeteries in Kosovo and Metohija – An Archaeological Aspect* (Srednjovekovna groblja na Kosovu i Metohiji – arheološki aspekt), which will be written by Associate Professor Dr. Dejan Radičević, mostly on the basis of the collected materials.

9. The long-established cooperation in the digitization of the archival material and photo documentation relating to Kosovo and Metohija monuments was continued. The project is carried out within the SASA Committee for Visual Arts.

10. The preparations for printing the 8th volume of *Kosovo and Metohija Proceedings* (Kosovsko-Metohijski zbornik br. 8) for 2019 are nearing completion (it should be printed in March 2020).

## COMMITTEE FOR BYZANTINE STUDIES

(Academician Ljubomir Maksimović)

In 2019, the Committee members conducted their regular research under the project *Tradition, Innovation and Identity in the Byzantine World* (Tradicija, inovacija i identitet u vizantijskom svetu), on the basis of their engagement at the SASA Institute for Byzantine Studies. The project was formally completed at the end of the year. The detailed research reports were submitted to the Ministry of Education, Science and Technological Development, SASA Department of Historical Sciences and SASA Executive Board. Since the research was supported by the Committee, it was possible to ensure almost full cooperation between the SASA and the Institute. The Committee, together

with the Chilandar Committee (due to which it represented the SASA engagement), was especially involved in the preparation of the proceedings of the SASA scientific forum on the proclamation of the Kingdom in 1217 and the scientific meeting on the proclamation of the Archbishopric in 1219. The proceedings including 20 papers and titled **The Kingdom and the Archbishopric of the Serbian and Maritime Lands** came out in early December.

The publications of the Committee members are listed in the 2019 report on the activities of the SASA Institute for Byzantine Studies.

The statements presented by the Committee members at scientific meetings were included in the 2019 report on the activities of the SASA Institute for Byzantine Studies.

## COMMITTEE FOR BALKAN STUDIES

(Corresponding Member Vujadin Ivanišević)

As in previous years, the Committee for Balkan Studies thematically and chronologically organized its work within the scope of three entities. Its antiquity research is focused on the region of the central and western Balkans in the Roman era and its communications, institutions, society and cult, showing particular interest in ethnic and cultural permeations, and the process of integration of the epichorians into the Roman state.

The subject of its medieval era research involves the phenomena, processes and ideas that exerted influence on the formation of specified cultural models in the Balkan countries during the late medieval period.

The contemporary period anticipates a comparative historical research on the development of political principles, systems and institutions of the Balkan peoples during the last two centuries of South-East European history.

## Project: **MATERIAL FOR THE HISTORY OF THE SERBS IN CROATIA AND SLAVONIA**

(Academician Vasilije Krestić)

In 2019, I published the book titled **Material on Serbian-Croatian Relations and the Serbs in Croatia (1848–1914)** (Gradja o srpsko-hrvatskim odnosima i Srbima u Hrvatskoj /1848-1914), 598 p. The book was published by the SASA and the Archives of Serbia.

Project: **MONASTERY OF ST JOHN THE FORERUNNER  
IN JAŠUNJA**

(Academician Gojko Subotić)

The monograph titled *The Monastery of Saint John the Forerunner at Jašunja* (Manastir Svetog Jovana Preteče u Jašunji) was completely finished and prepared for printing, in cooperation with Professor Dr. Michitaka Suzuki, Okayama University. According to Professor Michitaka's wish, the book should have the same volume and be simultaneously published in the Japanese language. Therefore, the Serbian version of the book, in its final form, was sent to Professor Michitaka with a proposal that the Japanese version should be published as a special edition in Japan and be printed on the basis of our preparation of the book for printing. The text is translated by our colleague, Sachi Shimada, an art historian who is fluent in the Serbian language. Naturally, adequate funds for printing the Japanese version should be provided by the Japanese side. In any case, the Serbian version of the book can be submitted for printing in early 2020 as the edition of the SASA Department of Historical Sciences.

Project: **EUROPE AND SERBIA IN THE MIDDLE AGES**

(Academician Jovanka Kalić)

In 2019, as part of the study of the history of Serbian statehood, attention was focused on sorting the historical material collected by the author of the project in the Raška region over the years. This region played a crucial role at the time of the creation of the Nemanjić state and determined Serbia's international position. A good part of the material (history, language, geography, culture) is the result of the author's field research. This work is voluminous and will be continued in the coming years.

Two scientific papers are being printed. One is dedicated to Stefan Nemanja (the proceedings of a scientific conference held in Belgrade) and the other to the early history of Belgrade in English, *Balkanica 50*, Belgrade: SASA Institute for Balkan Studies, 2019.

Project: **THE MEMO OF THE ACCOUNT BOOKS OF THE KABUŽIĆ BROTHERS**

(Academician Desanka Kovačević-Kojić)

During 2019, I continued transcribing and studying the account books sent from Venice to the Kabužić brothers in Dubrovnik, preserved in the Dubrovnik Archives and so far unpublished.

The article *Serbian Silver in the Mint of Venice* (Srpsko srebro u kovnici novca u Veneciji) was submitted for publishing in the journal *Balkanica* of the SASA Institute for Balkan Studies. The article is mostly based on the study of the account books sent from Venice to the Kabužić brothers in Dubrovnik.

The article *Serbian Silver and Gold in Venice 1429–1439* (Srpsko srebro i zlato u Veneciji 1429–1439) is also mostly based on the study of the account books sent from Venice to the Kabužić brothers in Dubrovnik. The paper was submitted for printing to the Archaeological Institute for “Homage to Marko Popović” (Spomenica Marka Popovića).

Project: **SERBIA AND THE ITALIAN STATES IN THE LATE MEDIEVAL PERIOD**

(Academician Momčilo Spremić)

The project *Serbia and the Italian States in the Late Medieval Period* has political, economic and cultural significance. It was the time of the Turkish conquest of the Balkan countries, which caused great concern among the rulers of the Italian states, who themselves were endangered. Therefore, during the 14th and 15th centuries they were making plans to launch a crusade against the sultan's state. These plans also involved Serbia as one of the most significant South East European countries. However, a crusade was never launched, but economic cooperation between Serbia and the Italian states continued to be very intensive. Precious metals from Novo Brdo and other Serbian mines as well as other goods were exported to Venice and other Italian cities, down to Apulia and Sicily. It was the time of scarcity of precious metals, so that the quest for them led to the discovery of America in the late 15th century. Fabrics, handicraft goods and various colonial goods arrived in Serbia from Italian cities, usually via Dubrovnik and Kotor. Serbia maintained especially intensive trade relations with Venice, which ruled the entire eastern Adriatic coast. As for cultural relations, they mostly included the printing of Serbian books in Venice. Those were mostly Cyrillic liturgical books which were in great de-

mand. During the most difficult period of slavery under the Turks, from the 15th to 17th century, Venice was the only place where Serbian Cyrillic books were printed. They were distributed across a large territory, from Šibenik to Scutari, while Mileševa Monastery provided storage for Serbian liturgical books. The first Serbian primer was also printed in Venice in 1597. Printing was primarily carried out by Serbian monks, who brought printing presses from Italy, hid them from the Turks and usually printed books for several years. Naturally, these books were sold in the Serbian lands, from Hilandar to Szentendre. Thanks to political, economic and cultural ties, the Serbian people were migrating to Italy, mostly to Venice, Marche and Apulia. The study of all these ties is of great historical significance and, to say the least, is a worthy endeavour.

**Project: STATE AND SOCIETY IN BYZANTIUM**

(Academician Ljubomir Maksimović)

In 2019, collecting the materials for textual processing (which was partly done over the past years) was mostly finished. Therefore, I suggest to the Department to close the project. Namely, I think that further textual processing does not need to be a registered project, because will not entail any expenses or defined time.

**Project: FONTES – THE GREEK ACTS OF THE HILANDAR MONASTERY, VOL. III (14<sup>TH</sup>-15<sup>TH</sup> CENTURY)**

(Academician Mirjana Živojinović)

The second volume of “Greek Acts of Hilandar Monastery” (Grčki akti manastira Hilandara / Actes de Hilandar II) includes 81 documents (from No. 48 to No. 129 + two acts in the Appendices). They cover the period from 1320 to 1335. The revision of the annotations, translated into French and including the transcribed Greek text, was finished. After my revision of the introductory essay, also translated into French, and reconciliation of my notes with those of my associate, the manuscript will be submitted for publication. It will be published as the 24th volume of the series.

The third volume of “Greek Acts of Hilandar Monastery” includes the documents from No. 130 to No. 168, which cover the period from 1335 to 1500. My work on them was finished; the annotations were translated into French and include the transcribed Greek acts. It remains for me to write the introduc-

tory essay that will also be translated into French. Thereafter, my associate and I will separately revise the manuscript and reconcile our notes, after which the manuscript will be ready for publication.

Project: **STOJAN NOVAKOVIĆ IN THE POLITICS OF SERBIA**

(Academician Mihailo Vojvodić)

In 2019, I finished the manuscript and the book titled **Serbia and Turkey 1878–1914** (Srbija i Turska 1878–1914) was published, so that the work on this topic of my individual project was finished. The next topic will be on *The Years of Uncertainty. Serbia in International Politics 1903–1908*.

Project: **YUGOSLAVIA AND THE SOVIET UNION  
SUMMIT MEETINGS**

(Academician Ljubodrag Dimić)

In 2019, we continued our research related to the project *Yugoslavia and Europe (1945–1980)* (Jugoslavija i Evropa /1945–1950/). Our main goal is to finish the work on a book that will bear the same title.

The works published in 2019:

---

**Srbsko vo Velkej vojne** (Serbia in the Great War), co-authored with Mira Radojević, Bratislava – Novi Sad 2019, 299 p.

Serbia and the Culprits of the Great War: Crises, Wars, Balances (1812–1918) (Srbija i vinovnici Velikog rata: krize, ratovi, bilansi /1912–1918/), **Historical Records** (Istorijski zapisi), LXXXVIII, 3-4, 2015, pp. 7–31.

The Yugoslav State and Albanians (1918–1921) (Jugoslovenska država i Albanci /1918 – 1921/), Andrićgrad. 2019, pp. 273–310.

Belgrade of the 1960s – Between the Historical and the Everyday (Beograd 60-tih izmedju istorijskog i svakodnevnog), **Belgrade of the 1960s** (Beograd šezdesetih godina XX veka), Belgrade 2019, pp. 44–79.

Yugoslavia and the Soviet Union in 1968 (Jugoslavija i Sovjetski Savez 1968. godine), **Academic Speeches** (Akademske besede), Vol. 2, Belgrade 2019, pp. 323–344.

**Bibliographies of SASA Members** (Bibliografije članova SANU), Vol. 1, Ljubodrag Dimić 2012 – 2018, Belgrade 2019, pp. 219–238.

Rodolphe Archibald Reiss (1875–1929). In Pursuit of Truth, Justice and Law (U potrazi sa istinom, pravdom i pravom), in: **Rodolphe Archibald Reiss** (Rodolf Arčibald Rajs), Vol. 1, Belgrade 2019, pp. XI–XXIX.

---



Project: **EUROPE AND THE SERBS IN THE SECOND HALF  
OF THE 19TH AND EARLY 20TH CENTURIES**

(Corresponding Member Slavenko Terzić)

During my stay in Moscow, I studied the materials about Russian policy toward the Balkans in the second half of the 19th and the beginning of the 20th century kept at the Russian archives. At the Archive of Foreign Policy of the Russian Empire I scanned the materials from the Russian Vice-Consulate in Scutari and the Russian Consulate in Mitrovica. I also scanned the materials on Pan-Islamism in the late 19th and early 20th centuries, and Russia's attitude towards this political and religious movement, which partly refers to the Pan-Islamic activities in the Balkans during that period. At the international scientific conference on *Serbian-Russian Relations in the Times of Major Political Changes (the End of the 18th – the End of the 19th Centuries)* (Srpsko-ruski odnosi u epohi velikih političkih promena /kraj 18. – kraj 19. veka/), held at the SASA on 3 October 2019, I presented the statement on *Ivan Yastrebov on the Albanian League in Prizren* (Ivan Jastrebov o Albanskoj ligi u Prizrenu).

I started to write the book titled *Russia and the Balkans in the Second Half of the 19th and the Beginning of the 20th Century* (Rusija i Balkan u drugoj polovini 19. i početkom 20. veka) (this is its working title).

Project: **PAVEL PETROVIĆ, THE FORGOTTEN SERBIAN PAINTER  
OF THE 19TH CENTURY**

(Corresponding Member Miodrag Marković)

In 2019, the research activities were adjusted to the basic research objectives formulated in the project description. In late August and early September, I visited the museum, archival and library institutions in California and Nevada (San Francisco, Los Angeles and Virginia City) where Petrović lived and worked in 1851 and from 1874 to 1878, as one of the pioneers of portraiture in that part of the United States. In the de Young Museum in San Francisco and Natural History Museum in Los Angeles I studied all existing documents relating to the portraits painted by Petrović which are kept in the mentioned museums. In the Huntington Library in Los Angeles, I gained insight into all available materials about the life and work of our artist, which are owned and kept by this renowned institution. In the photo library of the Mechanics' Institute in San Francisco, I found the photographs from the 1874 and 1875 exhibitions where Pavel Petrović displayed his paintings. Unfortunately, my



visit to Virginia City did not offer anything new. From 5 to 12 September, I visited all museum, archival and library institutions in Honolulu in Hawaii where Petrović stayed on two occasions, from 1851 to 1852 and in 1885. On his second visit, he was chosen as the court painter of Hawaiian King Kalakaua and painted a number of royal family portraits and high government officials. Most of these portraits were known only from the scanty Hawaiian press articles from that period and it was also known that only the portrait of Princess Po'omaikelani survived. During my visit, I identified the portraits of King Kalakaua and Queen Kapiolani, which were recently privately donated and included in the collection of the Iolani Palace, the former royal residence in Honolulu. They are currently undergoing restoration. At the Hawaii State Archives I found a greater number of the documents about Petrović's life and work in Hawaii, including the artist's original last will signed by him and the original letter he sent from Rome to the Hawaiian Bishop Herman Koeckemann. In the photograph collection of the Bishop Library in Honolulu I discovered the colour photograph of the previously unknown portrait of King Kalakaua that had been donated to Japanese Emperor Mutsuhito. The portrait is now kept at the Royal Museum in Tokyo. He ended his journey by visiting Portland and Victoria in Canada, where he stayed briefly in 1878–1879. In both cities, I visited several archives and libraries where I collected various materials on the basis of which Petrović's work in these cities can be better reconstructed.

Project: **THE MONETARY ECONOMY IN BYZANTIUM  
AND MEDIEVAL SERBIA**

(Corresponding Member Vujadin Ivanišević)

The research conducted under individual project was dedicated to coinage in late antiquity in Byzantium and, in particular, medieval Serbia. Special emphasis was laid on the monetary economy, organization of minting and, in particular, the volume of money issues in Serbia in the late 13th and early 14th centuries.

Special attention was devoted to the methodology of studying Serbian medieval coins due to the fact that this important scientific issue was often superfluously treated, as evidenced by some published "studies" verified by unfounded peer reviews. In the absence of serious numismatic studies at the University of Belgrade, we considered it necessary to dedicate a special project to the methodology of studying medieval money, especially Serbian one.

Serbian medieval coinage minted during the period of kings was viewed in the same light. Special attention was devoted to the amounts of money issued by King Stefan Uroš II Milutin (1282–1321). A theoretical approach to determining the amounts of money issues provided important knowledge, which largely corresponds to the known historical sources about the volume of monetary production in Europe and, in particular, Venice.

As part of the project, Dr. Vesna Radić worked on the preparation of the monograph “Coinage of the Serbian Despotate” (Novčarstvo Srpske despotovine) for publication. This is a doctoral dissertation defended at the Department of History of the Faculty of Philosophy, University of Belgrade.

The work also included an analysis and catalogization of the collections of Serbian medieval coins from the period of kings at the National Museum in Belgrade: Tetovo (51 dinars), Dučina (67), Bosnia (147), Postenje (698), Dobrište (325), Kragujevac (88), Žabare (38) and Priluzje (101).

Let us also mention an analysis of the circulation of 5th century solidi in northern Illyricum, the province of Moesia Prima and Barbaricum, whose results were presented at a scientific conference in Budapest.



## DEPARTMENT OF FINE ARTS AND MUSIC

### Project: **LEXICON OF ARTISTIC DANCE**

(Academician Dejan Despić)

During 2019, the lexicon design was made and so was the final editing, including the reconciliation of bibliographies, titles, names and orchestras. Final editing and proofreading will be done by the Orion/Art Publishing House.

Thus, one of the three volumes of *A Lexicon of Ballet and Scenic Artistic Dance* (Modernism and Postmodernism) (Leksikon baleta i scenskog umetničkog plesa /moderna i postmoderna/) was prepared for publication.

### Project: **CONTEMPORARY SERBIAN MUSIC SCENE**

(Academician Dejan Despić)

CONGRESSES. Milanović, Biljana, “Historical Studies of Music and Cultural Diplomacy: Towards a Research Agenda in Subaltern Europe”, in: Ivana Vesić, Vesna Peno (ed.), *The Tunes of Diplomatic and Music Notes. Music and Diplomacy in Southeast Europe (19th–21st Century)* (Tragom zvuka i depeše. Muzika i diplomatija u zemljama jugoistočne Evrope /19-21. vek/. International Scientific Conference, SASA Institute of Musicology, Belgrade, 16–17 May 2019. Book of Abstracts (Knjiga sažetaka) /The Tunes of Diplomatic and Music Notes. Music and Diplomacy in Southeast Europe (19th-21st century). International Conference, SASA Institute of Musicology, Belgrade 16-17 May, 2019. Book of Abstracts. Belgrade, SASA Institute of Musicology, 17 p.

Nadežda Mosusova participated in the International Musicological Conference “The Yugoslav Idea in/of Music” (Jugoslovenska ideja u/o muzici), Novi Sad, 25-26 May 2019. She presented the paper on “A Contribution to the History of Performance on the Music Scenes of Former Yugoslavias

and the History of Performance of Yugoslav Works, as well as the Presence of Yugoslav Performers on Foreign Scenes” (Prilog istoriji izvodjaštva na muzičkim scenama bivših Jugoslavija i istoriji izvođenja jugoslovenskih dela, kao i prisustva jugoslovenskih izvođača na inostranim scenama).

ROUND TABLES. Milica Zajcev participated with her audio contributions in a round table titled “Maga Magazinović Days” (Dani Mage Magatinović), organized by Sanja Krsmanović-Tasić, and a round table titled “Smiljana Mandukić Days” (Dani Smiljane Mandukić), organized by Vera Obradović, Belgrade 2019.

Nadežda Mosusova participated in the round table at the National Theatre Museum on 4 June, which was held on the occasion of the premiere of Konjović’s “Koštana” in the National Theatre in Belgrade on 14 June 2019.

#### PRINTED WORKS

MELITA MILIN. The SASA Institute of Musicology published Melita Milin’s monograph on Ljubica Marić, Belgrade 2019. The book won the Stana Djurić-Klajn Award that is given by the Serbian Musicological Society.

KATARINA TOMAŠEVIĆ. “Life Dedicated to Music. On the Creative Poetics of Dejan Despić” (Život posvećen muzici. O stvaralačkoj poetici Dejana Despića), in: Banatian Falstaff. Comic Opera “Priest Ćira and Priest Spira” by Dejan Despić (Banatski Falstaf. Komična opera “Pop Ćira i pop Spira” Dejana Despića). Editors: Dr. Sonja Marinković and Dr. Nemanja Sovtić, Miloš Crnjanski Cultural Centre of Vojvodina and Serbian Musicological Society, Novi Sad 2019, pp. 19–32.

Davorin Jenko – “Our Prominent Foreigner” in the Directions of the Development of the Serbian Art and Culture of the Modern Era (Davorin Jenko – “naš znameniti stranac” u tokovima razvoja srpske umetnosti i kulture modernog doba). – On the occasion of the presentation of the collection of papers titled “Davorin Jenko (1835–1914). Contributions to Cultural Remembrance (Davorin Jenko /1835–1914/. Prilozi za kulturu sećanja). Publishers: SASA Institute of Musicology and National Council of the Slovene National Minority in the Republic Serbia. Editor: Katarina Tomašević; Belgrade 2016. In: Miro Vuksanović (ed.), Yearbook of the SASA Library Forum (Godišnjak Tribine Biblioteke SANU) / The SASA Library Forum, VII, 7, 2019.

She is also the author of the introductory essay “A Polyvalent Creative Portrait” (Polivalentan stvaralački portret) and editor of Dr. Jelena Mihajlović Marković’s monograph “Predrag Milošević – Portrait of a Music Maker” (Predrag Milošević – portret muzičkog stvaraoca), SASA Institute of Musicology and Serbian Musicological Society, Belgrade 2019, pp. 7–13.

BILJANA MILANOVIĆ. Biljana Milanović (ed.): On the Margins of the Musicological Canon: The Generation of Composers Petar Stojanović, Petar Krstić and Stanislav Binički (Na marginama muzikološkog kanona: kompozitorska generacija Petra Stojanovića, Petra Krstića i Stanislava Biničkog), Serbian Musicological Society – SASA Institute of Musicology, Belgrade 2019, 382 p.

Biljana Milanović, “Activities of Petar Krstić and Stanislav Binički in the Association of Serbian Musicians” (Delovanje Petra Krstića i Stanislava Biničkog u Udruženju srpskih muzičara), in: Biljana Milanović (ed.), On the Margins of the Musicological Canon: The Generation of Composers Petar Stojanović, Petar Krstić and Stanislav Binički (Na marginama muzikološkog kanona: kompozitorska generacija Petra Stojanovića, Petra Krstića i Stanislava Biničkog). Belgrade: Serbian Musicological Society – SASA Institute of Musicology, 2019, pp. 241–264.

Biljana S. Milanović, “Study of the Artistic Biography and Musical Activities of Petar Stojanović: A Contribution to the Identification and Consideration of Research Sources” (Proučavanje umetničke biografije i muzičkog delovanja Petra Stojanovića: prilog identifikaciji i razmatranju istraživačkih izvora), Zbornik Matice Srpske za scenske umetnosti i muziku 61 (2019), pp. 209–238.

MILICA ZAJCEV. “That’s how it started, never to be forgotten”, the publication of the “Chronicle of the Development of the Art of Ballet in the Former Yugoslavia in the 20th Century” (“Tako je počelo, da se ne zaboravi”, publikacija “Hronike razvoja baletske umetnosti na bivšim jugoslovenskim prostorima u 20. veku”), published by the author at her expense, Belgrade 2019.

NADEŽDA MOSUSOVA. Texts for the programme booklet for Petar Konjović’s opera “Koštana”, including “Lament for Youth” (Žal za mladost), National Theatre, Belgrade 2019.

## COMMITTEE FOR THE DICTIONARY OF VISUAL ARTS AND ARCHITECTURE

(Academician Milan Lojanica)

During the year, the work on the 2nd volume of the *Dictionary of Visual Arts and Architecture* (Rečnik likovnih umetnosti i arhitekture) was continued and completed. It was planned to complete the first third of the texts for the third volume. The plan was fulfilled by completing 162 entries.

**COMMITTEE FOR THE PROTECTION PRESERVATION  
OF SERBIAN MUSICAL HERITAGE**

(Academician Isidora Žebeljan)

In 2019, the Committee for the Preservation of Serbian Musical Heritage continued to carry out its activities, including specifically:

1. The entry of the data about all Serbian composers and their works, from the 15th century to the present day, into the database;
2. The collection of Serbian composers' scores;
3. The concert presentation of the works of prominent Serbian composers, whose valuable works have so far been inaccessible, or have rarely or never been performed at a concert;
4. The professional audio recording of concert-related activities, as a preparation for music editions on sound carriers, and the publishing of the mentioned editions, so that the complete series will come out in both Serbian and English;
5. The distribution of Serbian composers' works/scores to prominent musicians in Serbia and abroad.

In 2019, the following was accomplished:

1. Work continued on the entering of data into the web browsers with the database encompassing all Serbian composers and their well-known works, as well as on expert materials processing – in 2019, about 2,000 works of Serbian composers were entered.
2. During 2019, the scores from the legacies of two Serbian composers – SASA corresponding member Milenko Živković and Ludmila Frajt – were collected.
3. In December 2019, the Committee organized a concert of choral and chamber music by renowned Serbian composer Ludmila Frajt in commemoration of her 100th birth anniversary. The performers included renowned Serbian musicians from Belgrade, including the Collegium Musicum Choir.
4. A master recording was prepared for the production of a dual compact disc containing chamber music by five Serbian composers – Petar Stojanović, Mihovil Logar, Academician Rudolf Bruči, Dragutin Gostuški and Aleksandar Obradović. The compact disc will be released in 2020, in cooperation with Mascom Records from Belgrade.
5. During 2019, the Committee participated in the preparation of the full score of Petar Konjović's opera *Koštana*, one of the most significant works of 20th century Serbian music, for its new production, directed by Jug Radivojević at the National Theatre in Belgrade in June 2019.

Project: **OLGA JEVRIĆ'S LEGACY AT THE SASA**

(Academician Dušan Otašević)

The processing and recording of archival materials in electronic form continued. All scanned units of the hemerotheque were entered into the Legacy Database.

An expert guided tour was organized every Wednesday. The total number of visitors: 1758+157.

The Database of the Legacy of Olga Jevrić was regularly updated.

The conservation of 20 sculptures from the Legacy of Olga Jevrić was completed at the National Museum, Belgrade; conservator: Rista Mihić.

PEER Gallery, London. The exhibition of 20 sculptures from the SASA Legacy of Olga Jevrić, staged in cooperation with the SASA Legacy of Olga Jevrić, Legacy House and Contemporary Art Museum in Belgrade, 24 June – 11 October 2019. The exhibition catalogue was also published. Its presentation took place at the Embassy of the Republic of Serbia in London.

The Kraljevo National Museum in Kraljevo. The exhibition was staged in cooperation with the SASA Legacy of Olga Jevrić, Legacy House and Contemporary Art Museum in Belgrade, 15 October – 15 November 2019. The exhibition featured 10 sculptures from the SASA Legacy of Olga Jevrić, invitations, posters and catalogues.





# CENTRE FOR SCIENTIFIC RESEARCH OF THE SASA AND UNIVERSITY OF KRAGUJEVAC

## **Scientific Meetings/Professional-Scientific-Artistic Events:**

A series of forums titled *Corypheuses of the University of Kragujevac* (Korifeji Univerziteta u Kragujevcu) started with the forum dedicated to Professor Dr. Dušan Simić (1928-2008), which was held at the Faculty of Engineering Sciences in Kragujevac on 4 July. Professor Dr. Miroslav Demić spoke about the academic career of Professor Dr. Dušan Simić, the first Rector of the University of Kragujevac; Professor Dr. Radivoje Pešić, the current Head of the Department for Motors and Motor Vehicles, spoke about the scientific achievements of Professor Dr. Simić and his role in the establishment of this Department. In his speech, the Dean of the Faculty, Professor Dr. Dobrica Milovanović, focused on the role of Professor Dr. Dušan Simić in the development of the Faculty and the Regional Centre for Talents he had established and headed. Academician Miloš Kojić shared his memories of the time the University was founded and the role of Professor Dr. Dušan Simić in the founding of the Faculties or, more exactly, in the process of becoming independent from the parent faculties in Belgrade.

On 17 October, in cooperation with the Historical Institute in Belgrade, Kragujevac hosted a round table titled *From the Capital to the Industrial Centre of Serbia – Kragujevac in the Mid-19th Century* (Od prestonice do industrijskog centra Srbije – Kragujevac sredinom 19. veka). The participants included the historians from the Historical Institute from Belgrade, National Museum, 21 October Museum, Historical Archives from Kragujevac, Museum of the Rudnik-Takovo Region from Gornji Milanovac, and Jagodina. The papers presented at the round table will be published thanks to the support of the Ministry of Education, Science and Technological Development.

The forum and exhibition titled *An Evening Dedicated to Vladimir Veličković* (Veče posvećeno Vladimiru Veličkoviću), organized in cooperation

with the RIMA Gallery from Kragujevac, were held at the University Gallery on 24 October. A greeting letter from Academician Milan Lojanica, Secretary of the SASA Department of Visual Arts and Music, was read. The inspired and emotional speeches about their encounters with one of the most prominent Serbian painters were delivered by Professor Emeritus Irina Subotić, Dr. Jelena Šalinić Terzić, Professor at the Faculty of Philology and Arts and the winner of the Drawings Award of the Vladimir Veličković Drawing Fund, Nevena Martinović, the custodian of the RIMA Gallery and author of the last monograph on Vladimir Veličković. The RIMA Gallery exhibited drawings and monographs dedicated to Vladimir Veličković.

The opening of a permanent exhibition in the Legacy of Academician Nikola Koka Janković. The permanent exhibition displaying the works bequeathed by the artist to his hometown and the University of Kragujevac was formally opened on 11 December in the building housing the Legacy of Academician Nikola Koka Janković where, according to the donor's wish, there are also the offices of the SASA Centre for Scientific Research and the University of Kragujevac. The authors of the exhibition titled *Living Art* (Živeti umetnost) are Katarina Babić, Senior Custodian, Professor Dr. Zdravko Joksimović and Zoran Ševkušić, SASA Custodian.

### **Publishing Activity:**

The monograph **ENERGIES OF GRAPHS - Survey, Census, Bibliography**, authored by Academician Ivan Gutman and Professor Dr. Boris Furtula, Faculty of Natural Sciences and Mathematics in Kragujevac, was published.

### **Lectures/Book Presentations:**

1. On 21 March, Academician Ivan Gutman delivered a lecture titled *150 Years of the Periodic System of Chemical Elements (1869–2019)* (150 godina periodnog sistema hemijskih elemenata /1869–2019/). The lecture was attended by the SASA President, Academician Vladimir Kostić, SASA Vice-President, Academician Ljubomir Maksimović, Academician Ninoslav Stojadinović, President of the SASA Branch in Niš, Academician Vladimir Stevanović, Secretary of the SASA Department of Chemical and Biological Sciences, Academician Bogdan Šolaja, Deputy Secretary of the SASA Department of Chemical and Biological Sciences, Academician Slobodan Milosavljević, Academician Radomir Saičić, as well as a large audience comprising the professors and students of the University of Kragujevac, and prominent cultural and scientific figures.

2. Academician Dragan Micić, Secretary of the SASA Department of Medical Sciences, delivered a lecture on *Medicamentous Therapy of Obesity* (Medikamentozna terapija gojaznosti) at the Ceremonial Hall of the University of Kragujevac on 29 March. After lecturing, Academician Dragan Micić visited the First Kragujevac High School, which he had attended. At the same time, the school library was donated the books on the history of science, which were published by the SASA.

3. Academician Jasmina Grković-Major delivered a lecture on *The Contributions of Milan Rešetar to Serbian Philology and Culture* (Doprinosi Milana Rešetara srpskoj filologiji i kulturi) at the Ceremonial Hall of the University of Kragujevac on 16 April. The lecture was held on the occasion of publishing the book *The Serbian Prayer Book. A Festschrift for Milan Rešetar 1512–1942–2012* (Srpski molitvenik. Spomenica Milanu Rešetaru 1512–1942–2012).

4. On 18 April, the Jovan Cvijić Geographical Institute of SASA presented its publications to the Faculty of Hotel Management and Tourism in Vrnjačka Banja, within the celebration of the Faculty Day. The work of the Jovan Cvijić Geographical Institute of SASA and its publishing activity were presented by Dr. Marko Petrović. The monograph titled *The Geography of Serbia* (Geografija Srbije) was presented by Dr. Marko Urošev; the *Lexicons of the National Parks of Serbia* Edition (Edicija leksikona: Nacionalni parkovi Srbije) Edition and collective monograph titled *From the Notebooks of Jovan Cvijić: Selected Pages and Interpretations* (Iz beležnica Jovana Cvijića: prikazi i tumačenja) were presented by Dr. Ana Milanović Pešić. Dr. Jovana Brankov presented the special editions devoted to tourism and published by the Geographical Institute: *Ecological Tourism in Protected Natural Assets in Banat* (Ekološki turizam u zaštićenim objektima prirode u Banatu) (author: Dr. Jovan Brankov), *Tourist Events in Serbia* (Turističke manifestacije u Srbiji) (author: Dr. Željko Bjeljac), *Development Perspectives of the Cultural Route "Fortresses Along the Danube" for Enriching the Tourist Offer of Serbia* (Perspektive razvoja kulturne rute "Tvrđave na Dunavu" u funkciji obogaćivanja turističke ponude Srbije) (author: Aleksandra Terzić) and *Tourism on Vršac Mountains* (Turizam Vršackih planina) (co-authors: Dr. Željko Bjeljac and Dr. Jovana Romelić).

5. The *Dictionary of SASA* (20 volumes of the Dictionary of the Serbo-Croatian Literary and Vernacular Language) (Rečnik srpskohrvatskog književnog i narodnog jezika) was presented at the Ceremonial Hall of the University on 23 April. The speeches about this most significant national lexicographic, research and publishing project were delivered by Dr. Marija Djindjić, Dr. Nataša Vulović and Dr. Nenad Ivanović, associates at the SASA Institute for the Serbian Language.

6. On 7 June, Academician Miloš Kojić delivered a lecture titled *Computer Modelling in Engineering and Medicine – A Survey of the Results and Current Challenges* (Kompjuterski modeli u tehnici i medicini – pregled rezultata i sadašnji izazovi). The lecture was also attended by the students of the First Kragujevac High School, including the participants in the world championship in LEGO robot programming, which was held in Houston, in April 2019. The teachers of the Kragujevac High School, who travelled to Houston with their students, handed over thank you notes to the University of Kragujevac for its financial support and Academician Miloš Kojić for his hospitality shown during their stay in Houston.

7. On 8 July, the Greek scientists Georgia Karanasiou and Themis Exarchos gave lectures at the Ceremonial Hall of the University.

8. On 18 July, Dr. Drago Bešlo, Professor of Biochemistry and Molecular Biology at the Faculty of Agrobiotechnical Sciences, Josip Juraj Strossmayer University in Osijek (Croatia), delivered a lecture on *Antioxidant Activity of Polyphenols* (Antioksidativna aktivnost polifenola).

9. On 10 September, Erik Klein, Professor at the Department of Physical Chemistry, Slovak University of Technology in Bratislava, delivered a lecture titled *From Phenols to Quinones*.

10. On 18 November, the Ceremonial Hall of the University hosted the presentation of the monograph *ENERGIES OF GRAPHS – Survey, Census, Bibliography*. In addition to the authors, Academician Ivan Gutman and Professor Dr. Boris Furtula, Academician Dragoš Cvetković also took part in the presentation of the monograph. He spoke about the significance of graph theory and its applications in mathematics, information technology and other sciences, as well as about Academician Ivan Gutman's scientific contributions.

11. On 29 November, SASA corresponding member Vladica Cvetković, Professor at the Faculty of Mining and Geology in Belgrade, delivered a lecture titled *Geoarchaeology at Work: New Views on Raw Materials for the Production of Chipped Stone Artifacts from Lepenski Vir* (Geoarheologija na delu: novi pogledi na sirovine za izradu okresanih artefakata iz Lepenskog Vira) in the Gallery of the National Museum of Kragujevac. The lecture was organized as part of cherishing the memory of Academician Dragoslav Srejskić, the first Director of the Centre, on the occasion of the 23rd anniversary of his death.

### **Exhibitions:**

1. The exhibition of photographs titled *This Is also Serbia* (I ovo je Srbija), authored by Zoran Cvetković, MA, was opened at the University Gallery on

12 February and lasted until 22 February. The exhibition was officially opened by Academician Dragan Škorić, President of the SASA Committee on Village.

2. The exhibition titled *Branislav Kojić: Space in the Village, the Village in Space* (Branislav Kojić: prostor u selu, selo u prostoru), authored by Dr. Zlata Vuksanović-Macura, Dr. Marija Drobnjaković, Dr. Jovana Todorčić and Dr. Aleksandra Spalević, Scientific Associates at the Jovan Cvijić Geographical Institute of SASA, was opened in the entrance hall of the Faculty of Hotel Management and Tourism in Vrnjačka Banja on 18 April. The exhibition was opened by Dr. Zlata Vuksanović-Macura and lasted until 30 April.

3. The exhibition titled *Academician Mihailo Gavrilović: Historian, Archivist and Diplomat* (Akademik Mihailo Gavrilović: istoričar, arhivist i diplomata) was opened at Prince Mihailo's Residence within the National Museum in Kragujevac and lasted until 27 December. The exhibition was organized by the SASA Gallery of Science and Technology, SASA Branch in Niš, Historical Archives of Niš and National Museum in Niš. The author of the exhibition was Miljana Djordjević from the Historical Archives of Niš. The lecture on the life and work of Academician Mihailo Gavrilović was delivered by SASA corresponding member Mira Radojević.



# INTERNATIONAL COOPERATION ACTIVITY IN 2019

During 2019, the Serbian Academy of Sciences and Arts hosted the following events that were coordinated by the Section for Organizing Conferences, Lectures and International Cooperation:

## INTERNATIONAL COOPERATION

In 2019, the Serbian Academy of Sciences and Arts was also active on the international plane. It focused its attention on the promotion and expansion of cooperation with foreign academies and international scientific institutions and organizations, either through membership in these organizations or work on joint scientific projects under bilateral agreements.

The SASA representatives participated in the meetings of international scientific associations or other academies of sciences through:

- The exchange of researchers under bilateral agreements on scientific cooperation (at the inter-academy, inter-institutional and inter-state levels).

- Multilateral cooperation, which implies the activities associated with the programmes that are financed from the European Commission's and other funds (FP 7, EUREKA, TEMPUS, COST, HORIZON).

- Membership in non-governmental international scientific associations at different levels, namely at the global level: InterAcademy Partnership (IAP), International Science Council (ISC), International Union of Academies (UAI) and UNESCO; at the European level: European Federation of National Academies of Sciences and Humanities (ALLEA), Alliance of International Science Organizations in the Belt and Road Region (ANSO), European Academy of Sciences and Arts (EASA), European Academy of Arts, Sciences and Humanities (EAASH) and European Science Foundation (ESF); at the regional level: *Global Round Table*, Euro-Mediterranean Academy Network (EMAN) and Danube Academies Conferences (DAC), and at the Balkan level: Inter-Academy Council for South East Europe (IAC SEE).

- Participation in international scientific meetings abroad and the organization of such meetings in the country.



– Guest lectures by renowned foreign and domestic scientists.

The Serbian Academy of Sciences and Arts also promotes scientific cooperation with institutions outside of it, which is primarily based on the realization of joint scientific projects under scientific cooperation agreements concluded with other academies.

### **International Activities of SASA**

As for its bilateral cooperation, the SASA actively maintained and developed cooperation with foreign academies.

On 27 March, the delegation of the Chinese Academy of Sciences, headed by its President, Professor Bai Chunli, visited the SASA and on this occasion the two Academies signed the Agreement on Scientific Cooperation.

The delegation of the Chinese Academy of Social Sciences, headed by its Vice-President, Professor Gao Peiyong, visited the SASA on 16 April.

The Executive Boards of the SASA and the Academy of Sciences and Arts of the Republic of Srpska (ASARS) held a joint meeting in Banja Luka on 18 April.

On 14 June, the delegation of the Bulgarian Academy of Sciences, headed by its Vice-President, Professor Vasil Nikolov, visited the SASA for the opening of the joint exhibition of the SASA and BAS titled *Sofia and Belgrade – Archaeological Pearls* (Sofija i Beograd – Arheološki biseri), which was simultaneously staged in Sofia and Belgrade.

At the initiative of the Embassy of the People's Republic of China and at the invitation of the President of SASA, Academician Vladimir S. Kostić, the delegation of the Shandong Province and the Shandong Academy of Sciences visited the SASA on 28 June.

H.E. Dr. Armen Sarkissian, the President of the Republic of Armenia and member of the National Academy of Sciences of the Republic of Armenia, visited the SASA with his delegation on 5 October.

On 29 October, Professor Dr. Pavol Šajgalik, President of the Slovak Academy of Sciences, visited the Serbian Academy of Sciences and Arts.

On 8 November, at the proposal of Mrs Dušica Milivojević, Coordinator of the Speaker Program of the US Embassy in Belgrade, the SASA was visited by Dr. Stephen O'Regan, Science Director for Central & Eastern Europe, US Office of Naval Research Global.

The SASA delegation paid a return visit to the German National Academy Leopoldina on 25-26 November. It included the President of SASA, Academician Vladimir S. Kostić, and Vice-President of SASA, Academician Ljubomir Maksimović.

On 2 December, the SASA was visited by Academician Vladimir G. Gusakov, Chairman of the Presidium of the National Academy of Sciences of Belarus (NASB). On this occasion the two Academies signed a new Cooperation Agreement.

During 2019, the SASA representatives participated in numerous international meetings and conferences, as well as the general assemblies of international associations whose member is also the SASA.

The President of SASA, Academician Vladimir S. Kostić, participated in the General Assembly of the European Federation of National Academies of Sciences and Humanities (ALLEA), which was held in Bern from 7 to 9 May. This year's host of the General Assembly was the Swiss Academy of Arts and Sciences.

The Vice-President of SASA, Academician Ljubomir Maksimović, participated in the 5th Joint Science Conference of the Western Balkans, which was held in London from 28 to 31 May.

As a SASA representative, Academician Miodrag Čolić participated in the Annual General Assembly of the International Science Council (ISC) in Amsterdam from 9 to 10 September.

The President of SASA, Academician Vladimir S. Kostić, attended the celebration of the 150th anniversary of the Bulgarian Academy of Sciences in Sofia on 12 October.

As a SASA representative, Academician Ninoslav Stojadinović, President of the SASA Branch in Niš, participated in the 10th Danube Academies Conference (DAC), which was held in Prague from 30 to 31 October.

The President of SASA, Academician Vladimir S. Kostić, participated in the Saint Demetrius Day (Mitrovdan) session in Nevesinje on 8 November.

The Executive Board of SASA elected Vujadin Ivanišević, a corresponding member of SASA, as a permanent delegate and Mira Radojević, a corresponding member of SASA, as a deputy delegate to the International Union of Academies (UAI). As a SASA representative, Vujadin Ivanišević attended the General Assembly and the celebration of the 100th anniversary of UAI in Paris from 26 to 29 November.

### **Bilateral Scientific Cooperation Under the Concluded Agreements**

The Serbian Academy of Sciences and Arts has concluded bilateral agreements on scientific (and artistic) cooperation with 22 national academies of sciences. These agreements cover 71 research projects and anticipate the an-

nual quota of 135 man/weeks for a non-foreign currency exchange of Serbian and foreign researchers. .

A total of 75½ man/weeks was used. Foreign researchers used 29 weeks and domestic researchers 46½ weeks.

### **Cooperation with the Azerbaijan National Academy of Sciences**

See SASA Almanac (Godišnjak SANU) CXXII for 2015.

### **Cooperation with the Academy of Sciences and Arts of the Republic of Srpska**

The Executive Board of SASA comprising the President of SASA, Academician Vladimir S. Kostić, Vice-President of SASA, Academician Zorann Popović, Vice-President of SASA, Academician Ljubomir Maksimović, Secretary General of SASA, Academician Marko Andjelković, President of the SASA Branch in Novi Sad, Academician Stevan Pilipović, President of the SASA Branch in Noš, Academician Ninoslav Stojadinović, and Executive Director of SASA, Dr. Bojan Bugarčić, attended a meeting with the Executive Board of ASARS in Banja Luka on 18 April.

### **Cooperation with the Academy of Athens**

See SASA Almanac (Godišnjak SANU) CXXII for 2015, p. 248.

### **Cooperation with the Austrian Academy of Sciences**

See SASA Almanac (Godišnjak SANU) CXXII for 2015, p. 248.

### **Cooperation with the Bulgarian Academy of Sciences**

The current Thematic Cooperation Plan contains 20 joint projects, while the annual non-foreign currency exchange quota is set at 35 weeks for each side. Domestic researchers used 30½ weeks and Bulgarian researchers 12 weeks.

### **Cooperation with the National Academy of Sciences of Belarus**

The SASA and the National Academy of Sciences of Belarus concluded a new Scientific Cooperation Agreement in Belgrade on 2 December 2019.

### **Cooperation with the Hungarian Academy of Sciences**

See SASA Almanac (Godišnjak SANU) for 2018, p. 231.

### **Cooperation with the Macedonian Academy of Sciences and Arts**

The current Thematic Plan contains 16 projects. This year, the Macedonian side used 2½ weeks and the Serbian side 4 days.

### **Cooperation with the Polish Academy of Sciences**

The Thematic Plan contains five projects, while the annual quota for the exchange of researchers is seven weeks each. This year, the Polish side used 2½ weeks and our side one week.

### **Cooperation with the Romanian Academy**

There are 17 joint projects. Out of the annual exchange quota of 15 weeks for each side, the Romanian side used 8½ and our side 11½.

### **Cooperation with the Russian Academy of Sciences**

See SASA Almanac (Godišnjak SANU) CXXIII for 2016, p. 219.

### **Cooperation with the Slovak Academy of Sciences**

The Thematic Plan contains 4 joint projects, while the annual quota for the exchange of researchers is 4 weeks each.

Out of the annual exchange quota of four weeks for each side, our researchers used three weeks and Slovaks one week.

### **Cooperation with the Slovenian Academy of Sciences and Arts**

The Thematic Plan contains five joint projects, while the annual exchange quota is two weeks each. This year, there was no exchange of researchers.

### **Cooperation with the Turkish Academy of Sciences**

See SASA Almanac (Godišnjak SASA) CXVIII for 2011, p. 269.

### **Cooperation with the National Academy of Sciences of Ukraine**

See SASA Almanac (Godišnjak SANU) CXXI for 2014, p. 219.

### **Cooperation with the Czech Academy of Sciences**

The current Cooperation Protocol was signed in 2010. The annual exchange quota is set at 15 weeks each, while the Thematic Plan includes six projects. Out of the annual exchange quota of 15 weeks each, the two sides did not use any.

### **Cooperation with the Royal Swedish Academy of Letters, History and Antiquities**

See SASA Almanac (Godišnjak SASA) CXXI for 2014, p. 219. There was no exchange of researchers.

### **Cooperation with the Royal Flemish Academy of Belgium for Sciences and Arts**

See SASA Almanac (Godišnjak SANU) CXVIII for 2011, p. 264.

Out of the annual exchange quota of four weeks for each side, our side did not use the quota, while the Belgian side used 2½ weeks.

### **Cooperation with the Chinese Academy of Social Sciences and the Chinese Academy of Sciences**

See SASA Almanac (Godišnjak SANU) CXXIII for 2016, p. 220 for CASS.

The Agreement on Scientific Cooperation between the SASA and the Chinese Academy of Sciences was concluded on 27 March 2019. It was signed by the President of SASA, Academician Vladimir S. Kostić, and the President of CAS, Professor Bai Chunli.

Out of the annual exchange quota of 14 weeks for each side, the sides did not use any.

### **Cooperation with the Accademia Nazionale dei Lincei**

See SASA Almanac (Godišnjak SANU) CXXI for 2014, p. 220.

### **Cooperation with the Montenegrin Academy of Sciences and Arts**

See SASA Almanac (Godišnjak SANU) CXXIII for 2016, p. 220.

There was no exchange of researchers in 2019.

### **Cooperation with the Academy of Sciences of the Islamic Republic of Iran.**

See SASA Almanac (Godišnjak SANU) CXVIII for 2011, p. 264.

### **Cooperation with the National Research Council of Canada**

See SASA Almanac (Godišnjak SANU) 2011, p. 264.

# SCIENTIFIC MEETINGS AND LECTURES IN 2019

## CEREMONIAL GATHERINGS

### Accession Speeches

The Serbian Academy of Sciences and Arts organized a ceremonial gathering dedicated to *Accession Speeches by Newly Elected Full Members of the Serbian Academy of Sciences and Arts* (Pristupne besede novoizabranih redovnih članova Srpske akademije nauka i umetnosti) where newly elected full members of SASA presented themselves by delivering a speech. The gathering lasted three days, from 13 to 15 May. On the first day (13 May) the speeches were delivered by Academicians Zoran Radović, Milan Sudar, Miodrag Mateljević, Slobodan Milosavljević, Radmila Petanović and Radomir Saičić. On the second day (14 May) the speeches were delivered by Academicians Miloš Kojić, Zoran Krivokapić, Milorad Mitković. Petar Seferović and Milica Stevanović. On the third day (15 May) the speeches were delivered by Academicians Goran Petrović, Zlata Bojović, Milovan Danajlić, Aleksandar Kostić and Ljubodrag Dimić.

### Ceremonial Sessions

*The ceremonial session dedicated to the 30th anniversary of the SASA Committee for the Study of National Minorities and Human Rights* was held at the SASA Grand Hall on 28 February 2019.

The SASA Department for Language and Literature organized the ceremonial session dedicated to *Twenty Years Since NATO Bombing* (Dvadeset godina od NATO bombardovanja) on 7 June. The participants included Academicians Dragoslav Mihailović, Matija Bečković, Ljubomir Simović, Milosav Tešić, Dušan Kovačević, Miro Vuksanović, Goran Petrović and Milovan Danajlić. The keynote speech was delivered by corresponding member of SASA Jovan Delić.

On 23 October, the Department of Historical Sciences and Department of Language and Literature organized the *Ceremonial Gathering to Mark the 50th Anniversary of the Death of Academician Petar Kolendić (1882–1969) and Jorjo Tadić (1899–1969)*. The speeches were delivered by Academicians Mihailo Vojvodić, Desanka Kovačević-Kojić and Zlata Bojović.

On 19 November, the SASA held the ceremonial session marking the *Day of the Serbian Academy of Sciences and Arts*, which was attended by SASA members, high-level political and public figures, representatives of the Serbian universities, deans, directors of research institutes, heads and representatives of the diplomatic and consular missions in Serbia, as well as SASA supporters, associates and friends. The audience was addressed by the President of SASA, Academician Vladimir S. Kostić, while Academician Ljubomir Simović prepared a selection of Slobodan Jovanović's texts titled *Legacy – About Totalitarianism* (Zaveštanje – O totalitarizmu). The musical part of the programme included the works of Academicians Dejan Despić, Isidora Žebeljan and Ivan Jevtić, as well as corresponding member of SASA Svetislav Božić.

On 12 December, the Serbian Academy of Sciences and Arts held a ceremonial session to mark *800 Years Since the Consecration of Saint Sava as the First Archbishop of Serbia* (800 godina od posvećenja svetog Save za prvog srpskog arhiepiskopa). The scientific forum titled *Athonite and Chilandarian Monk Saint Sava – 800 Years since the Consecration as the First Serbian Archbishop* (Svetogorski i hilendarski monah sveti Sava – 800 godina od posvećenja za prvog srpskog arhiepiskopa), organized by the SASA Committee for Byzantine Studies and SASA Chilandar Committee, was held on 12 December as part of the ceremonial session marking of the 800th anniversary of the consecration of Saint Sava as the first Serbian Archbishop.

On 9 December, the SASA Department of Technical Sciences and SASA Department of Mathematics, Physics and Earth Sciences organized the *Ceremonial Session Dedicated to the 175th Birth Anniversary of Ljubomir Klerić (1844–2019)* (Svečani skup posvećen obeležavanju 175 godina od rođenja Ljubomira Klerića /1844–2019/).

## LECTURE CYCLES

In 2019, two lecture cycles were held: *Yugoslavia and the Cominform 1948–1956* (Jugoslavija i Informbiro 1948 – 1956), 15 lectures, and *Energy as One of the Greatest Challenges of Humanity in the 21st Century* (Energija kao jedan od najvećih izazova čovečanstva u XXI veku), 14 lectures.

In 2019, at the proposal of the SASA Departments and SASA Executive Board, 9 lectures were held.

## LECTURES

On 20 March, at the proposal of the SASA Department of Chemical and Biological Sciences, Dr. Robert Dominko, Professor at the Faculty for Chemistry and Chemical Technology, University of Ljubljana, and leading researcher at the National Institute of Chemistry in Ljubljana, delivered a lecture on *Post Li-ion Battery Trends*.

On 17 May, at the proposal of the SASA Department of Chemical and Biological Sciences, Professor Dr. Jovica Badjić, Department of Chemistry and Biochemistry of the Ohio State University, USA, delivered a lecture on *Molecular Baskets; from Molecular Recognition to Nanomedicine*.

On 1 July, at the proposal of the SASA Department of Technical Sciences, Professor Dr. Mauro Ferrari, a foreign member of SASA and Vice-President of the University of St Thomas, Houston, Texas, USA, delivered an inaugural lecture titled *My 27 Years of Failure (Trying to Cure Lung and Liver Metastases)*.

On 23 July, the U.S. Embassy to Serbia organized the lecture of David Vujić (David Vuich), a recipient of the Presidential Medal of Freedom for his contribution to the Apollo Mission as a NASA Program Coordinator. The topic of his lecture was *Apollo 11: The First Mission of Landing on the Moon (16–24 July 1969) – in the Spirit of Nikola Tesla and Mihajlo Pupin: The Serbian Apollo 7*.

On 10 September, at the proposal of the SASA Department of Technical Sciences, Dr. Miroslav Krstić, Professor at the University of California, San Diego, and foreign member of SASA delivered an inaugural lecture on *Automatics: The Crossroads of Technical, Natural and Mathematical Sciences*.

On 21 October, Dr. Milan Stojanović, Professor at the University of Columbia, New York, USA, and foreign member of SASA, delivered an inaugural lecture titled *Short Stories on Oligonucleotides Recognizing Small Molecules*.

On 29 October, at the proposal of the Vice-President of SASA, Academician Zoran Popović, and in cooperation with the Vinča Institute of Nuclear Sciences, Professor Dr. Pavol Šajgalik, President of the Slovak Academy of Sciences, delivered a lecture titled *High-Pressed Ultra-High Creep Resistant Silicon Carbide Ceramics*.

On 22 November, at the proposal of the SASA Department for Language and Literature, Academician Eugen Simion, President of the Department for



Philology and Literature of the Romanian Academy of Sciences and foreign member of SASA, delivered an inaugural speech on *The Future of National Culture*.

### BOOK PRESENTATION

On 1 February, the premises of the SASA Audiovisual Archives and Digitization Centre hosted the presentation of the book titled *Data Protection Law – GDPR* (Pravo zaštite podataka – GDPR), authored by Professor Dr. Dragan Prlja, Professor Dr. Dražen Cerović and Andrej Diligenski, and published by the Institute of Comparative Law in Belgrade.

### COMMEMORATIVE MEETINGS

During 2019, thirteen members of SASA passed away: six full members, one corresponding member, three foreign members and three external members.

The Serbian Academy of Sciences and Arts held six commemorative meetings honouring its deceased members Olga Hadžić, full member of SASA, on 22 February; Zaviša Janjić, corresponding member of SASA, on 10 May; Petar Omčikus, full member of SASA, on 25 September; Dinko Davidov, full member of SASA, on 30 September; Nikola Hajdin, full member of SASA (Vice-President of SASA 1994–2003 and President of SASA 2003–2015), on 6 November 2019.

### STUDY TRIPS

At the first session of the Managing Board of the SASA Fund for Scientific and Art Research, which was held on 17 April 2019, it was decided to remove the special item relating to the financing of the participation of SASA members in scientific meetings and their study trips abroad. It was concluded that such an activity should be financed from the funds of the SASA Committees and individual projects of SASA members. The Section for Organizing Conferences, Lectures and International Cooperation assisted in the preparation and realization of trips for about 70 SASA members and associates, who realized study trips, participated in the working bodies of international associations and acted as the SASA representatives at important international gatherings. Instead of the Section for the Performance of Tasks of the SASA Fund, this Section was preparing travel orders for the trips that are financed from the funds of individual projects and the Committees until the end of the year.

## MEETINGS

– On 22 January, under the auspices of the Serbian Academy of Sciences and Arts, the Cardiology Society of Serbia, European Society of Serbia and SASA Committee on Cardiovascular Pathology held a conference titled *EuroHeart Project of European Society of Cardiology (ESC): Implementation in Serbia as a Pilot Project of ESC (SerbHeart)*.

– On 22 January, the Central Institute for Conservation of the Serbian Ministry of Culture and Information organized *The Day of the Central Institute for Conservation*.

– On 22 March, The Professor Dr. Marko V. Jarić Foundation held a *ceremonial session on the occasion of awarding the Marko Jarić Prize for Physics for 2018*.

– On 10 April, the Serbian Academy of Sciences and Arts, World Bank Office Serbia and Serbian Association of Economists organized the presentation of the *World Development Report* titled *The Changing Nature of Work*, which was dedicated to the changing nature of jobs as a result of advances in technology and human capital. The presentation was held by Simeon Djankov, Director of Development Economics at the World Bank.

– On 17 April, the Serbian Academy of Sciences and Arts was officially visited by Serbian Prime Minister Ana Brnabić. Apart from having an official meeting with SASA representatives, she visited the SASA Library, SASA Archives and the SASA Audiovisual Archives and Digitization Centre.

– On 25 April, on the occasion of the *World Immunology Day 2019*, the SASA Department of Medical Sciences, SASA Committee on Immunology and Allergology, and Immunological Society of Serbia held a public forum titled *Promotion of Immunology Research in the Service of Health Preservation*.

– On 11 April, at the proposal of the Department of Social Sciences and the Committee for the Study of Life and Customs of the Roma and within the scope of the 70th anniversary of the Council of Europe and the International Roma Day, Dr. Kalin Rus delivered a lecture on the history and culture of Roma.

– On 5-6 April, in cooperation with the Faculty of Medicine, University of Belgrade, and Neurology Clinic of the Clinical Centre of Serbia, the Serbian Academy of Sciences and Arts organized an international conference titled *Update on Dementia*. The conference was held at the Serbian Academy of Sciences and Arts and the lecturers were the leading experts from the United Kingdom, the Netherlands, Sweden, Denmark, Germany, Italy, Greece and Serbia.

– On 15 May, under the auspices of the Serbian Academy of Sciences and Arts and at the proposal of the SASA Department of Mathematics, Physics and Earth Sciences, the Faculty of Mathematics, University of Belgrade, and Astronomical Observatory of Belgrade held a conference titled *Astronomy in Serbia and Serbia in the International Astronomical Union*.

– On 27 May, JP Službeni Glasnik held the presentation of the book *Neurology of the Newborn*, authored by Dragomir Branković, Borivoje Marjanović and Ljubomir Stojanović, at the SASA.

– On 29 May, the Serbian Academy of Sciences and Arts held an international scientific meeting titled *A Day Dedicated to Funds for the Financing of Science*, which was presided by Academician Zoran Knežević, President of the SASA Committee for Science.

– From 31 May to 1 June, the Serbian Academy of Sciences and Arts and the Italian Cultural Institute, in cooperation with the SASA Institute for Balkan Studies, held an international scientific conference to mark the *140th Anniversary of Diplomatic Relations Between Italy and Serbia*.

– On 20-21 June, under the auspices of the Serbian Academy of Sciences and Arts, the Centre of Excellence for Molecular Food Sciences, University of Belgrade Faculty of Chemistry, and Horizon2020 FoodEnTwin Consortium held an international scientific meeting *Food and Environmental – Omics* (Omiks tehnologije u naukama o hrani i životnoj sredini).

– On 22 June, the Serbian Academy of Sciences and Arts and the Faculty of Economics, University of Belgrade, held an international scientific meeting titled *Belgrade Symposium in Economics and Finance (BSEF 2019)*.

– On 26 June, a meeting titled *DAIS – Two Years Later* was organized in order to exchange a two-year experience with the Digital Archive of SASA (DAIS).

– On 27-29 June, the Serbian Academy of Sciences and Arts held an international scientific conference titled *Eurasian Environmental Dynamics and Humans Interactions over Different Time Scales (EDDH)*.

– On 26-30 August, the SASA Department of Mathematics, Physics and Earth Sciences, Vinča Institute of Nuclear Sciences and Optical Society of Serbia organized the *7th International School and Conference on Photonics – PHOTONICA 2019*.

– On 9-14 September, under the auspices of the Serbian Academy of Sciences and Arts and at the proposal of the SASA Department of Mathematics, Physics and Earth Sciences, the Institute of Physics, SASA Mathematical Institute, Vinča Institute of Nuclear Sciences, Faculty of Physics and Faculty

of Mathematics of the University of Belgrade, held an international conference titled *10th Mathematical Physics Meeting: School and Conference on Modern Mathematical Physics*.

– On 17-20 September, under the auspices of the SASA and at the proposal of the SASA Department of Mathematics, Physics and Earth Sciences, the Institute of Physics in Belgrade and ATLAS Group at CERN held a scientific meeting titled *ATLAS Standard Model Workshop 2019*.

– On 16-18 September, the SASA Branch in Niš, SASA Department of Technical Sciences, Faculty of Electronic Engineering of the University of Niš, and IEEE Serbia and Montenegro Section - ED/SSC Chapter held the *31st International Conference on Microelectronics – MIEL 2019* on the premises of the SASA Branch in Niš and the Faculty of Electronic Engineering, University of Niš.

– On 18-20 September, at the proposal of the SASA Department of Mathematics, Physics and Earth Sciences, the SASA Mathematical Institute organized the *15th European Conference on Symbolic and Quantitative Approaches to Reasoning with Uncertainty (ESQARU 2019)*.

– On 23-25 September, at the proposal of the SASA Department of Technical Sciences, the Serbian Ceramic Society and SASA Institute of Technical Sciences held the conference on *Advanced Ceramics and Applications*.

– On 27 September, under the auspices of the SASA and at the proposal of the SASA Department of Social Sciences, the SASA Committee for the Study of Minorities and Human Rights held a scientific meeting titled *Gender Equality – from Equal Rights to Equal Opportunities*.

– On 1 October, on the occasion of the 95th anniversary of Radio Belgrade and the 90th anniversary of permanent radio broadcasting from the premises of the Serbian Academy of Sciences and Arts, Radio Belgrade held a ceremonial session titled “Golden Microphone” at the SASA.

– On 2 October, the Serbian Academy of Sciences and Arts, Office of the Minister Without Portfolio in Charge of Demography and Population Policy and the Institute of Social Sciences – Centre for Demographic Research held a scientific conference titled *Serbia: Gender, Policies and Population*.

– On 3 October, the SASA Department of Historical Sciences held an international scientific meeting titled *Serbian-Russian Relations in the Times of Major Political Changes (from the End of the 18th to the End of the 20th Century)*.

– On 7-11 October, the SASA Department of Mathematics, Physics and Earth Sciences, Faculty of Physics of the University of Belgrade, Vinča Institute of Nuclear Sciences and Institute of Physics held the *20th Symposium on Condensed Matter Physics – SCMP* at the Serbian Academy of Sciences and Arts.

– On 28 October, the Serbian Academy of Sciences and Arts, Archives of Yugoslavia and SASA Institute for Balkan Studies organized the presentation of the English translation of Vladimir Ćorović's book *The Relations Between Serbia and Austria-Hungary in the 20th Century*, published by the Archives of Yugoslavia, SASA Institute for Balkan Studies and Hoover Institution, Stanford University. The book was presented at the SASA, while the appropriate speeches were delivered by the President of SASA, Academician Vladimir S. Kostić, foreign member of SASA Jean-Paul Bled, Academician Ljubomir Dimić, Professor Dr. John Keiger, Professor Dr. Luciano Monzali and Dr. Vojislav G. Pavlović.

– On 1 November, the Serbian Academy of Sciences and Arts organized an international conference titled *Where the Engineering and Nature Meet: 100 Years from the Birth of Rajko Tomović*.

– On 7-8 November, on the occasion of the 150th birth anniversary of Slobodan Jovanović (1869–1958), President of the Serbian Royal Academy, Rector of the University of Belgrade, Professor and Dean of the Faculty of Law in Belgrade, President of the Serbian Cultural Club and Prime Minister, the Serbian Academy of Sciences and Arts held a scientific meeting titled *Slobodan Jovanović – Life, Work, Times*.

– 11-13 November, the Serbian Academy of Sciences and Arts, World Academy of Art and Science, World University Consortium, University of Belgrade, Serbian Association of Economists and Serbian Branch of the Club of Rome held the *4th International Conference on Future Education*.

– On 22 November, the SASA Department of Social Sciences and Committee for the Study of the Life and Customs of Roma held a scientific conference titled *Contribution of Rade Uhlik to the Linguistics and Culture of the Roma*.

– On 25 November, the Serbian Academy of Sciences and Arts organized a scientific conference titled *Avramović: Hyperinflation, Stabilization and Reforms*.

– On 27 November, at the proposal of the SASA Department of Medical Sciences and under the auspices of the Serbian Academy of Sciences and Arts, the Faculty of Medicine, University of Belgrade, and Dr. Dragiša Mišović

Clinical Hospital Centre held an expert meeting titled *Laparoscopic Surgery in Serbia Today*.

– On 28-30 November, at the proposal of the SASA Department of Visual Arts and Music and under the auspices of the Serbian Academy of Sciences and Arts, the Faculty of Applied Arts in Belgrade organized an international conference titled *SMARTART*.

– On 5 December, under the auspices of the Serbian Academy of Sciences and Arts and at the proposal of its Department of Medical Sciences, the Serbian Society for Human Reproduction held a symposium titled *Human Reproduction 2019 – From Egg Donation to Mitochondrial Donation. Is There a Risk?*

– On 5 December, on the occasion of its founding anniversary, the Serbian Chemical Society organized the *Ceremonial Session of the Serbian Chemical Society*.

– On 6 December, the Faculty of Mathematics, University of Belgrade, held the 10th Symposium on *Mathematics and Applications*.

– On 10 December, under the auspices of the Serbian Academy of Sciences and Arts, the Vladimir Mandić Manda Association of Researchers held an expert meeting titled *Science for All – 50 Years of the Young Researchers' Movement*.

– On 13-14 December, the Serbian Academy of Sciences and Arts and the Institute of Social Sciences held a scientific meeting titled *Social Sciences and Humanities in Serbia*.

– On 16 December, under the auspices of the Serbian Academy of Sciences and Arts, the SASA Department of Medical Sciences and the Committee on Endocrinology and the Effect of Environmental Factors organized the symposium on *Novelties in Endocrinology*.

– On 8 February, the SASA Department of Social Sciences held a two-day scientific-expert meeting titled *State Order: Sovereignty in the Age of Globalization* within the lecture cycle *Strategic Directions of the Development of Serbia in the 21st Century*.

– On 29 March, the SASA Department of Social Sciences held a scientific meeting titled *Socio-Political and Scientific Thought of Dragoljub Jovanović* within the cycle *Social and Political Thought in Serbia in the 19th and 20th Centuries*. The Committee for Philosophy and Social Theory of the SASA Department of Social Sciences organized this meeting as the fifth within the cycle *Strategic Directions of the Development of Serbia in the 21st Century*. The previous meetings were dedicated to science, culture and

economy. The participants presented Dragoljub Jovanović's political activity and scientific contribution, as well as the situation in pre-war and post-war Yugoslavia.

– On 18-20 July, the SASA Department of Technical Sciences, in cooperation with the Institute of Physics, held a scientific meeting titled *POSMOL 2019* and the *20th International Workshop in Low-Energy Positron and Positronium Physics*, *21st International Symposium on Electron-Molecule Collisions and Swarms* and *5th Workshop on Unbalanced Processes* at the SASA.

– On 3 September, at the proposal of Academician Gojko Subotić, corresponding member of SASA Miodrag Marković and corresponding member of SASA Dragan Vojvodić, and in cooperation with the SASA Gallery of Science and Technology, the Serbian Academy of Sciences and Arts held a ceremonial session before the opening of the exhibition *Gabriel Millet and Research of Old Serbian Architecture*.

– On 15 October, the SASA Committee for the Study of Kosovo and Metohija, organized a scientific conference titled *Results of the Current and Course of Future Studies of Serbian Vernacular Language of Kosovo and Metohija* in cooperation with the SASA Institute for the Serbian Language and the Faculty of Philosophy of the University of Priština, temporarily located in Kosovska Mitrovica.

– On 31 October, the Workshop on *Cardiac Insufficiency and Pericardial Effusion – Clinical and Therapeutic Implications* was organized under the auspices of the SASA Department of Medical Sciences.

– On 4 November, the SASA Department for Language and Literature held a round table on *Development of Poetics in Serbian Literature – Serbian Literary Theory*.

– On 15 November, under the auspices of the SASA Department of Medical Sciences, the Heart Failure Society of Serbia held a scientific symposium on *Contemporary Recommendations for Heart Failure Treatment 2019*.

– On 18 December, a scientific symposium on *Heart Failure and Diabetes* was held under the auspices of the SASA Department of Medical Sciences.



## PUBLISHING ACTIVITY IN 2019

During the year, 63 editions were published, including 18 proceedings, 17 catalogues, 14 individual journal issues, 9 monographs, four bibliographies and Volume III of *Serbian Encyclopedia* (Srpska enciklopedija). A total of 472 authors published 438 papers. The commercial *Catalogue of SASA Editions: 2017–2018–2019* (Katalog izdanja SANU: 2017–2018–2019) was prepared and published. The total publishing costs amounted to more than eleven million dinars. The editions of the SASA Gallery were financed from special sources.

In addition, 33 manuscripts were technically processed and prepared for publication; the make-up of four publications and cover design of 16 publications were finished. The SASA maintained regular contact with the National Library of Serbia concerning the preparation of a Cataloguing in Publication (CIP) record for all SASA editions. Publications were regularly sent to the National Library of Serbia, Svetozar Marković University Library, Belgrade City Library and University Library in Banja Luka. Cooperation with national and world repositories was successfully carried out. The Audiovisual Archive and Digitization Centre prepared all editions published over the past 26 years for the scanning of SASA editions.

### PRESIDENCY

- *Almanac* (Godišnjak) CXXV for 2018
- *Bulletin of the SASA Fund for Scientific and Art Research for 2018* (Bilten Fonda SANU za istraživanja u nauci i umetnosti za 2018. godinu), No. 44
- *Bulletin of Scientific and Art Research. Annual Report for 2018*
- *Catalogue of the Editions of the Serbian Academy of Sciences and Arts 2017–2018–2019* (Katalog izdanja Srpske akademije nauka i umetnosti 2017–2018–2019)
- *Academic Speeches* (Akademske besede), Vol. 2
- *Accession Lectures by Corresponding Members* (Pristupna predavanja dopisnih članova), Vol. 1
- *Bibliographies of SASA Members* (Bibliografije članova SANU), Vol. 1



SERBIAN ACADEMY OF SCIENCES AND ARTS

- *Serbian Encyclopedia* (Srpska enciklopedija), Vol. III, Book 1
- *Mihailo Petrović Alas: Life, Work, Times* (Mihailo Petrović Alas: život, delo, vreme)
- *Mihailo Petrović Alas – On the Occasion of the 150th Anniversary of His Birth: Collection of Works* (Mihailo Petrović Alas – povodom 150 godina od rođenja: zbornik radova)
- *Sofia and Belgrade – Archaeological Pearls* (Sofija i Beograd – arheološki biseri)
- *From the Notebooks of Jovan Cvijić: Selected Pages and Interpretations*

DEPARTMENT OF MATHEMATICS, PHYSICS  
AND EARTH SCIENCES

- *Bulletin Tome CLI, Classe des Sciences mathematiques et naturelles. Sciences mathematiques, No 43*
- *Stevan Bošković – Life and Work* (Stevan Bošković – život i delo)
- *Vladimir D. Laskarev – Life and Work* (Vladimir D. Laskarev – život i delo)
- *Geohazard in 21st Century Serbia – Knowledge Is the Best Bulwark Against the Elements* (Geohazard u Srbiji u 21. veku – znanje je najbolji bedem protiv stihije)

DEPARTMENT OF CHEMICAL  
AND BIOLOGICAL SCIENCES

- Š. Miljanić, J. Radić-Perić, M. Perić, *On Fission and Uranium* (Do fisije, o fisiji i uranijumu)
- *Renewable Use of Natural Resources in Rural Regions in Serbia* (Obnovljivo korišćenje prirodnih resursa u seoskom područjima Srbije)
- *Scientific Meeting Proceedings Marking the 50th Death Anniversary of Academician Milutin Radovanović* (Zbornik sa naučnog skupa povodom pedeset godina od smrti akademika Milutina Radovanovića)
- *The Use of Pesticides in Plant Production and Environmental Protection* (Korišćenje pesticida u biljnoj proizvodnji i zaštita životne sredine)
- *Bibliography of Academician Miroslav J. Gašić's Works* (Bibliografija radova akademika Miroslava J. Gašića)
- *Momčilo St. Mokranjac – Chemist, Professor, Toxicologist* (Momčilo St. Mokranjac – hemičar, profesor, toksikolog)

DEPARTMENT OF TECHNICAL SCIENCES

- *Rajko Tomović – One Hundred Years from His Birth* (Rajko Tomović – sto godina od rođenja)

DEPARTMENT OF MEDICAL SCIENCES

- *Prevention in the Service of Health Protection in the Republic of Serbia* (Prevenција u funkciji zaštite zdravlja u Republici Srbiji)

DEPARTMENT OF LANGUAGE AND LITERATURE

- *Glas* CDXXIX, Vol. 31
- *South Slavic Philologist* (Južnoslovenski filolog), LXXV, Vol. 1
- *South Slavic Philologist* (Južnoslovenski filolog), LXXIV, Vol. 2
- *Serbian Dialectological Proceedings* (Srpski dijalektolaški zbornik), LXV/1
- *Serbian Dialectological Proceedings* (Srpski dijalektološki zbornik), LXV/2
- *SASA Library Forum* (Tribina Biblioteke SANU), Year VII, No. 7
- *Scala Paradisi: In Memory of Academician Dimitrije Bogdanović 1986–2016* (Scala paradisi: akademiku Dimitriju Bogdanoviću u spomen 1986–2016)
- *The Periodization of New Serbian Literature: On the Occasion of the 150th Birth Anniversary of Pavle Popović* (Periodizacija nove srpske književnosti: povodom 150. godišnjice rođenja Pavla Popovića)
- Dejan Vukićević, *Bibliography of Matija Bećković* (Bibliografija Matije Bećkovića)
- *Onomatological Contributions* (Onomatološki prilozi) 25
- *Onomatological Contributions* (Onomatološki prilozi), 26

DEPARTMENT OF SOCIAL SCIENCES

- *Preservation, Protection and Perspectives of the Roma Language in Serbia* (Očuvanje, zaštita i perspektive romskog jezika u Srbiji)
- *The Rights of National Minorities in the Constitutional and Legal System of the Republic of Serbia* (Prava nacionalnih manjina u ustavnopravnom sistemu Republike Srbije)

- *Thirty Years of the Committee for the Study of the Life and Customs of Roma: 1989–2019* (Trideset godina rada Odbora za proučavanje života i običaja Roma: 1989–2019)
- *State Order: Sovereignty in the Era of Globalization* (Državni poredak: suverenitet u vremenu globalizacije)
- *Bibliography of the Works of Academician Vojislav Stanovčić* (Bibliografija radova akademika Vojislav Stanovčića)
- *The World and Times of Slobodan Jovanović (1869–1958)* (Svet i vreme Slobodana Jovanovića /1869–1958/)
- *The Application of Digitization in Culture and History* (Primena digitalizacije u kulturi i nauci)

#### DEPARTMENT OF HISTORICAL SCIENCES

- *Proceedings on Serbs in Croatia* (Zbornik o Srbima u Hrvatskoj), 12
- *Serbian Artistic Heritage in Kosovo and Metohija: History, Identity, Vulnerability* (Umetničko nasledje srpskog naroda na Kosovu i Metohiji: istorija, identitet, ugroženost), 2nd edition.
- *St George's Church in Rečani* (Crkva Svetog Djordja u Rečanima)
- *The Kingdom and the Archbishopric of the Serbian and Maritime Lands of the Nemanjić Dynasty* (Kraljevstvo i arhiepiskopija u srpskim i pomorskim zemljama Nemanjića)
- *Students and Colleagues for Professor Fanoula Papazoglou* (Učenici i kolege za profesora Fanulu Papazoglu)
- V. Krestić, *Material on Serbo-Croatian Relations and Serbs in Croatia* (Materijal o srpskohrvatskim odnosima i Srbima u Hrvatskoj)
- *Gabriel Millet and Research of Old Serbian Architecture* (Gabrijel Mije i istraživanja stare srpske arhitekture)
- G. Subotić, B. Miljković, N. Dulić, *The Inscriptions of Chilandar Monastery, Vol. I, 14th – 17th Centuries* (Natpisi manastira Hilandara, Tom I, XIV–XVII vek)
- *Roman Limes and Cities in Serbia* (Rimski limes i gradovi na tlu Srbije)
- Olivera Golubović, *Bibliography of the Works of Academician Momčilo Spremić* (Bibliografija radova akademika Momčila Spremića)
- *Spiritual and Cultural Heritage of Studenica Monastery – Antiquity, Constancy, Contemporaneity* (Duhovno i kulturno nasledje manastira Studenice, drevnost, postojanost, savremenost)

DEPARTMENT OF FINE ARTS AND MUSIC

- *Svetomir Arsić Basara: Works 1998–2018* (Svetomir Arsić Basara: radovi 1998–2018)
- *Peintres/combattants/temoins* = *Художники/воиы/свидетели*
- *A Story About the Watermill – from Wheel to Turbine* (Priča o vodenici – od kola do turbine)
- *Applied Arts in SASA – Graphic Design of the SASA Medal and SASA Promotional Material* (Primenjena umetnost u SANU – grafički dizajn medalje i promotivnog materijala SANU)
- *The Imprint of Time 70/∞ - Grafički kolektiv Gallery – 70 Years* (Otisak vremena 70/∞ - Grafički kolektiv – 70 godina)
- *Љуба Поповић (1934–2016)*, in Serbian
- *Ljuba Popović (1934–2016)*, in English
- *Ljuba Popović (1934–2016)*, in French
- *8th Salon of Landscape Architecture* (8. Salon pejzažne arhitekture)

SASA BRANCH IN NOVI SAD

- *Annals of the SASA Branch in Novi Sad* (Anali Ogranka SANU u Novom Sadu), No. 14 for 2018
- *Chronicle of the SASA Branch in Novi Sad* (Hronika Ogranka SANU u Novom Sadu), No. 8
- *Gas Equation – The Challenges of Gas Supply* (Gasna jednačina – izazovi snabdevanja gasom)
- *Medicine Facing the Enigma of Complex Diseases* (Medicina pred enigmom kompleksnih bolesti)
- *HELIA* Vol. 42, No. 70/2019
- *HELIA* Vol. 42, No. 71/2019

SASA BRANCH IN NIŠ

- *Chronicle of the SASA Branch in Niš* (Hronika Ogranka SANU u Nišu), No. 2
- *Proceedings Art and Context 3: Migration and Art and Context 4: Nature* (Zbornik radova Umetnost i kontekst 3 i Umetnost i kontekst 4: priroda)

SERBIAN ACADEMY OF SCIENCES AND ARTS

- *Centre for Scientific Research of the SASA and University of Niš 1990–2016*  
(Centar za naučnoistraživački rad SANU i Univerziteta u Nišu 1990–2016)

CENTRE FOR SCIENTIFIC RESEARCH OF THE SASA  
AND UNIVERSITY OF KRAGUJEVAC

- Ivan Gutman, Boris Furtula, *Energies of Graphs*



CIP – Каталогизација у публикацији  
Народна библиотека Србије, Београд

001

**BULLETIN of Scientific and Art Research** : Annual Report for ... /  
editor-in-chief Marko Anđelković.– 2015–

. – Belgrade : Serbian Academy of Sciences and Arts, 2016– (Belgrade :  
Serbian Academy of Sciences and Arts). – 24 cm

Godišnje.– Je nastavak: Bulletin of Scientific Research – Serbian Academy  
of Sciences and Arts = ISSN 1820-340X

. –Ima izdanje na drugom jeziku: Билтен Фонда САНУ за истраживања  
у науци и уметности = ISSN 2466-4286

ISSN 2466-5150 = Bulletin of Scientific and Art Research (Serbian  
Academy of Sciences and Arts)

COBISS.SR-ID 226641932

