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SERBIAN ACADEMY OF SCIENCES AND ARTS

BULLETIN

OF SCIENTIFIC AND ART RESEARCH

Annual Report for 2018



BELGRADE 2019

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BELGRADE 2019

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EDITOR'S NOTE

The SASA Fund allotted the available resources for the following purposes: scientific and art research 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 and Art Research Programme.

Scientific and Art Research Projects

In 2018, the SASA Scientific and Art Research Programme contained 28 projects in the fields of mathematics, physics and earth sciences, 20 in the fields of chemical and biological sciences; 13 in the fields of technical and technological sciences; 28 in the field of medical sciences, 12 in the fields of language and literature; 16 in the field of social sciences; 25 in the field of historical sciences, and 8 in the fields of visual arts and music.

Publishing Activity

During the year, the SASA published 52 editions, including 13 journal issues, 19 collections of papers, 13 catalogues, five monographs, two jubilee bibliographies and Volume XX of the SASA Dictionary, while 1,162 authors published 540 papers. The first-ever commercial Catalogue of the SASA Editions: 2016–2017–2018 (Katalog izdanja SANU: 2016–2017–2018) was prepared and published. In addition, 22 manuscripts were technically processed and prepared for publication; the make-up and cover design of six 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. Fourteen manuscripts in the Serbian language underwent orthographic editing and 15 publications underwent proofreading, thus being prepared for publishing.

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

The Serbian Academy of Sciences and Arts hosted the meeting of the COST (European Cooperation in Science and Technology) Action titled “Maximizing Impact of Research in Neurodevelopmental Disorders”. It was the first formal meeting of the COST Action which has so far been joined by about 50 researchers from 20 European countries.

During 2018, two lecture cycles were held: “The Fascinating World of Nanoscience and Nanotechnology” (Fascinantni svet nanonauke i nanotehnologije) and “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), totalling 11 lectures.

In 2018, at the proposal of the SASA Departments and SASA Executive Board, 12 lectures were held.

Activities of the SASA Library

Pursuant to the Decision of the Professional Council of the SASA Library, the SASA Library Day will be celebrated on 14 June. The SASA Library started working on this day, when it received the first books from Dimitrije Tirol. Its first librarian was Konstantin Bogdanović. The SASA Library Day was marked by the celebration honouring Aleksa Šantić. In 2018, the SASA Library organized 17 forums. It presented 18 books and 13 collections of papers by SASA members, SASA editions, as well as the research institutes and centres founded by the SASA. It staged 12 chamber exhibitions. The SASA Library also published the jubilee Bibliography of Academician Nikola Tasić’s Works, authored by Milena Obradović, and the sixth issue of the SASA Library Forum Almanac (Godišnjak “Tribina Biblioteke SANU”). The 293-page issue of the Almanac contains the presentations given at the forums in 2017.

Activities of the SASA Galleries

In 2018, the SASA Gallery staged eight thematic exhibitions on its premises: “Stojan Novaković and His Era” (Stojan Novaković i njegovo doba), “So, you are Uroš Predić?” (Dakle, vi ste taj Uroš Predić), “35 Years of Petnica” (35 godina Petnice), “Mihailo Petrović Alas, the Founding Father of the Serbian School of Mathematics” (Mihailo Petrović Alas, rodonačelnik srpske matematičke škole), “Nedeljko Gvozdrenović. On a Quest for Absolute Painting” (Nedeljko Gvozdrenović. U potrazi za apsolutnim slikarstvom), “Roman Limes and Cities in Serbia” (Rimski limes i gradovi u Srbiji), 57th October Salon. “The Marvellous Cacophony” (57. Oktobarski salon. Čudo kakofonije), “Marko Čelebonović (1902-1986)”, Retrospective Exhibition (Marko Čelebonović /1902-1986/. Retrospektivna izložba). All exhibitions were accompanied by catalogues, lectures and expert guidance. Six catalogues were printed and one was prepared for printing. The exhibitions staged outside the SASA Gallery included: “SASA Art Collection – Academician Artists” (Umetnička zbirka SANU – likovni umetnici akademici), which toured Požarevac, Leskovac and Svilajnac, and “Olga Jevrić Exhibition – Sculptures” (Izložba Olga Jevrić – skulpture) in Užice. Seven new exhibitions were also prepared.

In 2018, the Gallery of the Serbian Academy of Sciences and Arts organized 74 concerts within the relevant cycles. The concert-related activity of the SASA Gallery is headed by Academician Ivan Jevtić.

During the year, the SASA Gallery of Science and Technology staged 15 exhibitions, supported by rich accompanying programmes. The names of these exhibitions were “Roma Tribulation in World War I” (Stradanje Roma u Prvom svetskom ratu); “Ivan Djaja. The Belgrade School of Physiology – from the Sorbonne to Belgrade” (Ivan Djaja. Beogradska škola fiziologije – od Sorbone do Beograda); “Brain Awareness Week 2018 – All Sides of Consciousness” (Nedelja svesti o mozgu – Sve strane svesti); “Traditional Architectural Heritage in the Area of the Stara Planina” (Tradicionalno arhitektonsko nasledje u regionu Stare planine); “The History of Toxicology” (Istorija toksikologije); THE POWER OF HERBS – The 70th Anniversary of the Institute for Medicinal Herb Research “Dr Josif Pančić” (MOĆ BILJA – povodom 70 godina rada Instituta za proučavanje lekovitog bilja “Dr Josif Pančić”); “This too Is Serbia, ’68 in *Student*” (I ovo je Srbija, ’68. u *Studentu*); “Archaeological Forensics – 20 Years of New Archaeological Investigations of Vinča” (Forenzika drevnosti – 20 godina novih arheoloških istraživanja lokaliteta Vinča); “Serbian Lexicography from Vuk to the Present Day” (Srpska leksikografija od Vuka do danas); “Jovan Stejić, First Serbian Doctor

of Medicine in Restored Serbia” (Jovan Stejić, prvi Srbin doktor medicine u obnovljenoj Srbiji); The Salonika Front, 1916-1918 (Solunski front 1916-1918); World War One in Miniature (Prvi svetski rat u minijaturi), and ON ARCHITECTURE 2018 (OARHITEKTURI 2018). The exhibitions were supported by the relevant catalogues (5) and rich accompanying programmes.

Conservation and Acquisition of Archival Materials

In 2018, the SASA Archives enriched its holdings by numerous gifts. It finished processing Academician Vasa Čubrilović’s manuscript legacy and Patriarch German Andjelić’s legacy. The processing of Dragoljub Jovanović’s legacy will be finished during the first few months of 2019. The work on organizing the collection held in the Cabinet for Medals was carried out. The electronic Incoming Inventory of the Cabinet was prepared. All decorations were sorted out and placed into archival boxes in order to ensure better protection and facilitate handling. The Central Institute for Conservation conserved 169 decorations. More than 800 decorations were photographed and cataloguing was done in accordance with all museological processing rules. The website and digital presentation were created, and the biographies of all donors were written. The result of this work is the permanent exhibition of the Cabinet for Medals, which was opened on the Day of the Academy on 19 November 2018. During the past year, the SASA archivists catered to 223 researchers. The reference library of the SASA Archives was enriched by 70 new books.

DEPARTMENT OF MATHEMATICS, PHYSICS AND EARTH SCIENCES

EARTH SCIENCES

COMMITTEE FOR PALEOFLORA AND PALEOFAUNA

(Academician Milan Sudar)

The Committee is the result of coordinated 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) the new data about the radiolarian fauna from the Jurassic *mélange* of Avala were established, (b) the Lower Albian ammonites from the Kosmaj Mt. were studied and their biostratigraphic implications were established, as well as brachiopods fauna and fossils of the Jurassic and Cretaceous age and other characteristics of the Vrbovac reef, (c) the type locality of the Lower Cretaceous Udoteacean alga, which was lost a long time ago, was found and defined again, (d) from the territory of the Jadar Block (SW Serbia), results of microfaunal and geochemical investigations in the Permo-Triassic boundary interval were presented, and investigations of Devonian and Lower Carboniferous conodont microfauna and carbonate microfacies were done; (e) in the register of paleofaunistic taxa of Serbia, one new genus and one new species of Lower Cretaceous foraminifers were incorporated, as were new Triassic conodonts: one subfamily and three genera; (f) in the paleofaunistic investigations of Tertiary, sediments of the Miocene age which belong to the Serbian Lake System (localities: Kraljevica, Vračevići, Ovča) were studied; Quaternary sediments of the Belgrade source area and the left side of the Sava River near Belgrade were also investigated, (g) during paleofloristic investigations, attention was focused on the Oligocene, Middle Miocene and Neogene flora of Banat and Western Serbia.

This year, in the fields in the surroundings of Belgrade and in Central Serbia where Lower Cretaceous, Urgonian rocks are investigated, only one field excursion was realized as part of inter-academic collaboration on a joint project with researchers from the Romanian Academy. As 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, Apusenî Mts.).

Sudar M. N., Kolar-Jurkovšek T., Nestell G. P., Jovanović D., Jurkovšek B., Williams J., Brookfield M., Stebbins A., 2018: New results of microfaunal and geochemical investigations in the Permian-Triassic boundary interval from the Jadar Block (NW Serbia). **Geologica Carpathica**, 69, 2, 169–186. doi: 10.1515/geoca-2018-1010

Sudar M. N., Novak M., Korn D., Jovanović D., 2018: Conodont biostratigraphy and carbonate microfacies of the Late Devonian to Mississippian Milivojevića Kamenjar section (Družetić, NW Serbia). **Bulletin of Geosciences**, 93 (2), 163–189, Chech, Prague. doi: 10.3140/bull.geosci.1690

Bucur I. I., Sudar M. N., Săsăran E., Jovanović D., Pleş G., Polavder S., 2018: Rediscovery of the type locality of the Udoteacean alga *Boueina hochstetterri* Toulou, 1884, in the Lower Cretaceous of Serbia. **Carnets de Géologie**, 18, 4, 123–137. doi: 10.4267/2042/66509

Plasencia P., Kiliç A. M., Baud A., Sudar M., Hirsch F., 2018: The evolutionary trend of platform denticulation in Middle Triassic acuminate Gondolellidae (Conodonts). **Turkish Journal of Zoology**, 42, 2, 187–197. doi: 10.3906/zoo-1708-20

Ayoub-Hannaa W., Radulović B. V., Fürsich F. T., Vasić N. D., Radulović V. J., 2018. Late Albian ammonites from Koraćica (Kosmaj Mountain, central Serbia) and their biostratigraphic implications. **Cretaceous Research**, 85, 280–308. <https://doi.org/10.1016/j.cretres.2018.02.003>

Sant K., Mandić O., Rundić Lj., Kuiper K., Krijgsman W., 2018: Age and evolution of the Serbian Lake System: integrated results from Middle Miocene Lake Popovac. **Newsletter on Stratigraphy**, 51/1, 117–143. doi:10.1127/nos/2016/0360

Sant K., Andrić N., Mandić O., Demir V., Pavelić D., Rundić Lj., Hrvatović H., Matenco L., Krijgsman W., 2018: Magneto-biostratigraphy and paleoenvironments of the Miocene freshwater sediments of the Sarajevo-Zenica Basin. **Palaeogeography, Palaeoclimatology, Palaeoecology**, 506, 48–69. doi:10.1016/j.palaeo.2018.06.009

Bragin Yu. N., Bragina G. L., Gerzina Spajić N., Djerić N., Schmid M. S., 2018: New radiolarian data from the Jurassic ophiolitic mélange of Avala Mountain (Serbia, Belgrade Region). **Swiss Journal of Geosciences**, 1–15. <https://doi.org/10.1007/s00015-018-0313-8>

Knežević S., Nenadić D., Radulović B., Bogičević K., Zarić J., 2018: Stratigraphic characteristics of Quaternary deposits on the left bank of the Sava River near Belgrade. **Geološki anali Balkanskoga poluostrva**, 79 (1), 21–30. doi: 10.2298/GABP1879021K

COMMITTEE FOR GEODYNAMICS OF EARTH CRUST

(Corresponding Member Vladica Cvetković)

At the last meeting held on 15 October 2018 (via electronic means), the Committee proposed the incorporation of new members. After the proposal had been confirmed by the Department of Mathematics, Physics and Geosciences, the following new members were appointed by the Executive Council of the SASA (23rd meeting, 1 November 2018): Slobodan Marković, Corresponding Member of the SASA, Prof. Dr. Dejan Prelević, Prof. Dr. Kristina Šarić, Assist. Prof. Dr. Dejan Radivojević and Dr. Ana Mladenović (all from the University of Belgrade – Faculty of Mining and Geology), as well as Dr. Ivan Dulić (NIS–Gaspromnjeft).

The most important activities of the Committee in 2018 were: 1) the organization of the SASA Special Lecture Series entitled: “*GEOHAZARDS IN SERBIA OF THE 21st CENTURY – The best rampart for natural disasters is knowledge*“, which involved seven lectures about the most important geological hazards for this region, and 2) the participation at the 21st International Carpatho-Balkan Geological Association (Salzburg, 10-13 September 2018), at which the Committee members acted as session chairs or plenary lecturers. In 2018, a preliminary report on the recent situation of the investigations of solar neutrino flux as well as on the actual assessment of the necessary quantity of lorandite as monitor mineral was published (Nuclear Inst. and Methods in Physics Research, A, 895, 62–73). The investigations related to the numerical modelling of geodynamic processes, which have already progressed within the framework of the PhD thesis of Nevena Andrić (Gondwana Research, 56, 119–134), continued in the second half of 2018. Nikola Stanković, a PhD candidate, commenced his PhD project and started to work on applying a numerical code for reconstructing Mesozoic geodynamic of the Balkan Peninsula.

Andrić N., Vogt K., Matenco L., Cvetković V., Cloetingh S., Gerya T., 2018: Variability of orogenic magmatism during Mediterranean-style continental collisions: A numerical modelling approach. **Gondwana Research**, 56, 119–134.

Pavićević M. K., Amthauer A., Cvetković V., Boev B., Pejović V., Henning W. F., Bosch F., Litvinov Yu. A., Wagner R., 2018: Lorandite from Allchar as geochemical detector for pp-solar neutrinos. **Nuclear Instruments and Methods in Physics Research A**, 895, 62–73.

Boev B., Cvetković V., Jelenković R., Boev I., 2018: Implications of the geological characteristics and genesis of the Allchar deposit for the Lorex Project. **Geologica Macedonica**, 32, 1, 5–20.

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

(Academician Milan Sudar)

In this project, investigations in several directions were carried out and the results of the following complex synthesis were presented: a) emendation and new definition of the Grivska Formation in its type area of the Dinaridic Ophiolite Belt in SW Serbia, b) in the early defined mélanges presented in the Inner Dinarides of SW Serbia, the Jurassic Hallstatt mélange of the Zlatibor and Zlatar Mts. and their influence on the Triassic-Jurassic geotectonic reconstruction of the western Tethyan Realm were separately described, c) the structural and geochronological constraints in the Drina-Ivanjica thrust sheet as implications for Cretaceous-Paleogene tectonics of the Inner Dinarides were established, d) the new paleomagnetic results established in the Inner Dinarides of SW Serbia were presented, e) in the Serbian part of the Pannonian Basin, characterizations of hydrocarbon and geothermal source reserves were defined, e2) Upper Miocene depositional environments of Kikinda-Mokrin High and e3) rift sequence stratigraphy and its influence on the understanding of source rocks.

The following was established by tectonic investigations: a) on the Juhor Mt example, tectonothermal evolution of the asymmetrical extensional system was defined, b) geothermal geometry of internal Getic nappes in the area between river Danube and the Sokobanja Basin, c) the genetic properties of Cretaceous sediments in Central Serbia and their importance for geodynamic evolution of the active European margin.

Sudar M. N., Gawlick H.-J., 2018: Emendation of the Grivska Formation in their type area (Dinaridic Ophiolite Belt, SW Serbia). **Geološki anali Balkanskoga poluostrva**, 79, 1, 1–19. doi: 10.2298/GABP1879001S, Beograd (in English, Serbian summary)

Gawlick H.-J., Sudar M. N., Missoni S., Suzuki H., Lein R., Meres Š., Jovanović D., 2018: The Jurassic Hallstatt Mélange of the Inner Dinarides (SW Serbia): implications for Triassic-Jurassic geodynamic and palaeogeographic reconstructions of the western Tethyan realm. **Neues Jahrbuch für Geologie und Paläontologie, Abhandlungen**, 288/1 (2018), 1–7. doi: 10.1127/njgpa/2018/0721

Porkoláb K., Kövér S., Benkó Z., Héja G., Fialowski M., Soós B., Gerzina Spajić N., Đerić N., Fodor L., 2018: 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 (B7), 1–18, <https://doi.org/10.1007/s00015-018-0327-2>

Németh B., Tari G., Bada G., Radivojević D., Tomljenović B., Krézsek Cs., 2018: Introduction to special section: Characterization of hydrocarbon and geothermal

resource potential and carbon sequestration opportunities of the Pannonian Basin. **Interpretation**, 6 (1), pp. SBi–Sbii, <https://doi.org/10.1190/INT-2017-1207-SPSEINTRO.1>

Ivanišević S., Radivojević D., 2018: Upper Miocene depositional environments of the Kikinda–Mokrin High (Serbia). **Interpretation**, 6 (1), SB65–SB76, <https://doi.org/10.1190/INT-2017-0084.1>

Radivojević D., 2018: The different approaches in seismic stratigraphy interpretation. **Tehnika – rudarstvo, geologija i metalurgija**, 69, 2, 211–217. doi: 10.5937/tehnika1802211R

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

(Corresponding Member Vladica Cvetković)

In 2018, the collecting of new data about the Sava-Vardar zone continued as part of the project “Study of the ophiolite belts of the Vardar zone, the Dinarides and the Carpatho Balkanides”, as these rocks have substantial importance for our present-day understanding of all other Balkan ophiolites. Petrographic investigations of the rock material recovered from new boreholes (Jelica–1; NIS–Gaspromnjeft) in the Čačak-Kraljevo Cenozoic basin, have revealed that the occurring basaltoid rocks are very similar to other localities of the Sava-Vardar zone (e.g. Kozara, Klepa, etc.). The very first data were presented at the 17th Congress of the Serbian Geologists. The existing data about the northernmost occurrences of the Sava-Vardar zone are reported in the paper: “Geology of the Kozara Mts”, which was published in the monograph entitled: “Geology of the Kozara and the Prosara Mts”, issued by the Academy of Sciences and Arts of the Republic of Srpska. Along with these studies, a synthesis about the East Vardar Zone was also published as part of the inter-academic cooperation between the SASA and the Macedonian Academy of Sciences and Arts. The synthesis encompassed all existing data about the East Vardar ophiolites, which occur from Transylvania in the north up to the Halkidiki Peninsula in the south. The synthesis is reported in the paper: “East Vardar ophiolites revisited: a brief synthesis of geology and geochemical data” (Contributions, Macedonian Academy of Sciences and Arts, Section of natural, mathematical and biotechnical sciences. 39, 1, 51–68).

Boev B., Cvetković V., Prelević D., Šarić K., Boev I., 2018: East Vardar ophiolites revisited: a brief synthesis of geology and geochemical data. **Contributions, Macedonian Academy of Sciences and Arts, Section of natural, mathematical and biotechnical sciences**, 39, 1, 51–68.

COMMITTEE FOR GEOCHEMISTRY

(Academician Vidojko Jović)

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

In 2018, Dr. Dejan Prelević continued his research in the scientific field of geochemistry and petrology with a special emphasis on the origin of alkaline magmatic rocks and the processes related to the mantle melting. His study area includes the application of radiogenic isotopes of Sr, Nd, Pb, Hf, Os, as well as stable isotopes O and Li, followed by geochemical modelling and study of geochronology and mineralogy, as well as their relationships to the regional and structural geology, geodynamics, tectonics and ore deposits. Dr. Dejan Prelević performs studies of in situ analysis of the chemical and isotopic composition of minerals, the analysis of trace elements, stable isotopes, and U-Pb geochronology, using the method of inductively coupled plasma and mass spectrometer (solid and solution ICP-MS / MC /). In this year, research in the field of experimental petrology and geochemistry was particularly intensified, especially in two directions: research related to the creation of the metasomatized mantle; research related to the P-T conditions of melting of the metasomatized mantle and the geochemical characteristics of the melts that are produced.

Förster M. W., Prelević D., Schmück H. R., Buhre S., Marschall H. R., Mertz-Kraus R., Jacob D. E., 2018: Melting phlogopite-rich MARID: Lamproites and the role of alkalis in olivine-liquid Ni-partitioning. **Chemical Geology**, 476, 429–440.

Boev B., Cvetković V., Prelević D., Šarić K., Boev I., 2018: East Vardar ophiolites revisited: a brief synthesis of geology and geochemical data. **Contributions, Section of Natural, Mathematical and Biotechnical Sciences**, MASA, 39 (1), 51–68.

Lustrino M., Fedele L., Agostini S., Prelević D., Salari G., 2018: Leucitites within and around the Mediterranean area. **Lithos**, 324, 216–233.

Velojić M., Prelević D., Jelenković R., 2018: The origin of lead and sulfur in Tular ore field, Lece magmatic complex. **Geološki anali Balkanskoga poluostrva**, 79 (2), 19–28.

Prelević D., Köpping J., Petermell M., 2018: Cretaceous tectonic evolution of the Sava Zone as seen from the Klepa-massif, Macedonia (FYROM) – a combined geochemical and paleostress study. **Advances of Geology in southeast European mountain belts**, 205.

2. Geochemistry of rock alteration

During the exploitation of ore deposits, sulphide minerals are exposed to a large extent to atmospheric impacts. Since sulphides are unstable in an oxidizing environment, these minerals are subject to alteration and dissolution processes, causing the release of heavy metals and toxic elements, which are otherwise mainly concentrated in sulphides. On the basis of the waste dump of the Rudnik polymetallic ore deposit it was shown that sulphides are by far the most common sulphide oxidation products. The mechanism of their formation is significant for understanding the migrativity of lead, arsenic and other toxic elements that often occur in higher concentrations in water, causing environmental pollution in the area of the town of Rudnik in general.

3. Mineralogy

Diffuse reflectance (DR) spectroscopy represents an important method in mineral diagnostics, which can be used as a method to gain information about the aggregation of MB molecules on the surface of clay minerals.

Investigation was carried out on different types of clays from Serbia: montmorillonite (mon.B), mixed-layer smectite-illite and kaolinite-illite. Kaolinite from Sedlec (Czech Republic), was used as a reference for kaolinite. DR spectra were measured in the VIS-NIR region (380-950 nm) with two different angles of the polarised light, parallel and at 45 degrees, in regard to the surface of the samples. Presented at: 9th Mid-European Clay Conference MECC 2018, Zagreb, 17-21 September 2018 (Maja Milošević and Mihovil Logar).

The Rudnik ore field is one of the well-known skarn-replacement and high-temperature hydrothermal Pb-Zn-Cu-Ag-Bi-W polymetallic sulfide deposits, and it is a part of the Šumadija Metallogenic District, Serbia. It comprises ore bodies grouped into several major ore zones. The pseudostratified and platelike ore bodies have a relatively high content of valuable metals. The average content varies in wide ranges: Pb (0.94–5.66 wt%), Zn (0.49–4.49 wt%), Cu (0.08–2.18 wt%), Ag (50–297 ppm), Bi (~100–150 ppm), and Cd (~100–150 ppm). Generally, a complex mineral association has been determined. Iron sulfides, arsenopyrite, chalcopyrite, sphalerite, galena and sulfosalts are abundant minerals in the ore.

Stojanović J., Radosavljević S., Tošović R., Pačevski A., Radosavljević-Mihajlović A., Kašić V., Vuković N., 2018: A review of the Pb-Zn-Cu-Ag-Bi-W polymetallic ore from the Rudnik orefield, Central Serbia. **Geološki anali Balkanskoga poluostrva**, 79, 47–69.

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

(Academician Vidojko Jović)

The petrographically complex Neresnica granitoid was intruded into the Osanica Neoproterozoic-Cambrian metamorphic unit in the Early Permian. On the basis of the modal mineral composition it was possible to determine the presence of tonalites, granodiorites, monzogranites, two-mica granites and leucogranites. The conclusions concerning the process of crystallization of this pluton were derived from the chemism of the main petrogenic minerals.

According to more recent investigations, the contents of rare earth elements in granates are the good indicators of the process of ore deposit formation and the behaviour of skarn hydrothermal systems. The granates in the Rogozna skarns, which are greatly characterized by oscillatory zonarity and anisotropy, were analyzed.

The possibility of using chlorite geothermometry to define the temperature of mineralized fluids was investigated on the basis of two propilitized volcanic rock samples from the Rudnik polymetallic deposit.

The cores of five exploratory boreholes drilled at the Kraljevica site in Eastern Serbia were investigated. The radiometric age of zircon grains from a vitroclastic tuff was determined (16.9 Ma). This is the first evidence about the Miocene age and precise chronostratigraphic status of the (Carpathian) coal series in the so-called Serbian Lake System of the Miocene Epoch. The total Miocene Lake thickness is 110-260 m.

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

(Corresponding Member Slobodan B. Marković)

During 2018, all planed project activities were successfully realized. In October, together with Chinese colleagues (professors at the Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing), we realized 16 days of joint field work in Serbia related to tree ring investigations.

I participated in organizing two scientific conferences: "Natural Hazards – Lessons from the past and contemporary challenges" held in the SASA Branch in Novi Sad, 5-7 October 2018, and "125th anniversary of pub-

lishing Das Karstphänomen monograph by Jovan Cvijić” held in the SASA in Belgrade, 7 November 2018.

Zeeden C., Hambach U., Obrecht I., Hao Q. Z., Abels H. A., Lehmkuhl F., Gavrilov M. B., Marković S. B., 2018: Patterns and timing of loess-paleosol transitions in Eurasia: Constraints for paleoclimate studies. **Global and Planetary Change**, 162, 1–7.

Marković S. B., ... , Lehmkuhl F., 2018: The Crvenka loess-paleosol sequence: A record of continuous grassland domination in the southern Carpathian Basin during the Late Pleistocene. **Palaeogeography, Palaeoclimatology, Palaeoecology**, 509, 33–46.

Marković S. B., ... , Lehmkuhl F., 2018: Loess correlations – Between myth and reality. **Palaeogeography, Palaeoclimatology, Palaeoecology**, 509, 4–23.

Smalley I., Marković S. B., 2018: Four loess pioneers: Charles Lyell, F. von Richthofen, V. A. Obruchev, L. S. Berg. **Quaternary International**, 469, 4–43.

Song Y., Guo Z., Marković S. B., Hambach U., Deng C., Chang L., Wu J., Hao Q., 2018: Magnetic stratigraphy of the Danube loess: A composite Titel-Stari Slankamen loess section over the last one million years in Vojvodina, Serbia. **Journal of Asian Earth Sciences**, 155, 68–80.

Radaković M., Tošić I. A., Gavrilov M. B., Bačević N., Gavrilov M. B., Marković S. B., 2018: The analysis of aridity in Central Serbia from 1949 to 2015. **Theoretical and Applied Climatology**, 133, 887–898. doi: 10.1007/s00704-017-2220-8

Lukić T., Bjelajac D., Fitzsimmons K. E., Marković S. B., ... , Samardžić I., 2018: Factors triggering landslide occurrence on the Zemun loess plateau, Belgrade area, Serbia. **Environmental Earth Sciences**, 77, 519–524.

Lehmkuhl F., Bösken J., Hošek J., Sprafke T., Marković S. B., Obrecht I., Hambach U., Sümegi P., Thiemann A., Steffens S., Lindner H., Veres D., Zeeden C., 2018: Loess distribution and related Quaternary sediments in the Carpathian Basin. **Journal of Maps**, 14, 673–682. doi:10.1080/17445647.2018.1526720

Gavrilov N. B., Marković S. B., Schaetzl R. J., Tošić I. A., Zeeden C., Obrecht I., Sipos Gy., Ruman A., Putniković S., Emunds K., Perić Z., Hambach U., Lehmkuhl F., 2018: Prevailing surface winds in Northern Serbia in the recent and past time periods; modern- and past dust deposition. **Aeolian Research**, 31, 117–129. doi:10.1016/j.aeolia.2017.07.008

Vasiljević D. A., Vujičić M. D., Božić S., Jovanović T., Marković S. B., Basarin B., Lukić Čakardić J., 2018: Trying to underline geotourist profile of National park visitors: Case study of NP Fruška Gora, Serbia (Typology of potential geotourists at NP Fruška Gora). **Open Geosciences**, 10, 222–233.

Vujičić M. D., Vasiljević D. A., Hose T. A., Tasić N., Đurić A., Marković S. B., 2018: A multi-criteria decision analysis with special reference to loess and archaeological sites in Serbia (Could geosciences and archaeology cohabitate?). **Open Geosciences**, 10, 333–343.

MATHEMATICS

Project: **NONLINEAR ANALYSIS IN FUZZY STRUCTURES**

(Academician Olga Hadžić)

In 2018, multi-year research under the project “Nonlinear Analysis in Fuzzy Structures” continued.

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

(Academician Dragoš Cvetković)

In papers [1], [2] and [3] we consider the symmetric traveling salesman problem (TSP) with instances represented by complete graphs G with distances between cities as edge weights.

A complexity index is an invariant of an instance I by which the execution time of an exact TSP algorithm for I can be predicted. In [1] we consider some subgraphs of G consisting of short edges and define several new invariants related to their connected components. For computational experiments we have used the well-known TSP Solver Concorde.

Computational experiments with instances on 50 and 100 vertices with weights as in [1] show that there exists a correlation between the sequences of spectral moments of the distance matrix and the lengths of optimal tours obtained by Concorde. In the paper [2] we give a theoretical explanation of this correlation.

Computational experiments described in [2] 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 the paper [3] we give a theoretical explanation.

In [4] a spectral graph theory approach is described for representing melodies as graphs, based on intervals between the notes they are composed of. These graphs (or digraphs) are then indexed using eigenvalues of some graph matrices. The eigenvalues are used to define a spectral distance between graphs.

In [5] we show that principles developed for the theoretical analysis of Bee Colony Optimization metaheuristic hold for swarm intelligence based

metaheuristics: they need to implement learning mechanisms in order to properly adapt the probability rule for modification of a candidate solution.

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- [1] Cvetković D., Čangalović M., Dražić Z., Kovačević-Vujčić V., 2018: Complexity indices for the traveling salesman problem based on short edge subgraphs. **CEJOR**, 26, No. 3, 759–769.
- [2] Cvetković D., Čangalović M., Dražić Z., Kovačević-Vujčić V., 2018: The traveling salesman problem: spectral moments and the length of an optimal tour. **SYM-OP-IS**, 118–122.
- [3] Cvetković D., Čangalović M., Dražić Z., Kovačević-Vujčić V., 2018: The traveling 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, 17–26.
- [4] Cvetković D., Drobni T., Todorčević V., 2018: Recognition of music melodies in spectral graph theory. **Phlogiston**, 26, 165–180.
- [5] Davidović T., Jakšić Kruger T., 2018: Convergence Analysis of Swarm Intelligence Metaheuristic Methods. In: A. Eremeev, M. Khachay, Y. Kochetov, P. Pardalos (eds), **Optimization Problems and Their Applications, 7th Int. Conf. OPTA 2018**, Omsk, Russia, July 8-14, 2018, Springer Series Communications in Computer and Information Science, 871, 251–266.
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Project: ASYMPTOTIC FORMULAS IN ANALYTIC NUMBER THEORY

(Academician Aleksandar Ivić)

In the year 2018, A. Ivić published the following works:

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1. On a cubic moment of Hardy's function with a shift. In: **Exploring the Riemann Zeta Function**, eds. H. L. Montgomery, A. Nikeghbali, M. T. Rassias, Springer Verlag, Berlin etc., 2017, 99–112. doi 10.1007/978-3-319-59969-4_6
 2. Some remarks on the difference between ordinates of consecutive zeta zeros. **Functiones et Approximatio**, 58 (2018), 23–35. doi: 10.7169/facm/1633.
 3. On certain sums over ordinates of zeta-zeros II (with A. Bondarenko, E. Saksman and K. Seip). **Hardy Ramanujan Journal**, 41 (2018), 71–83.
 4. On the multiplicities of zeros of $\zeta(s)$ and its values over short intervals. **Journal of Number Theory**, 185 (2018), 65–70. <https://doi.org/10.1016/j.jnt.2017.09.017>
-

The first paper deals with Hardy's function $Z(t)$, which plays an important role in the theory of the Riemann zeta-function $\zeta(s)$. The remaining papers deal with various problems involving $\zeta(s)$.

In March 2018, A. Ivić was at the NTNU, Trondheim, where he gave three lectures. From 16-19 May, he attended the 14th Serbian Mathematical

Congress, organized in Kragujevac by the University of Kragujevac, where he gave a talk. He also gave a talk at the “Max Planck Institut für Mathematik” in Bonn. The meeting ELAZ2018 (Elementary and analytic number theory) was held there, with about 100 participants from more than 20 countries.

Project: QUALITATIVE AND NUMERICAL ANALYSIS OF SOME CLASSES OF DIFFERENTIAL AND DIFFERENCE EQUATIONS

(Academician Vojislav Marić)

In 2018, multi-year research on differential and difference equations continued.

Project: EQUATIONS WITH SINGULARITIES THROUGH METHODS OF FUNCTIONAL ANALYSIS

(Academician Stevan Pilipović)

In 2018, multi-year research under this project continued. Its result is the publishing of the following papers:

Pilipovic S., Prangoski B., Vindas J., 2018: Spectral asymptotics for infinite order pseudo-differential operators. **Bulletin of Mathematical Sciences**, 8, 81–120.

Atanackovic T., Pilipovic S., 2018: On a constitutive equation of heat conduction with fractional derivatives of complex order. **Acta Mechanica**, 229, 1111–1121.

Chen C. C., Kostić M., Pilipović S., Velinov D., 2018: D-hypercyclic and D-chaotic properties of abstract differential equations of first order. **Electronic Journal of Mathematical Analysis and Applications**, 6, 1–26.

Atanackovic T., Pilipovic S., Zorica D., 2018: Properties of the Caputo-Fabrizio fractional derivative and its distributional settings. **Fractional Calculus and Applied Analysis**, 21, 29–44.

Atanackovic T. M., Janev M., Pilipovic S., 2018: Non-linear boundary value problems involving Caputo derivatives of complex fractional order. **Applied Mathematics and Computation**, 334, 326–342.

Jaksic S., Maksimovic S., Pilipovic S., 2018: An algebraic approach to tempered ultradistributions. **Journal of Mathematical Analysis and Applications**, 466, 1, 927–935.

Gordic S., Oberguggenberger M., Pilipovic S., Selesi D., 2018: Probabilistic properties of generalized stochastic processes in algebras of generalized functions. **Monatshefte für Mathematik**, 186, 4, 609–633.

Pilipovic S., Prangoski B., Vindas J., 2018: On quasianalytic classes of Gelfand-Shilov type. Parametrix and convolution. **Journal de Mathématiques Pures et Appliquées**, 116, 174–210.

Aleksic J., Pilipovic S., Vojnovic I., 2018: H-distributions with unbounded multipliers. **Journal of Pseudo-Differential Operators and Applications**, 9, 3, 615–641.

Levajković T., Pilipović S., Selesi D., Žigić M., 2018: Stochastic evolution equations with Wick-polynomial nonlinearities. **Electronic Journal of Probability**, 23, 116, 25 pp.

Pilipovic S., Prangoski B., 2018: Complex powers for a class of infinite order hypoelliptic operators. **Dissertations Mathematics**, 529, 1–58.

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

(Academician Gradimir V. Milovanović)

Using the so-called (p, q) -analogue of the beta operators, an integral modification of the generalized Bernstein polynomials is considered in [1], including estimations of some direct results on local and global approximation. A modification of the Szász–Mirakjan–Kantorovich operators as well as Stancu operators (or a Dunkl generalization of modified Szász–Mirakjan–Kantorovich operators) which preserve the linearity are presented in [2]. Also, recent results on weighted polynomial approximations for functions defined on the real semiaxis are summarized in [3]

Following recent generalizations of classical theorems for the series ${}_2F_1$ [*Integral Transform. Spec. Funct.* 229(11), (2011), 823–840] and interesting Laplace transforms of Kummer’s confluent hypergeometric functions obtained by Kim et al. [*Math. Comput. Modelling* 55 (2012), 1068–1071], we first expressed generalized summations theorems in explicit forms and then, by employing these, we derived various new and useful Laplace transforms of convolution type integrals by using product of two special generalized hypergeometric functions ${}_pF_p$ by employing classical summation theorems for the series ${}_2F_1$, ${}_3F_2$, ${}_4F_3$ and ${}_5F_4$ available in the literature. Results are presented in [4] and [5]. An extension of Pochhammer’s symbol and its application to some hypergeometric functions are given in [11].

Orthogonal polynomials with respect to the modified measure on $(-1, 1)$, where $T_2(x)$ is the second degree monic Chebyshev polynomial of the first kind and $s > \frac{1}{2}$, are considered in [6]. The coefficients of the three-term recurrence relation for these polynomials in an analytic form, a differential equality, as well as the corresponding differential equation are obtained. Assuming a logarithmic potential, an electrostatic interpretation of the zeros of these polynomials is established. Procedures based on moments are devel-

oped in [7], for computing the three-term recurrence relations for orthogonal polynomials relative to the Binet, generalized Binet, squared Binet, and related subrange weight functions.

Finally, some efficient numerical methods for analysis of random processes and their applications in telecommunications, as well as a rigorous truncation error analysis in some problems in telecommunication, are treated in [8] and [9], while the work [10] is related to numerical integration of one class of quasi-singular integrals appearing in the convenient formulas of electromagnetic field components and potential functions of linear source distributions. An efficient method for solving integral equations of convolution type in the problems of electrical discharge and a construction of the Gauss-Rys quadrature formulas are given in [12] and [13], respectively.

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1. Milovanović G. V., Gupta V., Malik N., 2018: (p,q)-Beta functions and applications in approximation. **Boletín de la Sociedad Matemática Mexicana**, 24, 219–237.
 2. Milovanović G. V., Mursaleen M., Nasiruzzama Md., 2018: Modified Stancu type Dunkl generalization of Szász-Kantorovich operator. **Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas**, 112, 135–151.
 3. Mastroianni G., Milovanović G. V., Notarangelo I., 2018: Polynomial approximation with Pollaczec-Laguerre weights on the real semiaxis. A survey. **Electronic Transactions on Numerical Analysis**, 50, 36–51.
 4. Milovanović G. V., Parmar R. K., Rathie A. K., 2018: A study of generalized summation theorems for the series ${}_2F_1$ with an applications to Laplace transforms of convolution type integrals involving Kummer's functions ${}_1F_1$. **Applicable Analysis and Discrete Mathematics**, 12, 257–272.
 5. Milovanović G. V., Parmar R. K., Rathie A. K., 2018: Certain Laplace transforms of convolution type integrals involving product of two special ${}_pF_p$ functions. **Demonstratio Mathematica**, 81, 264–276.
 6. Cvetković A.S., Milovanović G. V., Vasović N., 2018: Recurrence relation and differential equation for a class of orthogonal polynomials. *Results in Mathematics*, 73, no. 1, 73, 16. <https://doi.org/10.1007/s00025-018-0779-8>.
 7. Gautschi W., Milovanović G. V., 2018: Binet-type polynomials and their zeros. **Electronic Transactions on Numerical Analysis**, 50, 52–70.
 8. Milovanović G. V., Suljović S., Panić S. R., Kalco I., Stefanović M., 2018: Efficient numerical methods for analysis of square ratio of $\kappa - \mu$ and $\eta - \mu$ random processes with their applications in telecommunications. **Mathematical Problems in Engineering**, Volume 2018, Article ID 4967613, 9 pages; <https://doi.org/10.1155/2018/4967613>.
 9. Marjanović Z. M., Djordjević G. T., Milovanović G. V., 2018: Truncation error analysis in computing of SEP and SEP floor for partially coherent receiver of MPSK signals over composite fading channels. **Journal of the Franklin Institute: Engineering and Applied Mathematics**, 355, no. 2, 965–980.

10. Milovanović G. V., 2018: Remarks on “Application of mixed quadrature rule on electromagnetic field problems”. **Computational Mathematics and Modeling**, 29, no. 2, 201–210.
 11. Masjed-Jamei M., Milovanović G. V., 2018: An extension of Pochhammer’s symbol and its application to hypergeometric functions, II. **Filomat**, 32, 19, 6505–6517.
 12. Pavlović D., Milovanović G. V., Cvetić J., 2018: Calculation of the channel discharge function for the generalized lightning traveling current source return stroke model. **Filomat**, 32, 20, 6937–6951.
 13. Milovanović G. V., 2018: An efficient computation of parameters in the Rys quadrature formula. **Bulletin. Classe des Sciences Mathématiques et Naturelles. Sciences Mathématiques**, 43, 39–64.
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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” since 2013. In the 2011-2017 period, he was also head of the project “Analysis and Algebra with Applications” (Ministry of Education, Science and Technological Development) which is connected with the SASA project. In 2018, 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 harmonic quasiconformal (hqc) 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.

[1] Mateljević M., 2018: Schwarz lemma and Kobayashi Metrics for holomorphic and pluriharmonic functions. **Journal of Mathematical Analysis and Applications**, 464, 78–100.

[2] 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>)

[3] Mateljević M., 2018: Schwarz lemma and distortion for harmonic functions via length and area. **arXiv:1805.02979v1 [math.CV]** 8 May 2018.

- [4] Mateljević M., Khalfallah A., 2018: Schwarz lemmas for mappings with bounded Laplacian. **arXiv**:1810.08823v1 [math.CV] <http://arxiv.org/abs/1810.08823>
- [5] Mateljević M., Svetlik M., 2018: Hyperbolic metric on the strip and the Schwarz lemma for HQR mappings. Submitted on 20 Aug 2018, **arXiv**: 1808.06647v1 [math.CV], <http://arxiv.org/abs/1808.06647>
- [6] Mateljević M., 2017: Schwarz Lemma and Kobayashi Metrics for Holomorphic Functions. **Filomat**, 31, 11, 3253–3262. doi: 10.2298/FIL1711253M
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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, many results have been obtained for matrix transformations on BK-spaces.

Malkowsky E., Rakočević V., 2017: Some results in metric fixed point theory. **Advances in the Theory of Nonlinear Analysis and its Application**, 1, No. 2, 64–112.

Djolović I., Malkowsky E., 2017: Compactness of multiplication, composition and weighted composition operators between some classical sequence spaces: A new approach. **Rocky Mountain Journal of Mathematics**, 47, no. 8, 2545–2564.

Djolović I., Petković K., Malkowsky E., 2018: Matrix mappings and general bounded linear operators on the space bv . **Mathematica Slovaca**, 68, No. 2, 405–414.

Patle P. R., Rakočević V., Patel D. P., 2018: An alternative partial metric approach for the existence of common fixed points. **Communications in Optimization Theory**, 2018, article ID 15.

Cvetković M., Karapinar E., Rakočević V., 2018: Fixed point results for admissible Z -contractions. **Fixed Point Theory**, 19, No. 2, 515–526.

Abbas M., Nazir T., Rakočević V., 2018: Common Fixed Points Results of Multivalued Perov type Contractions on Cone Metric Spaces with a Directed Graph. **The Bulletin of the Belgian Mathematical Society — Simon Stevin**, 25, 1–24.

Abbas M., Rakočević V., Iqbal A., 2018: Fixed Points of Perov type contractive mappings on the set endowed with a graphic structure. **Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales, Serie A, Mathematicas**, 112, 209–228.

Petrović M., Rakočević V., Kontrec N., Panić S., Ilić D., 2018: Hybridization of accelerated gradient descent method. **Numerical Algorithms**, 79, 769–786.

PHYSICS AND METEOROLOGY

Project: **STATISTICALITY AND CAUSALITY IN QUANTUM MECHANICS**

(Academician Fedor Herbut)

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

I have begun writing a new review article.

Project: **NUMERICAL SIMULATION OF WEATHER AND CLIMATE**

(Academician Fedor Mesinger)

Work was continued on the analysis of the results published in 2017 on the advantage of the Eta (or “cut-cell Eta”) 21 member ensemble over ECMWF ensemble that was supplying lateral boundary conditions (LBCs) to the Eta members. In that experiment, attention was focused on the accuracy of the forecast position of the jet stream, considering as jet stream winds of speeds greater than 45 m/s in the upper troposphere, at the elevation of 250 hPa. During about days 2 through 10 of the experiment, the Eta members achieved better accuracy scores than their ECMWF (EC in further text) driver members, even though the resolution used by the Eta was about the same as that of the EC driver members. Analyses were continued by counting the number of “wins” of one model over another, which may be a novel verification method as we have not seen it used. An attractive feature of the method is that results can be used to calculate the significance level of the relative accuracy statement arrived at. Three accuracy measures were used: equitable threat score adjusted for bias, RMS difference, and extreme dependency score (EDS), specifically designed for forecasts of rare binary-events (Stephenson et al., Meteor. Appl. 2008). With all three of those, it occurred multiple times during days 2 to 5 of the experiment that all 21 Eta members achieved better jet stream accuracy scores than their EC driver members.

In order to enable an analysis of the synoptic features of the two ensembles that led to this advantage of the Eta, contour maps were generated for one verification time, that of 4.5 days, for all three ensembles. They showed that

none of the 21 Eta members reproduced at least two visible erroneous features that numerous EC members showed, and that some of the Eta/sigma members did reproduce these erroneous EC members' features.

Kovačević N., Veljovic K., 2018: Impact of drizzle-sized cloud particles on production of precipitation in hailstorms: A sensitivity study. **Atmosphere**, 9, 13.

Mesinger F., Rančić M., James Purser R., 2018: Numerical Methods in Atmospheric Models. In: **Oxford Research Encyclopedia of Climate Science**, 51 pp. Available online at doi:10.1093/acrefore/9780190228620.013.617

Putniković S., Tošić I., Lazić L., Pejanović G., 2018: The influence of the large-scale circulation patterns on temperature in Serbia. **Atmospheric Research**, 213, 465–475. Available online at doi:10.1016/j.atmosres.2018.07.003

Project: **PHYSICAL AND MATHEMATICAL MODEL FOR
MESOSCALE ATMOSPHERIC PROCESSES**

(Corresponding Member Zaviša Janjić)

In 2018, multi-year research on the physico-mathematical model for meso-scale processes continued.

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

(Academician Zoran Knežević)

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

(Academician Zoran Knežević)

In the course of 2018, we completed investigations pertaining to the identification and characterization of the asteroid cratering families, originated in low energy collisions with large asteroids.

The asymmetry of the initial velocity fields of these families and a preferential direction of the spin of fragments were analyzed, and for each of them a plausible collisional interpretation was given of their dynamical counterparts.

Also completed was the examination of the stability over the very long time spans of asteroid proper orbital elements computed by means of the analytical perturbation theory, and their comparison with the synthetic proper ele-

ments, both of which were parts of a study intended to decide whether or not to continue the regular maintenance and update of the catalog of analytical proper elements.

The maintenance and further development of the Internet portal devoted to asteroid families (<http://asteroids.matf.bg.ac.rs/fam/>) has been continued. In 2018, a new service was introduced which provides answers on whether and when a given family was formed by a break up of a parent body in the last 20 My.

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

(Dr. Goran Damljanović)

In the first half of 2018, from 12 to 15 April, we had observing time (2018A) on the 2 m telescope of the Rozhen Observatory (Bulgaria). Similarly, in the second half of the year (2018B), we observed at the Rozhen from 31 October through 4 November. This collaboration has been realized through a couple of three-year projects of the SASA and the BAS in the 2017-2019 period. We also collected CCD observations on our telescopes, 60 cm and 1.4 m ones, at the Astronomical Station Vidojevica – ASV. We observed the following objects: double and multiple stars, ERS (*Extragalactic Radio Sources* – quasars, QSOs) from the ICRF (*International Celestial Reference Frame*) list, visible in optical wavelengths range for GAIA astrometry, as well as Gaia Alerts (e.g. Gaia-FUN-TO, Gaia-Follow-Up Network for Transients Objects) and WEBT (Whole Earth Blazar Telescope) objects.

Hsieh H. H., Novaković B., Kim Y., Brassier R., 2018: Asteroid Family Associations of Active Asteroids. **Astronomical Journal**, 155, 96.

Carruba V., Vokrouhlicky D., Novaković B., 2018: Asteroid families interacting with secular resonances. **Planetary and Space Science**, 157, 72–81.

Cvetković Z., Pavlović R., Boeva S., 2018: CCD measurements of double and multiple stars at ASV and NAO Rozhen in 2016: four linear solutions. **Astronomical Journal**, 156 (3), 134, 11 pp.

Kushwaha P., Gupta A. C., Wiita P. J., Gaur H., de Gouveia Dal Pino E. M., Bhagwan J., Kurtanidze O. M., Larionov V. M., Damljanovic G., ... , Bachev R., Vince O., ..., 2018: Multi-wavelength temporal and spectral variability of the blazar OJ 287 during and after the December 2015 flare: a major accretion disc contribution. **MNRAS**, Vol. 473, 1145–1156.

Kushwaha P., Gupta A. C., Wiita P. J., Pal M., Gaur H., de Gouveia Dal Pino E. M., Kurtanidze O. M., Semkov E., Damljanovic G., ... , Vince O., ..., Bachev R., ..., 2018: The ever-surprising blazar OJ 287: multiwavelength study and appearance of a new component in X-rays. **MNRAS**, Vol. 479, 1672–1684.

Knežević Z., 2018: 125 years from the birth of Vojislav V. Mišković. **Proceedings of the XVIII Serbian Astronomical Conference** (L. Č. Popović, D. Urošević and R. Pavlović, Eds.), **Publications of the Astronomical Observatory of Belgrade**, No. 98, 355–366 (invited lecture).

Pavlović R., Cvetković Z., Damljanović G., Jovanović M. D., Knežević Z., Marčeta D., Milić-Žitnik I., Ninković S., Novaković B., Stojanović M., Todorović N., 2018: Dynamics and kinematics of celestial bodies and systems. **Publications of the Astronomical Observatory of Belgrade**, No. 98, 39–48 (invited lecture).

Vince O., Samurović S., Pavlović R., Cvetković Z., Djurašević G., 2018: The first year of the “Milankovic” telescope. **Publications of the Astronomical Observatory of Belgrade**, No. 98, 233–239.

Pavlović R., Cvetković Z., Damljanović G., Vince O., Jovanović M. D., 2018: The first test of new Andor iXon Ultra 897 EMCCD camera. **Publications of the Astronomical Observatory of Belgrade**, No. 98, 321–324.

Samurović S., Djurašević G., Cvetković Z., Pavlović R., Vince O., 2018: Telescope “Milankovic”: mounting, present and future work. **Publications of the Astronomical Observatory of Belgrade**, No. 98, 333–336.

Damljanovic G., Latev G., Boeva S., Vince O., Bachev R., Jovanovic M. D., Cvetkovic Z., Pavlovic R., 2018: Observations of GAIA-FUN-TO from 2014 using Serbian and Bulgarian telescopes. **Publications of the Astronomical Observatory of Belgrade**, No. 98, 277–280.

Damljanovic G., Vince O., Bachev R., Zeilinger W. W., 2018: WEBT Project and observations at the 60-cm ASV telescope. **Astronomical and Astrophysical Transactions (AApTr)**, Vol. 30, Issue 4, Cambridge Scientific Publishers, Proc. of the X Serbian-Bulgarian Astronomical Conference (May 30 – June 3, 2016, in Belgrade), 453–458.

Damljanovic G., Vince O., Jovanovic M. D., Cvetkovic Z., Pavlovic R., Boeva S., Latev G., Stojanovic M., Markovic G., 2018: Serbian-Bulgarian mini-network telescopes and GAIA-FUN-TO. **Astronomical and Astrophysical Transactions (AApTr)**, Vol. 30, Issue 4, Cambridge Scientific Publishers, Proc. of the X Serbian-Bulgarian Astronomical Conference (May 30 – June 3, 2016, in Belgrade), 459–466.

Pavlovic R., Cvetkovic Z., Boeva S. Damljanovic G., 2018: Determination of orbits of visual binary and linear elements of double stars. **Astronomical and Astrophysical Transactions (AApTr)**, Vol. 30, Issue 4, Cambridge Scientific Publishers, Proc. of the X Serbian-Bulgarian Astronomical Conference (May 30 – June 3, 2016, in Belgrade), 403–408.

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

(Academician Nikola Konjević)

Stark broadening parameters for He I spectral lines, calculated using numerically improved semi-classical formalism of Griem, were reported and

favorably compared with the original results of Griem. The comparison with other sets of data was carried out and the results presented as well. In addition, new Stark broadening parameters are available now in extended electron temperature range from 2500 K to 80,000 K.

We reported the results of the experimental study of the singly charged beryllium spectral line 436.1 nm, transition $3p^2P^o-4d^2D$, and forbidden component, transition $3p^2P-4f^2F^o$, which is for the first time identified in this work. Beryllium lines are recorded from gas discharge, after ablation of a beryllium oxide discharge tube, running in pulsed regime with the following gases: helium with traces of hydrogen, argon with traces of hydrogen and pure krypton. The ratio of line intensities and wavelength separation of the Be II 436.1 nm line and neighboring line located at the blue wing are followed in the electron density range $(1.16-6.4) \times 10^{22} \text{ m}^{-3}$ determined from the hydrogen Balmer beta line in the electron temperature interval between 10500 K and 15500 K. The functional dependence of the wavelength separation range and peak intensity ratio of these lines upon electron number density suggests the complex profile of the forbidden and allowed line, which can be used for diagnostics of low-temperature beryllium containing plasmas.

Blagojević B., Ivković M., Konjević N., 2018: Semiclassical calculations of Stark broadening parameters of He I lines revisited. **Journal Quantitative Spectroscopy Radiative Transfer**, 217, 278–287.

Stankov B. D., Ivković M., Vinić M., Konjević N., 2018: Forbidden component the Be II 436.1 nm line recorded from pulsed gas discharge plasma. **EPL (Europhysics Letters)**, 123, 63001.

Project: **AFFINE SYMMETRY OF PHYSICAL LAWS**

(Academician Đorđe Šijački)

The project matter was the continuation of the ongoing research within the ATLAS experiment at the CERN Large Hadron Collider (LHC) predominantly at the energies of 13 TeV. The LHC experiments are long-term activities at the frontier of the fundamental research in physics, and there are plans for some twenty more years. The studies of the Standard Model (SM) electroweak sector, notably the measurement of the W boson mass, was in the focus of our research, and resulted in the world's best determination of the W mass. Our contribution to the muon momentum calibration was of great importance in the precise measurement of mass and properties of the Higgs boson discov-

ered in 2012. An impressive amount of new experimental data opened new frontiers for searches and investigations including searches for particles predicted by the theories beyond the Standard Model (BSM) at the TeV energy scales. In particular, in searches for Supersymmetry, the most important BSM framework, we focused on searches for newly predicted particles, i.e. squarks and gluinos. We have put, and further improved, the most stringent limits on the masses of these particles in a wide range of supersymmetric models. In searches for the BSM phenomena, we had an important role in setting and further improving the lower limits on the masses of new heavy gauge bosons W' and Z' .

The results were published in the following journals: **Physical Review D**, **Physics Letters B**, **Physical Review Letters**, **Journal of High Energy Physics**, **Journal of Instrumentation**, **European Physical Journal C**, **Particles and Fields**, **Physical Review C**, **Nuclear Physics A**.

Project: N-REPRESENTABILITY PROBLEM

(Academician Milan Damnjanović)

The irreducible representations of all double groups of symmetry of the low-dimensional regular systems were found. The implementation within computer code POLSym was enabled by a new theorem allowing automatic realization of the induction of the representations from a halving subgroup to the group. Also, the group action on the graph, developing a special concept of neighborhood, was elaborated for geometrical symmetries. These results created a firm ground for efficient studies of the energy bands and spin ordering (and its classification according to the spin groups) caused by spin-orbit coupling in the mentioned regular materials. Long-term work on the book about symmetry in nonrelativistic physics has been continued and entered its finalization stage.

Lazić N., Milivojević M., Vuković T., Damnjanović M., 2018: Double line groups: structure, irreducible representations and spin splitting of the bands. **Journal of Physics A: Mathematical and Theoretical**, 51, 225203.

Milivojević M., Lazić N., Damnjanović M., Vuković T., 2018: Spin Splitting in Quasi-One Dimensional Systems. **Physica Status Solidi B**, 2018. <https://doi.org/10.1002/pssb.201800184>

Nikolić B., Popović Z. P., Milošević I., Damnjanović M., 2018: Rigid Unit Modes in Layers and Nanotubes. **Physica Status Solidi B**, 2018. <https://doi.org/10.1002/pssb.201800196>

Project: **PHYSICS OF SUPERCONDUCTIVITY**

(Academician Zoran Radović)

The main results of the research were presented as an invited talk: “Could an Extension of BCS Theory Explain HTS in Cuprates?” at the 6th International Conference on Superconductivity and Magnetism 2018 (ICSM2018), 29 April – 4 May 2018, Antalya, Turkey.

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

(Academician Miljko Satarić)

In accordance with the proposed plan for 2018, M. Satarić et al. realized three segments of research.

The first one established the general model of microtubule dynamics. The second was dedicated to the modelling of the RNA-DNA transcription and the third segment considered the role of calcium ions in the function of the acoustic apparatus of the inner ear.

The main results were published in relevant journals and presented at conferences, as follows:

Zdravković S., Satarić M. V., Sivčević V., 2018: General model of microtubules. **Nonlinear Dynamics**, 92, 479–486.

Zdravković S., Satarić M. V., Parkhomenko A. Y., Bugay A. N., 2018: Demodulated standing solitary wave and DNA-RNA transcription. **Chaos; An Interdisciplinary Journal of Nonlinear Science**, 28 (11), 113103.

Tuszynski J. A., Satarić M. V., Sekulić D. L., Satarić B. M., Zdravković S., 2018: Nonlinear calcium ion waves along actin filaments control active hair-bundle motility. **Bio Systems**, doi: //dx.doi.org/10.1101/292292

International Conferences: from 27-30 May 2018 in the EMBL Advanced Training Centre in Heidelberg (Germany) “Microtubules: From Atoms to Complex Systems”, M. Satarić presented a contribution entitled: “Model of how post-translational detyrosination of C-termini of microtubules impacts kinesin in intra-cellular traffic”.

From 27-30 June 2018, at the International Conference “Protein Electrostatics”, M. Satarić presented a paper: “How post-translational modifications of C-termini of microtubules impact intra-cellular traffic by motor proteins”.

From 12-16 October 2018, M. Satorić took part at the 5th International Conference on Computational and Experimental Science and Engineering, ICCESSEN 2018, in Kemer-Antalia (Turkey). M. Satorić presented a paper entitled: “Nonlinear calcium ion waves along actin filaments control active hair-bundle motility”.

Project: **DEVELOPMENT OF NONLINEAR MICROSCOPE**

(Corresponding Member Branislav Jelenković)

Investigations in biomimetics focused on studying optical and chemical properties of natural biological materials and fabrications of structures with similar optical properties, using dichromated pullulan [1, 8]. We investigated the effects of thermal radiation on scales on butterfly wings, and forces that act on nano and micro structures of the scale, enabling high sensitivity of this nature material on infrared radiation [7]. In collaboration with colleagues from the Shanghai University, replicas were made of natural structures on scales using solid and hard materials like TiO₂ [5].

Investigations in nonlinear optics include the development and applications of models and experiment on studies of propagations of narrow laser pulses, 20-120 ns, through hot alkali vapor, in this case the Potassium vapor, when conditions for four-wave mixing in the vapor are met.

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1. Savić Šević S., Pantelić D., Jelenković B., Salatić B., Stojanović D., 2018: Golden moth-inspired structures with a synergistic effect of interference, absorption and scattering. **Soft Matter**, 14, 5595–5603.
 2. Ćurčić M. M., Khalifa T., Zlatković B., Radojičić I. S., Krmpot A. J., Arsenović D., Jelenković B. M., Gharavipour M., 2018: Four-wave mixing in potassium vapor with an off-resonant double- Λ system. **Physical Review A**, 97, 063851.
 3. Arsenović D., Ćurčić M. M., Khalifa T., Zlatković B., Nikitović Ž., Radojičić I. S., Krmpot A. J., Jelenković B. M., 2018: Slowing 80-ns light pulses by four-wave mixing in potassium vapor. **Physical Review A**, 98, 023829.
 4. Zlatković B., Ćurčić M. M., Radojičić I. S., Arsenović D., Krmpot A. J., Jelenković B. M., 2018: Slowing probe and conjugate pulses in potassium vapor using four wave mixing. **Optics Express**, 26, Issue 26, 34266.
 5. Wu Liping, Wang Wanlin, Zhang Wang, Su Huilan, Gu Jiajun, Liu Qinglei, Zhang Di, Pantelic D. V., Jelenkovic B. M., 2018: Optical Performance Study of Gyroid-Structured TiO₂ Photonic Crystals Replicated from Natural Templates Using a Sol-Gel Method. **Advanced Optical Materials**, 6, 21.
 6. Arsenovic D. M., Dimitrijevic J., Jelenkovic B. M., 2019: Spectral method for numerical solution of the electric field envelope propagation equation.

Communications in Nonlinear Science and Numerical Simulation, vol. 67, 264–271.

7. Grujic D. Z., Vasiljevic D. M., Pantelic D. V., Tomic Lj. D., Stamenkovic Z. M., Jelenkovic B. M., 2018: Infrared camera on a butterfly's wing. **Optics Express**, 26, 14143.
 8. Savic-Sevic S. N., Pantelic D. V., Damljanovic V., Jelenkovic B. M., 2018: Bifurcation in reflection spectra of holographic diffraction grating recorded on dicromated pullulan. **Optical and Quantum Electronics**, vol. 50, 4.
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COMMITTEE FOR KARST OF AND SPELEOLOGY

(Corresponding Member Slobodan B. Marković)

During 2018, the Committee for Karst and Speleology of the Serbian Academy of Sciences and Arts (SASA) continued its long tradition of successful activities. We usually organized two meetings. The majority of Committee members participated at these meetings.

The most important activity in 2018 was the organization of the scientific conference “**125th anniversary of publishing Das Karstphänomen monograph by Jovan Cvijić**”. The conference took place on 7 November 2018 in the main hall of the SASA. The conference was opened by the President of the SASA, Academician Vladimir S. Kostić. After that, Academicians Vidojko Jović and Aleksandar Kostić and corresponding members Vladica Cvetković and Slobodan Marković delivered their lectures about the history and the future perspectives of the Committee, respectively. Additionally, 5 plenary and 15 thematic presentations were successfully delivered during the conference. These presentations will be published in the next issue of the Proceedings of the Committee for Karst and Speleology of the SASA, Volume 12. Judging by a very positive atmosphere, very good and interesting presentations, this conference can be said to have been very successful.

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 2019. 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 accordance with the 2018 work plan, the Committee's most significant activity was the organization of the one-day international conference to mark the 45th anniversary of the creation of the first contemporary computer code for solving hydrodynamic equations of air motion, that is, the code for weather simulation and forecasting. It was conceived and presented by SASA Academician Fedor Mesinger in Belgrade in 1973. This conference titled "Numerical Weather and Climate Modelling: Beginnings, Now and Vision of the Future" (Numeričko modeliranje vremena i klime: počeci, sadašnjost i vizija budućnosti) was held on 10 September. The attendees, most of whom were personally invited, included the relevant experts from Brazil, Italy, South Korea, Russia, the United States, Serbia, the United Kingdom, Finland and Croatia, as well as the representative of the European Centre for Medium-Range Weather Forecasts (ECMWF). In cooperation with Academician Mesinger, Chairman of the Organizing Committee of the Conference, the SASA services prepared a 82-page preprints book.

In coauthorship with Dr. Ana Vuković, Academician Mesinger held the introductory lecture on "Climate Change – Why and How to Reduce the Human Impact" at the meeting titled "Energy and Climate Change", which was organized by the SASA Committee on Energy in Belgrade, on 26 November 2018.

On 15 February 2018, the Vuk Endowment, Slovene Society (Matica slovenska) and Slovenian Academy of Sciences and Arts organized the meeting titled "On the Life and Work of Milutin Milanković" on the premises of the Slovene Society in Ljubljana. On this occasion, Academician Zoran Knežević gave a lecture on "Milutin Milanković and His Canon of Insolation", while Professor Aleksandar Petrović's lecture was titled "Milutin Milanković and His Cooperation with Köppen and Wegener".

Cooperation with the "Milutin Milanković" Cultural and Scientific Centre in Dalj continued. At the initiative of the Committee, the Academy donated to the Centre the model of the Earth's secular insolation relief, authored by Professor Aleksandar Petrović. On 27 May, the meeting, which is traditionally held at the Centre in late May, was attended by the members of the Committee. Academician Zoran Knežević gave a lecture on "The Sun", while Professor Aleksandar Petrović lectured on "Building the Model of the Milanković Cycles". At this event, Academician Knežević was awarded a

plaque and Milanković Gold Metal in recognition of his contribution to the study and popularization of Milutin Milanković's work.

ACADEMIC COMMITTEE DEFICIENCY OF SELENIUM AND MAGNESIUM IN SERBIA

(Academician Vidojko Jović)

In 2018, the work continued on the systematization and processing of all existing publications on selenium and magnesium in minerals, rocks, soils, waters, plants, field crops and human population in Serbia. In addition, the data from the relevant world literature, especially that of the neighbouring countries, were collected and published for comparison purposes. Since the presence of selenium in different geological and biological materials in Serbia has been investigated for more than 30 years, it is necessary to make a synthesis of all results. The work involves the study of more than a hundred publications published in the country and abroad. Finally, it is planned to publish a monograph on selenium in Serbia. The situation concerning the presence of magnesium in the environment is similar. However, due to an extremely great number of the relevant publications, it will take more time for their processing.

Special attention will be devoted to the effects of the foliar addition of selenium on field crops quality.

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 in their respective field. So far, data have been completed for the following fields: Physics and Astronomy (Zoran Radović) and Medicine (Ljubisav Rakić). Contact took place with the following associations: Organization of Serbian Students Abroad (President Aleksandar Jakovljević), and Prof. Dr. Slavka Drašković from the American-Serbian Studenica Days, Belgrade, 2018, held on 7 July at Singidunum University. He held a lecture and chaired the Panel "Diaspora and Return Policy". On that occasion, the chairman of the Committee organized a visit to the SASA for Mr. Michael Djordjevic from

California. He had a significant talk with President of the Academy Vladimir Kostić.

Our plan is to complete the database in 2019 and to invite our scientists and artists worldwide to cooperate. 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 ON SCIENCE

(Academician Zoran Knežević)

In 2018, the SASA Committee on Science held four plenary sessions, two of which had no quorum, and a number of the meetings involving the Legislative Working Group. The purpose of these meetings was to discuss some issues included in the work programme and the issues of current interest which imposed themselves during the year.

On 3 May 2018, the Committee held the meeting that was attended by Professor Dr. Vladimir Popović, State Secretary at the Ministry of Education, Science and Technological Development, Professor Dr. Tibor Sabo, Assistant Minister for Science, and Dr. Saša Lazović, Assistant Minister for Technological Development, Technology Transfer and Innovation System. The topic of the meeting was the drafting of a new Law on Scientific Research, laying special emphasis on the planned establishment of the Science Fund.

On 14 September 2018, the SASA hosted a public debate on the Draft Law on the Science Fund of the Republic of Serbia, which was actively prepared, conducted and commented by a number of Committee members. On 19 September 2018, the Committee held the session at which the comments on the Draft Law on the Science Fund made by the Committee on Science were adopted. Almost all comments were adopted by the Working Group of the Ministry and incorporated into the final text of the Draft Law, which was subsequently adopted by the Serbian Parliament.

The Committee also addressed other issues falling within its competence such as the inclusion of 1,000 young people in the relevant projects; prepared the response to the Ministry's request concerning Serbia's status in the Horizon Europe Framework Programme for Research and Innovation, and

acquainted itself with the possibilities for the SASA's cooperation with the European Science Foundation as its affiliate member, etc.

The Legislative Working Group of the Committee on Science was very active in the preparaton of the proposed amendments and supplements to the Draft Law on Science and Research. It took upon itself this important responsibility in the situation in which the Committee could not meet.

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 six-atomic molecules with linear equilibrium geometry has been developed. The method has been applied in calculations of the vibronic spectrum of $X^2\Pi_u$ electronic state of the ion C_6^- .

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, while working simultaneously on bilateral international projects having a similar subject matter with the partner from Slovenia. According to the working plan for 2018, investigations were carried out of the intercalation processes, particularly of sodium ions in aqueous solutions, with the aim to find the crystallographic with the fastest electrode processes. The crystallographic forms with the fastest intercalation kinetics were considered, that being va-

nadium pentoxide this year. The investigations were expanded towards the interrelations between the structure and the conductivity of crystallohydrates. The nanodispersed carbon materials were investigated, including metal-doped graphenes, catalytically active in fuel cells, from the aspect of double layer capacity in both aqueous and non-aqueous solutions.

Pecovska-Gjorgjevich M., Stefov V., Najdoski M., Koleva V., Mentus S., Petrushevski G., 2018: $Mg_2KH(XO_4)_2 \cdot 15H_2O$ ($X = P, As$) containing acidic dimer units: Electrochemical Impedance Spectroscopy, IR spectroscopy and DSC studies. **Journal of Alloys and Compounds**, 746, 699–709.

Jovanović A., Dobrota A. S., Rafailović L. D., Mentus S. V., Pašti I. A., Johansson B., Skorodumova N. V., 2018: Structural and electronic properties of V_2O_5 and their tuning by doping with 3d elements – Modelling with DFT+*U* method and dispersion correction. **PCCP**, 20, 13934–13943.

Gavrilov N., Momčilović M., Dobrota A. S., Stanković D. M., Babić B., Skorodumova N. V., Mentus S. V., Pašti I. A., 2018: A study of ordered mesoporous carbon doped with Co and Ni as a catalyst of oxygen reduction reaction in both alkaline and acidic media. **Surface and Coatings Technology**, 349, 511–521.

Gutić S. J., Kozlica Dž., Korać F., Bajuk-Bogdanović D., Mitrić M., Mirsky V., Mentus S. V., Pašti I. A., 2018: Electrochemical tuning of capacitive response of graphene oxide. **PCCP**, 35, 22698–22709.

Vujković M., Bajuk-Bogdanović D., Matović Lj., Stojmenović M., Mentus S., 2018: Mild electrochemical oxidation of zeolite templated carbon in acidic solution, as a way to boost its charge storage properties in alkaline solution. **Carbon**, 138, 369–378.

CHEMISTRY

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

(Academician Miroslav J. Gašić)

In 2018, multi-year research on the chemical and biochemical reactivity of natural hinones and hydrohinones and their derivatives continued.

RESEARCHES IN MATHEMATICAL CHEMISTRY

(Academician Ivan Gutman)

In the plan for the year 2018, we pointed out four main directions of intended research. Here we mention some of the results that were published in 2018.

- (a) Papers 7 and 8 are studies of graph energy and related graph-spectrum-based quantities.
- (b) Papers 2, 3, 4, and 10 are concerned with investigations of chemically interesting graph invariants, especially those related to distance and vertex degrees.
- (c) Paper 1 is concerned with the study of electronic effects in benzenoid and related polycyclic hydrocarbons.
- (d) Papers 5, 6, and 9 deal with various graph-theoretical topics.
- (e) There are also other published works that have not been mentioned in this Report (some 15 more).

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1. Đurđević Nikolić J., Gutman I., 2018: A comparative study of isomers of bicalicene. **Polycyclic Aromatic Compounds**, 38, 25–31.
 2. Gao Y., Zhu E., Shao Z., Gutman I., Klobučar A., 2018: Total domination and open packing in some chemical graphs. **Journal of Mathematical Chemistry**, 56, 1481–1492.
 3. Arockiaraj M., Kavitha S. R. J., Balasubramanian K., Gutman I., 2018: Hyper-Wiener and Wiener polarity indices of silicate and oxide frameworks. **Journal of Mathematical Chemistry**, 56, 1493–1510.
 4. Furtula B., Das K. C., Gutman I., 2018: Comparative analysis of symmetric division deg index as potentially useful molecular descriptor. **International Journal of Quantum Chemistry**, 118, 1–14.
 5. Gutman I., 2018: Stepwise irregular graphs. **Applied Mathematics and Computation**, 325, 234–238.
 6. Xu K., Gu X., Gutman I., 2018: Relations between total irregularity and non-self-centrality of graphs. **Applied Mathematics and Computation**, 337, 461–468.
 7. Das K. C., Gutman I., 2018: On Laplacian energy, Laplacian-energy-like invariant and Kirchhoff index of graphs. **Linear Algebra and Its Applications**, 554, 170–184.
 8. Das K. C., Gutman I., Milovanović I., Milovanović E., Furtula B., 2018: Degree-based energies of graphs. **Linear Algebra and Its Applications**, 554, 185–204.
 9. H. Abdo, D. Dimitrov, Gutman I., 2018: Graphs with maximal σ irregularity. **Discrete Applied Mathematics**, 250, 57–64.
 10. X. Li, Y. Mao, Gutman I., 2018: Inverse problem on the Steiner Wiener index. **Discussiones Mathematicae Graph Theory**, 38, 83–95.
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Project: **VIEW INTO MOLECULES THAT CHANGE THE WORLD**

(Academician Živorad Čeković)

In the project, we investigated the scientific contributions of scientists in chemistry in the second half of the twentieth century mainly and their influence on further development of chemical sciences in Serbia.

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

(Academician Bogdan Šolaja)

Anti-parasitic and antiviral drugs are of primary importance, because many current medications develop resistance and adequate medicines have not been found so far. Likewise, it is very important to stress that the change in climate conditions contributes to the expansion of the territory which is susceptible to the activity of a carrier disease, for example, Anopheles mosquito (malaria), sandfly (Leishmania), bats and primates (Ebola). Also, we studied the inhibitor effect of our new compounds on botulinum neurotoxin.

To this purpose, during 2018 we carried out research with our co-workers from Italy (Parasitology/Immunology of the Department of Biomedical, Surgical and Dental Sciences of the University of Milan) and the US (United States Army Research Institute of Infectious Diseases (U.S.), Walter Reed Army Institute of Research). Our research resulted in finding effective inhibitors of *Leishmania infantum* and *L. tropica*. A detailed analysis was made of the activity of 30 compounds of the aminoquinoline structure in relation to their potential as a possible cure against Leishmaniasis. The ten compounds showed IC₅₀ values of < 1 μm against promastigote phase of *L. Infantum* and *L. tropica*, and five compounds expressed IC₅₀ values < 1 μm versus intramacrophage *L. infantum* amastigotes. The two compounds demonstrated exceptional parasite reduction in vivo, with the advantage of a fast action of the drug (thus reducing the possibility of resistance). These are the first examples of 4-amino-7-chloroquinoline derivatives active against mice infected with a parasite *Leishmania infantum*.

Marković O. S., Cvijetić I. N., Zlatović M. V., Opsenica I. M., Konstantinović J. M., Terzić Jovanović N. V., Šolaja B. A., Verbić T. Ž., 2018: Human serum albumin binding of certain antimalarials. **Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy**, 192, 128–139.

Konstantinović J., Kiris E., Kota K. P., Kugelman-Tonos J., Videnović M., Cazares L. H., Terzić Jovanović N., Verbić T. Ž., Andjelković B., Duplantier A. J., Bavari S., Šolaja B. A., 2018: New Steroidal 4-Aminoquinolines Antagonize Botulinum Neurotoxin Serotype A in Mouse Embryonic Stem Cell Derived Motor Neurons in Postintoxication Model. **Journal of Medicinal Chemistry**, 61, 1595–1608.

Konstantinović J., Videnović M., Orsini S., Bogojević K., D'Alessandro S., Scaccabarozzi D., Terzić Jovanović N., Gradoni L., Basilico N., Šolaja B. A., 2018: Novel Aminoquinoline Derivatives Significantly Reduce Parasite Load in Leishmania infantum Infected Mice. **ACS Medicinal Chemistry Letters**, 9, 629–634.

Videnović M., Mojsin M., Stevanović M., Opsenica I., Srdić-Rajić T., Šolaja B., 2018: Benzothiazole carbamates and amides as antiproliferative species. **European Journal of Medicinal Chemistry**, 157, 1096–1114.

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

(Academician Slobodan Milosavljević)

NMR-based metabolomics, combined with dry-column flash chromatography (DCFC) to identify cytotoxic metabolites from *Amphoricarpos autariatus* as well as cytotoxic activity tests of the fractions from MeOH/CH₂Cl₂ (1:1) extract, were carried out on human cervical adenocarcinoma cell lines. Correlation of the chemical composition of the fractions with the cytotoxic activity was established using OPLS multivariate data analysis. The preliminary results were presented at conferences in Greece and Brazil.

New aurone epoxide, 2,10-oxy-10-methoxysulfuretin (14), and new auronolignan (15), named cotinignan A, were isolated by silica gel column and semipreparative HPLC chromatography from the CH₂Cl₂/MeOH extract of *Cotinus coggygria Scop.* heartwood.

Cvetković M., Anđelković B., Stevanović V., Jadranin M., Đorđević I., Tešević V., Milosavljević S., Gođevac D., 2018: NMR-based metabolomics study of *Amphoricarpos* species from Montenegro. **Phytochemistry Letters**, 25, 1–5.

Novakovic M., Bukvicki D., Vajs V., Tesevic V., Milosavljevic S., Marin P., Asakawa Y., 2018: Microbial Transformation of *Calamintha glandulosa* Essential Oil by *Aspergillus niger*. **Natural Product Communications**, 13, 479–482.

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

(Academician Radomir N. Saičić)

Enantioselective total synthesis of antibiotic platensimycin is completed. Synthetic efforts towards platensimycin also resulted in the discovery of a novel cyclization reaction (cyclization of unsaturated haloketones in the presence of silver salts). We performed a short study of this reaction, and concluded that it can have a general importance and find application in synthesis. The paper has been written and submitted to a top-tier scientific journal; we are awaiting the referees' opinion.

In the synthesis of hippolachnin A – a natural product with an unusual structure and an interesting biological activity – we faced a problem related to the extreme steric hindrance of the advanced tricyclic intermediate, that required the modification of the synthesis plan. Using a modified approach, we successfully accomplished the enantioselective synthesis of (+)-hippolachnin A. In the meantime, a unified synthesis of both (+)-hippolachnin and gracilioethers – the class of structurally related compounds isolated from similar organisms – was reported. Having in mind that our synthetic approach also allows for the synthesis of gracilioethers, we decided to postpone the publication of our results until we accomplish the total synthesis of (-)-gracilioether F, and then to publish a unified synthesis in a top-tier international scientific journal. The initial results (regarding the gracilioether F synthesis) are encouraging and we plan to accomplish the synthesis in February 2019, when the paper should be submitted for publication.

Bihelovic F., Vulovic B., Saicic R. N., 2018: Gold(I)-Catalyzed C-O/C-C Bond-Forming Domino Reactions and Their Synthetic Applications. **Israel Journal of Chemistry**, 58, 521–530.

Project: **METAL COMPLEXES AS POTENTIAL THERAPEUTIC AGENTS**

(Corresponding Member Miloš I. Đuran)

The report includes: (a) Synthesis, spectroscopic and crystallographic characterization, cytotoxic evaluation and DNA-binding study of mononuclear copper(II) complexes with terpyridine (Ref. 1); (b) Immunomodulatory and

antimicrobial properties of six water soluble gold(III) complexes containing different ligands, such as polyamines and methionine- or histidine-containing dipeptides (Ref. 2); (c) The regioselective hydrolysis of the amide bond in the N-acetylated Ac-L-His-Gly and Ac-L-Met-Gly dipeptides in the presence of aqua derivatives of dinuclear platinum(II) complexes containing different benzodiazines as the bridging ligands (Ref. 3); (d) Synthesis, spectroscopic and crystallographic characterization, antimicrobial and *in vitro* cytotoxic evaluation, as well as toxicity *in vivo* on zebrafish (*Danio rerio*), of five new silver(I) complexes resulted from the reaction between different silver(I) salts and 1,7-phenanthroline (Ref. 4); (e) Synthesis, spectroscopic and crystallographic characterization and antimicrobial activity against the broad panel of Gram-positive and Gram-negative bacteria and fungi of three new silver(I) complexes with 1-benzyl-1*H*-tetrazoles (Ref. 5); and (f) Synthesis, spectroscopic characterization, *in vitro* cytotoxic activity and DNA binding evaluation of seven new dinuclear platinum(II) complexes with 1,5-naphthyridine as the bridging ligand (Ref. 6).

1. Glišić B. Đ., Nikodinovic-Runic J., Ilic-Tomic T., Wadepohl H., Veselinović A., Opsenica I. M., Djuran M. I., 2018: Synthesis, cytotoxic activity and DNA-binding properties of copper(II) complexes with terpyridine. **Polyhedron**, 139, 313–322. <https://doi.org/10.1016/j.poly.2017.11.008>
2. Radulović N. S., Stojanović N. M., Glišić B. Đ., Randjelović P. J., Stojanović-Radić Z. Z., Mitić K. V., Nikolić M. G., Djuran M. I., 2018: Water-soluble gold(III) complexes with N-donor ligands as potential immunomodulatory and antibiofilm agents. **Polyhedron**, 141, 164–180. <https://doi.org/10.1016/j.poly.2017.11.044>
3. Rajković S., Waržajtis B., Živković M.D., Glišić B. Đ., Rychlewska U., Djuran M. I., 2018: Hydrolysis of methionine- and histidine-containing peptides promoted by dinuclear platinum(II) complexes with benzodiazines as bridging ligands: influence of ligand structure on the catalytic ability of platinum(II) complexes. **Bioinorganic Chemistry and Applications**, Vol. 2018, 12 pages. <https://doi.org/10.1155/2018/3294948>, Article ID 3294948
4. Savić N. D., Vojnović S., Glišić B. Đ., Crochet A., Pavić A., Janjić G., Pekmezović M., Opsenica I. M., Fromm K. M., Nikodinovic-Runic J., Djuran M. I., 2018: Mononuclear silver(I) complexes with 1,7-phenanthroline as potent inhibitors of *Candida* growth. **European Journal of Medicinal Chemistry**, 156, 760–773. doi: 10.1016/j.ejmech.2018.07.049
5. Andrejević T. P., Nikolic A. M., Glišić B. Đ., Wadepohl H., Vojnović S., Zlatović M., Petković M., Nikodinovic-Runic J., Opsenica I. M., Djuran M. I., 2018: Synthesis, structural characterization and antimicrobial activity of silver(I) complexes with 1-benzyl-1*H*-tetrazoles. **Polyhedron**, 154, 325–333. doi: 10.1016/j.poly.2018.08.001
6. Kononov B., Živković M. D., Milovanović J. Z., Djordjević D. B., Arsenijević A. N., Vasić I. R., Janjić G. V., Franich A., Manojlović D., Skrivanj S., Milovanović M. Z., Djuran M. I., Rajković S., 2018: Synthesis, cytotoxic

activity and DNA interaction studies of new dinuclear platinum(II) complexes with aromatic 1,5-naphthyridine bridging ligand: DNA binding mode of polynuclear platinum(II) complexes in relation to the complex structure. **Dalton Transactions**, 47, 15091–15101. doi: 10.1039/c8dt01946k

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

(Corresponding Member Velimir Popsavin)

A series of new conformationally rigid goniofufurone mimics, bearing an additional 1,3-dioxane ring and a halogen, azido or benzoyloxy functionality at the C-7 position, has been designed and synthesized. The Appel reaction was used for replacement of 7-OH group with Cl or Br functions, while 7-iodo derivative was prepared by using the Ph₃P/I₂/2,6-lutidine reagent system. 7-Fluoro group was introduced by treatment with DAST, while the corresponding 7-azido and 7-*O*-benzoyl derivatives were prepared by multi-step sequences. Synthesized products were evaluated for their ability to inhibit growth of selected human malignant cell lines. Structure-activity relationships demonstrated that the nature of a substituent at the C-7 position enhances antiproliferative activity of the analogues. The preliminary study on the mechanisms indicated that all synthesized analogues induced apoptosis in 61–77% of K562 cells.

Novel goniofufurone (**1**) and 7-*epi*-goniofufurone (**2**) derivatives bearing a methoxy group at the C-5 and/or C-7 positions were prepared and their in vitro antitumour activity against some human tumour cell lines was evaluated. Some of analogues displayed powerful antiproliferative effects against studied tumour cells, but almost all of them were non-cytotoxic toward the normal cells (MRC-5). A SAR study reveals that introduction of a methoxy group at the C-7 position increases antiproliferative effects of the analogues. The most active compounds are 7-*O*-methyl derivatives of goniofufurone (**3**) and 7-*epi*-(+)-goniofufurone (**6**), which exhibited 1177- and 451-fold higher potencies than leads **1** and **2** toward MDA-MB 231 cell line. At the same time, compound **3** is by 50% more active than the commercial drug doxorubicin (DOX) against the same cell line. Flow cytometry data confirmed that cytotoxic effects of these analogues are mediated by apoptosis, additionally revealing that these molecules induced changes in the K562 cell cycle distribution.

Svirčev M., Benedeković G., Kovačević I., Popsavin M., Kojić V., Jakimov D., Srdić-Rajić T., Rodić M. V., Popsavin V., 2018: Conformationally restricted goniofufurone mimics with halogen, azido or benzoyloxy groups at the C-7 position:

design, synthesis and antiproliferative activity. **Tetrahedron**, 74, 4761–4768. doi: <https://doi.org/10.1016/j.tet.2018.07.046>

Francuz J., Popsavin M., Djokić S., Kojić V., Srdić-Rajić T., Rodić M. V., Jakimov D., Popsavin V., 2018: Novel *O*-methyl goniofufurone and 7-*epi*-goniofufurone derivatives: Synthesis, in vitro cytotoxicity and SAR analysis. **MedChemComm**, 9, 2017–2027. doi: <https://doi.org/10.1039/C8MD00431E>

Popsavin V., Popsavin M., Miljković D., 2018: S-O Acetyl rearrangement in 6-thio-D-glucose derivatives. **Journal of the Serbian Chemical Society**, 83, 1297–1304. doi: <https://doi.org/10.2298/JSC180811075P>

BIOLOGY

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

(Academician Dragoslav Marinković)

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

Our studies in the field of biomedicine are directed at the discovery of deleterious effects of medicaments and chemical substances (as well as of their positive effects) that are used in common practice, especially from developmental and genetic aspects.

Pioneering work to spread and convey the basic principles of bioethics in our scientific and educational environment is permanently ongoing.

Milošević-Djordjević O.,, Marinković D., Grujičić D., 2018: Polyphenolic contents of *Teucrium polium* L. and *Teucrium scordium* L. associated with their protective effects against MMC-induced chromosomal damage in cultured human peripheral blood lymphocytes. **Turkish Journal of Biology**, vol. 42, 152–162.

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

(Academician Dragan Škorić)

Broomrape resistance tests were carried out in the greenhouse at VNIIMK-Don Trial Station in Rostov-on-Don, according to the method of Panchenko (1975), using the mixture of seeds of the most virulent broomrape races in the world. The obtained results revealed great diversity of broomrape, containing new genes of the parasitic plant which cannot be linked to any of the eight known broomrape races.

The obtained results confirm higher levels of infestation in the greenhouse in 2018 compared to open-field infestation in 2017, which is considered quite normal. We were therefore forced to look for new genetic variability in sunflower, containing genes for resistance to the new broomrape races, and we chose to use interspecific hybridization with wild sunflower species. The seeds of interspecific hybrids were multiplied in open-field conditions in 2018, and tested at the molecular level using primer ORS1036, containing Or5 gene for resistance to five broomrape races. Of the 36 tested interspecific hybrids, 16 contain at least five genes for resistance to broomrape. The 16 interspecific sunflower hybrids will be used for further testing of genetic resistance to new broomrape races.

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

(Academician Marko Anđelković)

A meta-analysis was carried out on the results of chromosome inversion polymorphism in 20 populations of *Drosophila subobscura* from the area of the Central Balkans. The results were interpreted in terms of climatic variables, while the objective was to establish a possible relationship between climatic variables and frequency of the components of inversion polymorphism. A correlation was observed of some inversion arrangements of A, E, and O chromosomes with certain main components of climatic variables. An analysis of inversion polymorphisms is underway in groups of laboratory populations of *D. subobscura* that have been reared for 80 generations on a standard substrate and substrates with varying lead concentrations.

Within the activity of population-eco-toxicology research, experimental investigations were carried out in order to elucidate certain effects of heavy metals on the genetic level. This includes a short-term and long-term treatment with lower and higher concentrations of heavy metals (Cu, Pb, Cd, Zn, and combinations of Cu with Pb). The objective of these experiments was to establish the profile of gene expressions for some methalothionines as a function of treatment, particularly their role in terms of long-term selection for lead resistivity.

Popović Bubujuk S., Djelić N., Muster V., Katranovski D., Andjelković M., 2018: Influence of cadmium chloride on the frequency of micronuclei in DA and AO rats. **Genetika**, 50 (2), 705–716.

Stamenkovic-Radak M., Kenig B., Djuracic M., Jelic M., Eric K., Andjelkovic M., 2018: Associations between environmental variability and inversion polymorphism of “*Drosophila subobscura*”: meta-analysis of populations from the Central Balkans. **Climate Research**, <https://doi.org/10.3354/cr01551>.

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

(Academician Vladimir Stevanović)

This year, research on the Project covered several topics:

1. Distribution of genus *Sorbus* s. lato (Rosaceae) in Serbia and the surrounding countries of the Balkan Peninsula;
2. Analysis of similarities between the endemic Balkan flora of Bosnia and Herzegovina, Montenegro and Serbia, with a special emphasis on mountain-highland endemism;
3. Chemotaxonomy of aggregate mountain species of the genus *Hieracium* (Asteraceae) from Serbia and the Balkans;
4. Biogeographic patterns of distribution and niche modelling of the Dinaric endemic species *Edraianthus tenuifolius* (Campanulaceae);
5. Disjunct distribution of high-mountain endemic-relict species *Geum bulgaricum* (Rosaceae) in the Balkan Peninsula.

Stevanović V., Niketić M., Tomović G., Vukojičić S., 2018: Distribution of the vascular plants in Serbia. In: Kurto A., Sennikov A. N., Lampinen R. (eds.) **Atlas Florae Europaeae. Distribution of vascular plants in Europe 17. Rosaceae**

(*Sorbus s. lato*). The Committee for Mapping the Flora of Europe & Societas Biologica Fennica Vanamo. Helsinki, 132 pp.

Milutinović V., Niketić M., Krunić A., Nikolić D., Petković M., Ušjak Lj., Petrović S., 2018: Sesquiterpene lactones from the methanol extracts of twenty-eight *Hieracium* species from the Balkan Peninsula and their chemosystematic significance. **Phytochemistry**, 154, 19–30.

Lakušić D., Tomović G., Gussev Ch., Barina Z., Siljak-Yakovlev S., Kuzmanović N., Janković I. Vukojičić S, 2018: Distribution and variability of the Balkan endemic *Geum bulgaricum* (Rosaceae) – a species of European concern. **Botanica Serbica**, 42 (1), 71–90.

Glasnović P., Temunović M., Lakušić D., Rakić T., Brečko Grubar V., Surina B., 2018: Understanding biogeographical patterns in the western Balkan Peninsula using environmental niche modelling and geostatistics in polymorphic *Edraianthus tenuifolius*. **AoB Plants**, 10 (6), ply064, 1–15.

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

(Academician Milena Stevanović)

Cognitive deficit and memory loss in neurodegenerative disorders might be related to an impaired process of hippocampal neurogenesis. Numerous studies have shown critical roles of *SOXB1* genes in the regulation of neurogenesis and endogenous reparative mechanisms, such as maintaining the multipotency, cell proliferation, cell fate decision and differentiation of neural stem cells. Thus, we have analyzed the expression profile of selected *SOXB1* genes in the hippocampal neurogenic niche of young 5XFAD mice, transgenic model of Alzheimer's disease. We showed a significant decrease in the number of cells expressing SOX1, SOX2 and SOX21 transcription factors in transgenic mice in comparison to their controls. However, the number of proliferative cells in neurogenic niches remained the same between these two groups of animals. Presented results, demonstrating that altered expression of SOXB proteins preceded disturbance in neural cell proliferation, suggest that these transcription factors might represent novel biomarkers of early impairments in neurogenesis and might be considered as targets for strategies in regenerative medicine.

We have proceeded with the study of the roles of SOX genes in the development of different types of neurons (GABAergic vs. Dopaminergic) using *in vitro* models of neuronal differentiation. To obtain a population enriched in a certain type of neurons, we tested several previously published protocols

using retinoic acid. By applying those protocols, our preliminary results have demonstrated that expression profiles of selected *SOXB1* genes are not altered. It is important to point out that results showed that different concentrations of retinoic acid lead to a change in the contribution of dopaminergic neurons in the final neuronal population.

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., 2018: SOX3 can promote the malignant behavior of glioblastoma cells. **Cellular Oncology**, doi: 10.1007/s13402-018-0405-5

Zaletel I., Schwirtlich M., Perović M., Jovanovic M., Stevanovic M., Kanazir S., Puskas N., 2018: Early impairments of hippocampal neurogenesis in 5xFAD mouse model of Alzheimer's disease are associated with altered expression of SOXB transcription factors. **Journal of Alzheimer's Disease**, 65, 963–976. doi: 10.3233/JAD-180277

Todorovic N., Micic B., Schwirtlich M., Stevanovic M., Filipovic D., 2018: 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

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

(Academician Radmila Petanović)

The main purpose of the investigations in 2018 was to clarify phylogenetic relationships within the relict family Phytoptidae using partial sequences of three genes (COI (560 bp), 28S (D2, 650 bp), ef1-alfa (≈700 bp) focusing on Phytoptidae s. str., inhabiting angiosperms. The list of taxa as well as the geographic regions were expanded (North-western Russia, Russian Republic Buryatia, Far East Russia, Serbia, Brazil, Peru, Chile, Costa Rica, Western and Central America), and collected samples of eriophyoids were processed together with the previously analyzed ones. The results of these investigations were presented at the XV International Congress of Acarology in 2018 and could be summarized as follows: (1) In accordance with our previous results, Eriophyoidea comprises basal monophyletic Pentasetacidae (*Loboquintus*, *Pentasetacus*) and three large monophyletic clades (Phytoptidae s. str., Nalepellidae and Eriophyidae s.l.). However, the position of Nalepellidae is uncertain. (2) No wellsupported clades corresponding to suprageneric group-

ings of Phytoptidae s.str. from Amrine *et al.* (2003) were found. Additionally, phytoptids from monocots and dicots do not form two distinct clades, suggesting possible numerous shifts between these two groups of hosts. (3) Genus *Oziella* is monophyletic as well as a group of *Oziella* spp. associated with Poales. (4) Endoparasitic genus *Novophytoptus* is nested within paraphyletic *Phytoptus*, suggesting possible origin of *Novophytoptus* from dicot inhabiting *Phytoptus*-like ancestors. (5) The used combination of markers is suboptimal and does not resolve the phylogeny of Phytoptidae s. str.

Chetverikov P. E., Petanović R. U., Cvrković T., Marinković S., Sukhareva S. I., Vidović B., Zukoff S., 2018: New species and records of phytoptids (Eriophyoidea, Phytoptidae) from cinquefoils (Rosaceae, Potentilla) from Serbia and southern Russia. **Systematic & Applied Acarology**, 23 (8), 1693–1714. <http://doi.org/10.11158/saa.23.8.16>

Chetverikov P. E., Letukhova V. Yu., Marinković S., Petanović R., 2018: Three new species and new records of eriophyoid mites (Acari, Eriophyoidea) from Karadag Nature Reserve, Crimea. **Systematic & Applied Acarology**, 23 (4), 628–642 (2018) <http://doi.org/10.11158/saa.23.4.5>

Knihinicki D. K., Petanović R., Cvrković T., Varia S., 2018: A new species of Aculus mite (Acari: Eriophyidae), a potential biocontrol agent for Australian swamp stonecrop, *Crassula helmsii* (Crassulaceae). **Zootaxa**, 4497 (4), 573–585.

Marinković S., Chetverikov P. E., Hörweg C., Petanović R. U., 2018: Supplementary description of three species from the subfamily Cecidophyinae (Eriophyoidea: Eriophyidae) from the Nalepa collection. **Systematic & Applied Acarology**, 23 (5) 838–859. <http://doi.org/10.11158/saa.23.5.5>

ACADEMIC COMMITTEE FOR STUDY OF FLORA AND VEGETATION IN SERBIA

(Academician Vladimir Stevanović)

The Committee's activity in this year could be summarized as follows:

1. The planned completion and printing of the “Flora of Serbia III new edition” was not achieved for technical reasons. Namely, the manuscript was completed, but the final preparations for the printing were in a certain way prolonged. The drawings of all 153 species of plants foreseen for this volume were completed and combined in more than 50 plates with the general habitus and details of organs of each species which are important for their determination and recognition. Distribution maps for selected species have not been finished as the collection of additional data on species distribution is still in

progress. This is the current stage of the manuscript for the “Flora of Serbia III, nov. ed.

2. The SASA published the “Critical List of Vascular Flora 1”, “Lycopodiopsida, Ekuisetopsida, Plipodipsida, Gnetopsida, Pinopsida and Liliopsida”, authored by Marjan Niketić and Gordana Tomović with associates (D. Lakušić, V. Randelović, G. Anačkov, V. Đorđević, P. Boža, P. Lazarević, R. Perić). The publication contains 294 pages and was printed in 500 copies.

3. The first part of the 3rd volume “Vegetation of Serbia” (Wetland herbaceous vegetation) has not been published as the manuscript is still under preparation.

ACADEMIC COMMITTEE FOR THE STUDY OF THE FAUNA OF SERBIA

(Academician Radmila Petanović)

During 2018, the Proceedings from the scientific meeting “Ecological and economic importance of the fauna of Serbia” held in the SASA in 2016 were published. Moreover, the manuscript of the monograph “Fauna of phytophagous species of gall midges (Diptera: Cecidomyiidae, subfamily Cecidomyiinae of Serbia)” by Dušanka Simova Tošić was revised and prepared for publication. The memorial scientific conference commemorating the 50th anniversary from the death of the famous Serbian zoologist and academician Milutin Radovanović was held in the SASA in 2018. A scientific meeting dedicated to the memory of Dr. Slobodan Glumac (1930-1998): Taxonomy, genetic diversity, and ecology of hoverflies (Diptera: Syrphidae) was organized in Matica Srpska in Novi Sad. Eight papers were presented. One of them was “The new check list of the hoverflies (Diptera: Syrphidae) of the Republic of Serbia” authored by Ante Vujić, Snežana Radenković, Zorica Nedeljković and Smiljka Šimić. These presentations will soon be published in the Proceedings of Matica Srpska, Department of Natural Sciences. “The Red Book of Fauna of Serbia IV Orthoptera”, authored by Dragan Pavićević, Ivo Karaman and Mladen Horvatić, was published in 2018 by The Institute for Nature Conservation of Serbia and The Faculty of Natural Sciences, University of Novi Sad.

The activities of collecting, preservation, maintenance and popularization of the fauna of the aquatic invertebrates, fishes, amphibians, aquatic reptiles and aquatic birds of the Danube river and its tributaries on the terri-

tory of Serbia have been carried out at the “Mali Dunav” Centre for Fishery and Applied Hydrobiology within the Experimental Station “Radmilovac” (University of Belgrade, Faculty of Agriculture).

Tomanović Ž., Mitrović M., Petrović A., Kavallieratos N. G., Žikić V., Ivanović A., Rakhshani E., Starý P., Vorburger C., 2018: Revision of the European *Lysiphlebus* species (Hymenoptera: Braconidae: Aphidiinae) on the basis of COI and 28SD2 molecular markers and morphology. **Arthropod Systematics & Phylogeny**, 76, 179–213.

Protić Lj., 2018: Species of the family Leptopodidae (Heteroptera) in Serbia. **Acta entomologica serbica**, 23, 1, 9–17.

Milošević Dj., Stojanović K., Djurdjević A., Marković Z., Stojković Piperac M., Živić M., Živić I., 2018: The response of chironomid taxonomy- and functional trait-based metrics to fish farm effluent pollution in lotic systems. **Environmental Pollution**, 242, 1058–1066.

Vujić A., Radenković S., Likov L., 2018: Revision of the Palaearctic species of the *Merodon desuturinus* group (Diptera, Syrphidae). **ZooKeys**, 771, 105–138.

Radenković S., Šašić Zorić Lj., Djan M., Obreht Vidaković D., Ačanski J., Ståhls G., Veličković N., Markov Z., Petanidou T., Kočiš Tubić N., Vujić A., 2018: Cryptic speciation in the *Merodon luteomaculatus* complex (Diptera: Syrphidae) from the eastern Mediterranean. **Journal of Zoological Systematics and Evolutionary Research**, 56 (2), 170–191.

Vrbica M., Petrović A., Pantelić D., Krmpot A., Rabasović M., Pavlović D., Jovanić S., Guéorguiev B., Goranov S., Vesović N., Antić D., Marković Đ., Petković M., Stanislavljević Lj., Čurčić S., 2018: The genus *Pheggomisetes* Knirsch, 1923 (Coleoptera: Carabidae: Trechinae) in Serbia: taxonomy, morphology and molecular phylogeny. **Zoological Journal of the Linnean Society**, 183 (2), 347–371.

Čurčić S., Pavićević D., Vesović N., Marković Đ., Petković M., Bosco F., Kuraica M., Nešić D., 2018: First report of aphaenopsoid trechines (Coleoptera: Carabidae: Trechini) from Serbia, with descriptions of new taxa. **Zootaxa**, 4425 (2), 311–326.

Mihajlović Lj., 2018: Chalcidoidea species (Insecta: Hymenoptera) on the Woody Vine *Campsis radican* (L.) Seem. ex Bureau. **Acta entomologica serbica**, 23 (1), 51–77.

Marić I., Međo I., Jovanović S., Petanović R., Marčić D., 2018: Spider mites (Acari: Tetranychidae) in protected natural areas of Serbia. **Systematic & Applied Acarology**, 23 (10), 2033–2053. <http://doi.org/10.11158/saa.23.10.12>.

ACADEMIC COMMITTEE „MAN AND ENVIRONMENT“

(Academician Marko Anđelković)

The most important activity of the Academy’s Committee “Man and Environment” was the preparation of the scientific meeting on the use and

consequences of the use of pesticides. In collaboration with the Academy's Committee for Rural Areas, the scientific meeting "Use of pesticides in plant production and environmental protection" was held from 13 to 14 November 2018, in the SASA Main Hall. 16 presentations were given at the meeting.

The Committee has actively participated in the forming of the coordination body for determining the consequences of the NATO bombing of the Republic of Serbia for the health of the human population and the environment, and the drawing up and realization of the work programme. On 12 June 2018, the Ministries of Environment, Health, Defence, and the Ministry of Education, Science and Technological Development signed a Contract on a joint body, whose task is to work on investigating the health and environmental consequences of the NATO bombing of Serbia in 1999. The joint body consists of the Council, Inter-domain Coordination Body, Network of National Laboratories, and the Governing Board. The president of the Council is Academician Marko Anđelković, and a number of members of Academy's Committee "Man and Environment" are included in the Inter-domain Coordination Body. As part of these activities, a meeting was organized at the SASA where conclusions were adopted, together with recommendations, and filed with the Prime Minister and the ministries in charge, which form the Governing Board.

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

(Academician Vladan Đorđević)

During 2018, preparations were made for printing the 2nd volume of abstracts in English. It contains 61 abstracts that were published in the previous five volumes (11th-15th) in the Series "Lives and Work of Serbian Scientists" (Život i delo srpskih naučnika). This volume was published at the end of the year.

The 17th volume in the Series with the following contents was submitted for publication:

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. Savo Perović (1937–2010)
12. Marko Vukobrat Jarić (1952–1997)

In early 2018, Volume XVI of the Series “Lives and Works of Serbian Scientists” (Život i delo srpskih naučnika) came out. It contains the essays about 12 scientists.

In late March, the SASA Grand Hall was the venue for the presentation of the latest five volumes (11th-15th) of the Series “Lives and Works of Serbian Scientists”, as well as the books of abstracts in the English language, containing the resumes and portraits of scientists which were published in the previous five volumes (11th-15th).

The latest five volumes were presented in cooperation with the SASA Scientific Research Centre in Kragujevac. The presentation of these volumes took place on the premises of the University of Kragujevac Rectorate.

Throughout the year, the assistance to the authors included the collection of materials, continuous consulting and cooperation with the reviewers.

It was also continued with the selection and recruitment of new authors for contributing to the subsequent volumes of this series.

As for the activity of the Committee, whose composition was extended by the members of the departments of humanities and arts, its task was to organize the work on the history of SASA on the occasion of its 175th anniversary. It prepared all relevant materials complete materials at the very beginning of the year. These materials previously underwent some review by the Department of Historical Sciences as being the most competent authority on the subject and were subsequently sent to all SASA Departments.

ACADEMIC COMMITTEE ON VILLAGE

(Academician Dragan Škorić)

Professor Dr. Danilo Tomić, a member of the Committee since its formation, passed away in August 2018.

The most significant activities of the SASA Committee on Village included the organization of scientific and expert meetings with a view to publicly promoting and supporting scientific research, action-oriented rural and agro-economic projects, national, regional and local rural cultural actions and events, as well as all other projects that contribute to comprehensive and sustainable rural development in Serbia.

The Committee on Village continued its active cooperation with the Cabinet of the Serbian Minister for Regional Development in the implementation of the project titled “500 Cooperatives in 500 Villages”. Since the launching of this project, The Committee has visited the cooperatives in 21 villages. In 2018, the members of the Committee, headed by its Chairman, Academician Dragan Škorić, participated in the selection of 73 cooperatives for the allocation of the non-repayable funds provided by the Serbian Government.

On 23 March 2018, Zrenjanin hosted a round table on “The Development of Organic Production in Serbia”. Seven papers and three examples of good practice confirm that organic agriculture in Serbia is mostly developed in small and medium-sized family farms, thus enabling rural development in economic and environmental terms.

On 29 May 2018, the photo exhibition “This Too Is Serbia”, which depicted abandoned houses and villages in Serbia, was opened at the SASA Gallery of Science and Technology. The exhibition catalogue was printed thanks to the donation of the Nikola Spasić Foundation. This exhibition was also presented in Niš and Žagubica and it is planned to tour it in a number of towns in Serbia.

In cooperation with the SASA “Man and Environment” Committee, it organized a two-day scientific and expert meeting on “The Use of Pesticides in Plant Production and Environmental Protection”, which was held on the SASA premises on 13-14 November 2018.

In cooperation with the Faculty of Agriculture in Novi Sad, the Committee members participated in the organization of counselling on modern fruit and vegetable production.

At the initiative of the Committee for the Formation of the Diaspora Agrarian Fund, which will participate in the action aiming to revive Serbian villages and will be based in Lausanne (Switzerland). The Executive Board of the SASA Presidency agreed with the proposal that Academician Dragan Škorić should be the Chairman of the Governing Board and Professor Dr Zorica Vasiljević its member.

Proceedings of the Scientific Meeting on Ethno-Villages and Rural Environmental Entities in the Republic of Serbia and the Republic of

Srpska, which was held at the Staro selo Sirogojno Open-Air Museum on 11 April 2017, were published.

Proceedings of the Scientific Meeting on **Water Supply of the Population in Hilly and Mountain Regions**, held at the SASA on 4 October 2016, were published.

Preparations are underway for printing the proceedings of the scientific and professional conference on “Renewable Use of Natural Resources in Serbian Rural Communities”, which was held at the SASA on 27-28 September 2017.

DEPARTMENT OF TECHNICAL SCIENCES

Project: **THEORETICAL AND EXPERIMENTAL RESEARCH OF METAL STRUCTURES AND THEIR INFLUENCE ON CONTEMPORARY DESIGN AND CONSTRUCTION**

(Academician Nikola Hajdin)

The subproject “Elasto-plastic behaviour of metal plates, plate and box girders” deals with box-girders with wide flanges subjected to bending and torsion and plate girders subjected to centric and eccentric patch loading. Experimental and theoretical investigation of the stability and ultimate load is carried out. The subproject “Dynamics of structures” is directed primarily at bridges. Research includes problems of the impact, vibrations and seismic design. The subproject “Composite structures of steel and concrete” deals with the analysis of composite structures according to the theory of elasticity and the theory of plasticity and with fire design. The subproject “Aluminium structures” deals with different aspects of those structures.

Research continued in 2018 on all subprojects. The results were presented at an international conference and in a journal. For the next year, continuation of research on all subprojects is planned.

Jakovljević I., Kovačević S., Marković N., 2018: Buckling of plates and plate girders subjected to patch load. **Proceedings (CD) 15. International Congress of Association of Structural Engineers of Serbia**, Zlatibor, September 6-8, 2018, editors Lađinović Đ., Marković Z., Stevanović B., Beograd, 608–617.

Jakovljević I., Kovačević S., Marković N., 2018: Elastic critical load of plates and plate girders subjected to patch load. **Building Materials and Structures**, 61, 4, 55–67.

Stipanić B., 2018: Factors of importance for durability of bridges. **Proceedings (CD) 15. International Congress of Association of Structural Engineers of Serbia**, Zlatibor, September 6-8, 2018, editors Lađinović Đ., Marković Z., Stevanović B., Beograd, 144–153.

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

(Academician Zoran Petrović)

We have finalized and published the first section of the results relating to the model of radiofrequency breakdown. We continued working on cross sections and transport coefficients for CF_3^+ ions in CF_4 . Work was carried out on the modelling of the influence of the density of charged particles on energy distribution function for electrons and subsequently on chemical kinetics of plasmas in atmospheric gases, with helium as a buffer gas and in the presence of water vapour. During 2018, we modelled the effect of cooling of the environment on final thermalization of positrons in a Surko trap. It was shown that, contrary to electrons, rotational energy losses of positrons become the dominant energy loss for energies below that defined by the room temperature.

We published eleven papers in international journals and presented thirteen invited lectures. The SASA fund contributed to the finalization of two papers and one invited lecture at a major international conference.

Puač M., Marić D., Radmilović-Radjenović M., Šuvakov M., Petrović Z. Lj., 2018: Monte Carlo modeling of radio-frequency breakdown in argon. **Plasma Sources Science and Technology**, 27, 075013 (16 p.), Institute of Physics Publishing, doi: 10.1088/1361-6595/aacc0c

Mladenović Ž., Gocić S., Marić D., Petrović Z. Lj., 2018: Influence of space charge density on electron energy distribution function and on composition of atmospheric pressure He/O₂/air plasmas. **European Physical Journal - Plus**, 133, 344 (15 p.), Springer, doi: 10.1140/epjp/i2018-12187-6

Project: **DYNAMICS AND STABILITY OF VISCO-ELASTIC BODIES
OF FRACTIONAL TYPE**

(Academician Teodor Atanacković)

We worked mainly on problems of mechanical behavior of visco-elastic rods described by constitutive equations containing non integer derivatives. We examined the restrictions that follow from the dissipation inequality, i.e. the restrictions that are consequences of the Second law of thermodynamics. The results were presented at two conferences and published in six papers.

Atanackovic T. M., Pilipovic S., Zorica D., 2018: Properties of the Caputo-Fabrizio Fractional Derivative and Its Distributional Settings. **Fractional Calculus and Applied Analysis**, 21, 29–44.

Atanackovic T. M., Janev M., Pilipovic S., 2018: Non-linear boundary value problems involving Caputo derivatives of complex fractional order. **Applied Mathematics and Computation**, 334, 326–342.

Krivokapic B., Blagojevic Z., Selesi D., Atanackovic T., Pilipovic S., Bascarevic Z., Stevanovic V., 2018: A Method for Prediction of Femoral Component of Hip Prosthesis Durability due to Aseptic Loosening by Using Coffin/Manson Fatigue Model. **BioMed Research International**, Volume 2018, Article ID 9263134, 13 pages.

Bouras Y., Zorica D., Atanackovic T. M., Vrcelj Z., 2018: A non-linear thermo-viscoelastic rheological model based on fractional derivatives for high temperature creep in concrete. **Applied Mathematical Modelling**, 55, 551–568.

Rehlicki L. Z., Janev M. B., Novakovic B. N., Atanackovic T. M., 2018: On Post-Critical Behavior of a Beam on an Elastic Foundation. **International Journal of Structural Stability and Dynamics**, 18, No 6.

Atanackovic T. M., Pilipovic S., 2018: On a constitutive equation of heat conduction with fractional derivatives of complex order. **Acta Mechanica**, 229, 1111–1121.

Atanackovic T. M., Janev M., Konjik S., Pilipovic S., 2018: Complex Fractional Zener Model of Wave propagation in R. **Fractional Calculus and Applied Analysis**, 21, 1313–1334.

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

(Academician Zoran V. Popović)

We studied the properties of a new class of iron-based superconducting materials. The research was primarily focused on the study of lattice dynamics, electron-phonon and spin-phonon interactions in iron chalcogenides (FeS, FeSe) [1,2].

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., Milosavljević A., Lazarević N., Radonjić M. M., Nikolić B., Mitschek M., Inanloo Maranloo Z., Šćepanović M., Grujić-Brojčin M., Stojilović N., Opel M., Wang A., Petrovic C., Popović Z. V., Hackl R., 2018: Phonon anomalies in FeS. **Physical Review B**, 97, 054306.

2. Baum A., Ruiz H. N., Lazarević N., Wang Y., Böhm T., Hosseinian Ahangharnejhad R., Adelman P., Wolf T., Popović Z. V., Moritz B., Devereaux T. P., Hackl R., 2017: Frustrated spin order and stripe fluctuations in FeSe. **Nature Communications Physics**, arXiv:1709.08998.

Project: **NUMERICAL SIMULATION OF ELECTROMAGNETIC FIELDS**

(Academician Antonije Đorđević)

Derivative probes are calibrated to ensure a better control of the plasma needle. Detailed characterization of the plasma needle was done, in the vicinity of three different targets (copper, polymer, and liquid). Volt-Ampere characteristics and power delivered to plasma were measured. The device was used for the treatment of the RPMI 1640 medium, which is used for cell manipulation. Spectrophotometric characterization of the medium confirmed that reactive oxygen and nitrogen species are deposited into the treated liquid by plasma treatment.

Monte Carlo code was extended to include processes of secondary emission induced by ions, fast neutrals, and photons in argon. In addition, breakdown voltages in synthetic air and helium were calculated.

Petrović A., Puač N., Škoro N., Đorđević A., Petrović Z. Lj., 2018: Electrical Characterization of a Portable Plasma Needle System. **29th Summer School and International Symposium on the Physics of Ionized Gases (SPIG)**, eds. G. Poparić, B. Obradović, D. Borka and M. Rajković, Aug. 28 – Sep. 1, 2018, Belgrade, Serbia, 258–261.

Petrović J., Đorđević A., Savić M., Marić D., Petrović Z. Lj., 2018: Detection of breakdown in radiofrequency fields. **Proceedings of the 22nd International Conference on Gas Discharges and Their Applications**, September 2–7 2018, Novi Sad, Serbia, 339–341.

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

(Academician Zoran Đurić)

We performed theoretical modelling and analysis of the stochastic time response of microfluidic chemical and biological sensors and their signal-to-

noise ratio in the case of adsorption of one substance, as well as in the case of sensor's nonideal selectivity, where the response is determined by competing adsorption of two substances and processes of mass transfer. The analysis used the results of computer simulations, which are based on developed mathematical models. Particular consideration is given to the reduction of detectable concentrations and active sensor surfaces in new generations of the sensor, which is in line with the current direction of development of micro and nanosensors.

Jokić I., Djurić Z., Radulović K., Frantlović M., 2018: Deterministic versus Stochastic Analysis of Competitive Adsorption in Microfluidic Biosensors. **Materials Today: Proceedings**, 5, 16006–16011.

Jokić I., Djurić Z., Radulović K., Frantlović M., Krstajić P. M., Cvetanović Zobe-nica K., 2018: Steady-State Analysis of Stochastic Time Response of Chemical and Biological Microfluidic Sensors. **Proceedings 5th International Conference on Electrical, Electronic and Computing Engineering, IcETran 2018**, Palić, Serbia, June 11–14, 2018, 943–948.

Jokić I., Djurić Z., Radulović K., Frantlović M., 2018: Analysis of stochastic time response of microfluidic biosensors in the case of competitive adsorption of two analytes. **32nd International Conference EuroSensors 2018**, P159-ID7397, 9-12. Sept. 2018, Graz, Austria, published in MDPI **Proceedings 2** (2018) pp. 991 1-5, doi:10.3390/proceedings2130991

Jokić I., Radulović K., Frantlović M., Djurić Z., Krstajić P. M., 2018: MEMS/NEMS sensors of chemical and biological agents: Applicability of different models for steady-state analysis of sensor time response and noise. **Proceedings 8th International scientific conference on defensive technologies OTEH 2018**, 11-12 October 2018, Belgrade, Serbia, 501–504.

Project: **APPLICATION OF COMPUTATIONAL INTELLIGENCE METHODS IN TRAFFIC**

(Academician Dušan Teodorović)

During 2018, we continued to study the phenomenon of traffic congestion on the transportation networks. We published the paper devoted to the development of a model of the reservation system of several garages in the network. We also analyzed the effects that such a system can produce. We continued with the development of models and software for work zones planning and scheduling in a way to minimize negative effects on regular traffic flows.

Triantis K., Taylor G., Roper M., Teodorović D., 2018: Revenue Management in the Parking Industry: A Multiple Garage Intelligent Reservation Model. **Transportation Planning and Technology**, 41 (2018).

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

(Academician Dejan B. Popović)

I continued the development of the methods and instruments for the assessment of the recovery of patients with the disability. The research was focused on the analysis of prevention of secondary complications caused by paralysis. I combined the resources from the Pavle Savić bilateral collaboration project between Serbia and France (Paris and Lyon) and this resulted in the system being delivered to Lyon and tested (estimation of the knee joint torque when the knee extensors are stimulated). The clinical research in Belgrade partly contributed to the PhD thesis of Dr. Radoje Čobeljić, Clinic for Rehabilitation “Dr Miroslav Zotović”, in the domain of the assessment of spasticity. The R&D activity resulted in an innovation that was awarded as the Best technological innovation in 2018 in Serbia. The innovation is a completely new electronic stimulator and electrodes for neurorehabilitation. The winning team was composed of Dr. Lana Popović Maneski, Academician Dejan Popović, and PhD student Ivan Topalović.

Popović-Maneski L., Aleksić A., Metani A., Bergeron V., Čobeljić R., Popović D., 2018: Assessment of spasticity by a pendulum test in SCI patients who exercise FES cycling or receive only conventional therapy. **IEEE Transactions on Neural Systems and Rehabilitation Engineering**, 26 (1), 181–187.

Popović D. B., Bajd T., 2018: Pendulum test: Quantified assessment of the type and level of spasticity in persons with central nervous system lesions. **Serbian Journal of Electrical Engineering**, 15 (1), 1–22.

Popović D. B., Topalović I., Dedijer-Dujović S., Konstantinović Lj., 2019: Wearable System for the Gait Assessment in Stroke Patients. Springer Nature Switzerland AG 2019, L. Masia et al. (Eds.): **ICNR 2018, BIOSYSROB 21**, 1–5, 2019, https://doi.org/10.1007/978-3-030-01845-0_199

Milovanović J., Gavrilović M., Topalović I., Popović D. B., 2018: Influence of two weeks balance practice with feedback on the gait in hemiplegic patients. **Proceedings of Papers 5th International Conference on Electrical, Electronic and Computing Engineering, IcETRAN 2018**, Palić, Serbia, June 11-14, 2018, Akademski misao, Beograd, 695–698.

Kundaica S., Gavrilović M., Topalović I., Popović D. B., 2018: Effects of Wii-Fit Balance Board Exercise on the Posture of Stroke Patients. **Proceedings of Papers 5th International Conference on Electrical, Electronic and Computing Engineering, IcETRAN 2018**, Palić, Serbia, June 11-14, 2018, Akademski misao, Beograd, 704–707.

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

(Academician Ninoslav Stojadinović)

Threshold voltage instabilities observed in p-channel power VDMOSFETs IRF9520 under the pulsed NBT stress conditions, and under consecutive NBT and irradiation stresses, have been investigated. These instabilities induced changes in oxide trapped charge and interface trap densities, and they are more pronounced at higher values of stress parameters. Pulsed NBT stress induced degradation is generally lower as compared to static stress. Less significant degradation of threshold voltage found after pulsed bias stressing is ascribed to recovery effects. It is shown that irradiation of previously NBT stressed devices leads to additional build-up of oxide trapped charge and interface traps, while NBT stress effects in previously irradiated devices depend on gate bias applied during irradiation and on the total dose received.

Davidović V., Danković D., Ilić A., Manić I., Golubović S., Djorić-Veljković S., Prijić Z., Prijić A., Stojadinović N., 2018: Effects of consecutive irradiation and bias temperature stress in p-channel power vertical double-diffused metal oxide semiconductor transistors. **Japanese Journal of Applied Physics**, 57, 044101–1-044101-10. doi: 10.7567/JJAP.57.044101

Danković D., Manić I., Prijić A., Davidović V., Prijić Z., Golubović S., Djorić-Veljković S., Paskaleva A., Spassov D., Stojadinović N., 2018: A review of pulsed NBTI in P-channel power VDMOSFETs. **Microelectronics Reliability**, 82, 28–36 (invited paper), doi: 10.1016/j.microrel.2018.01.003

Stojadinović N., Djorić-Veljković S., Davidović V., Golubović S., Stankovic S., Prijić A., Prijić Z., Manić I., Danković D., 2018: NBTI and irradiation related degradation mechanisms in power VDMOS transistors. **Microelectronics Reliability**, 88-90, 135–141 (invited paper), doi: 10.1016/j.microrel.2018.07.138

Davidović V., Danković D., Golubović S., Djorić-Veljković S., Manić I., Prijić Z., Prijić A., Stojadinović N., 2018: NBT stress and radiation related degradation and underlying mechanisms in power VDMOSFETs. **Facta Universitatis, Series: Electronics and Energetics**, 31, 3, 367–388 (invited paper).

Stojadinović N., Djorić-Veljković S., Davidović V., Golubović S., Stankovic S., Prijić A., Prijić Z., Manić I., Danković D., 2018: NBTI and irradiation related degradation mechanisms in power VDMOS transistors. **Proceedings 29th European Symposium on the Reliability of Electron Devices, Failure Physics and Analysis (ESREF)**, Aalborg, Denmark, October 01-05, 2018, 135–141 (invited paper) doi: 10.1016/j.microrel.2018.07.138

Project: **NANOSTRUCTURES UNDER ENVIRONMENTALLY
CONSTRAIN CONDITIONS**

(Corresponding Member Velimir Radmilović)

Our research was focussed on Pt based nanoparticles on Vulcan XC-72R, synthesized by the water-in-oil microemulsion method. Using HCl as a capping agent in the precursor-containing water phase, nanoparticle shape was varied. Activity and stability for formic acid oxidation, a structure-sensitive reaction, were tested. Electrochemical results revealed the influence of PtAu particle size, shape and exposed facets on the electrochemical processes.

Electron microscopy was used for structural characterization of SiC nanowires. Electron energy loss spectroscopy was used to characterize the local band gap data, which aligned within 0.1 eV of expected values. These experiments showed that individual 3C-SiC phase inclusions in 4H-SiC significantly alter the local electronic structure, in particular, the band gap.

Luna L., Gardner D., Radmilović V. R., Maboudian R., Carraro C., 2018: Atomic-scale electronic characterization of defects in silicon carbide nanowires by electron energy loss spectroscopy. **Journal of Physical Chemistry**, 122, 12047–12051.

Krstajić Pajić M. N., Stevanović S. I., Radmilović V. V., a Gavrilović-Wohlmuther A., Radmilović V. R., Gojković S. Lj., Jovanović V. M., 2018: PtAu catalyst with enhanced activity for formic acid oxidation. **Journal of Materials Protection**, 59, 159–166.

Nikolić I., Tadić M., Janković – Častvan I., Radmilović V. V., Radmilović V. R., 2018: Durability of alkali activated slag in a marine environment: influence of alkali ion. **Journal of the Serbian Chemical Society**, 83, 1143–1156.

Project: **EFFICIENCY IMPROVEMENT IN WIND POWER PLANTS**

(Corresponding Member Slobodan N. Vukosavić)

Energy efficiency of the wind power plant depends on the characteristics of the power electronics devices that turn the energy of the wind turbines into the energy of the ac currents supplied into the grid. Topology and control of the grid-side power converters used as the grid-interface are proposed and discussed in [1]. In order to reduce the conversion losses, electrical currents in the windings of the generator, the currents within the intermediate circuits and the currents supplied into the grid have to be controlled and shaped in a manner that reduces the losses in magnetic and current circuits. The structure of

the corresponding current regulators and the setting of relevant control parameters are described in [2], where one of the goals is to increase the capability of the regulator to suppress the effects of the external disturbances. In [3], a new approach is presented to designing electric machines with permanent magnets, suitable for electrical generators within wind-power systems. In [4], a novel approach to sensorless control of electrical machines is proposed, suitable for use in conjunction with low-speed wind-power generators where operation without the shaft sensors reduces system complexity and increases reliability.

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1. Vukosavić S. N., 2018: **Grid-Side Converters Control and Design**. Springer, New York 10013, USA, 266 p.
 2. Vukosavic S. N., Peric Lj. S., Levi E., 2018: Digital Current Controller with Error-Free Feedback Acquisition and Active Resistance. **IEEE Transactions on Industrial Electronics**, vol. 65, no. 3, 1980–1990, March 2018.
 3. Lekić Đ., Vukosavić S., 2018: Split ratio optimization of high torque density PM BLDC machines considering copper loss density limitation and stator slot leakage. **International Journal of Electrical Power & Energy Systems**, vol. 100, Sept. 2018, 231–239.
 4. Bazylev D., Vukosavic S., Bobtsov A., Pyrkin A., Stankovic A., Ortega R., 2018: Sensorless control of PM synchronous motors with a robust nonlinear observer. **Proceedings - 2018 IEEE Industrial Cyber-Physical Systems, ICPS 2018**, 304–309.
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ACADEMIC COMMITTEE ON THE NATURAL AND TECHNICAL-TECHNOLOGICAL RESOURCES OF SERBIA

(Academician Zoran Đurić)

The Committee was established at the SASA Presidency session held on 12 May 2017. The purpose of the project is to provide a body of credible information on Serbia's resources that would be constantly updated in accordance with current knowledge resulting from the scientific research conducted within the framework of the proposed project. Upon its establishment, the Committee undertook to prepare the project policy document entitled *Science's Support to the Development of Serbia's Resources*.

In 2018, the preparation of the aforementioned policy document was resumed. This document covers the following topics: the project structure and the legislative framework, the goals of the project, funding and budget, a preliminary analysis of the current state of resources; work packages, activities and the expected results are also defined. Resources are tentatively divided

into six areas: water, energy, metallic and non-metallic, other (biological resources, soil, air), technical-technological and socio-economic resources. Institutions and experts in relevant fields whose participation is necessary are identified in order to ensure the implementation of the project in the long term.

In this period, special attention was dedicated to water resources and photovoltaic energy. Further studies on these topics will be intensively done throughout 2019.

The scale of the Committee's activities in 2018 was smaller than expected, due to difficulties in securing funds for project implementation and organizational difficulties.

ACADEMIC COMMITTEE FOR HIGHER EDUCATION

(Academician Dušan Teodorović)

The Committee for Higher Education organized a workshop "Ranking of universities, faculties, professors and researchers", on 2 November 2018.

A number of relevant issues for the Serbian academic community were discussed. The participants at the workshop tried to find answers to the following questions: What will be the future impact of various higher education institutions of Serbia (of very different quality) on the development of the country? To what extent is the ranking of higher education institutions and researchers acceptable, desirable or undesirable in the academic community of Serbia? How to rank faculties and how to define the criteria for selecting university teachers in the future?

University professors and researchers from the Serbian research institutes participated at the workshop, together with the members of the Serbian Academy of Sciences and Arts. The existing ranking practice in Serbia was analyzed and it was concluded that there is no commonly accepted methodology in Serbia that is used for university ranking. Possible approaches to evaluation and ranking of faculties and universities were discussed.

ACADEMIC COMMITTEE FOR ENERGY

(Corresponding Member Slobodan N. Vukosavić)

The main goals of the Committee include the development of the Serbian energy sector, application of advanced technologies in increasing en-

ergy efficiency, recruiting of national institutions and experts in deriving and applying energy strategies and improving of university curricula.

The Committee recognized the need to stir up discussions, organize round-tables and set up seminars in three areas, i) Integration of the Serbian energy sector in the EU – towards 2025, ii) Trends, challenges and technologies in electrical power systems and iii) E-mobility in Serbia.

The Energy and Climate Change Conference was held on 26 November 2018, in the presence of the Minister of Mining and Energy, representatives of the Ministries of Environmental Protection, Ministry of Trade, Tourism and Telecommunications, Ministry of Education, Science and Technological Development and about 100 participants. The conference was opened by Academician Zoran Petrović, Secretary of the Department of Technical Sciences. The conference included four sessions, 11 speakers and two discussion tables. According to the common impression, the gathering was extremely successful. Discussions and findings of the conference will be amended at the next session of the Committee for Energy by including conclusions and appropriate recommendations.

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 2018, the following was published: 44 bibliographic units, of which 16 in professional – scientific papers; 4 articles at the International Summer School of Cardiology ECPD and the Committee of the SASA to the SEC; 9 biographies (including a substantial one about Đorđe Joannović); a presentation of a book; one review and 13 entries for the Serbian Encyclopaedia; first author 29 times; printed 24 times abroad, 20 bibliographical entries; held 10 invited lectures (including MASA and Tehran), 5 in Serbia and 5 abroad that have not been printed.

The following problems were studied: analysis of pericardial fluid, which leads to cardiac tamponade; neurogenic causes of sudden death; tumors of the heart; hibernating myocardium and coronary bypass surgery; tetralogy of Fallot; educational quiz on morphological-clinical correlations in cardiology; Gerontology and Geriatrics; experimental cardiac pharmacology: operation Epicatechin, procyanidin - B12, pinacidil – and the venous (saphenous vein) and arterial (internal mammary artery), in coronary by-pass grafts as well as medicines for dyslipidemia and certain CVs.

Ristić A. D., Seferović P. M., Maisch B., Kanjuh V., 2018: Chapter: Cardiac tamponade. **ESC CardioMed** (3 ed.), Edited by A. J. Camm, T. F. Lüscher, G. Maurer, P. W. Serruys, Oxford Medicine.

Japundžić-Žigon N., Šarenac O., Lozić M., Vasić M., Tasić T., Bajić D., Kanjuh V., Murphy D., 2018: Sudden death: Neurogenic causes, prediction and prevention. **European Journal of Preventive Cardiology**, 25 (1), 29–39.

Burazor I., Aviel-Ronen S., Imazio M., Goitein O., Perelman M., Shelestovich N., Radovanović N., Kanjuh V., Barshack I., Adler Y., 2018: Metastatic cardiac

tumors: from clinical presentation through diagnosis to treatment. **BMC Cancer**, 18, 202 (9 pp).

Novaković A., Marinko M., Stojanović I., Nenezić D., Milojević P., Kanjuh V., 2018: New drugs for the treatment of dyslipidemia. **Acta Medica Medianae** (Niš), 57 (1), 54–63.

Marinko M., Janković G., Nenezić D., Milojević P., Stojanović I., Kanjuh V., Novaković A., 2018: (-) -Epicatechin-induced relaxation of isolated human saphenous vein: Roles of K⁺- and Ca²⁺ channels. **Phytotherapy Research**, 32 (2), 267–275.

Project: **EXPERIMENTAL AND CLINICAL INVESTIGATIONS OF BIOLOGICALLY ACTIVE SUBSTANCES (CONVULSANTS, ANTICONVULSANTS, SLEEP PEPTIDE AND ITS ANALOGUES) ON EXCITABILITY OF THE CENTRAL NERVOUS SYSTEM**

(Academician Veselinka Šušić)

In the year 2018 following papers were published:

Hrnčić D., Grubač Ž., Šutulović N., Rašić-Marković A., Ademović A., Stanojlović O., 2018: Modulatory effects of delta sleep peptide in lindane model of generalized seizures. **Archives of Biological Sciences**, 70 (3), 559–566.

Hrnčić D., Šutulović N., Grubač Ž., Rašić-Marković A., Stanojlović O., 2018: The central nervous system is not immunoprivileged: inflammation and epileptogenesis. **Vojnosanitetski pregled**, 75 (8), 820–825.

Hrnčić D., 2018: Translational, multidisciplinary and integrative studies in neurophysiology: real need or contemporary fashion in brain research. **Medical Youth**, 69 (3), 1–2.

Šutulović N., Marchini S. P., Šuvakov S., Hrnčić D., 2018: Glial cells, blood brain barrier and cytokines in seizures: implications for therapeutic modalities. **Ibid**, 33–40.

Grubač Ž., Jovanović Đ., Puškaš N., Hrnčić D., 2018: Sleep disturbances and depression: directions and mechanisms of interaction. **Ibid**, 44–50.

Vorkapić M., Useinović N., Janković M., Hrnčić D., 2018: Heart rate variability processing in epilepsy: the role in detection and prediction of seizures and SUDEP. **Ibid**, 57–61.

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 a manuscript has been prepared for publication entitled: **Medicine in front of the enigma of complex diseases.**

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 aim of this study was to examine the significance and prognostic value of preserved coronary flow velocity reserve (CFVR) in patients with nonculprit intermediate stenosis early after primary percutaneous coronary intervention. Two hundred thirty patients with remaining intermediate (50–70%) stenosis of non-infarct-related arteries, in whom CFVR was performed within 7 days after primary percutaneous coronary intervention, were prospectively enrolled. In patients with CFVR > 2 of the intermediate nonculprit coronary lesion, deferral of revascularization is safe and associated with excellent long-term clinical outcomes.

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.

The objective of the study was to evaluate major adverse cardiovascular events (MACE) after successful versus failed percutaneous coronary intervention for chronic total occlusion (PCI-CTO). Limited data are available on long-term clinical follow-up in the treatment of chronic total occlusion (CTO). Between January 2009 and December 2010 PCI-CTO was attempted in 283 consecutive patients with 289 CTO lesions.

The effectiveness trial “Stress echo (SE) 2020” evaluates novel applications of SE in and beyond coronary artery disease. The core protocol also includes 4-site simplified scan of B-lines by lung ultrasound, useful to as-

sess pulmonary congestion. Purpose: to provide web-based upstream quality control and harmonization of B-lines reading criteria. Methods: 60 readers (all previously accredited for regional wall motion, 53 B-lines naive) from 52 centers of 16 countries of SE 2020 network read a set of 20 lung ultrasound video-clips selected by the Pisa lab serving as reference standard, after taking an obligatory web-based learning 2-h module (<http://se2020.altervista.org>).

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.

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Scali M. C., Ciampi Q., Picano E., ... Ostojic M., ...; Stress Echo 2020 study group of the Italian Society of Echocardiography and Cardiovascular Imaging (SIECVI), 2018: Quality control of B-lines analysis in stress Echo 2020. **Cardiovascular Ultrasound**, 2018 Sep 25; 16 (1), 20. doi: 10.1186/s12947-018-0138-7

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

(Academician Vladimir S. Kostić)

During 2018, 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 functional dystonia. Papers related to this topic were presented at 4 international meetings (not cited in this report), with 13 of them being published in peer-reviewed journals.

V.S. Kostić chaired and gave 5 invited lectures during 2018 in Warsaw, Tirana and Hong-Kong. In the course of 2018, V.S. Kostić actively collaborated with research groups from Italy and Germany.

Kresojević N., Petrović I., Dobričić V., Tomić A., Branković V., Milić Rašić V., Svetel M., Kostić V., 2018: Phenotype of *PLP1*-related Disorder Caused by Novel Mutation: A Case Report. **Movement Disorders Clinical Practice**, 2018 Aug 2; 5 (5), 548–550. doi: 10.1002/mdc3.12644

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Jecmenica-Lukic M. V., Pekmezovic T. D., Petrovic I. N., Dragasevic N. T., Kostic V. S., 2018: Factors associated with deterioration of health-related quality of life in multiple system atrophy: 1-year follow-up study. **Acta Neurologica Belgica**, 2018 Dec; 118 (4), 589–595. doi: 10.1007/s13760-018-0962-4

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Stojkovic T., Stefanova E., Soldatovic I., Markovic V., Stankovic I., Petrovic I., Agosta F., Galantucci S., Filippi M., Kostic V., 2018: Exploring the relationship between motor impairment, vascular burden and cognition in Parkinson's disease. **Journal of Neurology**, 2018 Jun; 265 (6), 1320–1327. doi: 10.1007/s00415-018-8838-3

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raveling ALS due to *SOD1* mutation through the combination of brain and cervical cord MRI. **Neurology**, 2018 Feb 20; 90 (8), e707–e716. doi: 10.1212/WNL.0000000000005002

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Svetel M., Tomić A., Kresojević N., Kostić V., 2018: Pharmacokinetic drug evaluation of opicapone for the treatment of Parkinson's disease. **Expert Opinion on Drug Metabolism & Toxicology**, 2018 Mar; 14 (3), 353–360. doi: 10.1080/17425255.2018.1430138.

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Project: **MOLECULAR MECHANISMS OF PROGRAMMED CELL DEATH**

(Academician Vladimir Bumbaširević)

In 2018, the investigations of the molecular mechanisms of programmed cell death were continued with the focus on modulation of signalling pathways that regulate intracellular energy balance. Among others, we investigated the effects of metformin and simvastatin on the ultrastructural characteristics of sciatic nerve fibers in C57BL/6J mice on a high fat diet (HFD), as a model for type 2 diabetes mellitus and metabolic syndrome. Metformin treatment increased the number of structural defects of the myelin sheet found in nerves of HFD mice, while simvastatin treatment had a neuroprotective effect. These

results warrant further research on the effects of metformin and statins in patients developing diabetic neuropathy and advise caution when deciding about optimal treatment modalities in these patients.

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Martinovic T., Ciric D., Pantic I., Lalic K., Rasulic I., Despotovic S., Lalic I., Djuricic D., Bumbasirevic V., Kravic-Stevovic T., 2018: Unusual shape and structure of lymphocyte nuclei is linked to hyperglycemia in type 2 diabetes patients. **Tissue and Cell**, 52, 92–100.

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Martinovic T., Ciric D., Kravic-Stevovic T., Papastefanaki F., Jakovcevski I., Pouliou N., Djogo N., Schulz F., Loers G., Vossmeier T., Weller H., Schachner M., Matsas R., Bumbasirevic V., 2018: Polyethylene Glycol Coated Gold Nanoparticles Nerve Tissue Uptake After Spinal Cord Injury. **Ibid**, 269–271.

Ciric D., Martinovic T., Kravic-Stevovic T., Volarevic V., Paunovic V., Markovic Z., Simovic Markovic B., Misirkic-Marjanovic M., Todorovic-Markovic B., Bojic S., Vucicevic L., Jovanovic S., Arsenijevic N., Holclajtner-Antunovic I., Milosavljevic M., Dramicanin M., Lukic M. L., Trajkovic V., Bumbasirevic V., 2018: Ultrastructural Analysis of Large Graphene Quantum Dots Internalization in Hepatocytes. **Ibid**, 272–274.

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 Art, the study of the immunomodulatory effect of nanomaterials (iron nanoparticles and nanocellulose) was continued. In addition, the effect of parasites and mesenchymal stromal stem cells on the function of dendritic, T regulatory cells and other cells of the immune system was investigated for the possible use of antigens and nanoparticles as tumor vaccines or for the treatment of autoimmune diseases and transplant reactions. The chapter entitled “Where is the vaccine site in colorectal cancer immunotherapy?” was published in the monograph on colon carcinoma, editor Z. Krivokapić, publisher:

SASA and the Institute for Textbooks Belgrade, 2018, pages 173-183. From the project, 4 full-length papers were published in international journals.

Tomic S., Ilic N., Kokol V., Gruden-Movsesijan A., Mihajlovic D., Bekic M., Sofronic-Milosavljevic L., Colic M., Vucevic D., 2018: Functionalization-dependent effects of cellulose nanofibrils on tolerogenic mechanisms of human dendritic cells. **International journal of nanomedicine**, 13, 6941–6960.

Marković M., Tomić S., Đokić J., Mihajlović D., Vučević D., Gazivoda D., Duka M., Čolić M., 2018: Mesenchymal stem cells from periapical lesions modulate cytokine production by local immune cells. **Vojnosanitetski pregled**, 75 (5), 473–480.

Fracasso G., Ghigna P., Nodari L., Agnoli S., Badocco D., Pastore P., Nicolato E., Marzola P., Mihajlovic D., Markovic M., Colic M., Amendola V., 2018: Nanoaggregates of iron poly-oxo-clusters obtained by laser ablation in aqueous solution of phosphonates. **Journal of colloid and interface science**, 522, 208–216.

Ilic N., Gruden-Movsesijan A., Cvetkovic J., Tomic S., Vucevic D. B., Aranzamendi C., Colic M., Pinelli E., Sofronic-Milosavljevic L., 2018: Trichinella spiralis Excretory-Secretory Products Induce Tolerogenic Properties in Human Dendritic Cells via Toll-Like Receptors 2 and 4. **Frontiers in immunology**, 9, 11.

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

(Academician Dragan Micić)

In 2018, investigations concerning endocrine disorders in obese subjects were continued. The head of project, Academician Dragan Micić, participated in investigations concerning the mechanism of obesity induced hypertension, diabetes and dyslipidemia, as well as in formulating practical guidelines for their treatment as a part of the Working group on Obesity, Diabetes and the High-risk Patient of the European Society of Hypertension and the European Association for the Study of Obesity. In the same group, Professor Dr. Dragan Micić participated in the investigation that was related to obesity induced cardiovascular disorders as well as to early prevention strategies and future research directions. Both investigations were published in the Journal of Hypertension in 2018. The head of project participated in the investigation of insulin resistance among menopausal patients with adrenal incidentalomas and its relation with LH, and it was published in Clinical Endocrinology in 2018. In national journals, Professor Dr. Dragan Micić published papers related to drug treatment of obesity, change of gut flora after bariatric surgery

and insulin resistance during surgical operations. In a national monograph, the head of project participated in writing the chapter about the relationship between obesity and colorectal carcinoma. Academician Dragan Micić delivered invited lectures at several national and international meetings devoted to drug therapy in obesity and treatment of comorbidities in obesity.

The results of the investigations are published in three international journals, four national journals, one chapter in a monograph, two chapters in national proceedings, six abstracts at international meetings and seven abstracts at national meetings. The project head delivered 19 invited lectures at national and international meetings.

Kotsis V., Tsioufis K., Antza C., Seravalle G., Coca A., Sierra C., Lurbe E., Stabouli S., Jelakovic B., Redon J., Redon P., Nilsson P. M., Jordan J., Micić D., Finer N., Leitner D. R., Toplak H., Tokgozoglu L., Athyros V., Elisaf M., Filippatos T. D., Grassi G., 2018: Obesity and cardiovascular risk: a call for action from the European Society of Hypertension Working Group of Obesity, Diabetes and the High-risk Patient and European Association for the Study of Obesity: part B: obesity-induced cardiovascular disease, early prevention strategies and future research directions. **Journal of Hypertension**, 36 (7), 1441–1455.

Kotsis V., Jordan J., Micić D., Finer N., Leitner D. R., Toplak H., Tokgozoglu L., Athyros V., Elisaf M., Filippatos T. D., Redon J., Redon P., Antza C., Tsioufis K., Grassi G., Seravalle G., Coca A., Sierra C., Lurbe E., Stabouli S., Jelakovic B., Nilsson P. M., 2018: Obesity and cardiovascular risk: a call for action from the European Society of Hypertension Working Group of Obesity, Diabetes and the High-risk Patient and European Association for the Study of Obesity: part A: mechanisms of obesity induced hypertension, diabetes and dyslipidemia and practice guidelines for treatment. **Journal of Hypertension**, 36 (7), 1427–1440.

Marina L. V., Ivović M., Tančić-Gajić M., Arizanović Z., Raković D., Milin-Lazović J., Kendereški A., Micić D., Vujović S., 2018: Luteinizing hormone and insulin resistance in menopausal patients with adrenal incidentalomas: The cause-effect relationship? **Clinical Endocrinology**, 88 (4), 541–548.

Project: **PROSTATE CANCER SCREENING**

(Academician Jovan Hadži-Đokić)

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 large number of prostate biopsies, due to elevated PSA which was the consequence of benign prostate hyperplasia (BPH) but not PCa.

2. Detection of a 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 ($PSA \geq 2.5$ ng/mL),
3. Men with abnormal DRE and $PSA \geq 2.5$ ng/mL.

All of these men would be candidates for TRUS-guided prostate biopsy. Some patients with proven prostate cancer would be candidates for radical prostate surgery. After the surgery, the definitive pathological tumor stage should be assessed.

The intention of the Committee is that the project should be carried out in several towns in Serbia, according to strict criteria.

During 2018, 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 82 TRUS biopsies made of the prostate, and patients were listed according to the above recommendations.

**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 the year 2018, the results of the relationship between insulin resistance (IR) and atherosclerotic vascular disease (AVD) were completed and published. The investigations have shown that in nondiabetic patients there are impairments not only at the level of IR (detected by minimal model analysis), but also in insulin secretion which strongly correlate with endothelial dysfunction, measured by intracoronary application of an increasing dose of acetylcholine, in patients without significant coronary stenosis, which is a very complicated and demanding method. Simultaneously, it was observed

that in these patients there are no standard lipid level disturbances, but there are changes in the structure of the LDL particle (small dense LDL), as well as significantly higher PAI-1 levels, suggesting the impairments at the level of fibrinolysis. The analysis of the association between IR and left ventricular (LV) mass as an early cardiovascular disturbance in patients with type 2 diabetes (T2D) has shown that patients with diabetes and without hypertension have shown the highest LV mass which correlated significantly in multivariable analysis with the degree of the metabolic control of diabetes (glycaemia and HbA1c) showing an important role not only of IR, but also of hyperglycemia in early impairments of remodelling of LV in patients with diabetes.

Lingvay I., Desouza C. V., Lalic K. S., Rose L., Hansen T., Zacho J., Pieber T. R., 2018: A 26-Week Randomized Controlled Trial of Semaglutide Once Daily Versus Liraglutide and Placebo in Patients With Type 2 Diabetes Suboptimally Controlled on Diet and Exercise With or Without Metformin. **Diabetes Care**, 2018 Sep; 41 (9), 1926–1937.

Lalić K., Rajković N., Popović L., Lukač S. S., Stošić L., Rasulić I., Lalić N. M., 2018: The effects of 3-year statin therapy and the achievement of LDL cholesterol target values in familial hypercholesterolemia patients: An experience from Serbia. **Atherosclerosis**, 2018 Oct; 277, 298–303.

Seferovic J. P., Tesic M., Seferovic P. M., Lalic K., Jotic A., Biering-Sørensen T., Giga V., Stankovic S., Milic N., Lukic L., Milicic T., Macesic M., Gajovic J. S., Lalic N. M., 2018: Increased left ventricular mass index is present in patients with type 2 diabetes without ischemic heart disease. **Scientific Reports**, 2018 Jan 17; 8 (1), 926.

Lloyd C. E., ..., Lalic N. M., Lecic Tosevski D., ..., Xin Y., 2018: Prevalence and correlates of depressive disorders in people with Type 2 diabetes: results from the International Prevalence and Treatment of Diabetes and Depression (INTERPRET-DD) study, a collaborative study carried out in 14 countries. **Diabetic Medicine**, 2018 Jun; 35 (6), 760–769.

Martinovic T., Ciric D., Pantic I., Lalic K., Rasulic I., Despotovic S., Lalic I., Djuricic D., Bumbasirevic V., Kravic-Stevovic T., 2018: Unusual shape and structure of lymphocyte nuclei is linked to hyperglycemia in type 2 diabetes patients. **Tissue and Cell**, 2018 Jun; 52, 92–100.

Micić D., Lalić N., Djukić V., Stanković S., Trajković G., Oluić B., Polovina S., 2018: Influence of IL-6, TNF- α and Hs-CRP on Insulin Sensitivity in Patients after Laparoscopic Cholecystectomy or Open Hernia Repair. **Journal of Medical Biochemistry**, 2018 Jul 1; 37 (3), 328–335.

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Lalić N., Russel-Szymczyk M., Culic M., Tikkanen C. K., Chubb B., 2018: Cost-Effectiveness of Insulin Degludec Versus Insulin Glargine U100 in Patients with Type 1 and Type 2 Diabetes Mellitus in Serbia. **Diabetes Therapy**, 2018 Jun; 9 (3), 1201–1216.

Lalić K., Nedeljković M., Jotić A., Babić R., Rajković N., Popović L., Lukić L., Miličić T., Singh Lukač S., Stošić L., Maćešić M., Rasulić I., Gajović J. S., Lalić N. M., 2018: Endothelial dysfunction of coronary arteries in subjects without diabetes: An association with both insulin resistance and impaired insulin secretion response. **Diabetes Research and Clinical Practice**, 2018 May; 139, 179–187.

Haluzik M., Kretowski A., Strojek K., Czupryniak L., Janez A., Kemppler P., Andel M., Tankova T., Boyanov M., Smircic Duvnjak L., Madacsy L., Tarnowska I., Zychma M., Lalic N., 2018: Perspectives of Patients with Insulin-Treated Type 1 and Type 2 Diabetes on Hypoglycemia: Results of the HAT Observational Study in Central and Eastern European Countries. **Diabetes Therapy**, 2018 Apr; 9 (2), 727–741.

Project: **HISTORY OF SERBIAN MEDICINE**

(Academician Radoje Čolović)

He participated on nine meetings in the field of history of Serbian medicine, including Congress “800 years of Serbian medicine” held in Monastery Mileševa in June 2018. He gave six lectures on various professional and scientific meetings during 2018.

He published in 2018 the following articles – biographies and bibliographies: Vojislav M. Subotić, Leon Ko(j)en, Ksenofon Šahović, Slobodan Kostić, Stanoje Stefanović, in the Series **Lives and Work of Serbian Scientists**, Vol. XVI, Serbian Academy of Sciences and Arts, Belgrade, 2018.

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

(Academician Nebojša Radunović)

In 2018, the main focus of our researches were pathological myometrium tissues as a consequence of the hypertensive syndrome and diabetes mellitus in pregnancy. As such, pregnant women with diabetes and/or hypertension were selected and samples of their uterus were taken during labours. All procedures were regularly approved and the consent was given by the Ethical Committee of the Medical Faculty in Belgrade. Molecular analysis of frozen myometrial tissue samples included analysis of potassium channel proteins (as in the previous work) but with new types of antibodies specific for the various subtypes of potassium channels.

Potassium channels play an important role in smooth muscle contraction during labor. As such, many of them represent the target site for the inhibition of unwanted contractions, especially in preterms. It is shown that the number and the activity of potassium channels in myometrium is decreased during pregnancy. It is also expected that pathological conditions (hypertension and diabetes) have modifying effects on the activity of those channels so our new researches will be, fortunately, expanded in that direction.

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

(Academician Đorđe Radak)

The Carotid Database provides information about the results of different 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.

The Carotid Database concerning early and late results of the treatment of carotid disease has now come to include more than 8,000 patients. All three treatment modalities (best medical treatment, stenting or surgery) are included. We analyze: demographic data, risk factors, laboratory findings, previous medications, diagnostic procedures performed prior to admission as well as all the details regarding diagnostic (ultrasound, CT angiography) and interventional procedures in each included patient. Mean follow up is 5 years, with regular clinical and ultrasound examination every 6 months. By analyzing follow-up results, any interventional detail, risk factor or comorbidity influencing on early and late outcome of carotid disease treatment can be detected and cross linked.

The Vascular Surgery Clinic Dedinje is participating in the multicentric multinational randomized controlled trials, but for addressing some questions big data are necessary. The aim of the Carotid Database in the prospective survey is: 1. to standardize the monitoring of brain ischemia during carotid surgery; 2. to elucidate the link between activity/expression of oxidative stress with changes in levels of pituitary and hypothalamic hormones in the venous blood before, during and after carotid clamping during carotid surgery in patients treated with different anaesthetics; 3. to analyze long term results of different treatment modalities of carotid disease.

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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.

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

Study is noncommercial.

INTERPRET-DD is a two-year longitudinal study of diabetes out-patients services in 21 countries. The study investigates recognition and management of depressive disorders in people with type 2 diabetes, with the aim to obtain in-depth knowledge of pathways to care and the impact of treatment of previously unrecognised depression on clinical outcomes of diabetes. It is expected that collected data will influence policy making decisions and help to improve care for people with these frequently prevalent comorbid conditions. Each first Monday of a month the international teleconference is being organized at which the progress and future tasks are discussed. 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.

The following instruments are applied for the assessment: Patient Information Form (PIF); Patient Health Questionnaire – 9 (PHQ-9); WHO (Five) Well-Being Index (WHO-5); Problem Areas in Diabetes Scale (PAID); Mini International Neuropsychiatric Interview – 6 (M.I.N.I-6); Hamilton Rating Scale for Depression-17, Patient Encounter Form, Holmes and Rahe Stress Scale.

The second joint manuscript of the study group was published in 2018. 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. Nine centres, including ours, have completed the second pilot follow up study. The study was presented at the meeting of the SASA Department for Medical Sciences on 27 June 2018. Two doctoral dissertations on depression and diabetes comorbidity are being prepared. Mentors/co-mentors are coordinators of the study in Serbia.

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language version: inter-rater and test-retest reliability. **Scientific Reports Online**, 7, 1. doi: 10.1038/s41598-017-08706-3

Szabo C. P., Castadelli J. M., Chandra P., Cia A., Heun R., Lecic-Tosevski D., Riba M., Tyrer P., 2018: Scientific publishing: a developmental role for the World Psychiatric Association. **Global Psychiatry**, Vol. 1, Issue 1. doi: <https://doi.org/10.2478/gp-2018-0003>

Project: SIGNIFICANCE OF ANTIREFLUX SURGERY AFTER THE ENDOSCOPIC RADIO-FREQUENT ABLATION IN TREATMENT OF PATIENTS WITH BARRETT 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 Conference of the Central and Eastern European Association for the Study of Barrett's Esophagus, which was held in Belgrade, April 2018.

Simić A., Skrobić O., Ivanović N., Peško P., 2018: Concurrent radiofrequency ablation and Nissen fundoplication. **Annals of Esophagus**, 1, 10.

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

(Academician Zoran Krivokapić)

The aim in the past year was to continue the ongoing work and to define new objectives in colorectal cancer (CRC) research, according to the latest global trends. Tissue samples were collected from patients with CRC in order to identify mutations in APC, BRAF, KRAS, RAD51, SMAD4 and SMAD7 genes, with the objective to characterize new prognostic biomarkers. Cell-free DNA, taken from blood and serum, was tested as potential sequence source for analyzing BRAF and KRAS mutations. Furthermore, cell-free DNA levels were questioned as biomarker in disease dynamics. The level of SMAD4 and SMAD7 expression was examined as it was shown that they are altered in cancer development and metastasis. Expression of other biomarkers such as

EGFR, VEGF, CD44v6 was obtained to evaluate prognosis in radically operated patients with T3N0M0 stage of CRC.

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2017 European Society of Coloproctology (ESCP) collaborating group, Bhangu A., Minaya-Bravo A. M., Gallo G., Glasbey J. C., Kamarajah S., ... & Buskens C. (...Krivokapic Z...), 2018: An international multicentre prospective audit of elective rectal cancer surgery; operative approach versus outcome, including transanal total mesorectal excision (TaTME). **Colorectal Disease**, 20 (6), 33–46.

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Petrovic-Sunderic J., Dragicevic S., Krnjajic M., Ristanovic M., Nikolic A., Krivokapic Z., 2018: Polymorphism RAD51 172G> T in Serbian patients with colorectal cancer. **Journal of BU ON.: official journal of the Balkan Union of Oncology**, 23 (4), 936.

Sekulić A., Barišić G., Dunderović D., Tatić S., Krivokapić Z., 2018: Vascular endothelial growth factor as a potential prognostic factor for T3N0 rectal cancer. **Vojnosanitetski pregled**, OnLine-First April (00), 71–71.

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)

On the basis of the defined optimal biomechanical conditions for bone callus formation during the bones angular deformities correction of the lower extremities, a small series of new original devices for external fixation has been produced. Devices were applied to patients in 2018, during the existing clinical study. The first results obtained by surgical correction of 10 extremities show that the application of this new device indicates high efficiency and safety of patients in performing surgical correction of angular deformities in the knee area. Special attention was paid to risk analysis, and it can already be assumed that the risk of using this device and method is lower compared to the risk of using other methods in the surgical treatment of these deformities. Risk reduction is expected in particular in the event of possible complications such as infection and mechanical complications. In 10 patients in clinical trials, there was not a single case of deep infection, though there was one minor (superficial) infection that, like other superficial infections, was easily resolved by frequent cleaning of the pin tract area during seven to ten days. Mechanical complications are less common after the application of this device compared to the application of other devices, probably due to the good definition of the optimal elasticity of the system. Certain elasticity is of great importance for bones union. However, such short period of application and a small number of patients does not give us the right to make conclusions in this regard. Immediately after surgery, patients were permitted to walk with full weight bearing and to maintain actively a full range of motion of the knee joint.

During 2018, activities continued on the development of additional remote controlled devices (attachment) and software for monitoring the bone healing process and for controlling the functioning of the device. Work on this part of the project has not yet been completed and will be continued during the next year.

Mitkovic M. M., Milenkovic S., Micic I., Kostic I., Stojiljkovic P., Mitkovic M. B., 2018: Operation time and intraoperative fluoroscopy time in different internal fixation methods for subtrochanteric fractures treatment. **Srpski arhiv za celokupno lekarstvo**, 146 (9-10), 543–548.

Stojkovic M., Veselinovic M., Vitkovic N., Marinkovic D., Trajanovic M., Arsic S., Mitkovic M., 2018: Reverse modeling of human long bones using T-splines Tibia. **Technical Journal**, 25 (6), 1753–1760.

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

(Academician Petar M. Seferović)

Heart failure remains one of the leading causes of mortality and disability in Serbia. The prevalence of heart failure in Serbia is 2.4 per 1000 patients, while mortality reaches 61.1 per 100,000. In order to improve the knowledge on the epidemiological burden of the disease, after the efforts of the Heart Failure Society of Serbia, the Ministry of Health of the Republic of Serbia approved mandatory registration of heart failure by health care professionals in the country. The registration is expected to start in 2019.

In May 2018, Prof. Seferović was appointed President of the Heart Failure Association of the European Society of Cardiology for period 2018-2020, during the HFA Annual Congress in Vienna, while in November 2018 he was elected full member of the SASA, which will allow the improvement of the activities in this field in Serbia and Europe-wide.

The activities within the SASA project were continued on the global and European arena with strong participation in the “Global heart failure awareness program”. This program operates under the auspices of the World Heart Federation and European Society of Cardiology and Prof. Seferović has the privilege to be appointed the Heart Failure Ambassador for the Republic of Serbia. This program aims to standardize the optimal diagnostic and therapeutic approaches in heart failure world-wide.

As founder of the Heart Failure National Societies Summit, and President of the Heart Failure Association of the ESC, Prof. Seferović was one of the organizers of the “VII Heart Failure National Societies Summit 2018” in Vilnius, Lithuania, October 2018, that gathered 48 representatives of National Heart Failure Societies from Europe. This Summit discusses and decides upon the organizational issues in heart failure management in ESC countries. During the Summit, joint activity of the Heart Failure Association of the ESC, Heart Failure Society of Serbia and Serbian Academy of Sciences and Arts: “ESC HFA Atlas in Europe”, continued. This large project should provide the information about diagnosis and treatment of heart failure in 45 European countries.

Neumann F. J., Sousa-Uva M., Ahlsson A., ..., Seferović P. M., ..., Zembala M. O., 2018: 2018 ESC/EACTS Guidelines on myocardial revascularization. **Kardiologia Polska**, 76 (12), 1585–1664.

Čelutkienė J., Plymen C. M., Flachskampf F. A., ..., Seferovic P., ..., Nihoyanopoulos P., 2018: Innovative imaging methods in heart failure: a shifting paradigm in cardiac assessment. Position statement on behalf of the Heart Failure Association of the European Society of Cardiology. **European Journal of Heart Failure**, 2018 Dec; 20 (12), 1615–1633.

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Crespo-Leiro M. G., Metra M., Lund L. H., ..., Seferovic P., Ruschitzka F., 2018: Advanced heart failure: a position statement of the Heart Failure Association of the European Society of Cardiology. **European Journal of Heart Failure**, 2018 Nov; 20 (11), 1505–1535.

Milinkovic I., Ašanin M., Simeunovic D. S., Seferović P. M., 2018: In the search for an ideal registry: Does the cloud have a silver lining? **European Journal of Preventive Cardiology**, 2018 Jun; 25 (9), 956–959.

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ACADEMIC COMMITTEE FOR BIOMEDICAL RESEARCH

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

(Academician Ljubiša Rakić)

Dietary restriction (DR) differently affects frailty in aging rats depending on DR onset and duration. In the animal model of AD, we showed: A β plaques number decrease and change in brain phospholipids composition after short-term omega-3 fatty acids treatment; impairments of hippocampal neurogenesis and impaired IL-17 production in gut-residing immune cells. Positive effects on recovery processes were shown for ribavirin in the EAE animal model, hyperbaric oxygen in traumatic brain injury and the vitamin B complex in peripheral nerve injury.

The study of health effects of depleted uranium proposed a new test for lung cancer screening by the biodosimetric model as well as analysis of micronuclei in cells of bronchoalveolar lavage specimens.

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Project: **BIOMEDICAL RESEARCH IN DENTISTRY**

(Academician Vojislav Leković)

The primary goal of the project was to examine the interaction of oral conditions and diseases (periodontal disease and its complications, peri-implantitis, burning mouth syndrome) with some systemic conditions and diseases (diabetes mellitus, premature birth and complications during pregnancy, depression, quality of life, etc.). The main objectives were to examine the impact of the above-mentioned diseases on oral health, as well as the impact of oral health itself (primarily inflammation in the oral cavity) on systemic health. The laboratory examinations were designed at the clinical and molecular level, in order to explain the cellular and molecular basis of disease interactions, where it might result in useful application in prevention, prognosis and treatment of the disease. The secondary objectives of the project were to monitor the outcomes of different therapeutic modalities in the treatment of periodontitis and peri-implantitis, as well as the impact of these therapeutic protocols on systemic health. In addition, in order to examine the effect of periodontal inflammation and the therapy of chronic periodontal disease on systemic health, it is necessary to further examine the still underdeveloped etiological factors (insufficiently investigated role of fungi, for example) and pathogenetic mechanisms of bone resorption in periodontitis and peri-implantitis, as well as optimal methods for the diagnosis of the disease and for the plan of periodontal therapy.

The achieved results of the previously defined and realized studies were published in referential scientific journals and were presented at national and international expert meetings. A number of researches have been developed into original scientific papers, which are currently in the process of journals' review. Additionally, most of the already published and presented research has been further continued.

COMMITTEE ON CARDIOVASCULAR PATHOLOGY

(Academician Vladimir Kanjuh)

The Committee held its Annual Meeting on 17 December 2018 at the Academy, in the presence of 120 participants: members, associates and interested colleagues. The Meeting welcomed: (1) the SASA President, Academician Vladimir S. Kostić, who said: "The Committee is the SASA's

oldest, it has a long tradition and consistency, with numerous collaborators; its energy contributes to the success of the SASA's work and it is the best among the SASA's Committees", and (2) Academician Dragan Micić, Secretary of the Department of Medical Sciences, President of the Health Council of the Republic of Serbia and Committee member, who said: "This Committee is one of the best in the SASA because its President, Academician V. Kanjuh, is organising its work. It is instructive that he, after his retirement, wrote more papers, books, and has been more often cited, than during his entire previous working life!"

In 2018, the Committee was the co-organizer of the following 9 meetings of Serbian cardiologists: 3. Congress of the 34th Branch of the American College Cardiology for Serbia and Republic of Srpska, February 23-24, Belgrade; XII Basics, April 15, Belgrade; Cardios 2018. XVI International Congress of Clinical Cardiology and Heart Failure, April 20-21, Belgrade; Symposium on Pulmonary Hypertension, May 3-5, Belgrade, SASA; X International Summer Cardiology School of ECPD, June 18-22, Igalo; SYNERGY, September 6-8, Belgrade; XV European Conference of the ESC Working Group on Myocardial and Pericardial Diseases, October 5-7, Belgrade, SASA; "NOVAK" Serbian Cardiologic Society, November 16-18, Novi Sad; 1st Dr Nanette Kass Wenger International Conference on CVD in Women, December 3, Belgrade, School of Medicine.

The Committee accepted the Project (organized and sponsored by the Committee) of the European Society of Cardiology: EuroHeart – SerbHeart, which should create a new Registry of cardiovascular diseases in Serbia like in Sweden and UK, headed by Prof. B. Beleslin, Committee member. Committee member Prof. Dr. A. Ristić promoted the ESC "Textbook of Cardiovascular Medicine 2018" which contains the chapters of Serbian authors: A. Ristić, P. Seferović, V. Kanjuh, A. Nešković, I. Stanković, P. Milićević, T. Potpara and D. Popović.

There were two lectures: (1) V. Kanjuh "World pioneers of heart transplantation and its future", and (2) Prof. D. Šćepanović "12 years of life with transplanted heart".

COMMITTEE FOR UROGENITAL TUMORS

(Academician Jovan Hadži-Đokić)

The Committee for Urogenital Tumors was founded in 2008. During 2018, the members of the Committee continued the 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 the Municipality of Vračar.

In addition, in 2018, the members of the Committee initiated new projects, such as the project of determination of androgens and estrogens in prostatic tissue. The members of the Committee issued numerous publications and took part in many domestic and international congresses during 2018 (Sofia, Skopje, Beograd, Istanbul).

The Committee members participated in the writing of the chapters for the book “Selected Chapters of Urology”, which will be presented at the beginning of 2019.

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, in 2018, the Committee organized a traditional scientific meeting in the SASA, 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 in-

ternational high-ranking journals, were presented. The works of Committee members from different fields in immunology and allergology were presented at international meetings. Of them, 5th European Immunology Meeting, held in Amsterdam, 2 – 5 September 2018, deserves to be mentioned in particular. The members also participated in several COST actions.

COMMITTEE ON SOMNOLOGY

(Academician Veselinka Šušić)

During 2018, the work of the Committee in the academic community of Serbia continued, with the establishment and fostering of international cooperation, with a special commitment to bring the somnology to the non-scientific public and point out the overall importance of sleep.

Sleep medicine was brought closer to the general public through a series of manifestations organized on the occasion of the World Sleeping Day, and included an interactive exhibition “World of Sleep through Questions” (moderators: O. Stanojlović, A. Rašić-Marković, D. Hrnčić, WSD delegate) and science-popular lectures, media coverages, and more. A report on these activities is available on the official World Sleeping Day webpage. The goal of these activities was to raise awareness of the significance of quality sleep as one of the health pillars. The committee members continued to actively work on education and retraining of personnel in the field of somnology. Accredited modules (Sleep Physiology, as well as Sleep and Parasomnias) continue to be active.

Committee Members continued their work on preparations for upcoming Symposium “Sleep and Sleep Disorders” which represents highly-profiled scientific meeting and panel of experts in this field.

Committee members were active participants in a number of international and national meetings, as well as members of election boards. Among others, O. Stanojlović and D. Hrnčić held invited lectures at a scientific meeting dedicated to Ivan Pavlov, Moscow, Russia. Scientific results were also published in national and international scientific journals.

COMMITTEE FOR MULTIDISCIPLINARY STUDIES OF DIABETES

(Academician Nebojša M. Lalić)

The Committee for Multidisciplinary Studies of Diabetes continued its activities during year 2018 on initiating and developing the multidisciplinary approach in diabetes research. In this context, the Committee promoted joint activities with other associations focusing on the diabetes complications, the co-morbidities of this disease as well as the diseases showing a similar impact on the public health.

During 2018, the Committee was the co-organizer of the 4th EASD Postgraduate Course which was held in Belgrade, 31 May – 2 June 2018 and which gathered 300 participants from the region and numerous experts involved in diabetes research from the country and abroad.

The members of the Committee continued their collaboration within the Insulin Resistance project: comparative analysis of its role in the onset and development of diabetes, atherosclerotic vascular disease and neurodegenerative disorders, supported by the SASA, and coordinated by Nebojša Lalić, as well as within other compatible projects. The collaboration under the project of Nebojša Lalić 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 1 diabetes. In addition, successful collaboration has been established with Dusica Lečić Toševski, full member, and her group within the international INTERPRET-DD project.

The members of the Committee participated as invited lecturers, chairpersons and presented their original papers in the common fields of collaboration.

COMMITTEE FOR ENDOCRINOLOGY AND ENVIRONMENTAL FACTORS

(Academician Dragan Micić)

In 2018, the Committee for Endocrinology and Environmental Factors of the SASA coordinated activities on promoting the prevention of obesity together with the Ministry of Health, Republic of Serbia, Republic Expert Committee for Chronic Non-communicable Diseases, Republic Expert

Committee for Endocrinology, Serbian Association for the Study of Obesity and Committee for Obesity of the Endocrinology Section of the Serbian Medical Society. The Committee for Endocrinology and Environmental Factors of the SASA and its members were one of the organisers of the IV Serbian Congress of Obesity with international participation on Zlatibor, 28-30 September 2018. The IV Serbian Congress of Obesity with international participation was organised under the auspices of the Ministry of Health, Republic of Serbia, and the Serbian Academy of Sciences and Arts. 8 foreign experts participated in Congress lectures, including Academician Hans Hauner, member of the German Academy of Sciences Leopoldina, as well as 54 national experts. During 2018, President of the Committee, Academician Dragan Micić, participated as invited lecturer at 19 national and international meetings, including the European Congress of Obesity in Vienna (Austria) where he delivered a lecture: “How to manage comorbidities” and the European Congress of Endocrinology in Barcelona (Spain) where he delivered a lecture: “How to manage the consequences of obesity (comorbidities)”.

At the end of 2018, the Committee started with preparations for the scientific meeting “Advances in Endocrinology” that will be organised in 2019 in the Serbian Academy of Sciences and Arts in Belgrade.

COMMITTEE FOR HUMAN REPRODUCTION

(Academician Nebojša Radunović)

During last year, the Committee for Human Reproduction of the SASA and the Association of Perinatal Medicine of Serbia organized the Symposium called “Human reproduction and genetics – the influence on heritage”. The event took place in the SASA, Belgrade, from 27 to 29 September. Members of the Committee for human Reproduction participated in organising this event. Additionally, as lecturers, they brought newest experiences about early fetal development and various diagnostic procedures and prevention of pre-term labours. Their knowledge was the basis of 25 lecturers in total (16 national and 9 international). The President of the Symposium was Academician Nebojša Radunović.

As a result of collaboration between the National Association of Perinatal Medicine of Serbia, Committee for Human Reproduction of the SASA and the National Association for Human Reproduction of Serbia, one

book was published in 2018 entitled “Human reproduction and genetics – the influence on heritage”, edited by Academician Nebojša Radunović.

In the monograph “Colorectal carcinoma – from prevention through cancerogenesis to metastasis”, written by Academician Zoran V. Krivokapić, Academician Nebojša Radunović is co-author of chapter entitled “Diagnostic and therapy of malignancies in pregnancy”.

During 2018, the President of the Committee for Human Reproduction, Academician Nebojša Radunović, spent 7 days at New York University (NYU) and 14 days at Yale University, USA. During that period, he gave lectures and participated in other types of education. He was invited lecturer at the 7th Congress of the South-East European Society for Perinatal Medicine and 3rd Congress of Fetal and Neonatal Medicine, held in Belgrade, from 10 to 12 May.

During 2018, president of Committee for human reproduction, Academician Nebojša Radunović, spent 7 days in New York University (NYU) and 14 days at the Yale University, USA. During that period he gave lectures and participated in other types of education. He was invitation lecturer on the 7th Congress of Society for perinatal medicine, Southeast Europe and 3rd Congress of Fetal and Neonatal medicine, held in Belgrade, from 10th to 12th of May.

ACADEMIC COMMITTEE FOR EDUCATION

(Academician Vladimir Bumbaširević)

The Committee meeting was held on 18 December. Emphasizing that a quorum was not present, Academician Bumbaširević greeted the members of the SASA Committee for Education in attendance and expressed his regret at the misunderstandings concerning the organization of the round table to be held on 18 December 2018. He explained that at the previous meeting he got an impression that he, as the newly elected President, was expected to maintain contact with the representatives of the Ministry of Education and perform all planned activities of the Committee, including primarily the meeting to be held in December, which was proposed by the former President, Academician Marjanović. Turning the attention to the frequent change of the President of the SASA Committee for Education, the President of SASA, Academician Vladimir Kostić, expressed his satisfaction that Academician Bumbaširević accepted the position of President. According to Academician Kostić, the SASA Committee for Education is one of the most important SASA Committees.

Therefore, he expressly emphasized that its future activities, decisions and initiatives would be fully supported by the SASA. As for the scientific meeting titled “Education as the Developmental Potential of Serbia”, which was held within the lecture cycle “Strategic Development Trends of Serbia in the 21st Century” in 2012, the SASA President expressed his view that it would be extremely important to hold a new meeting dedicated to education in the Republic of Serbia, which would be organized by the SASA Committee for Education.

The President of the Committee, Academician Bumbaširević, invited all present members to voice their opinions about the Committee’s role in the organization of the scientific meeting planned to be held in November 2019.

The Committee agreed in principle to hold a meeting in November 2019. Thus, Academician Bumbaširević asked its members to come up with the topics for this meeting and the meetings that would precede it, including symposia, forums and round table discussions, and submit them for consideration by the end of January 2019 in order to discuss them and decide which of them would further be considered at the Committee meetings.

DEPARTMENT OF LANGUAGE AND LITERATURE

ONOMASTIC COMMITTEE

(Academician Aleksandar Loma)

1. In 2018, field work in the territory of Jadar (Mirjana Petrović-Savić), Nikšićka Župa (Janko Jelić) and Banjani (Milan Ivanović) continued. Six villages in Nikšićka Župa (Bastaji, Dučice, Jugovići, Kuta, Liverovići, Carine) and four villages in Banjani (Koprivice, Macavare, Petrovići and Somina) were investigated (i.e. toponymy and anthroponymy). Mirjana Obradović finished collecting toponomastic materials in Levač. She collected about 3,000 units from 32 research points. A little more than 4,000 data were submitted (J. Jelić, M. Petrović-Savić), which was paid by the Committee.

Note: Onomastic field research in Montenegro was not financed by the Committee, but by the special SASA fund formed with a view to supporting the survival of Serbistica in Montenegro.

2. Volume XXIV of **Onomatological Contributions** (Onomatološki priloz) came out in early 2018, bearing the previous year as the year of publication. Volume XXV of *Onomatological Contributions* was prepared and should be accepted for publication at the session of the Department of Language and Literature on 25 December, and published in early 2019.

3. Mara Tijanić's monograph *Onomastics of Župa pivska* (Onomastika Župe pivske), as Volume IV of the Series "Library of Onomatological Contributions" (Biblioteka Onomatoloških priloga), is being printed.

4. The work on the *Dictionary of Old Serbian Personal Names* (Rečnik starosrpskih ličnih imena) continued. In 2018, Dr. Vladimir Polomac excerpted personal names from the Banjska Chrysobull (Banjska hrisovulja) (about 500 confirmations) and embarked on excerpting from the Dečani Chrysobulls, which has so far provided about 3,000 confirmations.

5. On 6 December, the President of the Committee visited the Military Geographical Institute. He was received by the Deputy Head of the Military Geographical Institute, Lieutenant Colonel (Dr.) Slaviša Tatomirović. Both of them expressed their readiness to cooperate, which would also include the Geodetic Authority. The talks will be resumed at the beginning of next year.

COMMITTEE FOR CRITICAL EDITIONS OF SERBIAN WRITERS

(Corresponding Member Slobodan Grubačić)

At the meeting held at the SASA on 22 January 2019, at the invitation of Professor Lj. Maksimović, SASA Vice-President, and with the participation of Professor Z. Bojović, SASA member, Professor T. Jovanović and Professor Lj. Juhas Georgievski (Faculty of Philology, University of Belgrade), and Dr. S. Pirivatrić (SASA Institute for Byzantine Studies), the relevant conclusions were adopted. The decision that the work on the critical edition of Domentian's Life of Saint Sava (Žitije svetog Save) should be jointly organized by the Committee for Critical Editions of Serbian Writers, Committee for Chilandar and Committee for Byzantine Studies was confirmed. The critical edition will first include a short introductory essay by Professor Juhas Georgievski, based partly on the conclusions from her comprehensive essay on the same text that was published in the SASA Critical Editions of Serbian Writers Series (Series No. 5), and then the basic text of The Life of Saint Sava with its variations, in accordance with the customary critical edition standards, which will be edited by Professor Jovanović. The editor and the author of the introductory essay will try to finish their work in the spring of this year, thus enabling the preparation of the critical edition of Domentian's Life of Saint Sava for printing and publishing by the end of 2019. It was concluded that the above mentioned three Committees should organize a round table dedicated to Domentijan in the spring of 2020. The central topic should be Life of Saint Sava, based on this critical edition.

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

(Academician Milosav Tešić)

In early 2018, most associates worked on the *SASA Dictionary* (Rečnik SANU), including the proofreading of its 20th volume and preparation for printing. Later on, the volume was printed and presented to the public (at its well-attended presentation on 23 October, a welcome speech was given by Academician Vladimir S. Kostić, SASA President, while other speakers at the event were Academician Milosav Tešić and Dr. Rada Stijović, while Dr. Stana Ristić's contribution was read by Dr. Marija Djindjić).

In 2018, the work on the 21st volume of the *Dictionary* mostly included co-copyediting; five sections (out of 27, which are planned to be included in this volume) are undergoing copyediting, while one section is in the basic processing stage.

During the year, the 22nd volume of the *Dictionary* was undergoing basic processing.

As for card digitization (under the project titled *Preparation of the Digital SASA Dictionary Card Catalogue* /Izrada digitalnog kataloga listića Rečnika SANU), the following was done: about 6,000,000 cards were scanned; 1,629,400 cards were annotated with the relevant entries, including 221,500 different entries (until the end of the letter Š it is necessary to annotate another 381,108 cards and begin to annotate the cards from A to O). This work is mostly done by associates on a volunteer basis. The Serbian Ministry of Culture and Information allotted only 300,000 dinars for this work on the project.

The Committee used its own funds to finance the excerption of the latest sources for the compilation of the *Dictionary* and paid a portion of the honoraria to the retired associates who worked on its 21st volume.

In 2018, the Committee held one session (on 12 December) at which it the project leader informed it about the current status of the preparation of the *SASA Dictionary*. The Committee expressed its satisfaction over the announced possibility that the work on the 21st volume of the *SASA Dictionary* would be finished by the end of 2019.

During the professional discussion about the project, the Committee concluded that in the future all dialect materials should be more critically and more cautiously entered into the *Dictionary*, thus being significantly reduced.

COMMITTEE FOR RESEARCH IN LITERARY HISTORY

(Academician Zlata Bojović)

During the first months of 2018, the Committee members worked on the organization of the scientific meeting titled *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). At the scientific meeting, which was held on 24 and 25 April 2018, the participants presented more than thirty papers.

After the meeting, the members of its Organizing Committee were involved in the preparation and reviewing of the manuscripts before sending them for publication. The completely prepared collection of 29 papers received two positive reviews from the Department of Language and Literature and was submitted for publication. The viewers were Academician Nada Milošević Djordjević and Corresponding Member Slobodan Grubačić.

In the second half of the year, the Committee's work included the comprehensive elaboration of a plan for the successive treatment of the most important topics for the study of literary history over the coming years, so that they create the basis for writing an integral and comprehensive history of new Serbian literature. The Committee began preparations for the first scientific round table, which will be dedicated to the poetics and theory of Serbian literature. The round table will be held in November 2019.

Academician Miro Vuksanović published his novels **Perish the Thought** (Daleko bilo) and **Točilo** with the accompanying essays by S. Koljević, N. Vuković and J. Delić, in the second series of his *Selected Works* (Izabrana dela) (Štampar Makarije, Belgrade; Obodsko slovo, Podgorica; Hercegovina izdavaštvo, Trebinje).

In the first half of the year, Academician Zlata Bojović participated as the President of the Organizing Committee in the preparation and organization of the scientific meeting titled *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). The scientific meeting was held on 25 and 26 April 2018.

OLD SLAVONIC COMMITTEE

(Academician Jasmina Grković-Mejdžor)

In 2018, the main activity of the Old Church Slavonic Committee included the finalization of the Festschrift titled *Scala paradisi: In Memory of Academician Dimitrije Bogdanović (1986-2016)* (*Scala paradisi: akademiku Dimitriju Bogdanoviću u spomen /1986-2016/*), the first volume of the Series *Slavic and Serbian Middle Ages* (Slovenski i srpski srednji vek), and its preparation for printing. The Editorial Board includes 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. The Festschrift consists of 25 papers by authors from 9 countries and in 5 languages, and *Artistic Contributions* (Likovni prilozi), including Dimitrije Bogdanović's photographs and the selected images of his working manuscripts.

The Festschrift needed, inter alia, additional technical editing in accordance with the SASA requirements. All texts, including the artistic contributions, had to be carefully read, edited and equalized. The responsibility for this work laid with Dr Viktor Savić, Secretary of the Committee, and a technical editor of the Series.

The reviews were written by Anatoly Arkadyevich Turilov, foreign member of SASA, and Academician Jasmina Grković-Major, and accepted at the session of the Department of Language and Literature on 26 June 2018. The decision to publish the Festschrift was made by the Department at its session on 27 November 2018, and submitted for further action.

The second book that is prepared by the Committee is *An Introduction to Philology* (Uvod u filologiju) and *The Philology of the Serbian People. Notes from Ljubomir Stojanović's Lectures at the Higher School, School Year 1895/96* (Filologija srpskog naroda. Beleške sa predavanja na Velikoj školi Ljubomira Stojanovića, školske 1895/96). The persons in charge of book preparation are Jasmina Grković-Major and Viktor Savić. Due to a large volume of work and the need to make certain changes in its makeup, including specifically technical harmonization of the complete new series, the preparation of this book for publication had to be postponed until next year.

COMMITTEE ON FOLK LITERATURE

(Academician Nada Milošević-Đorđević)

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

It was suggested to have Professor Dr. Ljubinko Radenković, the newly elected Corresponding Member of SASA and Vice-President of the Vuk Endowment, replace the deceased Academician Svetozar Koljević in the Committee.

The Committee continued to carry out the project involving the digitization (photo scanning) of folk literary texts from the Ethnographic Collection of the SASA Archives, with the expert assistance of Branislav Tomić, BSc (Eng.). The scans were computer-processed and the files were labelled according to their signatures. The scans were then entered into the SETNO database. The photographs of individual texts with their titles and paginations were also excerpted. The decoding and retyping of the material is underway.

The material has 1,469 pages and includes the following collections:

Collection No. 50: Jovan Vorkapić, 1,059 p.

Collection No. 51: Luka Grdjić Bjelokosić, 147 p.

Collection No. 52: Dušan S. Popović – Momir, 263 p.

COMMITTEE FOR RESEARCH OF SERBIAN LANGUAGE REGARDING CONTEMPORARY LINGUISTIC THEORIES

(Academician Milorad Radovanović)

He published:

Where in Language Do We Find the Proof of Its Fuzziness? (Gde u jeziku nalazimo dokaze o njegovoj fazičnosti?): (The Study of Language in the Light of Fuzzy Logic) (Proučavanje jezika u svetlu fazi logike) // **Serbian Slavistics : Collective Monograph** (Srpska slavistika : Kolektivna monografija) : Volume I : Language (Jezik) / Editors Rajna Dragičević and Veljko Brborić. Belgrade : Federation of Slavist Societies of Serbia : Čigoja štampa, 2018, pp. 317–325.

Pavle Ivić: **Complete Works** (Celokupna dela), Vols. X/1-5: Debates, Essays, Articles (Rasprave, studije, članci): 2. On Dialectology (O dijalektologiji) // Copy Editor Milorad Radovanović / Editor Slobodan Remetić. Sremski Karlovci / Novi Sad: Izdavačka knjižarnica Zorana Stojanovića, 2018. (1. On the Problems of Dia-

lectological Theory; Linguistic Geography /O problemima dijalektološke teorije: Lingvistička geografija/, 2. From the History of Dialects; General Problems of Serbo-Croatian Dialects /Iz prošlosti dijalekata; Opšti problemi srpsk(ohrvatskih dijalekata/, 3. Debates and Articles About Shtokavian Speeches /Rasprave i članci o štokavskim govorima/, 4. Debates and Articles About Chakavian and Kajkavian Speeches /Rasprave i članci o čakavskim i kajkavskim govorima/, 5. Reports on Dialectological Studies; From Debates at Scientific Meetings; Presentations, Forewords, Afterwords/ (Izveštaji o dijalektološkim istraživanjima; Iz diskusija na naučnim skupovima; Promocije, predgovori, pogovori).

COMMITTEE FOR THE ETYMOLOGICAL DICTIONARY OF THE SERBIAN LANGUAGE

(Academician Aleksandar Loma)

a) Further work on the Fourth Volume of the Etymological Dictionary of the Serbian Language (Etimološki rečnik ERSJ) (*bl-bre*) included the additional excerption of dialectal sources — 0.86 author's sheets (M. Gmitrović), basic entry processing — 16 author's sheets (M. Vučković, J. Janković, M. Kalezić. O. Ligorio, S. Manojlović, Ž. Stepanović, A. Španović, M. Gmitrović), out of which whereby 11.98 author's sheets underwent the first redaction at the meetings of the whole team and 2.29 author's sheets underwent the second redaction. The Supplements to the Instructions for the Compilation of the Etymological Dictionary of the Serbian Language (Uputstva za pisanje ERSJ) were also made (A. Loma).

b) Further work on the *Reference Etymological Dictionary of the Serbian Language* (Priručni etimološki rečnik srpskog jezika) included the proofreading and expansion of the list of words for the first edition; preparation of the primary entry versions and the first redaction of entries. In the primary version 1.75 author's sheets were prepared (J. Vlajić-Popović, S. Petrović), while 1.92 author's sheets underwent the first redaction. The segments *A-B*, *L-O* were revised (A. Loma).

c) Participation in the project titled *Raskovnik: Serbian Lexicographical Portal for the Comparative Study of the Serbian Lexicon* (Raskovnik: srpski leksikografski portal i platforma za uporedna istraživanja srpske leksike), including the preparation of the digital editions of the following dictionaries: *Dictionary of the Dubrovnik Vernacular* (Rječnik dubrovačkog govora) by M. Bojanić and R. Trivunac, and ISBN: 978-86-82873-63-1 (S. Petrović, A. Španović, S. Manojlović).

d) The excerption of bibliographical sources and etymological literature continued.

e) Thanks to the efforts of ASARS Academician Slobodan Remetić, the five-volume set of the collected dialectological papers of Academician Pavle Ivić, the founder of the etymological project at the SASA Institute for the Serbian Language and the first President of the Committee, were published by Izdavačka knjižarnica Zorana Stojanovića. The Etymological Dictionary project associates who participated in this work included A. Loma as the translator of Ivić's articles from English, German and French, and Ž. Stepanović who created the index.

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COMMITTEE FOR THE COMPARISON OF THE SERBIAN LANGUAGE WITH OTHER LANGUAGES

(Academician Predrag Piper)

Published: Academician Zuzana Topolinska et alia, and Academician Predrag Piper et alia, **Language as the Record of Culture in an Ethnological and Linguistic Analysis Between Serbia and Macedonia** (Jezik kao zapis kulture u etnološkoj i lingvističkoj analizi na relaciji Serbia – Makedonija) (the project launched in 2015 became the SASA-MASA inter-academy project in 2017; the first volume was published in 2018 and its editors are Predrag Piper and Marjan Marković);

Radoslava Trnavac, **Text Coherence and Evaluation in the Serbian and Russian Languages** (Koherentnost i evaluacija u tekstu u srpskom i ruskom jeziku) (2018).

At the end of 2018, two projects were in the final phase:

Biljana Sikimić, Anna Plotnikova, **Pčinja. Ethnolinguistic Research in the South Slavic Context** (Pčinja. Etnolingvistička istraživanja u južnoslovenskom kontekstu). In 2018, the following was done: a complete revision of the transcripts of the speeches recorded in Pčinja, which provide a basis for the filled-in ethnolinguistic questionnaire (an integral part of the monograph), and the final revision of the filled-in ethnolinguistic questionnaire. The introductory and theoretical parts of the planned book were written. The work on the descriptive part of the monograph is underway.

Andrey Bazilevsky, Kornelija Ičin, **Serbian Poetry 10th-19th Centuries: An Annotated Anthology. The Comparative Text in the Serbian and Russian Languages** (Srpsko pesništvo X-XIX v.: Antologija sa komentarima. Uporedni tekst na srpskom i ruskom jeziku). This project is

the continuation of long-standing cooperation between the RAS Institute of World Literature (IMLI RAN) and the SASA Department of Language and Literature.

The following project is underway: Kornelija Ičin (project head), Nenad Blagojević, Ivana Kojić, **Aleksandar Belić and the Russian Émigrés in Interwar Belgrade** (Aleksandar Belić i ruska emigracija u Beogradu izmedju dva rata). Project associate Ivana Kojić stayed in Moscow from 23 to 30 June 2018 in order to do research on Russian cultural émigrés in Serbia.

INDIVIDUAL PROJECTS

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

(Academician Predrag Piper)

Works published in 2018:

Contributions to the History of Serbian Linguistic Slavistics: The Second Half of the 20th Century (Prilozi istoriji srpske lingvističke slavistike: Druga polovina XX veka), Belgrade: Čigoja, 2018, 466 p.

On Serbian Linguistic Slavistics of the Second Half of the 20th Century (O srpskoj lingvističkoj slavistici druge polovine XX veka). **Serbian Slavistics: Collective Monograph, Vol. 1, Language** (Srpska slavistika: kolektivna monografija, tom 1, Jezik). Editors Rajna Dragičević. Veljko Brborić – Belgrade: Federation of Slavist Societies of Serbia, 2018, pp. 7-37.

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

(Corresponding Member Slobodan Grubačić)

During the last two centuries, the relations between Serbs and Germans, especially after the international recognition of Serbia as an independent state (1878) and the unification of Germany into a nation state (1871), abounded in political and cultural influences that are evident not only in literature, but also in art and science. Although these relations were mostly asymmetrical because the German influence was undoubtedly more significant, the influence of Serbian culture on Germans and Germany did not vanish without a trace,

especially in the first half of the 19th century. The question to which we still have no unambiguous answer is how much these influences were driven by political and geostrategic interests and how much they were derived from an authentic cultural permeation. Therefore, it needs a comprehensive scientific and culturological approach that will encompass all cultural fields, laying special emphasis on literary influences.

The formation of a committee within the SASA Department of Language and Literature, which could be named “Committee on Serbian-German Literary and Cultural Relations”, would be the first step in a systematic and long-term research on the mutual permeation of the two cultures. As already mentioned, special emphasis would be laid on literary influences. The activities of this Committee would include:

- Meetings with clearly defined topics, which would be attended by domestic and German researchers. All presented papers would be published in the proceedings that would be printed after each meeting.
- Round table discussions on narrower topics, which would also be attended by German researchers. The authorized transcripts of these discussions would also be printed.
- Lectures to be held by invited German researchers, which would address specified topics.
- Setting up special library for publications dealing with Serbian-German cultural and literary relations.
- Setting up a hemerotheque in order to follow writings about Serbian-German cultural relations.

The President of this Committee could be Professor Slobodan Grubačić, Corresponding Member of SASA. In accordance with the SASA Statute, the “initial group of Committee members” would include Jovan Delić and Miodrag Loma.

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, including the *Serbian Dialectological Atlas* (SDA) (Srpski dijalektološki atlas /SDA/) and the domestic sector of the *European Linguistic Atlas* (ALE) (Evropski lingvistički

atlas /ALE) and *General Slavic Linguistic Atlas* (OLA) (Opšteslovenski lingvistički atlas /OLA/).

At one time, the Committee formed the commissions for ALE, OLA, OKDA and SDA in order to ensure more efficient work on the mentioned projects.

European Linguistic Atlas

Our representatives on the ALE Editorial Board (A. Loma and S. Petrović) were not invited to attend the 51st Meeting of the Editorial Board of the *European Linguistic Atlas* which, as we learned via Internet, was held in Baia Mare (Romania) from 27 June to 1 July.

General Slavic Linguistic Atlas

Since it was impossible to organize the next meeting of the International OLA Commission in Macedonia (2018) due to financial reasons, as was announced at the meeting in Slovakia, Slobodan Remetić, Chairman of the Serbian National Commission for OLA, was asked by the International OLA Commission whether the SASA and SASA Institute for the Serbian Language could organize a three-day meeting in Belgrade. Such a proposal was met with full understanding on the part of the SASA and SASA Institute for the Serbian Language, so that the Commission's three-day meeting was held in Belgrade in the aftermath of the 16th International Congress of Slavists from 28 to 30 August 2018.

During the previous year, in pursuing its responsibilities, defined at the regular annual session of the OLA International Commission and International Working Group within the International Committee of Slavists, which was held in Casta Papernicka, Slovakia, from 8 to 15 October 2017, the Serbian National Commission for the *General Slavic Linguistic Atlas* (Opšteslovenski lingvistički atlas) did the following:

1) Collected the answers to all questions for the volume *Горное оцветоводство* from eight national commissions (Slovakian, Bulgarian, Czech, Croatian, Macedonian, Russian, Ukrainian and Polish), and the answers to eight selected questions from three commissions (Belarusian, Bosnian and Herzegovinian, and Serbian);

2) Submitted the material for six supplementary questions for the volume *Народная техника. Транспорт и пути сообщения* to the Ukrainian National Commission;

3) Submitted the verified indices from the second series with 37 questions for the volume *Народная техника. Транспорт и пути сообщения* to the Ukrainian National Commission;

4) Verified the material for the volume *Рефлексы *а*, entrusted to the Belarusian National Commission for preparation, and submitted the comments on the Serbian material;

5) Submitted the completed table and coded material for card SI 1925 'жилистый' for the volume *Личные черты человека* to the Russian National Commission.

Serbian Dialectological Atlas

In 2018, there was the long-desired shift in the collection of linguistic materials in the Serbian vernaculars in the territory of Croatia. Linguistic materials were picked up from the refugees' vernacular at a number of research points, which was also done at one research point in Bosnia.

DEPARTMENT OF SOCIAL SCIENCES

COMMITTEE ON THE SOURCES OF SERBIAN LAW

(Academician Kosta Čavoški)

In early 2016, the work began on the 18th-century Romanian version of the transcript of Dušan's Code. The text was decoded, collated with the images and original manuscript. A complete transcription of the text and its Latin alphabet transliteration were also made. The Committee entrusted Dr. Monica Hutanu, Language Instructor at the Department of Romanian Language and Literature, University of Belgrade Faculty of Philology, with this assignment. In addition, she co-wrote an essay on the language of the Romanian translation of Dušan's Code with Adina Cyril, lecturer at the West University of Timișoara, in Romanian. The essay was translated into Serbian.

Dr. Biljana Sikimić, Scientific Advisor at the SASA Institute for Balkan Studies, translated Emperor Dušan's Code into the contemporary Serbian language, using the Latin alphabet transcription of the Romanian text and epitome from a later epithimial nomocanon.

Professor Dr. Djordje Bubalo wrote the greater part of the introductory essay, arguing that the Serbian text – on which the Romanian translation of Dušan's Code, including the extract from a later epithimial nomocanon, is based – falls into the group of the transcripts of Dušan's Code belonging to a more recent redaction, which is represented by Stefan Stojković's transcripts, namely, the Kovilj and Sofia transcripts. Since this edition will be prepared in such a way that the Serbian text, based on the mentioned transcripts, will have its Romanian translation on the opposite page, and that the Kovilj transcript of Dušan's Code was already included in Volume IV of the manuscript of Dušan's Code, Professor Bubalo transcribed the extracts from a later epithimial nomocanon on the basis of the Kovilj transcript, including the Sofia transcript variations.

The Committee plans to publish the monograph titled “Dušan’s Code and the Extracts from a Later Epithemial Nomocanon in 18th Century Romanian Translation” (Dušanov zakonik i izvodi iz mladjeg epitimijinog nomokanona u rumunskom prevodu 18. veka) in 2019.

In early 2017, work began on the preparation of the Critical Edition of the Abridged Syntagm of Matija Vlastar (Kritičko izdanje Skraćene sintagme Matije Vlastara). It was entrusted to Professor Dr. Djordje Bubalo, a member of the Committee. So far, the following has been completed:

- Research into the history of studying the Syntagm and work on its publication;
- Collection of the images and making of transcripts from the manuscript of the Complete and Abridged Syntagm;
- Textological studies of some transcripts of the Abridged Syntagm.

In 2018, in preparing the Critical Edition of the Abridged Syntagm, the major efforts were directed towards acquiring the images of the transcripts of the Complete and Abridged Syntagm, but they only had partial success.

At the proposal of Academician Sima Ćirković, the Committee for the Sources of Serbian Law entrusted Dr. Dušan Sindik with decoding the last part of the Baranja Compendium – *Short Church Law Documents of Dušan’s Reign* (Kratki crkveno-pravni spisi Dušanove vladavine) and translating it into the contemporary language. The author also had to write the Introduction and Annotations as he deemed necessary. The work on this project lasted a number of years. In the meantime, Dr. Sindik’s health condition deteriorated and he passed away last year. The Committee received the original decoded text and 78-page translation with 59 annotations. It was agreed that Dr. Viktor Savić should write down what had been done and list all documents and their enclosures. Thereafter, the material would be filed in the archive of the Committee.

Under the project titled **Two Centuries of Serbian Constitutionality** (Dva veka srpske ustavnosti), Kosta Čavoški’s book *Justice and Fairness* (O pravdi i pravičnosti) was presented at the SASA Forum.

Viktor Savić, Mirjana Živojinović, *Composed Chrysoboulloi of Kings Uroš II Milutin and Stefan Dušan to Chilandar Monastery. A Contribution to Serbian Diplomacy* (Zbirne hrisevolulje kraljeva Uroša II Milutina i Stefana Dušana manastiru Hilandar. Prilog srpskoj diplomaciji), **Zbornik radova Vizantološkog instituta**, 54, 2017, pp. 213–250.

Ljubomirka Krkljuš, **Konstantin Bogdanović (1811–1854)**, Novi Sad 2018, 280 p.

Ljubomirka Krkljuš, *The May Assembly – In Its and Our Times* (Majska skupština – u svom i našem vremenu), **Letopis Matice srpske**, 2018, pp. 142–160.

COMMITTEE ON PHILOSOPHY AND SOCIAL THEORY

(Academician Aleksandar Kostić)

In 2018, the SASA Committee for Philosophy and Social History made preparations for the fifth scientific meeting titled “State Order: Sovereignty in the Era of Globalization“ (Državni poredak: suverenitet u vremenu globalizacije) within the cycle “Strategic Development Trends of Serbia in the 21st Century“ (Strateški pravci razvoja Srbije u XXI veku). It will be held on 8 and 9 February 2019. The Committee also made preparations for the scientific meeting dedicated to Dragoljub Jovanović 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). It will be held on 8 March 2019.

In 2018, **Proceedings of the Scientific Meeting on “Economy: Labour and Employment in Serbia in the 21st Century“** (Zbornik radova sa skupa „Ekonomija: zaposlenost rad u Srbiji u XXI veku“) came out. This scientific meeting was held in December 2017 within the cycle “Strategic Development Trends of Serbia in the 21st Century” (Strateški pravci razvoja Srbije u XXI veku).

COMMITTEE FOR THE STUDY OF POPULATION

(Academician Časlav Očić)

In 2018, the members of the Committee worked on two long-term projects: “Serbian Demographic Bibliography:” (Srpska demografska bibliografija) and “Methodology of Historical Demography” (Metodologija istorijske demografije). Work on the project “Demographic Future of Serbia” (Demografska budućnost Srbije) continues. After the discussion on this topic it was concluded (at the proposal of Professor Dr. Branislav Djurdjev, a member of the Committee for the Study of Population) that (due to the Committee’s shortage of funds) the topic should be narrowed to “Adjusting to the Demographic Future of Serbia” (Prilagodjavanje demografskoj budućnosti Srbije). The starting points (project assignment) for the topic (dedicated primarily to ageing issues) were formulated by Professor Djurdjev, who was appointed as project leader.

In 2018, the Committee for the Study of Population (together with the Committee on Economic Science) continued to give lectures, present books and organize workshops and round tables dedicated to different demographic, economic and related topics.

COMMITTEE ON ECONOMIC SCIENCE

(Academician Časlav Očić)

In 2018, the Committee on Economic Science (CES) finished the preparations for publishing the phototype edition of the journal *Ekonomist* (1912, 1913 and 1914). This important edition could be submitted for printing in the first half of 2019 as soon as the introductory essay is completed with the appropriate scientific apparatus, since much of the text (960 pages) has already been made up. The CES proposed that this publication (as a special and possibly co-published edition) should be entered into the 2019 publishing plan.

As for its monographs, the work on Serbian economic bibliography for the interwar period (1918–1941) was completed for most years. It could be prepared for printing by September 2019 (*Ekonomski zbornik /Economic Proceedings/, Vol. 16*).

The Committee on Economic Science also continued to work on other long-term (previously adopted) projects, primarily under the multidisciplinary and strategic umbrella project titled *The Future of Serbia*), which is of utmost importance for it. The subproject titled “Economic and Social Aspects of the Kosovo and Metohija Problem: Its Roots and Alternative Solving Outcomes” (*Ekonomski i socijalni aspekti kosovsko-metohijskog problema: koreni i alternativni ishodi rešavanja*) was elaborated and a round table discussion on the same topic was planned.

Finally, toward December 2018, the proceedings of the scientific conference on the economic crisis (*Economic Crisis: Its Origins and Outcomes /Ekonomska kriza: poreklo i ishodi/*. Editor Časlav Očić, Serbian Academy of Sciences and Arts, Department of Social Sciences, Committee on Economic Science, VIII, 479 p., Belgrade 2018) came out. These proceedings were printed in the *Ekonomski zbornik Series* (Vol. 14), the only legitimate SASA series which publishes the contributions in the field of economic science or, more exactly, the results of the work of the members and associates of the Committee on Economic Science.

In 2018, the Committee on Economic Science addressed the following issues at its sessions:

1. The updating of the membership data in order to ensure smooth communication; official web-site of the Committee; publications about the Committee, etc.;
2. Initiating the procedure for founding the economic science institute within the SASA;

3. *Srbija 2040* (Serbia 2040) brochure – considering the project assignment and its suitability as the basis for scientific research in the field of economic science at the SASA.

COMMITTEE FOR THE STUDY OF LIFE AND CUSTOMS OF THE ROMA

(Academician Tibor Varady)

In 2018, the Committee held five meetings, worked according to its plan and performed the following activities:

On 6 March 2018, it successfully organized the presentation of the proceedings titled “Habitation of Roma in Serbia: Status and Challenges” (Stanovanje Roma u Srbiji: stanje i izazovi) within the SASA Forum.

The Committee published two proceedings titled “Serbian Roma in the 21st Century” (Romi Srbije u 21. veku) and “The Preservation, Protection and Perspectives of the Roma Language in Serbia” (Očuvanje, zaštita i perspektive romskog jezika u Srbiji).

The presentation of the book “I Asked a Small Snail – My Sociological Story About Šaban Bajramović” (Pitao sam malog puža – moja sociološka priča o Šabanu Bajramoviću) by Dragoljub B. Djordjević was successfully organized on 15 June 2018.

The Committee also successfully organized the following professional lectures:

- “Documenting the Speech of Roma Children” (Dokumentovanje romskog dečjeg govora), delivered by Dr. Mirjana Mirić on 10 April 2018;
- “Roma Tribulation in World War I” (Stradanje Roma u Prvom svetskom ratu), delivered by Dr. Dragoljub Acković on 2 October 2018. .

On 25 October 2018, the Committee successfully organized the round table titled “Cultural Policies of Roma” (Kulturne politike Roma). The introductory speeches were delivered by Dr. Zoran Todorović and Dr. Dragoljub Acković.

At the invitation of the Union of Romanian Architects, Professor Dr. Vladimir Macura and Dr. Zlata Vuksanović-Macura participated in the 13th National Architecture Biennale in Bucharest. Within this event, they staged the exhibition titled “Space & Informality & Metaphors”.

Serbian Roma in the 21st Century (Romi Srbije u 21. veku), Tibor Várady (ed.), Belgrade: SASA, 2018, 200 p.

The Preservation, Protection and Perspectives of the Roma Language in Serbia (Očuvanje, zaštita i perspektive romskog jezika u Srbiji), Academician Tibor Várady and Dr Biljana Sikimić (eds.), Belgrade: SASA, 2018, 327 p.

Biljana Sikimić (ed.), **The Language and Tradition of the Roma in Knjaževac** (Jezik i tradicija knjaževačkih Roma), Knjaževac: Narodna biblioteka "Njegoš", 2018.

Vladimir Macura, Zlata Vuksanović-Macura, The right to housing: squatter settlement in interwar Belgrade – defense and demolition of Jatagan-mala, **Journal of Urban History**, 44 (4), 2018, 755–774.

Vladimir Macura, Slums – how to tackle the phenomenon? Experiences from Serbia. In: **Housing Forum 2018**, Bucharest: Habitat for Humanity Romania, 2018.

Goran Bašić, Ksenija Marković, Social Status of the Roma in Serbia – Demographic aspects in Public Multiculturalism Policies, **Stanovništvo**, Belgrade, 2018, 1–19.

Dragan Todorović, Protestantization of Roma from Southeastern Serbia. **Occasional Papers on Religion in Eastern Europe** 38, 1 (2018): 92–118.

Rajko Đurić, Die Morgendaemmerung der Worte, **Moderner Poesie – Atlas der Roma und Sinti**, Die Andere Bibliothek, Berlin 2018.

COMMITTEE FOR THE PREPARATION OF SCIENTIFIC CONFERENCE "PHILOSOPHY BETWEEN THE EAST AND THE WEST"

(Academician Danilo Basta)

The Committee held five sessions, two of which were e-sessions.

In 2018, due to the approaching 200th anniversary of Karl Marx's birth, the Committee timely considered the possibilities for marking this significant event, which is evidenced by the minutes of the meeting held on 5 March 2018. Unfortunately, the Committee was forced to conclude that there were no necessary prerequisites (including specifically an adequate number of competent authors) for a successful realization of this idea. Thus, it had to be abandoned.

During the year, the Committee was mainly focused on the book titled *Philosophy in the Academy Editions. Bibliography and Chrestomathy* (Filozofija u izdanjima Akademije. Bibliografija i hrestomatija), which was prepared by SASA Librarian Sanja Stepanović Todorović and Professor Dr. Ilija Marić. The Committee strongly supported the work on this precious book from the very beginning. Thus, it decided to earmark its modest 2018 funds

for its publishing in the “Philosophy Between East and West” Series of Dosije Studio in Belgrade. As the sixth volume of this series, the book will come out by the end of 2018.

Prof. Dr. Ilija Marić:

Ilija Marić, Sanja Stepanović Todorović, **Philosophy in the 1841-1941 Academy Editions. Bibliography and Chrestomathy** (Filosofija u izdanjima Akademije 1841-1941. Bibliografija i hrestomatija), Belgrade: Dosije studio, 2018, 384 p.

Prof. Dr. Časlav Koprivica:

Homo maximus. Elements of the Philosophy of Sport (Homo maximus. Elementi filozofije sporta), Belgrade: Ukronija, 2018, 442 p.

The Serbian Path. Experiences of Understanding Verisimilitude in Times of Great Trouble (Srpski put. Iskustva razabiranja istinolikosti u nedoba duboke smutnje), Belgrade: Catena mundi, 2018, 445 p.

Prof. Dr. Radosav Pušić:

Confucius Institute Almanac XV – XVI (Almanah Instituta Konfucije XV – XVI), Faculty of Philology in Belgrade, Confucius Institute, Belgrade, 2018, pp. 1-331.

Academician Aleksa Buha:

He prepared the book containing his philosophical and political writings for publishing. It will come out in 2019 and its publisher is the Academy of Sciences and Arts of the Republic of Srpska (ASARS).

COMMITTEE FOR STUDYING MINORITIES AND HUMAN RIGHTS

(Academician Tibor Varady)

In early 2015, the Committee initiated the topic of “Tzintzars in Serbia, Identity and Cultural Exchanges” (Cincari u Srbiji, identitet i kulturna razmena) in cooperation with the Lunjina Serb-Tzintzar Society. Its aim is to address the topics of significance for the study of Tzintzars in Serbia and the phenomenon of their near-disappearance from its ethnic map despite their great influence on Serbia’s civic culture and economy in the 18th and 19th centuries, through scientific forums/lectures. During the past years, 13 public expert lectures dedicated to the language, culture, identity, history and current

status of Tzintzars were held. In 2018, the Committee started preparing the relevant proceedings for publication. Within this topic it also launched a long-term research project in cooperation with the SASA Ethnographic Institute and Lunjina Serb-Tzintzar Society. The project titled **Family Memory and Cultural Heritage: Aromanians (Tzintzars, Vlachs) in Serbia and Macedonia** (Porodično pamćenje i kulturno nasleđe: Armani /Cincari, Vlasi/ u Srbiji i Makedoniji) will be realized within Inter-Academy Cooperation with the Macedonian Academy of Sciences and Arts.

On 27 November 2017, the Committee successfully organized the round table on “The Rights of National Minorities in the Constitutional and Legal System of the Republic of Serbia” (Prava nacionalnih manjina u ustavno-pravnom sistemu Republike Srbije). In 2018, it started preparing the Round Table Proceedings for publication.

On 11 December 2017, the Committee successfully organized the round table on “The Status of the Serbian National Minority in the Neighbouring Countries” (Položaj srpske nacionalne manjine u susednim zemljama). It was planned to publish the relevant proceedings.

On 9 and 10 November 2018, on the occasion of the 70th anniversary of the Universal Declaration of Human Rights and the 30th anniversary of the SASA Committee for Human and Minority Rights, the Committee successfully organized the international scientific conference titled “Human Rights in the 21st Century” (Ljudska prava u 21. veku). Its participants were prominent professors and experts from the United States, Russia, Japan, Britain, Germany, Turkey, Belgium, Italy, the Netherlands, Hungary, Bulgaria, Croatia and Montenegro. The conference was also attended by numerous Serbian experts. The Committee plans to prepare and publish the Conference Proceedings in 2019.

Goran Bašić, Policy of Multiculturalism in Serbia: Between Legal Confusion and Social Segregation, **Multiculturalism in Public Policies**, eds., Goran Bašić, Siniša Tatalović, Mitja Žagar, Institute of Social Sciences, Faculty of Political Sciences, Institute for Ethnic Studies, Beograd, Zagreb, Ljubljana, 2018, 62–96.

Goran Bašić, Ivana Stjelja, Media Reporting National Minorities in Serbia – The Role of Independent Institutions, **Yearbook Human Rights Protection, From Unlawfulness to Legality**, No. 1, Institute of Criminological and Sociological Researches & Provincial Ombudsman, Novi Sad, 2018, 295–315.

Dragoljub B. Đorđević, Danijela Gavrilović, Religionization of Public Space: Symbolic Struggles and Beyond –The Case of Ex-Yugoslav Societies, **Religions**, 9, 2018, no. 2, 36.

Marijana Pajvančić, Amendments to the Constitution of the Republic of Serbia – Comments about Provisions on Courts, **Testimony Preparation for the Changes to the 2006 Constitution and the Legal Profession**, The Judges’ Association of Serbia, Belgrade, 2018, 231–244.

DEPARTMENT OF HISTORICAL SCIENCES

COMMITTEE ON THE HISTORY OF ART

(Corresponding Member Miodrag Marković)

During 2018, the members of the Committee worked intensively on collecting and publishing materials for the *Corpus of the Monuments of Serbian Medieval Art* (Korpus spomenika srpske srednjovekovne umetnosti). In the realization of this project they cooperated with the scientific associates and researchers of the Institute of Art History, University of Belgrade Faculty of Philosophy. As planned, emphasis was laid on the destroyed, damaged and highly threatened monuments in Kosovo and Metohija. The first volume of the *Corpus*, dedicated to the Church of Saint George at Rečani, which was destroyed during the 1999 pogrom, was completely prepared for publication. At the same time, the monograph on the Jašunja monasteries was completed and prepared for publication (Academician G. Subotić).

Some members of the Committee carried out field research on the monuments of medieval art in Serbia (Gradac, Žiča) and Greece (Monastery of St John the Forerunner on Mt Menoikeion near Serres, the Athonite Monasteries of Chilandar, Simonos Petra, St Paul, Vatopedi, Iviron, Koutloumousiou and Dionysiou, and the Churches of Protaton and Molyvokklesias in Karyes). The collected data were processed and systematized.

CHILANDAR COMMITTEE

(Academician Mirjana Živojinović)

DJORDJE BUBALO published his paper “Dragutin Anastasijević on Mount Athos 1906/7 and 1912” (Dragutin Anastasijević na Svetoj Gori 1906/7.

i 1912. godine), **Chilandar Proceedings** (Hilandarski zbornik), 14 (2017; published in 2018), pp. 233–307.

MIRJANA ŽIVOJINOVIĆ continued her work on the Chilandar Committee's projects "Greek Acts of Chilandar Monastery" (Grčki akti manastira Hilandara) and, in cooperation with Viktor Savić, "Royal Charters of the Nemanjić Dynasty in the Chilandar Monastery Archives" (Vladarske povelje dinastije Nemanjića u Arhivu manastira Hilandara).

ALEKSANDAR LOMA – See about his work in the reports for the *SASA Almanac* (Godišnjak SANU) and *SASA Bulletin* (Bilten SANU).

BOJAN MILJKOVIĆ finished the book *The Inscriptions of Chilandar Monastery, I (14th – 17th Centuries)* (Natpisi manastira Hilandara, I /XIV–XVII vek) in cooperation with Gojko Subotić.

SRDJAN PIRIVATRIĆ participated in the Third International Scientific Workshop of the Mount Athos Centre in Thessaloniki, 7-9 December, with the statement "An Anathema on Stefan Dušan and Mount Athos" (Anatema Stefana Dušana i Sveta Gora) and the International Scientific Conference hosted by the Faculty of Orthodox Theology in Belgrade, 10-14 December, with the statement "Church Conditions in the Byzantine World at the Time of the Establishment of the Archbishopric in 1219. A Contribution to the Study of the Problem" (Crkvene prilike u vizantijskom svetu u vreme osnivanja arhiepiskopije 1219. Prilog proučavanju problema).

ZORAN RAKIĆ published the paper titled "The Eighteenth Century Wall Paintings in the Chilandar Monastery – Iconographic and Stylistic Characteristics", **Chilandar Proceedings** (Hilandarski zbornik), 14 (2017; published in 2018), pp. 217–231.

VIKTOR SAVIĆ published the following papers: "The Scribe of Chilandar Charter No. 139/141 and the Chrysobull of St Stephen. Palaeographic and Philological Analysis" (Pisar hilendarske povelje broj 139/141 i Svetostefanske hrisovulje. Paleografsko-filološko razmatranje). **Contributions for Literature, Language, History and Folklore** (Prilozi za književnost, jezik, istoriju i folklor), LXXXIII (2017), pp. 131–142; "Are 'Abbatial Monasteries' Mentioned in the Chilandar Typikon?" (Pominju li se 'igumanski manastiri' u Hilendarskom tipiku?), **Chilandar Proceedings** (Hilandarski zbornik), 14 (2017; published in 2018), pp. 19–27.

GOJKO SUBOTIĆ published: "Who Were Nuns Jefimija and Evpraksija from the Inscription on the Epitaphios of Putna Monastery?" (Ko su bile monahinje Jefimija i Evpraksija iz natpisa na plaštanici manastira Putne?), **Glas SANU CDXXVIII, Festschrift in Memory of Academician Milorad Ekmečić** (Zbornik radova posvećen akademiku Miloradu Ekmečiću), Department of Historical Sciences, Vol. 18 (2018), pp. 51–62; in memoriam –

“In Memory of Friend. Academician Dr Cvetan Grozdanov (1936-2018)” (U sećanju na prijatelja. Akademik dr Cvetan Grozdanov /1936-2018/), **Niš and Vizantija** (Niš i Vizantija), XVI (Niš 2018), pp. 505–508.

ALEKSANDAR FOTIĆ published the following papers: “From Mount Athos Stories: An Unusual “Union” between Hilandar and St Panteleimon in the 16th and 17th Centuries”, **Facta Universitatis, Series: Philosophy, Sociology, Psychology and History**, 17/2 (2018), 119–125.

IRENA ŠPADIJER published the following papers: „Функционалност српске књижевности XIII века – хагиографски и химнографски списи посвећени светом Симеону“, **XVI Међународни сјезд славистов Белград**, Србија, 20–26 августа 2018 г. Материјали тематичког блока 2.2: Функционалност славјанске књижности, 20–27; „Антолошки састав хиландарске рукописи № 505, Бугарско царство“, **Сборник в чест на 60-годишнината на доц. д-р Георги Н. Николов**. От ред. А. Николов, Софија 2018, 815–827.

DEJAN DŽELEBDŽIĆ published the paper “Two Unpublished Homologoi Concerning the Chilandar Cell of the Holy Archangels in Karyes” (Dve neiz-date isprave o hilendarskoj keliji Svetih Arhandjela u Kareji), **Chilandar Proceedings** (Hilandarski zbornik), 14 (2017), pp. 123-133.

SZENTENDRE COMMITTEE

(Academician Dinko Davidov)

During 2018, the Committee collected papers for the fifth issue of the *SASA Szentendre Proceedings* (Sentandrejski zbornik SANU). The received papers underwent peer review. As planned, the *Proceedings* should be editorially prepared for printing in mid-2019.

COMMITTEE ON THE HISTORY OF THE SERBS IN CROATIA

(Academician Vasilije Krestić)

In 2018, *Proceedings on Serbs in Croatia* 12 (Zbornik o Srbima u Hrvatskoj, knj. 12) were prepared for publication.

During 2019, we will try to collect contributions for Issue No. 13.

**COMMITTEE FOR THE STUDY OF THE CREATION
OF THE KINGDOM OF SERBS, CROATS AND SLOVENES
1914–1918**

(Academician Ljubodrag Dimić)

During 2018, the members of the Committee made preparations for the scientific meeting dedicated to the end of the First World War and the creation of the Yugoslav state. This scientific meeting was held at the end of December 2018 and was highly professionally evaluated.

**COMMITTEE ON THE HISTORY OF THE SERBS
IN XIX CENTURY**

(Corresponding Member Slavenko Terzić)

During 2018, the activities of the members and associates of the Committee mostly included the preparation of *The Diary of Milan Dj. Milićević* (Dnevnik Milana Dj. Milićević) for publication. Scientific Advisor Petar V. Krestić worked on the preparation of the third volume of Milićević's "Diary" (6 April 1877 – 31 March 1882). An associate collated the typed text with the original manuscript. In 2018, Scientific Advisor Dr. Aleksandar Rastović began with a critical editing of the fourth volume of "The Diary of Milan Dj. Milićević" (1 April 1882 – 1 January 1892). Apart from a linguistic and grammatical clarification, the author also worked on the annotations below the basic text. Some members of the Committee presented the results of their research on 19th century Serbian history at the scientific conferences held by the SASA and other scientific institutions.

VARDAR COMMITTEE

(Corresponding Member Slavenko Terzić)

During 2018, the Committee continued to collect contributions for Volume XII of *Vardar Proceedings* (Vardarski zbornik), which were launched by the late President of the Vardar Committee, Academician Vladimir Stojančević. It continued collecting contributions, although its work was slowed down due to the absence of the newly appointed President from the country and the impossibility of assigning this task to some of the remaining

members due to a reduced work-related activity. The group of the current associates belonging to the younger and middle generations continued to prepare papers that will be offered for the *Vardar Proceedings*. Research was conducted in the domestic archives as well as the Archive of Foreign Policy of the Russian Empire and Russian State Archive of Social and Political History in which, in the file on Josip Broz Tito and J.V. Stalin and V. Molotov's personal archives, there are the sources pertaining to that part of the former Kingdom of Serbia and then the Yugoslav state.

COMMITTEE ON THE HISTORY OF BOSNIA AND HERZEGOVINA

(Corresponding Member Slavenko Terzić)

During 2018, the collection of materials for the *Proceedings for the History of Bosnia and Herzegovina* was slowed down considerably due to both the absence of the newly appointed President of the Committee from the country and the illness or death of some members of the Committee. Nevertheless, the members of the Committee continued to conduct their own research, the results of which were published in other editions or presented at the scientific conferences hosted by the SASA or other similar scientific meetings. Some members of the Committee contributed to the marking of the 140th anniversary of the occupation of Bosnia and Herzegovina and the 110th anniversary of the annexation of this territory. Due attention was also devoted to some aspects of the 100th anniversary of Bosnia and Herzegovina's unification with the Yugoslav state.

COMMITTEE ON THE HISTORY OF THE 20TH CENTURY

(Academician Ljubodrag Dimić)

During 2018, the members of the Committee were involved in the preparation of the scientific meeting dedicated to the end of the First World War and the creation of the Yugoslav state. The scientific meeting was held in late November 2018.

In 2019, the members of the Committee will be involved in peer-reviewing of the scientific papers presented at the scientific meeting titled "The End of the War, the Serbs and the Creation of Yugoslavia" (Kraj rata, Srbi i stvaranje Jugoslavije), and the preparation of the proceedings bearing the same name for publication.

COMMITTEE ON THE HISTORY OF THE SERBIAN-RUSSIAN RELATIONS

(Academician Mihailo Vojvodić)

In 2018, the Committee established cooperation with the Institute of Russian History of the Russian Academy of Sciences, which resulted in the participation of its associates in a scientific meeting in Moscow in October 2018, and the participation of Russian colleagues in the large international scientific meeting titled *The End of the War, the Serbs and the Creation of Yugoslavia* (Kraj rata, Srbi i stvaranje Jugoslavije), held at the SASA in November 2018.

In addition, the representatives of the Committee and SASA Executive Board and their colleagues from the Institute of Russian History of the Russian Academy of Sciences held several meetings dedicated to their future cooperation.

ACADEMIC COMMITTEE FOR KOSOVO AND METOHİJA

(Academician Mihailo Vojvodić)

During 2018:

- The Committee held one session (21 June 2018);
- The members of the Committee carried out field research in Kosovo and Metohija: Professor Dr. Radivoje Mladenović collected materials for the monograph *The Speech of Sirinička Župa* (Govor Siriničke Župe) in the villages of Sirinička Župa from 15 to 29 July and from 3 to 18 September 2018;

Dr. Rada Stijović carried out dialectological research in the villages belonging to the municipalities of the Kosovska Mitrovica and Zubin Potok from 13 to 24 July 2018;

The Committee collected papers for the 8th volume of *Kosovo and Metohija Proceedings* (Kosovsko-metohijski zbornik) which, according to plan, should come out in 2019 (so far, only two dialectological papers have been received);

The 7th volume of the *Kosovo and Metohija Proceedings* was presented at the SASA Library Forum (6 November 2008); the speeches were given by SASA Academician Mihailo Vojvodić and SASA Corresponding Member Miodrag Marković.

COMMITTEE FOR BYZANTINE STUDIES

(Academician Ljubomir Maksimović)

During 2018, the members of the Committee 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 in the SASA Institute for Byzantine Studies. The detailed reports on this research 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 the convergent approach of all SASA Byzantological potentials. The Committee was especially active in the preparation of the proceedings of the SASA scientific forum on the proclamation of the kingdom in 1217 and the scientific meeting dedicated to the proclamation of the archbishopric in 1219. The thematic collection of 20 papers is prepared for submission to the SASA Publishing Service, according to the current publishing plan.

The publications of the members of the Committee are listed in the report on the activities of the SASA Institute for Byzantine Studies for 2018.

The statements of the members of the Committee are included in the report on the activities of the SASA Institute for Byzantine Studies for 2018.

Project: **MATERIAL FOR THE HISTORY OF THE SERBS IN CROATIA AND SLAVONIA**

(Academician Vasilije Krestić)

In 2018, he finished this comprehensive book titled *Material on Serbo-Croatian Relations and the Serbs in Croatia (1848-1941)* (Gradja o srpsko-hrvatskim odnosima i Srbima u Hrvatskoj (1848–1914)). The book will be published by the SASA and the Archive of Serbia.

Project: **MONASTERY OF ST JOHN THE FORERUNNER IN JAŠUNJA**

(Academician Gojko Subotić)

The work on the project *The Monastery of Saint John the Forerunner at Jašunja* (Manastir Svetog Jovana Preteče u Jašunji) was finished. The text was

sent to the co-author, Professor Dr. Michitaka Suzuki, for translation, since the integral version of the monograph will be published both in Serbian and Japanese. In 2018, the funds were spent on the preparation of the monograph for printing (digital document processing and makeup). If the Japanese translation of the text is finished on time, the book will be submitted for printing during 2019.

Project: **EUROPE AND SERBIA IN THE MIDDLE AGES**

(Academician Jovanka Kalić)

In 2018, research on medieval Serbian statehood continued, which is important because of wrong interpretations of some essential facts. In addition, the subject of research was the wider attitude of the Catholic Church towards the Serbs in the country and abroad, especially in Hungary or, more precisely, the border regions. The study “Old Ras in History and Science” (Stari Ras u istoriji i nauci), which covers both topics, was finished.

Jovanka Kalić gave the speech titled “Vladimir Ćorović, Historian and Author” (Vladimir Ćorović, istoričar i pisac) upon receiving the award bearing the same name at the SASA on 28 November 2018.

Project: **SERBS IN HUNGARY – CULTURAL PAST**

(Academician Dinko Davidov)

During 2018, he mostly organized his notes and the materials relating to the art of the Eparchy of Buda.

Project: **THE MEMO OF THE ACCOUNT BOOKS OF THE KABUŽIĆ BROTHERS**

(Academician Desanka Kovačević-Kojić)

During 2017, I continued to transcribe and study the contents of the account books sent from Venice to the Kabužić brothers in Dubrovnik, preserved in the Dubrovnik Archives and so far unpublished.

The article *Double-Entry Bookkeeping in Dubrovnik and Benko Kotruljević (New Views)* (Dvojno knjigovodstvo u Dubrovniku i Benko Kotruljević /novi pogledi/) was published in the Festschrift in memory of the late Milorad Ekmečić (**Glas** 428, SASA Department of Historical Sciences, 18, 19–35).

The article *Serbian Silver in the Mint of Venice* (Srpsko srebro u kovnici novca u Veneciji) was submitted for publishing in the annual journal *Balcanica* of the SASA Institute for Balkan Studies. This article is mostly based on the study of the contents of the account books sent from Venice to the Kabužić brothers in Dubrovnik.

Project: **SERBIA AND ITALIAN STATES
IN THE LATE MIDDLE AGES**

(Academician Momčilo Spremić)

Continuing my work on the project, I studied the Venetian material relating to 15th century Serbian history. The extinction of the sacrosanct Nemanjić dynasty unleashed a conflict within the nobility over the succession to the Serbian throne. After Despot Jovan Uglješa and King Vukašin were killed in the Battle of Marica in 1371, the Mrnjavčević family dropped out of the political battle. Thereafter, the leading role was played by the Lazarević and Branković families. Despite being related to each other by marriage, they had separate states and separately paid tribute to the Turkish sultan. They were in conflict until 1412 when, according to Constantine the Philosopher, they were reconciled with each other. Thanks to Venetian sources, I studied their later relationship, which can best be understood on the basis of the Serbian-Venetian peace negotiations that were held between 1423 and 1427. By Despot Stefan's authorization, the negotiations with the Venetian representatives were conducted by the son of his sister, "Master" Djuradj Branković. In a delicate game of diplomacy, he was increasingly acting as the representative of the Serbian side, ignoring his uncle, Despot Stefan. Finally, he also included his children in these negotiations, although only one daughter remained. According to Venetian sources, he was preparing his family for the ruling position in the Serbian Despotate due to the fact that Despot Stefan was childless. Thus, Venetian sources elucidate an important segment of 15th century Serbian history. I elaborated on this topic in my paper "Le Despot Stefan Lazarevic et 'Sieur' Djuradj Brankovic". *Balcanica*, 45 (2015), pp. 145–163.

Project: **STATE AND SOCIETY IN BYZANTIUM**

(Academician Ljubomir Maksimović)

In 2018, I could devote only minimum attention to the project due to my increasingly complex tasks and responsibilities as the SASA Vice-President both at home and abroad. This is, unfortunately, the third consecutive year that I cannot devote enough attention to the project.

Project: **FONTES – THE GREEK ACTS OF THE CHILANDAR MONASTERY, VOL. III (14TH-15TH CENTURY)**

(Academician Mirjana Živojinović)

The revision of the documents (81 acts) for the period 1318-1335 is nearing completion. I expect my associate to send me the introductory essay, so that I can take a look at it before sending the manuscript for publication.

It is planned to continue work on Greek acts and write the introductory essay.

Project: **STOJAN NOVAKOVIĆ IN THE POLITICS OF SERBIA**

(Academician Mihailo Vojvodić)

The writing of the book, based on the collected materials, archival documents and other sources, has been finished. Underway is its preparation for printing.

Project: **YUGOSLAVIA AND THE SOVIET UNION. SUMMIT MEETINGS**

(Academician Ljubodrag Dimić)

In 2018, I conducted research primarily at the Archives of Yugoslavia and the Diplomatic Archive of the Ministry of Foreign Affairs of the Republic of Serbia. The main aim was to finish my research and the manuscript bearing the same name until the end of 2019. I also plan to publish several papers that are related to the project topic.

Project: **EUROPE AND THE SERBS IN THE SECOND HALF OF THE
19TH AND EARLY 20TH CENTURIES**

(Corresponding Member Slavenko Terzić)

I continued archival research at the Archive of Foreign Policy of the Russian Empire. I previously finished my research on the work of the Russian Consulate in Scutari from its opening in 1857 until the early 20th century. This year, I finished my research on the work of the Russian Vice-Consulate in Prizren from its opening in 1866 until 1912. In addition, I carried out short research and started copying the relevant archival materials in the Russian State Archive of Social and Political History. It is a question of the file on Josip Broz Tito, especially the portion that was under an embargo, and the recently declassified portion of J.V. Stalin and V. Molotov's personal files on J.B. Tito's activity.

I was a member of the Organizing Committee of the International Scientific Conference on *The Great Eastern Crisis and the Serbian Question* (Velika istočna kriza i srpsko pitanje), organized by the SASA Department of Historical Sciences and the Historical Institute in Belgrade, on 4 October 2018.

I participated in the digitization of 374 old Serbian manuscripts and books kept in the Russian State Library in Saint Petersburg (together with its General Director Alexander I. Visly). The 375 digitized files were given to the SASA by Alexander Visly on 14 May 2018.

In 2018, I continued to serve on the editorial boards of three Russian scientific journals: "Вестник МГИМО Университета", "Концепт: философия, религия, культура" and "Вестник РУДН, Серия: Всеобщая история".

Project: **PAVEL PETROVIĆ, THE FORGOTTEN SERBIAN PAINTER
OF THE 19TH CENTURY**

(Corresponding Member Miodrag Marković)

At the end of 2018, according to the project plan, I stayed in London (11-15 and 20-22 December) and Paris (15-20 December). In London, I studied the source materials and literature on artistic activities in the city during Pavel Petrović's stay in it (1844, 1847-1849, 1857), as well as the artistic achievements of the middle and second half of the 19th century in British India where this painter stayed from 1844 to 1846, in 1850 and from 1885

to 1886 (Bombay, Calcutta, Simla and Lahore). I did my research primarily in the library of the Warburg Institute, University of London, School of Advanced Study, and the National Portrait Gallery. In Paris, I studied source materials and literature on artistic activities in the French capital during Pavel Petrović's stay in it (1847). I spent some time in the library of the Institut national d'histoire de l'art in Paris, the largest specialized library of that kind in the world.

I talk advantage of my stay in London and Paris to visit two extremely significant exhibitions dedicated to medieval art. The British Library in London staged the exhibition of early Anglo-Saxon manuscripts and other cultural monuments of Anglo-Saxon England (*Anglo-Saxon Kingdoms: Art, Word, War*), while the exhibition at the Cluny Museum in Paris was dedicated to the beginnings of Gothic architecture and sculpture in France (*Birth of Gothic Sculpture, Saint-Denis, Paris, Chartres, 1135-1150*).

DEPARTMENT OF FINE ARTS AND MUSIC

Project: **LEXICON OF ARTISTIC DANCE**

(Academician Dejan Despić)

In 2018, the texts about all 650 ballets were completed. Due to the lack of funds, the work had already to be suspended in March 2018. For this reason, text editing (the harmonization of reference materials, names, orchestras, etc.), copyediting, proofreading, design, makeup and index creation (about 180 pages) could not be carried out, thus preparing the *Lexicon* for printing.

In order to complete the first volume of this extremely important project in 2019, it is necessary to obtain funds for the last phase of its realization. Therefore, we hold that the SASA should provide funding for this edition by concluding a special contract with the Ministry of Education, Science and Technological Development.

Project: **CONTEMPORARY SERBIAN MUSIC SCENE**

(Academician Dejan Despić)

The project associates pleaded for marking the 70th anniversary of the SASA Institute of Musicology in a most dignified manner. Katarina Tomašević, Director of the Institute, responded by giving a lecture on “International Stars on the Podium of the Kolarac Adult Education Centre (1832-1941)” (Internacionalne zvezde na koncertnom podijumu Kolarčevog narodnog univerziteta /1932-1941/), while Biljana Milanović reported on mu-

sical and theatrical performances in Serbian POW camps in Austro-Hungary during the Great War. Melita Melin wrote the book on Ljubica Marić (480 p.) which was published by the Institute of Musicology. Nadežda Mosusova wrote an article on Petar Konjović, the founder of the Institute of Musicology, for the journal *Muzikologija* No. 25.

Nadežda Mosusova: Bibliography for 2018

A Serbian Opera in Zagreb During the First World War, **Voices of Identities. Vocal Music and De/con/struction of Communities in the Former Habsburg Areas**. Edited by Daniel Ender and Christoph Flamm, Cambridge Scholars Publishing 2018, pp. 69–78. (Petar Konjović's opera *The Fairy's Veil* /Vilin veo/)

“Спящая красавица” (1927) and “Раймонда” (1928) в Белграде. ”Весь мир продолжает жить наследием Петипа и Русского балета Дягилева”. // **Academia: Танец. Музыка. Театр. Образование**. - 2018 – No 1 (45), pp. 62–66. (Publisher: Moscow State Academy of Choreography, 2018)

Socialist Realism, Pyotr Tchaikovsky and Stevan Hristić: Rescuing the Beauty (Petar Čajkovski i Stevan Hristić: Spasavanje lepotice). Editor Hristina Medić, **Talas**, No. 47, Belgrade 2018, pp. 2–10.

Заметки о покровителях вообще, о покровителях Сергея Дягилева и о самом Дягилеве как вдохновителе и покровителе. **Музыкальная культура и образование: инновационные пути развития** – Материалы III международной научно-практической конференции 26-27 апреля 2018 года, ред. О. В. Бочкарёва и М. Г. Долгушина. Ярославль 2018, 100–103. (On line)

Stevan Hristić's Ballet *The Legend of Ohrid*, (Yugo)slavism and Serbian Musical Identity (the 70th Anniversary of Margarita Froman's *The Legend of Ohrid* and the 60th anniversary of Stevan Hristić's Death) (Balet Stevana Hristića *Ohridska legenda*, (jugo)slovenstvo i srpski muzički identitet /70 godina *Ohridske legende* i 60 godina od smrti Stevana Hristića). **Musical Identities** (Muzički identiteti), Thematic Proceedings of the 20th Pedagogical Forum of Performing Arts (Tematski zbornik 20. Pedagoškog foruma scen-skih umetnosti), held in Belgrade from 29 September to 1 October 2017; Dr Milena Petrović (ed.), Faculty of Music, Belgrade 2018, pp. 179–189. (Online)

Maga Magazinović and Modern Dance in Serbia (1910-1968): Marking the Fiftieth Anniversary of Her Death, **Musikgeschichte in Mittel- und Osteuropa**, Mitteilungen der Internationalen Arbeitsgemeinschaft an der Universität Leipzig, Heft 20, hrsg. von Helmut Loos und Klaus-Peter Koch, Gudrun Schröder Verlag, Leipzig 2018, pp. 263–269.

Meetings

28 October: participation in the CID UNESCO Saint Petersburg Section, International Congress, *Intangible Cultural Heritage of Humanity. Dialogue of Epochs in Arts of Music and Dance*, 25-29 April 2017: presentation of the paper titled “Creativity of Marius Petipa in the Balkans” (Творчество Мариуса Петипа на Балканах).

Participation in the interdisciplinary scientific meeting (round table) titled “Maga Magazinović – The Philosophy of Dance and/or more than Dance” (Maga Magazinović – filozofija igre i/ili više od igre) (organized by the Association of Ballet Artists of Serbia and the Museum of the Theatrical Arts of Serbia to mark the 50th anniversary of her death, Belgrade, 26 October 2018), with the paper titled *Frozen Potatoes and the Mother of the Jugovićs, Maga Magazinović’s Activity in 1941-1944 and the Consequences* (Smrznut krompir i Majka Jugovića, Delatnost Mage Magazinović 1941-1944 i posledice).

COMMITTEE FOR A TERMINOLOGICAL DICTIONARY OF VISUAL ARTS AND ARCHITECTURE

(Academician Milan Lojanica)

During 2018, the work on the second volume of the *Dictionary of Visual Arts and Architecture* (Rečnik likovnih umetnosti i arhitekture) was continued and completed. The Editorial Board of the *Dictionary* held six working sessions (in January, March, June, November and two in December 2018). As anticipated under the 2018 plan, all texts for the second volume were completed (60 entries in the *Middle Ages* section under the editorship of SASA Corresponding Member Miodrag Marković; 8 entries in the *Architecture* section and 12 entries in the *Modern Art* section). The first version of the complete second volume was prepared in March and, at the end of the same month, sent for peer-review, including the instructions concerning the appropriate entries for each peer-reviewer. The peer-reviewers included Academician Dinko Davidov (*New Era*), Academician Svetomir Arsić Basara (*Sculpture* and the whole *Dictionary*), Dr. Jerko Denegri (*Modern Art*), Dr. Mirjana Roter Blagojević (*19th Century Architecture*), Dr. Aleksandar Ignjatović (*20th Century Architecture* and *Architecture* in general) and Dr. Aleksandar Vojvodić (*Ancient and Medieval Art and Architecture*). After receiving the peer-review opinions and suggestions, the section editors returned a certain

number of entries to their authors or, as part of their responsibility, did some editing themselves. With the exception of a few cases, the interventions mostly included minor editions, additional examples, textual harmonization of the entries covering several fields or being written by several authors. Several minor corrections were also made but, on the whole, the opinions of all peer-reviewers were distinctly favourable. Finally, several minor entries found to be missing from the *Dictionary* were also added. On 12 December 2018, the text of the second volume of the *Dictionary* was sent to the publisher “Zavod za udžbenike” which, a month before, included it in its publishing plan.

In 2018, it was also continued with gathering illustrative material with accompanying captions and arranging it by sections. At the same time, the existing material was printed and systematized.

At the end of the year, the work on the third volume also began. The existing texts were digitized and sent to the section editors for review. The alphabetical arrangement was revised and supplemented, while the entries were distributed by sections.

During the year, 77 entries were completely finished, which implies that the second volume of the *Dictionary* was also completely finished.

COMMITTEE FOR THE PROTECTION OF SERBIAN MUSICAL LEGACY

(Academician Isidora Žebeljan)

In 2018, the Committee for the Protection of Serbian Musical Legacy continued its activities, including specifically:

1. The entry of the data on 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 on the podium;
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 be published in both Serbian and English;
5. The distribution of Serbian composers' works/scores to prominent musicians in Serbia and abroad.

In 2018, the following was done:

1. Work continued on the entry of data into the web browsers with the database related to all Serbian composers and their well-known works, as well as the expert processing of materials – in 2018, about 4,000 works of Serbian composers were entered.

2. In 2018, the scores from the legacy of three Serbian composers – SASA Corresponding Member Milenko Živković, Mihovil Logar and Ljubomir Bošnjaković – were collected.

3. In December 2018, The Committee organized the concert of chamber music by two prominent Serbian composers – Mihovil Logar and Dragutin Gostuški to mark their death anniversary. Their compositions were performed by renowned Serbian musicians from Belgrade at the SASA Gallery. The programme included the rarely performed works of these composers.

4. The master recording for the production of the compact disc containing the chamber music of Petar Stojanović, Academician Rudolf Bruči and Aleksandar Obradović was prepared. The compact disc itself will be produced in cooperation with Mascom Records from Belgrade in 2019.

5. During 2018, at the request of Gabriel Feltz, Chief Conductor of the Belgrade Philharmonic Orchestra, the Committee sent 30 compositions of Serbian composers, as well as their recordings and relevant information to the Belgrade Philharmonic Orchestra.

Project: **OLGA JEVRIĆ'S LEGACY AT THE SASA**

(Academician Dušan Otašević)

1. The exhibition “Olga Jevrić – SCULPTURES” was staged in Užice (10 October – 2 November 2018)

- The author of the exhibition and its catalogue: Žaklina Marković
- The exhibition was opened by: Academician Dušan Otašević and Žaklina Marković
- The exhibition was extended due to public interest.
- The following accompanying programme was organized:

– Film showing – *Sculpture in the World of Objects and Landscapes – Olga Jevrić* (Skulptura u svetu predmeta i pejzaža – Olga Jevrić) (film script: Academician Ljubomir Simović, Marko Karadžić; film director: Marko Karadžić, RTS, 1 July 2012).

– *Something Quite Personal – Olga Jevrić* (Nešto sasvim lično – Olga Jevrić) (the conversation with the artist held by Sveta Lukić; film director: Milan Knežević; the premiere was telecast on 13 May 1984).

– *A Retrospective of Olga Jevrić: A Documentary Film* (Retrospektiva Olge Jevrić: dokumentarni film) (film director: Dragomir Zupanc; script: Olga Jevrić, 1984).

– Children's workshop.

2. The processing and recording of archival materials in electronic form continued.

3. 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: 1876.

CENTRE FOR SCIENTIFIC RESEARCH OF THE SASA AND UNIVERSITY OF KRAGUJEVAC

In mid-2018, after a three-year interruption, the situation improved and the Centre for Scientific Research of the SASA and University of Kragujevac (in further text: the Centre) resumed its activities. In this connection, on 1 August 2018, the Rectorate of the University of Kragujevac held the meeting that was attended, apart from the Management of the University of Kragujevac (Professor Dr. Nenad Filipović, Acting Rector; Professor Dr. Miroslava Petrović Torgašev, Professor Dr. Živadin Micić and Professor Dr. Savo Trifunović, Vice-Rectors, and Marko Lukić, General Secretary) and the SASA members from Kragujevac (Academician Ivan Gutman, Miloš Kojić, Corresponding Member, and Miloš Djuran, Corresponding Member), Miloš Djuran), by the members of the SASA Presidency: Academician Vladimir Kostić, SASA President, Academician Ljubomir Maksimović, SASA Vice-President, and Academician Zoran Popović, SASA Vice-President. The topic of this meeting was the hitherto work of the Centre and resumption of its activities in the coming period. Changes in the management of the Centre were also agreed, because the current Director of the Centre, Academician Ivan Gutman, announced his resignation due to illness.

On 25 October, pursuant to the decision of the SASA Presidency and with the consent of the Senate of the University of Kragujevac, SASA Corresponding Member Miloš Djuran was appointed Director of the Centre, while SASA Corresponding Member Miloš Kojić was appointed Deputy Director. Professor Dr. Miodrag Stojković resigned his position as head of the Section of Medical Sciences.

The Centre's activities began with the guest lecture of Academician Vladimir Kostić, SASA President. On 19 October 2018, he gave the lecture titled *Parkinson's Disease 40 Years Later: Is There an End to Surprises?*

(Parkinsonova bolest 40 godina kasnije: imali kraja iznenađenjima?). This significant scientific and professional event was greeted by the Acting Rector, Professor Dr. Nenad Filipović. The lecture was held at the grand hall of the University of Kragujevac before the audience consisting of a great number of scientists and professionals, and prompted numerous questions and a discussion.

The next scientific and professional event entitled *Tadija Pejović, a Scientist from Kragujevac in the Series "Lives and Works of Serbian Scientists"* (Tadija Pejović, kragujevački naučnik u ediciji „Život i delo srpskih naučnika“), was held in the Grand Hall of the University of Kragujevac on 6 December 2018. On this occasion, the Series *"Lives and Works of Serbian Scientists"*, published by the SASA, was also presented. Special emphasis was placed on Tadija Pejović, a mathematician of Kragujevac descent, whose life and work were depicted in the 15th volume. Academician Vladan Djordjević, who is the editor of this series, spoke about its 16 volumes devoted to the lives and works of Serbian scientists working in the fields of natural science, mathematics, medicine and engineering. Professor Dr. Miodrag Rašković, Scientific Advisor to the SASA Institute of Mathematics and former professor at the Faculty of Natural Sciences and Mathematics in Kragujevac, and Dr. Miroslava Petrović Torgašev, Professor at the Institute of Mathematics of the Faculty of Natural Sciences and Mathematics and Vice-Rector of the University of Kragujevac in Kragujevac, spoke about the exciting life and fruitful career of Professor Dr. Tadija Pejović. The books of the Series *"Lives and Works of Serbian Scientists"* were donated to the library of the Centre and library of the First Kragujevac High School which was destroyed in fire.

INTERNATIONAL COOPERATION IN 2018

In 2018, the Serbian Academy of Sciences and Arts was also active on the international plane. Emphasis is still laid on regional cooperation, which is carried out through bilateral cooperation with the academies in the region, as well as through participation in regional initiatives with the aim of strengthening scientific cooperation in the region. The Academy also devoted its attention to promoting and expanding cooperation with other foreign academies and international scientific institutions and organizations, either through membership in these organizations or through work on joint scientific projects under bilateral agreements.

The SASA representatives participated in the meetings of international scientific associations, as well as those organized by other academies of sciences, which were dedicated to various topics: relations between science and society, scientific integrity, climate change, preservation of natural resources, environmental protection, development of information society, ethics and other global problems.

The Serbian Academy of Sciences and Arts carries out international cooperation 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 related to the programmes financed from the European Commission's and other funds (FP 7, EUREKA, TEMPUS, COST, HORIZON 2020);
- Membership in non-governmental international scientific associations at different levels or, more precisely, at the global level: InterAcademy Partnership (IAP), International Council for Science (ICSU), International

Science Council (ISC), International Union of Academies (UAI) and UNESCO; at the European level: European Federation of National Academies of Science and Humanities (ALLEA), 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 it, which is primarily carried out through the implementation of joint scientific projects under the scientific cooperation agreements concluded with other academies.

As for its **bilateral cooperation**, the SASA actively maintained and promoted cooperation with foreign academies.

On 30 March 2018, the Delegation of the Macedonian Academy of Sciences and Arts, headed by its President, Academician Taki Fiti, paid a visit to the SASA.

On 14 May, Alexander I. Visly, Director of the Russian State Library in Saint Petersburg, visited the SASA and handed the digitized collection of 370 Serbian medieval manuscripts and books to Academician Vladimir S. Kostić, SASA President.

On 18 July, the delegation of the German National Academy of Sciences Leopoldina, headed by its President, Professor Dr. Jörg Hacker, visited the SASA and invited it for a return visit in 2019 with the aim of identifying the topics of common interest and considering the ways of promoting mutual cooperation.

On 20-21 September, the SASA delegation, which included the SASA President and Vice-President Lj. Maksimović, paid a return visit to the Bulgarian Academy of Sciences.

In 2018, the SASA representatives actively participated in numerous international meetings and conferences, as well as the general meetings of those international associations whose member is also the SASA.

On 16-18 May, Academician Vladimir S. Kostić, SASA President, and Academician Ljubomir Maksimović, SASA Vice-President, participated in the General Assembly of the European Federation of Sciences and Arts

(ALLEA), which was held in Sofia. This year's host of the General Assembly was the Bulgarian Academy of Sciences.

Academician Ljubomir Maksimović, SASA Vice-President, attended the Annual Ceremonial Session of the Austrian Academy of Sciences, which was held on 18 May.

Academician Ljubomir Maksimović, SASA Vice-President, participated in the 4th Joint Science Conference of the Western Balkans, which was held in Rome, 30 May – 1 June 2018.

The President of the SASA Branch in Niš, Academician Ninislav Stojadinović, participated as the SASA representative in the Founding General Assembly of the International Science Council (ISC) in Paris, 3-5 July.

The SASA delegation, headed by SASA President Vladimir S. Kostić, attended celebration marking the 25th anniversary of the Academy of Sciences Arts of the Republic of Srpska (ASARS), which took place in Banja Luka, 24 September.

Academician Zoran Knežević participated as the SASA representative in the working session of the “Challenges for the European Research Area“ and the General Session of the European Science Foundation (ESF) in Florence, 3-4 October.

Academician Dejan Popović participated in the symposium titled *Culture, Technology and Humanism* (Kultura, tehnologija i humanizam), which was held in Bar, 4-6 October. It was organized by the Montenegrin Academy of Sciences and Arts in cooperation with the Croatian Academy of Sciences and Arts and Euro-Mediterranean Academic Network (EMAN).

Academician Dejan Popović participated as the SASA representative in the 9th Danube Academies Conference (DAC), which was held in Stuttgart, 11-12 October.

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 84 research projects and anticipate the annual quota of 132 man/week for each side for the non-foreign currency exchange of Serbian and foreign researchers.

A total of 81 man/weeks was used; foreign researchers used 23 weeks and domestic researchers used 58 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 SASA delegation, which was comprised of the SASA President, Academician Vladimir S. Kostić, SASA Vice-President, Academician Ljubomir Maksimović, SASA General Secretary, Academician Marko Andjelković, and President of the SASA Branch in Novi Sad, Academician Stevan Pilipović, attended the celebration marking the 25th anniversary of the ANURS. The event took place in Banja Luka on 24 September.

Cooperation with the Academy of Athens

See SASA Almanac (Godišnjak SANU) for 2015.

Cooperation with the Austrian Academy of Sciences

In 2018 there was no exchange of researchers. Due to its financial problems, the Austrian Academy of Sciences has not received researchers on a non-foreign currency exchange basis over the past few years.

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 man/weeks for each side. Domestic researchers used 33 weeks and Bulgarian researchers used 9 weeks.

Cooperation with the National Academy of Sciences of Belarus

See SASA Almanac (Godišnjak SANU) CXXIII for 2016, p. 218.

Cooperation with the Hungarian Academy of Sciences

Domestic researchers stayed in Hungary for 11 weeks nad Hungarian researchers for one week. Underway is the harmonization of the joint list of projects, which will be followed by the signing of the Cooperation Protocol for the period 2019-2021.

Cooperation with the Macedonian Academy of Sciences and Arts

The MASA delegation, which was comprised of its President, Academician Tiki Fiti, and SASA Vice-President, Academician Vlado Matevski, visited the SASA on 30 March 2018. The visit was realized in accordance with the agreement on the regular joint sessions of the two acad-

emies. On this occasion, the new Cooperation Protocol was signed and the list of joint projects for the period 2019-2020 was harmonized.

There are 16 joint projects. This year, the Macedonian side used its annual non-foreign currency exchange quota, while the Serbian side used one week.

Cooperation with the Polish Academy of Sciences

The Thematic Plan contains five projects, while the annual non-foreign currency quota is set at 7 man/weeks for each side. This year, each side used 5 man/weeks.

Cooperation with the Romanian Academy

There are 16 joint projects. The annual non-foreign currency exchange quota is set at 15 man/weeks for each side. The Romanian side used 5 1/2 man/weeks and our side used 3 1/2 man/weeks.

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 annual non-foreign currency exchange quota is set at 4 man/weeks for each side, while the Thematic Plan includes three joint projects.

Our researchers used almost 4 man/weeks (26 days), while the Slovaks used one man/week.

Cooperation with the Slovenian Academy of Sciences and Arts

The Thematic Plan contains five joint projects, while the annual non-foreign currency exchange quota is set at two man/weeks for each side. This year there was no exchange of researchers.

Cooperation with the Turkish Academy of Sciences

See SASA Almanac (Godišnjak SANU) 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 non-foreign currency exchange quota is set at 15 man/weeks for each side, while the Thematic Plan includes 6 projects. Out of the annual non-foreign currency

exchange quotas of 15 man/weeks for each side, the two sides used none this year.

Underway are the preparations for signing the new Cooperation Agreement and Protocol, which will be followed by the harmonization of the list of joint projects that will be valid for the period 2020-2022.

Cooperation with the Royal Swedish Academy of Letters, History and Antiquities

See SASA Almanac (Godišnjak SANU) 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 non-foreign exchange quota of 4 man/weeks for each side, both sides used one man/week each.

Cooperation with the Chinese Academy of Social Sciences in Beijing

See SASA Almanac (Godišnjak SANU) CXXIII for 2016, p. 220.

Out of the annual non-foreign exchange quota of 7 man/weeks for each side, the two sides used none.

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.

This year there was no exchange of researchers.

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) CXVIII for 2011, p. 264.

The SASA was also visited by the relevant Serbian ministers, renowned scientists, representatives of domestic and foreign scientific, cultural and economic institutions, as well as the heads or representatives of diplomatic and consular missions in Belgrade. They either had talks with the members of the

Executive Board, or participated in significant meetings which were organized or hosted by the SASA during the past year.

On 21 December, the President of SASA, Academician Vladimir S. Kostić, hosted the traditional reception for secondary school students who won one of the first three prizes at international competitions. The SASA handed over appropriate gifts to all prize winners.

SCIENTIFIC MEETINGS AND LECTURES IN 2018

MEETINGS

On 15 January, the Serbian Academy of Sciences and Arts and the Committee on Biomedical Investigations organized a scientific meeting on *Prevention in the Service of Health Protection in the Republic of Serbia* (Prevenција u funkciji zaštite zdravlja u Republici Srbiji).

On 25 January, the Grand Hall of the Serbian Academy of Sciences and Arts hosted the presentation of the following books: *Serbian Baroque Theology* (Srpska barokna teologija) by Vladimir Vukašinović; *A Historical and Theological Analysis of the 16th Century Printed Serbian Liturgiaries* (Istorijsko-bogoslovska analiza srpskih štampanih Liturgijara iz XVI veka) by Ratko Hrvaćanin, and *Liturgists and Liturgologists* (Liturzi i liturgolozi) by Srboљjub Ubiparipović, Vladimir Vukašinović and Nenad Milošević in the Series *Serbian Liturgical History* (Istorija srpskog bogosluženja), published by the Institute of Liturgics and Ecclesiastical Art History of the Belgrade University Faculty of Orthodox Theology. .

On 2 March, the SASA Department of Technical Sciences and SASA Department of Chemical and Biological Sciences held the scientific meeting titled *Ivan Djaja. The Belgrade School of Physiology – from the Sorbonne to Belgrade* (Ivan Djaja. Beogradska škola fiziologije – od Sorbone do Beograda).

On 5-6 March, the Serbian Academy of Sciences and Arts hosted the meeting of the COST (European Cooperation in Science and Technology) Action titled *Maximizing Impact of Research in Neurodevelopmental Disorders* (Povećanje uticaja istraživanja neurorazvoјnih poremećaja). It was the first official meeting of this COST Action, which has so far included about 50 researchers from 20 European countries.

On 14 March, the publication *Encyclopedia of the Republic of Srpska* (Enciklopedija Republike Srpske), published by the Academy of Sciences and Arts of the Republic of Srpska, was presented. At this event, the speeches were delivered by the President of SASA, Academician Vladimir S. Kostić; President of ASARS, Academician Rajko Kuzmanović; Vice-President of SASA, Academician Ljubomir Maksimović; Vice-President of ASARS, Academician Ljubomir Zuković; Vice-President of ASARS, Academician Vaskrsija Janjić, and General Secretary of ASARS, Academician Dragoljub Mirjanić.

On 23-24 March, under the auspices of the Serbian Academy of Sciences and Arts, the Marko Jarić Foundation and the University of Belgrade Faculty of Physics held the *Symposium on the Latest Scientific Achievements in Physics* (Simpozijum o najnovijim naučnim dostignućima u fizici). The Marko Jarić Award 2017 ceremony was also held.

On 12 April, the ceremonial opening of the 7th Forum of the Mental Health Institute was held.

On 13 April, the Serbian Trauma Association organized the scientific meeting titled *Skeletal Trauma in Serbia* (Skeletni traumatizam u Srbiji) under the auspices of the Serbian Academy of Sciences and Arts.

On 16 April, the Serbian Society of Toxicology and International Union of Toxicology (IUTOX) organized the forum *Toxicology and We* (Toksikologija i mi) under the auspices of the Serbian Academy of Sciences and Arts.

On 20-22 April, the Society of Serbian Neurologists and Neurology Clinic, Clinical Centre of Serbia, organized the *Regional Teaching Course of the European Academy of Neurology (EAN)*.

On 25-26 April, the SASA Department of Language and Literature held the scientific meeting titled *Periodization of New Serbian Literature* (Periodizacija nove srpske književnosti) on the occasion of the 150th birth anniversary of Academician Pavle Popović,

On 25 April, the Institute for Nature Conservation of Serbia and IUCN Regional Office for Eastern Europe and Central Asia held the formal meeting marking the 70th anniversary of the Institute of Nature Conservation of Serbia and the 70th anniversary of institutional nature preservation in Serbia.

On 26 April, the SASA Department of Medical Sciences, Committee for Immunology and Allergology, and Immunological Society of Serbia held the scientific meeting dedicated to *The World Day of Immunology – 2018*.

On 3 May, under the auspices of the Serbian Academy of Sciences and Arts, the SASA Department of Medical Sciences, University of Belgrade Faculty of Medicine and Pulmonary Hypertension Association Serbia held the

meeting dedicated to *Pulmonary Hypertension: - Diagnosis and Treatment* (Plućna hipertenzija – dijagnostika i lečenje).

On 4-5 May, the SASA Department of Medical Sciences and Neurology Clinic, Clinical Centre of Serbia, held the scientific conference titled *Update on Movement Disorders* (Novine u bolestima nevoljnih pokreta).

On 10 May, the Serbian Academy of Sciences and Arts presented its collections of papers titled *Umetničko nasledje srpskog naroda na Kosovu i Metohiji: istorija, identitet, ugroženost, zaštita* and *Artistic Heritage of the Serbian People in Kosovo and Metohija: History, Identity, Vulnerability, Protection*. At this event, the speeches were delivered by Academician Vladimir S. Kostić, SASA President, Academician Gojko Subotić, Academician Aleksandar Loma, Miodrag Marković, SASA Corresponding Member, and Dragan Vojvodić, SASA Corresponding Member.

On 11-12 May, the Neurology Clinic, Clinical Centre of Serbia, organized the 2nd Serbian Symposium on Neuropathies with international participation titled *Chronic Inflammatory Neuropathies* (Hronične inflamatorne neuropatije).

On 17-19 May, the Society of Serbian Neurologists held the first regional meeting titled *Multiple Sclerosis in Focus: Strategies for Early Diagnosis and Treatment in Southeast European Countries* (Multipla skleroza u fokusu: strategije za ranu dijagnozu i tretman u zemljama jugoistočne Evrope).

On 23-24 May, under the auspices of the Serbian Academy of Sciences and Arts, the Union of Engineers and Technicians of Serbia held the scientific meeting titled *The Past, Present and Future of Engineering and Architecture in Serbia* (Prošlost, sadašnjost i budućnost inženjerstva i arhitekture u Srbiji).

On 25 May, the Medicinal Plants Research Institute “Dr Josif Pančić” held the *Formal Meeting Marking the 70th Anniversary of the Medicinal Plants Research Institute “Dr Josif Pančić”*.

On 28 May, the Serbian Academy of Sciences and Arts organized the international scientific meeting on *Robotics, Neuroscience, and Surgery for Neurorehabilitation* (Robotika, neuronauka i hirurgija za neurorehabilitaciju).

On 30 May, the book *Organized Colorectal Cancer Screening in Serbia* (Organizovani skrining kolorektalnog karcinoma Srbije), authored by Zoran Krivokapić, Dušica Banković Lazarević, Goran Barišić, Biljana Mijović and Verica Jovanović, was presented. The speakers at the event were Academician Vladimir S. Kostić, SASA President, Academician Dragan Micić, Secretary of the SASA Department of Medical Sciences, Professor Dr Radan Džodić, Chairman of the Republican Expert Commission for Screening, and Academician Zoran Krivokapić.

On 4 June, the Serbian Academy of Sciences and Arts and the SASA Institute for Balkan Studies held the scientific meeting titled *The Right to Rebellion: '68 in Our Country and the World* (Pravo na pobinu: '68 kod nas i u svetu).

On 5-6 June, The international conference titled *A Loud Whistle: Whistleblowers and Journalists Against Corruption* (Glasna Pištaljka: Uzbunjivači i novinari protiv korupcije) was organized by the whistleblower organization Pištaljka within the project of the EU Delegation to the Republic of Serbia.

On 19 June, the Serbian Academy of Sciences and Arts organized the round table on *Health Care in Serbia in the Coming Decades* (Zdravstvo Srbije u narednim decenijama) in cooperation with the Economic Institute.

On 25-28 June, the SASA Department of Mathematics, Physics and Earth Sciences held the international scientific meeting on *Protein Electrostatics 2018* (Elektrostatika proteina 2018), which was attended by a great number (38) of renowned foreign colleagues, prominent scientists from all parts of the world.

On 20-27 August, the Serbian Academy of Sciences and Arts, International Committee of Slavists and Association of Slavist Societies co-organized the International Congress of Slavists in Belgrade.

On 27-31 August, the Serbian Academy of Sciences and Arts, SASA Branch in Novi Sad, Faculty of Natural Sciences and Mathematics, University of Novi Sad and ISAAC organized the *International Conference on Generalized Functions GF2018* in Novi Sad.

On 27-29 August, the SASA Department of Technical Sciences organized the *First International Conference on Electron Microscopy of Nanostructures (ELMINA 2018)*.

On 28-31 August, the SASA Department of Mathematics, Physics and Earth Sciences and Vinča Institute of Nuclear Sciences held the *Summer School and International Symposium on the Physics of Ionized Gases (SPIG 2018)*, which has a 52-year-long tradition and gathers world-reputed scientists in the fields of fundamental, experimental and applied physics. During the conference, the most renowned foreign and domestic experts in the field of physics gave 65 lectures, while about 50 posters were presented.

On 2-7 September, the SASA Department of Technical Sciences and Institute of Physics Belgrade held the *22nd International Conference on Gas Discharge and Their Applications* in Novi Sad.

On 10 September, the Serbian Academy of Sciences and Arts organized the international conference titled *Numerical and Climate Modelling: Beginnings, Now, and Vision of the Future* (Numeričko modeliranje vremena

i klime: počeci, sadašnjost i vizija budućnosti) marking the 45th anniversary since the creation of the first modern computer code for solving the hydrodynamic equations of air motion or, more exactly, the weather simulation and forecasting code (in Belgrade, 1973). The code became widely known in the world and is still used on a daily basis not only in Serbia, but also in Brazil, Greece, the United States and other countries. Apart from Serbian scientists, the participants included a great number of prominent scientists from Brazil, Greece, Italy, South Korea, the Russian Federation, the United States and the United Kingdom.

On 27 September, the Serbian Academy of Sciences and Arts and the Society for Human Reproduction of Serbia organized the symposium on *Human Reproduction and Genetics – Influences on Offspring* (Humana reprodukcija i genetika – uticaji na potomstvo).

Under the auspices of the Serbian Academy of Sciences and Arts, the Serbian Association for the Study of Obesity organized the *4th Serbian Congress on Obesity* (Četvrti srpski kongres o gojaznosti), which was held on Mt Zlatibor, 28-30 September.

On 2-3 October, the Serbian Academy of Sciences and Arts, University of Belgrade Faculty of Mathematics, SASA Mathematical Institute and Mathematical Society of Serbia organized the formal meeting and international conference titled *Mihailo Petrović Alas: His Life, Work and Times* (Mihailo Petrović Alas, život–delo–vreme) marking the 150th birth anniversary of Academician Mihailo Petrović Alas (1868-1943), one of the greatest Serbian scientists and the founding father of the Serbian mathematical school.

On 4 October, the SASA Department of Historical Sciences and the Institute of History Belgrade organized the international scientific meeting on *The Great Eastern Crisis and the Serbian Question* (Velika istočna kriza i srpsko pitanje).

On 5 October, the Serbian Genetic Society organized the *Formal Meeting of the Society* to mark its 50th anniversary.

The Serbian Academy of Sciences and Arts, SASA Branch in Novi Sad and Department of Geography, Tourism and Hotel Management of the Faculty of Natural Sciences and Mathematics in Novi Sad organized the international scientific conference *NATURAL HAZARDS – Lessons from the Past and Contemporary Challenges* in Novi Sad, 5-7 October.

On 4-7 October, under the auspices of the Serbian Academy of Sciences and Arts, the European Society of Cardiology held the 15th Annual Conference on *Myocardial and Pericardial Diseases*.

On 12 October, under the auspices of the Serbian Academy of Arts and Sciences, the Society of Coloproctology of Serbia held the *11th International Biennial Symposium of Coloproctology*.

On 22 October, the SASA Department of Medical Sciences, in cooperation with the European Commission's Erasmus+ programme relating to capacity building in higher education, organized the international scientific meeting titled *Pain Terrifying Lord of Life* (Bol zastrašujući gospodar života) at the SASA Grand Hall.

On 7 November, the Serbian Academy of Sciences and Arts organized the scientific meeting titled *The 125th Anniversary of Publishing Jovan Cvijić's Monograph "Das Karstphänomen"* (125 godina od publikovanja monografije „Das Karstphänomen“ Jovana Cvijića). It was dedicated to the 125th anniversary of the first publication of Jovan Cvijić's landmark monograph *Das Karstphänomen*, which laid down the foundation and standards for the scientific study of karst. The co-organizers of this meeting were the Serbian Society of Geomorphologists and the Karst Commission of the Serbian Geological Society, while official support to the meeting also came from the International Association of Hydrogeologists (through its Karst Commission) and International Speleological Union.

On 9-10 November, the Serbian Academy of Sciences and Arts and University of Belgrade Faculty of Law held the international scientific meeting on *Human Rights in the 21st Century* (Ljudska prava u 21. veku), marking the 70th anniversary of the Universal Declaration of Human Rights.

On 13-14 November, the SASA Department of Chemical and Biological Sciences, SASA Committee on Village and SASA Committee on "Man and the Environment" organized the scientific and expert meeting on *Pesticide Use in Plant Production and Environmental Protection* (Korišćenje pesticida u biljnoj proizvodnji i zaštiti životne sredine) at the SASA Grand Hall.

On 15 November, the Serbian Academy of Sciences and Arts held the scientific meeting *On the Occasion of the 50th Birth Anniversary of Academician Milutin Radovanović* (Povodom obeležavanja 50 godina od smrti akademika Milutina Radovanovića).

On 16 November, the SASA Department of Social Sciences, Institute for Comparative Law and Mihajlo Pupin Institute organized the scientific and expert meeting on *The Application of Digitization in Culture and Science* (Primena digitalizacije u kulturi i nauci) on the premises of the SASA Audiovisual Archives and Digitization Centre.

On 21 November, the Serbian Academy of Sciences and Arts held the scientific meeting dedicated to *The 150th Birth Anniversary of Academician*

Stevan Bošković (150 godina od rođenja akademika Stevana Boškovića) in cooperation with the Military Geographical Institute.

On 23-24 November, the SASA Department of Medical Sciences, Neurology Clinic of the Clinical Centre of Serbia, University of Belgrade Faculty of Medicine and Society of Serbian Neurologists held the symposium on *Stroke – Challenges* (Moždani udar – Izazovi).

The Serbian Academy of Sciences and Arts held the international scientific meeting on *The End of the War; the Serbs and the Creation of Yugoslavia* (Kraj rata, Srbi i stvaranje Jugoslavije) marking the 100th anniversary of the end of the First World War and creation of the Kingdom of Serbs, Croats and Slovenes/Yugoslavia, in cooperation with Matica srpska, Novi Sad, and the Academy of Sciences and Arts of the Republic of Srpska, from 29 November to 1 December.

On 3 December, the Serbian Academy of Sciences and Arts and Serbian Geological Society held the scientific meeting marking the *150th Birth Anniversary of Academician Vladimir Laskarev* (150 godina od rođenja akademika Vladimira Laskareva).

On 5 December, the Serbian Chemical Society held the *Formal Meeting of the Serbian Chemical Society* celebrating the day of its founding.

On 10 December, the SASA Department of Social Sciences and University of Belgrade Faculty of Economics held the symposium on *Inequality in Serbia* (Nejednakost u Srbiji) at the Hall of the SASA Audiovisual Archives and Digitization Centre.

On 13 December, the Serbian Academy of Sciences Arts organized the presentation of the book *Colorectal Cancer: from Prevention Through Carcinogenesis to Metastasis* (Karcinom debelog creva: od prevencije preko karcinogeneze do metastaze). The speakers at the event were Academician Vladimir S. Kostić, SASA President, Academician Radoje Čolović, Professor Dr. Dragoslav Stević, Dragoljub Kojčić, Director of “Zavod za udžbenike“, and Academician Zoran V. Krivokapić.

Formal Meetings

On 25 September, the Serbian Academy of Sciences and Arts, SASA Branch in Niš organized the *Formal Meeting to Mark the 150th Birth Anniversary of Academician Mihailo Gavrilović* in cooperation with the National Museum, Niš, and Historical Archives of the City of Niš.

On 25 September, the Serbian Academy of Arts and Sciences and SASA Branch in Novi Sad organized the *Formal Session* to mark the 100th anniversary of the unification of Vojvodina with the Kingdom of Serbia in Novi Sad.

On 26 October, the Serbian Academy of Sciences and Arts organized the *Formal Meeting dedicated to Miloš Crnjanski*. The speakers at the event were Academician Ljubomir Simović, Professor Dr. Radivoje Mikić and author Milisav Savić. The selected verses from his poems were recited by actor Nebojša Dugalić.

On 19 November, the SASA held the formal meeting marking the *Day of the Serbian Academy of Sciences and Arts*, which was attended by the SASA members, high-level political and public figures, representatives of the Serbian universities, directors of research institutes, heads or representatives of the diplomatic and consular missions in Serbia, as well as SASA supporters, associates and friends. The celebration began with the opening of the SASA Audiovisual Archives and Digitization Centre. The speakers at the event were Academician Vasilije Krestić and Radoslav Zelenović, Director of the SASA Audiovisual Archives and Digitization Centre. The celebration continued at the SASA Grand Hall where the audience was addressed by Academician S. Kostić, SASA President, and Academician Marko Andjelković, SASA General Secretary. Thereafter, they handed the appropriate charters and SASA pins to the newly elected corresponding members of SASA. The celebration ended with the opening of the permanent exhibition of the Collection of Decorations of the SASA Archives' Cabinet for Medals.

On 11 December, the SASA Department of Language and Literature held the *Formal Session dedicated to Alexander Solzhenitsyn*. The audience was greeted by Academician Vladimir S. Kostić, SASA President, while the speakers were Professor Tanja Popović and Professor Dr. Kornelija Ičin.

Lecture Cycles

During 2018, two lecture cycles were held: *The Fascinating World of Nanoscience and Nanotechnology* (Fascinantni svet nanonauke i nanotehnologije) and *Geohazard in Serbia in the 21st Century: Knowledge is the Best Bulwark Against the Elements* (Geohazard u Srbiji u 21. veku: Znanje je najbolji bedem protiv stihije), totalling 11 lectures.

During January, February and March, the SASA Department of Technical Sciences held the Lecture Cycle: *The Fascinating World of Nanoscience and Nanotechnology* (Fascinantni svet nanonauke i nanotehnologije).

On 30 January, Dr. Gordana Čirić-Marjanović, Professor at the Faculty of Physical Chemistry, University of Belgrade, gave a lecture on *Nanostructures of Electrically Conductive Polymers and Carbon Nanomaterials Produced by Their Carbonization* (Nanostrukture elektroprovodnih polimera i ugljenični nanomaterijali dobijeni njihovom karbonizacijom).

On 27 February, Academician Miodrag Čolić, Professor Emeritus, Medical Faculty of the Military Medical Academy, University of Defence in Belgrade, and scientific advisor to the Institute for Applied Nuclear Energy (INEP), gave a lecture on *Toxicity of Nanostructures* (Toksičnost nanostruktura).

On 13 March, Dr. Igor A. Pašti, Associate Professor at the Faculty of Physical Chemistry, University of Belgrade, gave a lecture on *Modelling and Simulation of Nanostructures* (Modelovanje i simulacija nanostruktura).

On 20 March, Dr. Aleksandra Korać, Professor at the Faculty of Biology, University of Belgrade, gave a lecture on *Biological Nanostructures* (Biloške nanostrukture).

During April, May and June, the Department of Mathematics, Physics and Earth Sciences organized the Lecture Cycle *Geohazard in Serbia in the 21st Century: Knowledge as the Best Bulwark Against the Elements* (Geohazard u Srbiji u 21. veku. Znanje kao najbolji bedm protiv stihije).

On 10 April, Slavica Radovanović gave a lecture on *Seismic Hazard in Serbia: Maps, Constraints and Challenges* (Seismic hazard u Srbiji: karte, ograničenja i izazovi).

On 24 April, Dr. Zoran Stevanović, Professor at the Department of Hydrogeology, University of Belgrade Faculty of Mining and Geology, UN Consultant and Chairman of the Kart Commission of the International Association of Hydrogeologists), gave a lecture on *The Assessment of Water Scarcity Risk in Serbia* (Procena rizika od nestašice vode u Srbiji).

On 7 May, Dr. Slaviša Trajković, Head of the Department of Water Management, University of Niš Faculty of Civil Engineering and Architecture, gave a lecture on *Spatial and Temporal Characteristics of Droughts in Serbia* (Prostorno-vremenske karakteristike suša u Srbiji).

On 15 May, Dr. Biljana Abolomasov, Professor at the Department of Geotechnics, University of Belgrade Faculty of Mining and Geology, gave a lecture on *Landslides in Serbia* (Klizišta u Srbiji).

On 1 June, Academician Vidojko Jović, Professor at the Department of Petrology and Geochemistry, University of Belgrade Faculty of Mining and Geology, gave a lecture on *Soil Pollution: Causes and Consequences* (Zagadjenje zemljišta: uzroci i posledice).

On 15 June, Dr. Dejan Prelević, Professor at the Department of Petrology and Geochemistry, University of Belgrade Faculty of Mining and Geology, gave the lecture titled *Does Volcanic Hazard Pose a Threat to the Territory of the Balkan Peninsula?* (Da li je vulkanski hazard pretnja za područje Balkanskog poluostrva?).

On 20 June, SASA Corresponding Member Slobodan Marković, Professor at the Department of Geography, Tourism and Hotel Management, University of Novi Sad Faculty of Natural Sciences and Mathematics, gave a lecture on *Climate Change: A Geoperspective* (Klimatske promene: geoperspektiva).

SASA GUEST LECTURE CYCLE

In 2018, there were two guest lecturers within the SASA Guest Lecture Cycle in accordance with the concept of presenting the SASA activities through the “Guest of the Serbian Academy of Sciences and Arts” Programme under which the persons who have pushed or are pushing the frontiers of knowledge and aesthetics in various fields of science, culture and arts can hold lectures/presentations at the SASA during the year, including a short stay, parallel to other guests and lecturers visiting the SASA on different grounds:

On 27 September, at the proposal of the SASA Department of Medical Sciences, Professor Dr. Hans Hauner delivered the lecture titled “Personalized Nutrition for a Better Health: Where Do We Stand Now?” The Chairman of the Programme Organizing Committee was Academician Dragan Micić.

Professor Dr. Hans Hauner is a member of the National Academy Leopoldina (since 2003), Director of the Else Kroener-Fresenius Centre for Nutritional Medicine, Technical University of Munich, Germany, and editor of the journal “Obesity Facts”.

On this occasion, Professor Hans Hauner was ceremonially awarded the SASA Guest Charter.

On 24 December, at the proposal of the Department of Mathematics, Physics and Earth Sciences and Academician Vidojko Jović, Dr. Ali Mehmet Celâl Şengör, Professor at the Istanbul Technical University, Turkey, and a foreign member of SASA, gave the lecture titled “The Geology of the Altaids”.

The Chairman of the Programme Organizing Committee was Academician Vidojko Jović.

On this occasion, Professor Celâl Şengör was ceremonially awarded the SASA Guest Charter and the Charter of a Foreign Member of SASA.

Lectures

In 2018, at the proposal of the SASA Departments and SASA Executive Board 12 lectures were held.

On 1 March, the SASA Mathematical Institute organized Dr. Keith Devlin's lecture on *Mathematics in the 21st Century*.

On 14 March, under the auspices of the Serbian Academy of Sciences and Arts, the Vinča Institute of Nuclear Sciences organized the lecture titled *From Physics to Medical Applications*, which was given by Professor Dr. Majnitić Dosanjh, Senior Advisor for Medical Application at CERN.

On 22 March, at the proposal of the SASA Department of Mathematics, Physics and Earth Sciences and within the scientific forum on *The Stunning Effects of Quantum Physics* (Čudesni efekti kvantne fizike) two lectures were given. Professor Dr. Vladan Vuletić, Massachusetts Institute of Technology (MIT) Department of Physics, USA, lectured on *Very Attractive Photons* (Vrlo atraktivni fotoni), while Dr. Vlatko Vedral, University of Oxford Department of Physics, UK, gave a lecture on *Living in a Quantum World* (Kako je živeti u kvantnom svetu?).

On 23 March, at the proposal of the SASA Department of Language and Literature, Professor Dr. Stephanie West, Hertford College, University of Oxford, gave a lecture on *Odyssean Alternatives* (Odisejske alternative).

On 2 April, at the proposal of the SASA Department of Technical Sciences, Professor Dr. Miroslav Krstić, Vice-Chancellor for Research at the University of California in San Diego, gave a lecture on *Automatic Control of Traffic Congestion Reduction* (Automatsko upravljanje smanjenjem zagušenja u saobraćaju).

On Monday 14 May, the electronic *Collection of Medieval Serbian Manuscripts and Books* (Kolekcija srednjovekovnih srpskih rukopisa i knjiga) was ceremonially delivered by Alexander Ivanovich Visly (Александр Иванович Вислый), General Director of the Russian State Library in Saint Petersburg.

On 18 July, at the proposal of the SASA Executive Board, Professor Dr. Jörg Hacker, President of the German National Academy of Sciences *Leopoldina*, gave a lecture on *Scientific Cooperation in Europe – The Potentials of the Berlin Process*.

On 3 September, the Serbian Ministry of Education, Science and Technological Development and the European Research Council established by the European Commission organized the lecture of Professor Jean-Pierre Bourguignon, Director of the European Research Council.

On 26 September, at the proposal of the SASA Department of Social Science, Professor Dr. Michael Keren, Max Stern College in Israel, gave a lecture on *The Role of Public Intellectual in the Digital Age*.

On 27 September, at the proposal of the SASA Institute of Technical Sciences and SASA Department of Technical Sciences, Professor Dr.

Józef Piotrowski gave a lecture on *Development of the Hot Mwir and Lwir Photodetectors*.

On the occasion of the 165th anniversary of biology in Serbia and the 50th anniversary of the Serbian Genetic Society and at the proposal of the SASA Department of Chemical and Biological Sciences, Dr. Carles Lalueza-Fox, Institute of Evolutive Biology, University Pompeu Fabra, Barcelona, Spain, gave a lecture on *Unveiling the Genomic History of Europe*.

On 1 October, at the proposal of the SASA Committee on Biomedical Investigations, Dr. Milan R. Dimitrijević, Professor Emeritus at Baylor College of Medicine in Houston, USA, gave a lecture on *The Human Nervous System and Movement Control: Paralysis and the Recovery of Neurocontrol of Movement* (Nervni sistem čoveka i upravljanje pokretima: paraliza i obnavljanje nervne kontrole kretanja).

Commemorative Meetings

The Serbian Academy of Sciences and Arts held six commemorative meetings honouring its deceased members.

On 22 May 2018, the commemorative meeting dedicated to the memory of the deceased full member of SASA, Nikola Koka Jovanović, was held to mark his one-year death anniversary at the SASA Gallery of Visual Arts and Music. The speeches about Academician Koka Janković's personality and work were delivered by art historian Bojana Djurić and Academician Dušan Otašević, while the introductory speech was delivered by Academician Milan Lojanica, Secretary of the SASA Department of Visual Arts and Music.

The commemorative meeting dedicated to the memory of the deceased full member of SASA, Bogoljub Stanković, was held on 15 June 2018. The speeches about Academician Bogoljub Stanković's personality and work were delivered by Academician Gradimir Milovanović, Secretary of the SASA Department of Mathematics, Physics and Earth Sciences; Academician Stevan Pilipović, President of the SASA Branch in Novi Sad; Academician Teodor Atanacković; Professor Dr. Zoran Marković and Academician Miro Vuksanović.

The commemorative meeting dedicated to the memory of the deceased full member of SASA, Pantelija Nikolić was held on 29 October 2018. The speeches about Academician Pantelija Nikolić's personality and work were delivered by Academician Zoran Petrović, Secretary of the SASA Department of Technical Sciences, Academician Zoran Popović, Vice-President of SASA, and Academician Dejan Popović.

The commemorative meeting dedicated to the memory of the deceased full member of SASA, Vladeta Jerotić, was held on 6 December 2018. The speeches about Academician Vladeta Jerotić's personality and work were delivered by Academician Miro Vuksanović, Professor Dr. Bojan Jovanović and journalist Aleksandar Gajšek.

The commemorative meeting dedicated to the memory of the deceased full member of SASA, Momčilo M. Ristić, was held on December 2018. The speeches about Academician Momčilo M. Ristić's personality and work were delivered by Academician Zoran Popović, Vice-President of SASA; Dr. Aleksa Maričić, Professor Emeritus, University of Kragujevac; Dr. Emilija Kostić, Scientific Advisor (retired), Vinča Institute of Nuclear Sciences, and Dr. Vladimir Pavlović, Professor at the University of Belgrade and Scientific Advisor to the SASA Institute of Technical Sciences.

The commemorative meeting dedicated to the memory of the deceased full member of SASA, Academician Veselinka Šušić-Rakić, the former Secretary of the SASA Department of Medical Sciences, was held on 20 December 2018. The speeches about Academician Veselinka Šušić-Rakić's personality and work were delivered by Academician Vladimir S. Kostić, President of SASA, Academician Dragan Micić, Secretary of the SASA Department of Medical Sciences, and Professor Dr. Olivera Stanojlović.

Study Trips

During the year, 55 SASA members and associates realized study trips, attended scientific meetings in the country and abroad and participated in the working bodies of international associations or major international meetings as SASA representatives. The SASA was visited by 60 scientists under cooperation agreements, as participants in scientific meetings, lecturers and members of official delegations. More than 15 researchers visited scientific institutions working outside the SASA, which are the bearers of project-related cooperation under its bilateral agreements.

PUBLISHING ACTIVITY IN 2018

PRESIDENCY

- **SASA Almanac (Godišnjak SANU) CXXIV for 2017**
- **Bulletin of the Scientific and Art Research Fund of SASA for 2017** (Bilten Fonda SANU za istraživanja u nauci i umetnosti za 2017), No. 43
- **Bulletin of Scientific and Art Research. Annual Report for 2016**
- **Bulletin of Scientific and Art Research. Annual Report for 2017**
- **Catalogue of the Editions of the Serbian Academy of Sciences and Arts: 2016-2017-2018** (Katalog izdanja Srpske akademije nauka i umetnosti: 2016–2017–2018)
- **The Participation of the Serbian Academy of Sciences and Arts in the Internal Dialogue on Kosovo and Metohija** (Učešće Srpske akademije nauka i umetnosti u unutrašnjem dijalogu o Kosovu i Metohiji), Scientific Meetings (Naučni skupovi) CLXXII, Vol. 11
- **Stojan Novaković: On the Occasion of His 175th Birth Anniversary** (Stojan Novaković: povodom sto sedamdeset pet godina od rođenja)
- **The 8th Danube Academies Conference** = 8. Konferencija akademija podunavske regije

DEPARTMENT OF MATHEMATICS, PHYSICS AND EARTH SCIENCES

- **Mihailo Petrović Alas, rodonačelnik srpske matematičke škole**, Galerija Srpske akademije nauka i umetnosti, 143
- **Mihailo Petrović Alas, The Founding Father of the Serbian School of Mathematics**, Gallery of the Serbian Academy of Sciences and Arts, 143

- Svetlana Simonović-Mandić, **Bibliography of the Works of Academician Milosav Marjanović** (Bibliografija radova akademika Milosava Marjanovića), SASA Library Editions (Izdanja Biblioteke SANU), Vol. 29

DEPARTMENT OF CHEMICAL AND BIOLOGICAL
SCIENCES

- **Ethno-Villages and Rural Environmental Entities in the Republic of Serbia and the Republic of Srpska** (Etno-sela i seoske ambijentalne celine u Republici Srbiji i Republici Srpskoj), Scientific Meetings (Naučni skupovi) CLXIX, Vol. 11
- **Ecological and Economic Significance of the Fauna of Serbia** (Ekološki i ekonomski značaj faune Srbije), Scientific Meetings (Naučni skupovi) CLXXI, Vol. 12
- **Water Supply of the Population in Hilly and Mountain Regions** (Vodosnabdevanje stanovnika brdsko-planinskih predela), Scientific Meetings (Naučni skupovi) CLXXIV, Vol. 13
- Marjan Niketić, Gordana Tomović, **An Annotated List of Vascular Flora of Serbia 1, Lycopodiopsida, Polypodiopsida, Gnetopsida, Pinopsida and Liliopsida** (Kritička lista vrsta vaskularne flore Srbije 1, Lycopodiopsida, Polypodiopsida, Gnetopsida, Pinopsida i Liliopsida), Special Editions (Posebna izdanja) DCXC, Vol. 10
- **Lives and Works of Serbian Scientists, Biographies and Bibliographies** (Život i delo srpskih naučnika, Biografije i Bibliografije), Vol. 16
- **Ivan Djaja. The Belgrade School of Physiology – from the Sorbonne to Belgrade** (Ivan Djaja. Beogradska škola fiziologije – od Sorbone do Beograda), SASA Gallery of Science and Technology (Galerija nauke i tehnike SANU), No. 31
- **This too Is Serbia** (I ovo je Srbija), SASA Gallery of Science and Technology (Galerija nauke i tehnike SANU), No. 33

DEPARTMENT OF TECHNICAL SCIENCES

- **Proceedings of the 22nd International Conference on Gas Discharges and Their Applications.** Vols. 1-2

DEPARTMENT OF MEDICAL SCIENCES

- Zoran V. Krivokapić et al., **Colorectal Cancer – from Prevention Through Carcinogenesis to Metastasis** (Karcinom debelog creva – od prevencije preko karcinogeneze do metastaze)

DEPARTMENT OF LANGUAGE AND LITERATURE

- **Dictionary of the Serbo-Croatian Literary and Vernacular Language** (Rečnik srpskohrvatskog književnog i narodnog jezika), Vol. 20, Petogodan–pogdegod
- **The Work of Ivo Andrić** (Delo Ive Andrića), Scientific Meetings (Naučni skupovi), CLXX, Vol. 30
- **Literature and Language in the Society of Serbian Letters** (Književnost i jezik u Društvu srpske slovesnosti), Scientific Meetings (Naučni skupovi) CLXVIII, Vol. 29
- **SASA Library Forum** (Tribina Biblioteke SANU), Year VI, No. 6
- **Onomatological Contributions XXIV** (Onomatološki prilozi XXIV)
- **Serbian Dialectological Proceedings LXIV/2** (Srpski dijalektološki zbornik LXIV/2)
- **South Slavist Philologist LXXIII** (Južnoslovenski filolog LXXIII), Vols. 3-4
- **South Slavist Philologist LXXIV** (Južnoslovenski filolog LXXIV), Vol. 1
- Radoslava Trnavac, **Text Coherence and Evaluation in the Serbian and Russian Languages** (Koherentnost i evaluacija u tekstu u srpskom i ruskom jeziku), The Serbian Language and Literature in Comparison with Other Languages and Literatures (Srpski jezik i književnost u poredjenju sa drugim jezicima i književnostima), Vol. 4
- **Serbian Lexicography from Vuk to the Present Day** (Srpska leksikografija od Vuka do danas). Exhibition Catalogue (Katalog izložbe)
- **Language as the Record of Culture in an Ethnological and Linguistic Analysis Between Serbia and Macedonia** (Jezik kao zapis kulture u etnološkoj i lingvističkoj analizi na relaciji Srbija–Makedonija), Vol. I
- **Selected Works of Miron Flašar**, Vol. I. Classical Literature. Literary Theory. Linguistics, Linguostylistics. (Izabrana dela Mirona Flašara, tom I. Antička književnost. Teorija književnosti. Lingvistika. Lingvostilistika)

- **Selected Works of Miron Flašar**, Vol. II. History of Religions. History of Ideas. Comparatistics. Traductology. Classical Studies Among the Serbs. (Izabrana dela Mirona Flašara, tom II. Istorija religija. Istorija ideja. Komparatistika. Traduktologija. Klasične studije u Srba)
- **Selected Works of Miron Flašar**, Vol. III. Classical Heritage in Serbian Literature (Izabrana dela Mirona Flašara, tom III. Antičko nasledje u srpskoj književnosti)

DEPARTMENT OF SOCIAL SCIENCES

- **Serbian Roma in the 21st Century** (Romi Srbije u XXI veku), Special Editions (Posebna izdanja) DCLXXXVIII, Vol. 109
- **Economics: Employment and Labour in Serbia in the 21st Century** (Ekonomija: zaposlenost i rad u Srbiji u XXI veku), Scientific Meeting (Naučni skupovi) CLXXVI, Vol. 41
- **Economic Crisis: Origins and Outcomes** (Ekonomska kriza: poreklo i ishodi), Economic Proceedings (Ekonomski zbornik), Vol. XIV

DEPARTMENT OF HISTORICAL SCIENCES

- **Glas CDXXVIII**, Vol. 18
- **Umetničko nasledje srpskog naroda na Kosovu i Metohiji: istorija, identitet, ugroženost, zaštita**
- **Artistic Heritage of the Serbian People in Kosovo and Metohija: History, Identity, Vulnerability, Protection**
- **The Kingdom of Serbs, Croats and Slovenes (1918-1920)**. Collection of Documents. Vol. 1. Military Protection, Tome 2 (Kraljevstvo Srba, Hrvata i Slovenaca /1918–1920. Zbornik dokumenata, tom 1. Vojna zaštita, knj. 2). Selected by Vlado Strugar; prepared by Milić F. Petrović.
- **Kosovo-Metohija Proceedings** (Kosovsko-metohijski zbornik) 7
- **Chilandar Proceedings** (Hilandarski zbornik) 14
- **Controversies in Serbian Historiography** (Kontroverze u srpskoj istoriografiji), Lecture Cycle (Ciklus predavanja), Vol. 4.
- Nenad Tasić, Kristina Penezić, **Archaeological Forensics – 20 Years of New Archaeological Investigations of Vinča** (Forenzika drevnosti)

- 20 godina novih arheoloških istraživanja Vinče), SASA Gallery of Science and Technology (Galerija nauke i tehnike SANU), No. 34.
- Novica Babović, **The Salonika Front 1916–1918** (Solunski front 1916-1918), SASA Gallery of Science and Technology (Galerija nauke i tehnike SANU), No. 35
 - Zoran Jakovljević, Časlav Mijušković, Darko Mladenović, **The First World War in Miniature** (Prvi svetski rat u minijaturi), SASA Gallery of Science and Technology (Galerija nauke i tehnike SANU), No. 36
 - Milena Obradović, **Bibliography of the Works of Academician Nikola Tasić** (Bibliografija radova akademika Nikole Tasića), SASA Library Editions (Izdanja Biblioteke SANU), XXVIII

DEPARTMENT OF FINE ARTS AND MUSIC

- Dijana Metlić, **Nedeljko Gvozdenović. On a Pursuit of Absolute Painting** (Nedeljko Gvozdenović. U potrazi za apsolutnim slikarstvom), Gallery of the Serbian Academy of Sciences and Arts (Galerija Srpske akademije nauka i umetnosti), 144
- **Marko Čelebonović.** Gallery of the Serbian Academy of Sciences and Arts (Galerija Srpske akademije nauka i umetnosti), 146
- Gorica Ljubenov, **Traditional Architectural Heritage in the Area of the Stara Planina** (Tradicionalno arhitektonsko nasledje u regionu Stare planine), SASA Gallery of Sciences and Arts (Galerija nauke i tehnike SANU), No. 32
- Jelena Mežinski Milovanović, **The Activities of Nedeljko Gvozdenović in the Serbian Academy of Sciences and Arts and His Contribution to the Establishment and Operation of the SASA Gallery** (Delatnost Nedeljka Gvozdenovića u Srpskoj akademiji nauka i umetnosti i njegov doprinos osnivanju i radu Galerije SANU), Gallery of the Serbian Academy of Sciences and Arts (Galerija Srpske akademije nauka i umetnosti), *Exhibition Review* (Izložbena sveska), No. 40

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- **Annals of the SASA Branch in Novi Sad** (Anali Ogranka SANU u Novom Sadu), No. 13 for 2017
- **Chronicle of the SASA Branch in Novi Sad** (Hronika Ogranka SANU u Novom Sadu), No. 7
- **Serbian Literature Today: Round Table Proceedings 2014-2017** (Srpska književnost danas: zbornik radova sa okruglih stolova 2014–2017)
- **The Works of Miloš Crnjanski: Round Table Proceedings**, 12 September 2018 (Delo Miloša Crnjanskog sa Okruglog stola, 12. IX 2018)
- Svetozar Koljević, **A Thing or Two About Ćopić** (Ponešto o Ćopiću)
- **HELIA**, Vol. 41, No. 68/2018
- **HELIA**, Vol. 41, No. 69/2018

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- **Chronicle of the SASA Branch in Niš** (Hronika Ogranka SANU u Nišu), No. 1
- **Academician Mihailo Gavrilović: A Historian, Archivist and Diplomat** (Akademik Mihailo Gavrilović: istoričar, arhivist i diplomata)

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