

MATHEMATICAL INSTITUTE OF SASA
On the occasion of the 80th anniversary



MI80th
ANNIVERSARY



Mathematical
Institute
of the Serbian Academy of
Sciences and Arts

MATHEMATICAL INSTITUTE OF SASA
On the occasion of the 80th anniversary

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Building at 36 Knez Mihailova Street,
housing the Mathematical Institute
of the Serbian Academy
of Sciences and Arts
(Photo by Dragan Aćimović)



ABOUT THE INSTITUTE

INTRODUCTION

*Text prepared by Dr Zoran Ognjanović
based on the original text by Dr Zoran
Marković*

The Mathematical Institute of the Serbian Academy of Sciences and Arts (MISASA) — an institute of national importance to the Republic of Serbia, an institutional member of the European Mathematical Society (EMS) and a member of ERCOM, the EMS Union of European Research Centres in Mathematics — is a unique centre for research in pure and applied mathematics, mechanics, and computer science in Serbia. This is clearly reflected in a wide range of activities, including the organisation of national and international scientific projects, conferences, workshops, summer schools, and seminars, as well as informal research groups.

In its first 60 years, the Institute did not have a large permanent staff, but over the last 20 years, many new researchers have been

hired. In addition to its headquarters in Belgrade, two other departments have been established in Novi Sad and Niš. Currently, the institute employs nearly 90 researchers, about two-thirds of whom hold PhDs, while the remainder are doctoral students. Nevertheless, the Institute still relies heavily and successfully on its numerous associate members, who have always played an essential role not only as heads of projects and seminars but also in managing the Institute as a whole. These scholars are from all over Serbia, which allows the MISASA to maintain close contacts with universities across the country, particularly with faculties of science and mathematics and with schools of engineering.

The Institute is run by a Managing Board and a director, who is elected by the Board with the Academy's approval. Since 2010, when the new Law on the Serbian Academy of Sciences and Arts was adopted, the Managing Board has consisted of five members appointed by the Academy, the Institute, and the Serbian government. All major decisions concerning scientific policy are made by the Institute's Scientific Council, which is composed of all research staff holding a PhD and three representatives of the Academy. After the adoption of the Law

on Science and Research, which introduced institutional financing for scientific institutes instead of the previous project-based model, the MISASA adjusted its organisational structure. Instead of grouping researchers into projects, three sectors were established in 2021: Mathematics, Computer Science, and Mechanics. Within these sectors, fundamental research is conducted in the corresponding fields, while dedicated centres carry out interdisciplinary and applied research.

One of the most important factors encouraging researchers to gather at the Institute is its rich library. Its valuable holdings include more than 12,000 books and hundreds of mathematical journals, many of them from their first issues. Researchers also have online access to (semi) public IT resources as well as to databases containing scientific content (e.g., eLib – electronic editions of Serbian mathematical journals with open access to full texts, and the institutional repository of research papers authored by the Institute’s collaborators).

Another activity that has made the MISASA a popular place among mathematicians is the organisation of colloquia and seminars, whose meetings are held regularly every week. Their chairpersons are expected to invite foreign and domestic researchers to present their own and others’ results and to organise discussions on issues important for research in the mathematical sciences.

The Institute’s development over the last two decades testifies to an intense exploration of new directions in multidisciplinary research, such as information processing and security, the digitisation of cultural and scientific heritage, and novel approaches to presenting research results. In recognition of this orientation, the Serbian Academy’s award in the field of mathematics and related sciences

was presented in 2013 to a group of five research professors from the Institute.

In 2012, the Institute, together with the Centre for the Promotion of Science, launched the largest national festival for the popularization of science, “May, the Month of Mathematics.” In 2011, in cooperation with the Mathematical Grammar School, a programme for monitoring the progress of young mathematical talents was created. Since 2017, the Institute has been awarding annual prizes to the best undergraduate, master’s, and doctoral students from Serbia in the fields of mathematics, mechanics, and computer science. In collaboration with universities from Novi Sad, Niš, Kragujevac, and Novi Pazar, the MISASA has also established a joint doctoral school in mathematics. In cooperation with the Serbian Society for Mathematical Sciences, the Institute organises the national Congress of Young Mathematicians.

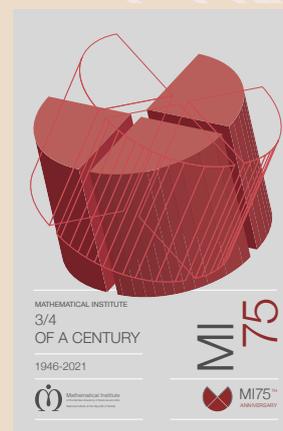
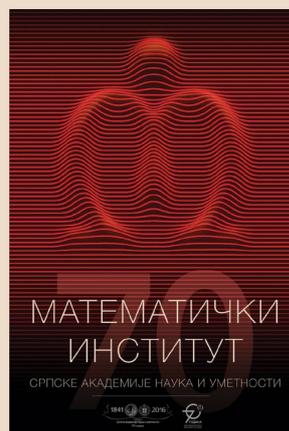
These activities illustrate the Institute’s efforts to realise its mission, which is defined as:

- ▶ Achieving and maintaining the highest level of scientific research in mathematics, mechanics, and computer science;
- ▶ Mobilizing mathematical resources in Serbia, offering research infrastructure, and improving communications between groups with similar scientific interests;
- ▶ Discovering ways and means of applying scientific results;
- ▶ Solving problems posed by science and industry;
- ▶ Organising scientific and expert training and participating in the organisation and delivery of doctoral studies;
- ▶ Organising international collaborations and supporting participation in domes-

tic and international scientific conferences;

- ▶ Supporting the education of young people of exceptional talent;
- ▶ Popularizing the mathematical sciences.

This mission confirms the Institute's orientation toward Responsible Research and Innovation, a modern approach to science that involves communication and cooperation with all societal actors.



Promotional posters marking the 50th, 60th, 70th, and 75th anniversaries of the Mathematical Institute of the Serbian Academy of Sciences and Arts (MISASA Archives)



**FOUNDERS OF THE
MATHEMATICAL INSTITUTE**

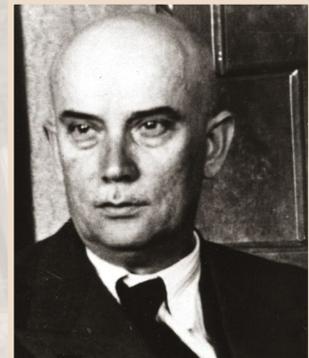
Anton Bilimovič
Mathematician; University
Professor (Kyiv, Odesa,
Belgrade); Academician
(Zhytomyr, 1879 – Belgrade, 1970)



Bogdan Gavrilović
Mathematician; University
Professor (Belgrade); Academician
(Novi Sad, 1863 – Belgrade, 1947)



Jovan Karamata
Mathematician; University Professor
(Belgrade, Geneva); Academician
(Zagreb, 1902 – Geneva, 1967)



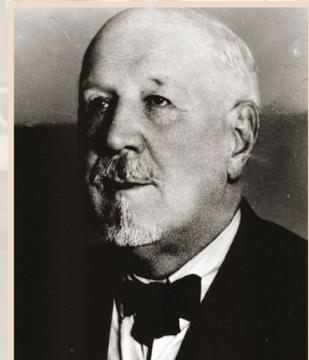
Radivoj Kašanin
Mathematician; University Professor
(Belgrade); Academician
(Beli Manastir, 1892 – Belgrade, 1989)



Milutin Milanković
Civil engineer, Mathematician;
University Professor (Belgrade);
Academician (Dalj, 1879 –
Belgrade, 1958)



Vojislav Mišković
Astronomer; University Professor
(Belgrade); Academician
(Fužine, 1892 – Belgrade, 1976)



Nikola Saltikov
Mathematician; University Professor
(Kharkiv, Belgrade); Academician
(Vyshny Volochyok, 1872 – Belgrade,
1961)

THE MATHEMATICAL INSTITUTE OF THE SERBIAN ACADEMY OF SCIENCES AND ARTS — EIGHT DECADES OF DEVELOPMENT

Text prepared by Dr Marija Šegan-Radonjić based on the original text by Dr Zoran Marković

The Mathematical Institute of SASA was founded in 1946 as the first scientific institute of the Serbian Academy of Sciences. Its establishment marked a turning point in the institutional development of mathematics in Serbia, laying the foundations for organised scientific research during a period of post-war recovery and social transformation. Although the Institute began its work in a country devastated by war, it relied on significant traditions of earlier scientific and educational development. Modern mathematical activity in Serbia emerged at the end of the 19th century. Its leading figures were professors of the Great School, later the University of Belgrade, who had been educated at prominent universities in Germany, Austria-Hungary, and France. The arrival of Russian émigrés after the First World War further stimulated the development of mathematics in Serbia; among them were distinguished mathematicians who significantly improved teaching, scientific research, and the institutional framework.

During the 1920s, an informal organisation — the “Club of Mathematicians” — was formed, bringing together University of Belgrade professors interested in scientific research. The Club held regular scientific lectures, and in 1932 launched the first international mathematical journal in Serbia: *Publications Mathématiques de l'Université de Belgrade*.

The Club’s work was supported by the rich library of the Mathematical Seminar, founded in 1895. However, almost the entire collection of the Seminar and the University library was destroyed in 1944, only two days before the liberation of Belgrade. The last printed issue of *Publications* was lost during the 1941 bombing — only a single copy survived, kept in the editor’s home.

After the war, the founders of the Institute — former members of the Club of Mathematicians — recognized the new institution as a means of renewing mathematical activity in the country. The original seven members soon elected seven more associates; scientific lectures resumed (first monthly, then weekly) and a systematic restoration of the library began.

In 1947, a new series of the journal appeared, now under the title *Publications de l'Institut Mathématique*, thereby restoring continuity with the pre-war series and clearly emphasizing the Institute’s commitment to international scientific cooperation.

One of the greatest challenges during the Institute’s early years was the lack of young researchers, as nearly all founders were older than sixty. The admission of the first cohort of fellows and assistants in 1949 marked the beginning of a gradual but steady strengthening of the Institute’s staff.

Instead of employing a large number of researchers, the Institute developed a model in which its associates were predominantly



Belgrade Mathematical School. Photograph by M. Savić, 1926. Miloš Radojčić, Tadija Pejović, Vyacheslav Zhardetsky, Anton Bilimovič, Petar Zajankovski (Jelenko Mihailović, seismologist), Radivoj Kašanin, Jovan Karamata (standing). Nikola Saltikov, Mihailo Petrović (Pavle Popović, Rector), Bogdan Gavrilović (K. Petković, Dean of the Faculty of Philosophy), Milutin Milanković (seated).
(SASA Archives, 14197/16)

university employees, while the Institute provided scientific infrastructure — a library, seminars, publishing activities, and support for establishing international collaboration. This organisational model proved particularly suitable for the structure of higher education in Serbia, where mathematicians were distributed across various faculties.

As the university network expanded throughout Yugoslavia, cooperation between the Institute and newly established universities and mathematics departments became increasingly important. Young mathematicians typically received advanced training at the Institute and then went to Skopje,

Sarajevo, and Novi Sad, where they became leading figures in scientific and educational development.

During the 1950s and 1960s, the Institute employed a small number of assistants who, after further training, usually continued their careers at universities, contributing to the formation of new mathematics departments. Thanks to this model, the Institute remained the principal scientific centre in the field of mathematics, while the number of permanent researchers remained limited. Only after legislative changes in the 1970s and new models of financing after 2001 did the

number of employees begin to grow gradually.

In the first decades of the Institute's existence, analysis and mechanics were the dominant research areas. However, from the outset, the Institute supported work in all mathematical disciplines that met high scientific standards. In line with global trends and the interests of individual researchers, areas of focus changed over time: in the 1970s, logic became one of the most dynamic fields; in the 1980s, geometry and topology came to the forefront; while in the 1990s, analysis and mechanics regained strength. In recent decades, fields closely related to computing — cryptology, optimisation, graph theory, and other applied disciplines — have gained particular prominence.

The Institute recognized the importance of computing relatively early and, in the mid-1960s, established a Computing Centre equipped with an IBM 360 — one of the most advanced scientific computers of its time. However, due to high maintenance costs, limited resources, and political and economic changes in Yugoslavia, the Centre's activities gradually declined and were fully discontinued in 1985. Afterward, the Institute focussed its research activities on the use of personal computers.

As an important consequence of this technological shift, the Institute initiated activities in the field of digitisation as early as the late 1980s. First, digital preparation of *Publications* was introduced, followed by a systematic digitisation program. In the decades that followed, the Institute developed broad academic and cultural collaborations with institutions in Serbia and abroad, resulting in numerous projects and achievements in the preservation of scientific and cultural heritage.

From the second half of the 1980s onward, the Institute participated in numerous large-scale national scientific projects — both in terms of the number of researchers involved and thematic diversity. At the beginning of the 21st century, the Institute became actively engaged in European scientific programmes, such as FP7, Horizon 2020, and others, which further enhanced its international visibility.

The Institute gained independent status in 1961 but continued to operate under the auspices of the Academy. After the adoption of the new SASA Law in 2010, it was reintegrated into the Academy, strengthening its institutional position. Further progress was confirmed by the introduction of institutional financing in 2020, while a major milestone was reached on March 25, 2021, when the Mathematical Institute of SASA was declared an institute of national importance.

The Institute's international reputation was further reinforced in September 2023, when it became a member of European Research Centres on Mathematics, an important recognition of its scientific contributions at the European level.

The celebration of the 80th anniversary of the Mathematical Institute of SASA is not only an opportunity to honor the Institute's rich history, but also a moment to reflect on its enduring role in the institutional development of mathematics in Serbia.



The Palace of SASA, which housed the Mathematical Institute of SASA from 1952 to 2008.
Photograph by Jeremija Stanojević, c. 1930. (Belgrade City Museum, UR/9527).

DIRECTORS OF THE MATHEMATICAL INSTITUTE



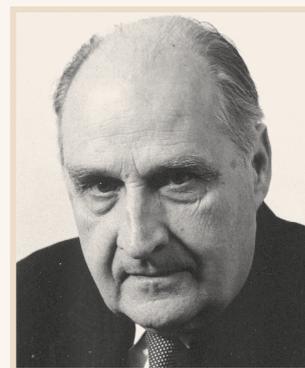
Dr Anton Bilimovič
Director 1947–1949
(MISASA Archives)



Dr Jovan Karamata
Director 1949–1951
(SASA-F 347, 347/1–4)



Dr Radivoje Kašanin
Director 1951–1958
(MISASA Archives)



Dr Miodrag Tomić
Director 1958–1961
(MISASA Archives)



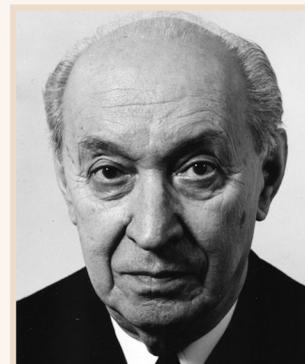
Dr Tadija Pejović
Director 1961–1968
(Courtesy of Pejović's Family)



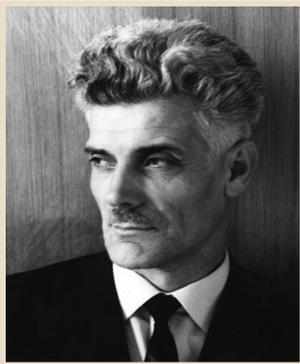
Dr Đuro Kurepa
Acting Director 1968–1969
(MISASA Archives)



Dr Veljko Vujičić
Acting Director 1969,
1992–1993
(MISASA Archives)



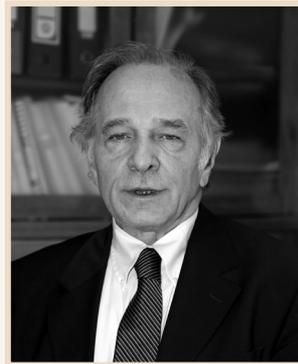
Dr Tatomir Anđelić
Director 1969–1978
(MISASA Archives)



Dr Mirko Stojaković
Director 1978–1981
(MISASA Archives)



Dr Stevo Komljenović
Director 1981–1985
(MISASA Archives)



Dr Zoran Marković
Director 1985–1992,
1993–2014
(MISASA Archives)

Institute Leadership



Dr Zoran Ognjanović
Director 2015–present
(Photo by Dragan Aćimović)



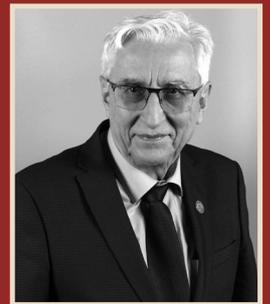
Academician Dr Miodrag Mihaljević
Deputy Director
2015–present
(Courtesy of M. Mihaljević)



Dr Đorđe Baralić
Assistant Director
2021–present
(Courtesy of Đ. Baralić)



Academician Dr Teodor Atanacković
Chairman of the
Managing Board
2010–present
(Photo by Marko Beg)



Academician Dr Stevan Pilipović
President of the
Scientific Committee
2022–present
(Photo by Marko Beg)

AWARDS OF THE MATHEMATICAL INSTITUTE OF SASA

On August 16, 2012, the Executive Board of the Mathematical Institute of SASA established the Award of the Mathematical Institute of SASA to recognize outstanding contributions to the development of the Institute and of mathematics in the Republic of Serbia.

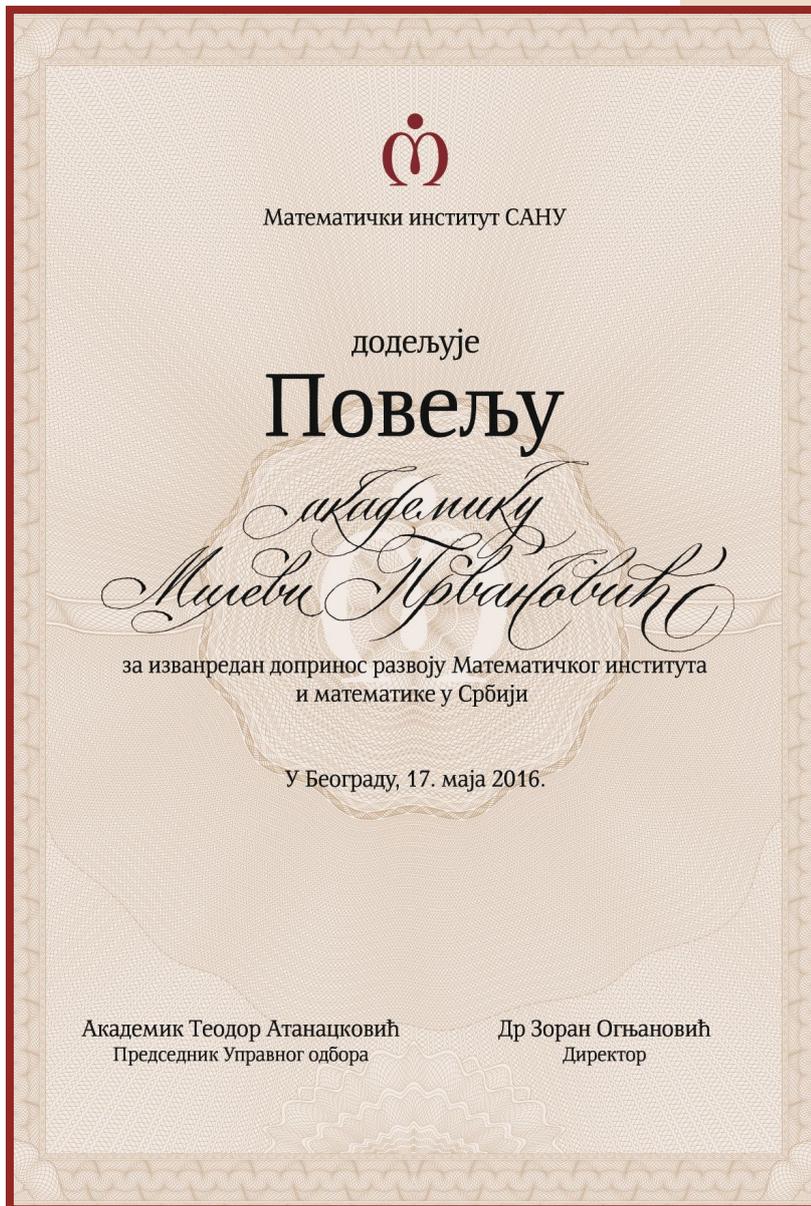
This recognition has so far been awarded to:

- ▶ 14 September 2012 — to young mathematician Teodor von Burg for outstanding results achieved at the International Mathematical Olympiads;
- ▶ 31 October 2014 — to Academician Prof. Dr Bogoljub Stanković for his remarkable contribution to the development of Serbian mathematics;
- ▶ 26 April 2016 — to Academician Prof. Dr Mileva Prvanović and Prof. Dr Veljko Vujičić in recognition of their immeasurable contribution to the development of the Mathematical Institute of SASA and mathematics in the Republic of Serbia;
- ▶ 30 August 2019 — to Srđan Ognjanović, MA, for his outstanding contribution to the development of the Mathematical Grammar School in Belgrade and mathematics in the Republic of Serbia;

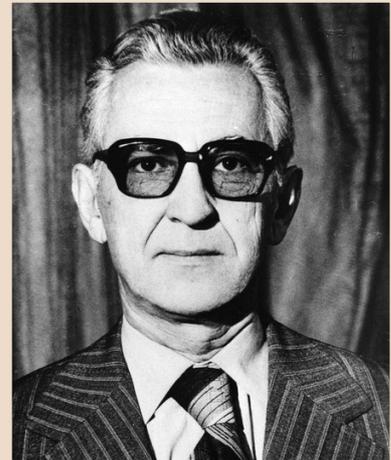
- ▶ 10 September 2021 — to Academician Teodor Atanacković, Academician Vladan Đorđević, Academician Dragoš Cvetković, Prof. Dr Žarko Mijajlović, and Prof. Dr Zoran Marković in recognition of their significant contribution to the development of the Mathematical Institute of SASA and mathematics in Serbia.

Student Awards of the Mathematical Institute of SASA

Each year, the Mathematical Institute of SASA recognizes notable achievements of undergraduate, master's, and doctoral students (BSc, MSc, and PhD) in mathematics, mechanics, and computer science, and awards the authors of the best theses in mathematics and computer science.



Award of the Mathematical Institute of SASA
 awarded to Academician Mileva Prvanović, May 17, 2016
 (Digital Archive of MI SASA)



Bogoljub Stanković
 Mathematician; University Professor (Novi Sad); Academician
 (Botoš near Zrenjanin, 1924 – Novi Sad, 2018)
 (SASA)



Mileva Prvanović
 Mathematician; University Professor (Novi Sad); Academician
 (Žlne near Knjaževac, 1929 – Belgrade, 2016)
 (SASA)



RESEARCH

NATIONAL PROJECTS (2020 – 2026)

Projects supported by the Science Fund of the Republic of Serbia

(2023–2026)

Lazy walk counts and spectral radius of threshold graphs, LZWK
Project Reference No: 6767, supported by the Science Fund of the Republic of Serbia

Project leader: Dr Sanja Stevanović

Imagine a network of nodes connected by edges. The spectral radius of such a network is closely related to its potential for the spread of an infection or information. A classical open problem asks: which connected networks with a given number of nodes and edges have the maximal spectral radius? In the LZWK project we tackle this question by analysing a lazy walker who at each step either remains at the current node or moves to a neighbouring node — a model that is easier to analyse here than an active walker, who must move to a neighbour at every step. In the second part of the project, when our lazy walker gets tired of

walking, we will apply reinforcement learning to construct particularly interesting networks that exhibit extremal properties tailored to mathematicians' needs.

(2023–2026)



Advanced Techniques of Mathematical Aggregation and Approximative Equations Solving in Digital Operational Research, AT-MATADOR

Project Reference No: 6565, supported by the Science Fund of the Republic of Serbia

Project leader: Dr Andreja Tepavčević

In the project, contemporary mathematical areas in algebra and analysis dealing with aggregation operators and approximate equation solving are developed and investigated with the main objective of obtaining advanced techniques applicable to digital operational research. Some of the first

results obtained are connected to new algebraic structures that are useful in applications where not all possibilities are linearly ordered. Approximate solutions for several types of fuzzy relational equations are determined, which are convenient in cases where there is a lack of information, corrupted data, or errors, as well as problems with data ranking. A new method for the prioritization of data based on the Choquet integral has also been developed. Some of the project results have already been published in journals of the highest category and presented at leading conferences in this area.

(2024–2025)



Approximate Algebraic Structures and Arithmetic Combinatorics

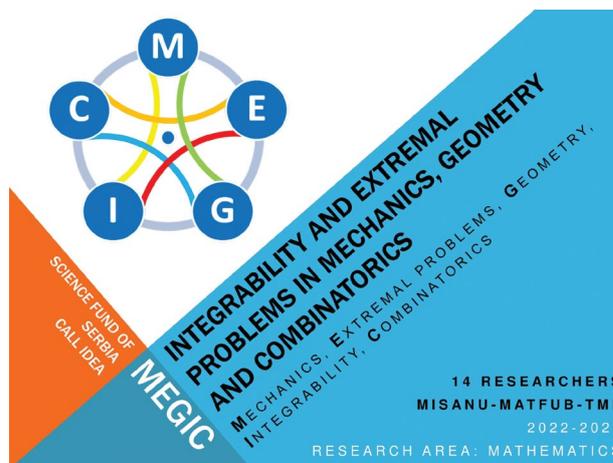
Approximate Algebraic Structures of Higher Order: Theory, Quantitative Aspects and Applications, A-PLUS

Project Reference No: 11143, supported by the Science Fund of the Republic of Serbia

Project leader: Dr Luka Milićević

The project A-PLUS advances the theory of Gowers uniformity norms, which are a central object of the higher-order Fourier analysis. It focuses on understanding approximate algebraic structures, especially Freiman multihomomorphisms, to address open questions in the inverse theory, including obtaining novel inverse theorems and achieving good quantitative bounds. An important aspect of the project is to extend the algebraic regularity method from finite vector spaces to general finite abelian groups. The project also draws on tools from additive combinatorics and aims to produce significant new results with applications in number theory and combinatorics.

(2022–2025)



Integration and Extremal Problems in Mechanics Geometry and Combinatorics, MEGIC

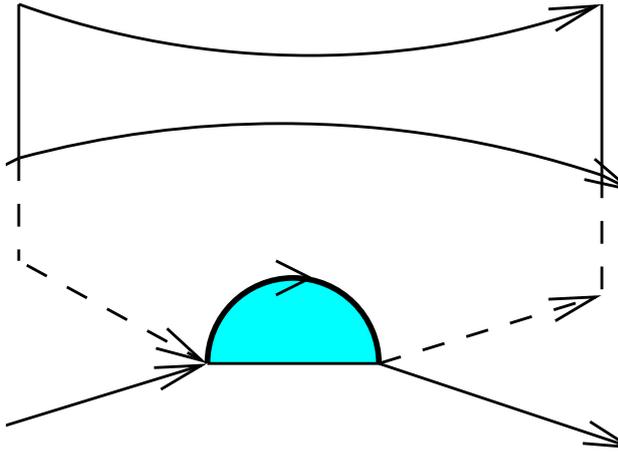
Project Reference No: 7744592, supported by the Science Fund of the Republic of Serbia

Project leader: Dr Božidar Jovanović

MEGIC is a natural continuation of the project 174020 (2011–2019, PI Vladimir Dragović) which brought together 14 researchers from the Mathematical Institute, the Faculty of Mathematics and the Faculty of Technology-Metallurgy, University of Belgrade. In the IDEAS call, it was the highest ranked project in the fields of mathematics, mechanics and computer science. MEGIC provided a foundation for the development of new geometric and topological methods in solving fundamental problems in integrable systems; geometric combinatorics; non-holonomic and Hamiltonian mechanics; geometry of Lie groups; convex analysis and optimal control. Several long-standing problems were solved with significant breakthroughs: classification of resonant billiard trajectories; deforma-

tions of extremal polynomials and solutions of Painlevé VI and Schlesinger equations; the proof of Bogoyavlensky's conjecture; general matrix pencil completion problem; Bier spheres and generalized permutohedra. More than 50 papers were published in leading international journals.

(2022–2025)



Graphical Languages, GWORDS
Project Reference No: 7749891, supported
by the Science Fund of the Republic of
Serbia

Project leader: Dr Zoran Petrić

During the period 2022–2024, the project involved twelve researchers from the Mathematical Institute of SASA and the Faculty of Mathematics, University of Belgrade: Danica Cekić, Bojana Femić, Jovana Obradović, Zoran Petrić, Marko Stošić, Mladen Zekić, Dušan Drobnjak, Milica Jovanović, Jovana Nikolić, Tanja Stojadinović, Igor Uljarević and Siniša Vrećica. The research used methods from the fields of algebraic topology, symplectic geometry, categorical logic and mathematical physics, combined with coherence and categorification. The main problem was

the faithfulness of 3-dimensional topological quantum field theories. All the goals have been achieved.

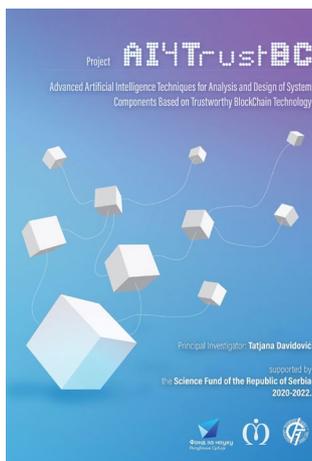
(2022–2025)

Model-theoretical and Ramsey-theoretical Phenomena in Mathematical Structures: Similarity and Diversity, SMART
Project Reference No: 7750027, supported
by the Science Fund of the Republic of
Serbia

Project leader: Dr Miloš Kurilić

SMART is a project in Foundations of Mathematics. The objects of investigation are classes of structures, similarities of structures and the related classification. The members of the team completed 44 papers. 30 papers have been published in international journals: 3 of category M21a, 7 of category M21, 10 of category M22 and 10 of category M23, and 3 in *Zbornik radova Matematičkog instituta* (Proceedings of the Mathematical Institute). 22 papers belong to set theory, 12 to model theory and 10 to Ramsey theory. The team members gave 7 invited and 16 contributed lectures at international conferences, and organised three international conferences: SETTOP 2022, YSTW 2022 and SETTOP 2024 at the Faculty of Sciences, Novi Sad.

(2020–2023)



Advanced artificial intelligence techniques for analysis and design of system components based on trustworthy Blockchain technology — AI4TrustBC
Supported by the Science Fund of the Republic of Serbia

Project leader: Dr Tatjana Davidović

Blockchain (BC) is a specially designed distributed data storage structure, maintained without any third party that must be absolutely trusted. BC is applicable in various domains, cryptocurrency/finance, digital identity, voting, notary, smart contracts, IoT, insurance, health-care, etc. Verification of data is realised by the so-called consensus protocols (CP), most of which are based on cryptographic techniques. The reliability and security of CPs are issues of paramount importance. Artificial Intelligence (AI) and BC have proven to be quite a powerful combination, improving virtually every industry in which they are implemented. The goal of this project is to make a contribution to the application of AI techniques (machine learning, knowledge reasoning based on formal methods, non-classical logics, and metaheuristics) in the BC technology domain for managing privacy, ensuring consistency and reliability.

Projects supported by the Innovation Fund of the Republic of Serbia

(2024–2025)



LibrAlfy, the software for increasing the quality of scanned documents and optically recognized text, LibrAlfy
Project supported by the Innovation Fund of the Republic of Serbia (IF) in the scope of the GovTech programme – Innovations in the service of the public sector of Serbia (Digitisation of Textual Cultural Heritage – Increasing the Quality of Optically Recognized Text)

Project leader: Dr Lazar Velimirović

LibrAlfy is an artificial intelligence-based software solution in the field of digitisation of written cultural heritage, adapted to the needs of the National Library of Serbia, with a focus on improving the quality of scanned documents and recognized text. The solution consists of several modules for digital image processing and natural language processing, as well as a user interface for monitoring the digitisation process and searching digital content by keywords. The software solution is integrated with the existing Digital NLS platform. Supporting modern digitisation standards and user requirements, the proposed software solution enables the digitisation and efficient management of digitised materials.

(2020–2023)

A decentralized blockchain platform for reading, writing, publishing, selling and buying e-books, supported by the Innovation Fund of the Republic of Serbia

Project leader: Dr Miodrag Mihaljević

The goal of the project was to create a decentralized platform that will make monetizing, distributing and protecting digital content as straightforward as possible, while on the other hand providing security and DRM capabilities previously available only to the largest

players in the digital content industry. The platform should provide a streamlined solution for anyone who wants to distribute their digital content and sell it through the network. Four main capabilities of the network include:

- ▶ Distribution of digital content;
- ▶ Purchase of digital content via online and micro-payments;
- ▶ Secure access to purchased digital content;
- ▶ Digital rights management (DRM) of secured content.

INTERNATIONAL PROJECTS AND COLLABORATIONS

International collaboration and projects

Text prepared by Dr Đorđe Baralić and Dr Silvia Ghilezan

The Mathematical Institute of SASA is dedicated to developing a wide range of international collaborations that contribute to joint research projects, partnerships, innovations, building institutional capacities, the promotion of mathematics, mechanics, and computer science, educational exchange and increasing its visibility. Every year, the MISASA hosts more than 100 international guests at its colloquia, seminars, conferences, workshops and other events. The MISASA has numerous forms of cooperation with institutions and researchers from more than 80 countries worldwide. The joint international activities have positioned the MISASA as a highly respected research institution. For example, in the area of advanced techniques of cryptology and blockchain, the extensive cooperation with partners from Japan, India and China resulted in over 100 references, including more than 40 co-authored papers published in leading journals, as well as in eight granted patents in Japan, the US, and China.

MEMBERSHIPS IN INTERNATIONAL ASSOCIATIONS

European Mathematical Society

The Mathematical Institute of SASA is an institutional member of the European Mathematical Society (EMS) and actively participates in its professional bodies (Executive Committee and Executive Council meetings) and scientific events, such as the European Congress

of Mathematicians. EMS is the main organisation representing mathematicians across Europe. Its mission is to support the development of mathematics in research, education, and applications. The EMS coordinates Europe-wide mathematical activities through committees and scientific groups, publishes journals and books through EMS Press, and fosters international cooperation among national mathematical societies, research institutions, and individual mathematicians.

The MISASA contributes to and supports the work of the European Research Centres on Mathematics and the EMS Young Academy. Đorđe Baralić, a full research professor at the MISASA, is a member of the EMS Committee for European Solidarity (2025–2028), while Vladimir Dragović, a full professor at the MISASA, is a member of the EMS Education Committee (2022–2025) and the EMS Ethics Committee (2019–2026). In March 2026, the MISASA hosted the EMS Executive Committee meeting in Belgrade. Through these activities, the institute strengthens the Serbian mathematical community and integrates it into the wider European mathematical network.

European Research Centres on Mathematics



European Research Centres on Mathematics (ERCOM) is a committee of the European Mathematical Society that brings together leading mathematical research institutes

across Europe. Its main goal is to promote scientific cooperation, exchange of researchers, and joint research initiatives among member institutions. ERCOM serves as a platform for sharing best practices in research management, organising scientific events, and strengthening mobility within the European mathematical community.

Membership in ERCOM is granted to institutes with strong international research activity, outstanding scientific output, and a commitment to collaboration. Through its activities, ERCOM supports the development of mathematical research at the highest level and contributes to the visibility and influence of European mathematics on the global scene.

The MISASA became a full member of ERCOM in 2022 and will host the annual ERCOM meeting in Belgrade in March 2026.

EMS Young Academy

To strengthen the voice of Europe's next generation of mathematicians, the European Mathematical Society established the European Mathematical Society's Young Academy (EMYA) in 2022. Comprising young researchers and educators from institutions across Europe, EMYA represents emerging mathematicians and contributes fresh perspectives to EMS initiatives.

EMYA's activities include promoting exchange programmes, organising talks, conferences, and events, and publishing materials that address the professional and personal challenges faced by young mathematicians.

From the Mathematical Institute of SASA, Dr Šejla Dautović and Dr Bogdan Đorđević were elected as EMYA members for 2024–2027. Both actively participate in decision-making, outreach, and promoting opportunities for young Serbian mathematicians. Dr Đorđević also serves as EMYA's Vice-Secretary, respon-

sible for meeting records, agendas, and coordination of upcoming activities.

International Commission on the History of Mathematics

The International Commission on the History of Mathematics (ICHM) is the oldest and most representative international association of historians of mathematics, with members from 44 countries all over Europe, Asia, Africa, and the Americas.

The ICHM is an inter-union commission joining the International Mathematical Union (IMU) and the Division of History of Science and Technology of the International Union of History and Philosophy of Science and Technology (IUHPST/DHST) whose main aims since its founding in 1971 have been to encourage the study of and research in the history of mathematics, and to promote international cooperation and a high level of historically and mathematically sophisticated scholarship in the field. In its effort to support and encourage quality research in the history of mathematics, the ICHM co-sponsors events of high intellectual calibre, and provides individual grants for international research-related activities, especially of younger scholars.

During 2024 and 2025, the ICHM has supported the organisation of the international conference 34th Novembertagung on the History and Philosophy of Mathematics, organised and hosted by the Mathematical Institute of SASA.

In June of 2025, the Executive Committee of the International Commission on the History of Mathematics (ICHM) unanimously approved Serbia's re-entry into the ICHM, following a 35-year absence. This return has been made possible through the initiative of the MISASA, Serbia's foremost research centre in the historiography of mathematics since its founding in 1946.

HORIZON PROJECTS



LeTSGEPs — Leading Towards Sustainable Gender Equality Plans in research institutions

Leading Towards Sustainable Gender Equality Plans in research institutions (LeTSGEPs) was a HORIZON 2020 project carried out from 2020 to 2023. The main objective of the project was to support the implementation of Gender Equality Plans (GEPs) in research-performing organisations. The project was coordinated by the University of Modena and Reggio Emilia and funded by more than 2,000,000 euros.

Besides the MISASA, the partners were: RWTH Aachen University (Germany), Università degli Studi di Messina (Italy), Faculty of Economics — University of Tirana (Albania), Max Planck Society for the Advancement of Science, Munich (Germany), Institute of Marine Sciences, Spanish National Research Council, Barcelona (Spain) and CY Cergy Paris Université (France).

Gender Budgeting was a key element of LeTSGEPs, contributing to the effectiveness and sustainability of Gender Equality Plans by identifying resources and the impact of actions on gender equality.

NUCLEUS — New Understanding of Communication, Learning and Engagement in Universities and Scientific Institutions



Within the Horizon 2020 project NUCLEUS – New Understanding of Communication, Learning and Engagement in Universities and Scientific Institu-

tions (2015–2019), the MISASA participated as a partner in an international consortium of 24 institutions coordinated by the Rhine-Waal University of Applied Sciences (Germany). The project focussed on implementing Responsible Research and Innovation (RRI) within research organisations by developing and testing new institutional models that foster openness, ethical governance, gender equality, public engagement, and open access to scientific results.

Through activities such as “living labs,” case studies, and pilot actions, NUCLEUS transformed RRI from a conceptual framework into practical organisational change, producing a roadmap and guidance for universities and research institutes seeking to embed RRI principles into their everyday structures. The MISASA’s involvement contributed to strengthening the culture of open science and societal engagement within mathematical research and the wider academic environment.

BC4GRID — Blockchain for Creating a Decentralized Smart-Grid System

Blockchain for Creating Decentralized Smart Grid System is a project funded through the SMART4ALL – Horizon 2020 framework (Grant Agreement No. 872614), active from 2023 to 2027. The project focuses on developing and testing a decentralized smart-grid architecture based on blockchain technology, enabling trustworthy and transparent management of energy production, consumption, metering, billing, and peer-to-peer energy trading.

By integrating blockchain into smart-grid operations, BC4GRID aims to increase reliability, data integrity, and efficiency in future energy networks. The Mathematical Institute of SASA participates in the project, contributing expertise in cryptography, data security, and algorithmic aspects of blockchain applications in energy systems.

COST ACTIONS

COST (European Cooperation in Science and Technology) is a long-standing EU-funded programme that supports the creation of interdisciplinary research and innovation networks across Europe and beyond. Instead of funding research itself, COST funds networking activities that help researchers build communities, exchange ideas, and develop new project proposals.

The MISASA researchers have traditionally been very active within COST networks and host COST-related events. In the last decade, the MISASA staff have participated in the following actions:

- ▶ A pan-European network of Ocean Triology CA23155 (2024–2028);
- ▶ A Multilingual Repository of Phraseme Constructions in Central and Eastern European Languages CA22115 (2023–2027);
- ▶ Grassroots of Digital Europe: from Historic to Contemporary Cultures of Creative Computing CA21141 (2022–2026);
- ▶ Information, Coding, and Biological Function: the Dynamics of Life CA21169 (2022–2026);
- ▶ European Research Network on Formal Proofs CA20111 (2020–2025)
- ▶ Optimising Design for Inspection CA18203 (2019–2023);
- ▶ Saving European Archaeology from the Digital Dark Age CA 18128 (2019–2023);
- ▶ A network for Gravitational Waves, Geophysics and Machine Learning CA17137 (2018–2022);
- ▶ Correlated Multimodal Imaging in Life Sciences CA 17121 (2018–2020);
- ▶ A new Network of European BioImage Analysts to advance life science imaging CA 15124 (2016–2020);

- ▶ New Exploratory Phase in Research on East European Cultures of Dissent CA16213 (2017–2021);
- ▶ Cryptanalysis of Ubiquitous Computing Systems IC1403 (2014–2018);
- ▶ Cryptography for Secure Digital Interaction, IC1306 (2014–2018).

BILATERAL COLLABORATIONS — EUROPE

Collaborations and projects with institutions in Austria

The MISASA thermodynamics and geometrical statistics group, in collaboration with the Section for Science of Complex Systems, Centre for Medical Statistics, Informatics and Intelligent Systems, Vienna, carried out a joint bilateral project, ITEMICS — Information-theoretic Entropic Measures In Complex Systems – Theory And Applications (2022–2024). The project was funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia and OeAD – Austria’s Agency for Education and Internationalisation. The project studied generalised entropies and complex systems modelling.

Collaborations and projects with institutions in Bulgaria

The MISASA collaborates with its Bulgarian counterparts, the Institute for Mathematics and Informatics and the Institute of Mechanics of the Bulgarian Academy of Sciences. The main fields of collaboration are pure and applied mechanics, digitisation of cultural heritage, numerical analysis, engineering and differential geometry.

In the period 2023–2025, two joint projects, Nonlinear Dynamics of Thermally and Mechanically Loaded Composite Structures and Development of Software Tools and Multimedia Technologies for Digital Presentation, Preservation and Management

of Cultural Heritage, were funded through the Inter-Academy Agreements on Scientific Cooperation of the Serbian Academy of Sciences and Arts and the Bulgarian Academy of Sciences.

Collaborations and projects with institutions in Croatia

Logic and Application (LAP) is an annual international conference and school founded in 2012 and jointly organised by logicians from the MISASA and the Universities of Zagreb, Pennsylvania, Novi Sad, and Bern. The event is hosted by the Inter-University Centre Dubrovnik.

Building on its established good practices and tradition, LAP brings together renowned experts, young researchers, and students from the region and around the world. Numerous PhD theses, research projects, and scientific publications have emerged from collaborations initiated at LAP.

Collaborations and projects with institutions in France

Collaboration between Serbian and French mathematicians dates back to the beginning of university education in Serbia. The MISASA research groups in logic, theoretical computer science, category theory, optimisation, cryptography, information security and applied mathematics have maintained long-term cooperation with French colleagues.

Recent projects funded by the Ministry of Education, Science and Technological Development of Serbia and the Centre national de la recherche scientifique, France, through the programme “Pavle Savić — Partenariat Hubert Curien” were:

- ▶ Secure and Energy Efficient Distributed Source Coding for Sensor Networks (2018–2019);

- ▶ CoLoHA — Computational Logics and Higher Algebra (2016–2017);
- ▶ The Development of Hybrid Heuristics for Combinatorial Optimisation Problems (2016–2017).

Collaborations and projects with institutions in Hungary

The MISASA’s collaboration with partners in Hungary has a long tradition. Much more recent is the cooperation between the MISASA and the Alfréd Rényi Institute of Mathematics in Budapest, under the auspices of the Serbian Academy of Sciences and Arts and the Hungarian Academy of Sciences, which funded the bilateral project “Discrete Mathematics and Combinatorics — Theory and Applications” (DMCTA, 2020–2023). The Hungarian team was led in this project by well-known experts in Combinatorics and discrete mathematics, Gyula O.H. Katona and Miklós Simonovits. The MISASA was represented primarily by the mathematicians associated with the seminar “Combinatorics in Geometry, Topology and Algebra” (CGTA), with participants from Belgrade, Novi Sad, and Kragujevac.

Collaborations and projects with institutions in Italy

The MISASA is engaged in improving the local and regional scientific environment and spreading excellence to the developing world. To this end, the MISASA is actively collaborating with the Abdus Salam International Centre for Theoretical Physics ICTP (Trieste, Italy), which is the only UNESCO Category 1 research institute in Europe.

At the moment, the MISASA is the only research institute in Serbia delegating a researcher to the ICTP’s Associates Programme, one of the oldest and most prestigious schemes among all ICTP activities.

In recent years, the MISASA–ICTP collaboration has resulted in two international training schools organised in Niš (“Information, Noise and Physics of Life” in 2022 and 2024), with the aim of supporting the scientific development in south-east Serbia and of expanding international collaboration and the exchange of scientific and professional knowledge and experience, bridging young researchers and world-renowned scientists from the developed and developing world.

Collaborations and projects with institutions in Montenegro

The MISASA has excellent, close cooperation with the Faculty of Sciences, University of Montenegro. Together with the Faculty of Mathematics, University of Montenegro, we have been organising biennial international conferences, the Joint Mathematical Meeting of Serbia & Montenegro (Budva 2019, Belgrade 2023, Petrovac 2025) since 2019.

Regular exchanges of researchers, common scientific publications, and applications for international projects take place. Several MISASA researchers lecture and supervise students in undergraduate, master’s, and PhD programmes at the University of Montenegro.

In Petrovac in September 2023, we jointly organised the Summer School for Future (STEM) Leaders for 25 students from Bosnia and Herzegovina, Montenegro, North Macedonia and Serbia. This project was funded by the Western Balkan Fund. The MISASA and the University of Montenegro mutually supported each other in establishing cooperation with partners from Europe, China, and Cuba.

Collaborations and projects with institutions in the Republic of Srpska

The MISASA extensively collaborates with the University of Banja Luka and the University of East Sarajevo. The main fields of this cooperation are algebra, analysis, algebraic topology, applied mathematics, digitisation of cultural heritage and science projects. Researchers from the Republic of Srpska often participate in colloquia, seminars, and conferences organised by the MISASA.

Collaborations and projects with institutions in Russia

Arguably, the central mathematical events illustrating the fruitful collaboration between the MISASA and the Steklov Mathematical Institute of the Russian Academy of Sciences are the renowned GDIS conferences, dedicated to Geometry, Dynamics, Integrable Systems (GDIS) and related areas, including classical and celestial mechanics, rigid body dynamics, Hamiltonian dynamics, geometric and topological aspects of dynamics, algebraic geometry, etc.

The GDIS conferences are typically organised every two years. The first was GDIS–2008, in Belgrade, and the latest, GDIS–2024, in Zlatibor (Serbia). Of the nine GDIS conferences held so far, four were organised in Serbia (Belgrade and Zlatibor), three in Russia (Moscow and Izhevsk), GDIS–2011 took place in Lisbon, and GDIS–2014 in Trieste.

The MISASA has active cooperation agreements with the Institute of Computational Technologies (Novosibirsk), the Matrosov Institute for System Dynamics and Control Theory (Irkutsk), and the Institute of Computational Modelling (Krasnoyarsk) of the Siberian Branch of the Russian Academy of Sciences.

Collaborations and projects with institutions in Slovenia

The MISASA researchers have traditionally had extensive collaborations with colleagues from Slovenia, especially in the fields of algebraic topology, complex analysis, computer science, discrete mathematics and graph theory. Exchanges of researchers and scientific visits occur frequently.

In the last decade, the MISASA has had the most bilateral projects with Slovenian partners: the Faculty of Mathematics, University of Ljubljana, and the University of Primorska in Koper. Recent projects funded by the Ministries of Science of Serbia and Slovenia are:

- ▶ Applied and Computational Algebraic Topology (2016–2017);
- ▶ Discrete Morse Theory and Its Applications (2020–2022) and
- ▶ Modern Trends in Chemical Graph Theory (2020–2022).

In 2018, the Faculty of Electrical Engineering of the University of Ljubljana and the MISASA implemented the bilateral Erasmus+ Programme, Key Action 1, Mobility for learners and staff, Higher Education Student and Staff Mobility.

Collaborations and projects with institutions in Türkiye

The topology research group at the MISASA collaborates with topologists from Karadeniz Technical University in Trabzon and Middle East Technical University in Ankara.

During the period 2021–2024, they had a joint bilateral project, Multidimensional Persistence and Toric Topology, funded by the Ministry of Science, Technological Development and Innovations of Serbia and TUBITAK, the Scientific and Technological Research Council of Türkiye.

The two groups have an online Ankara–Belgrade Topology Seminar, which had two in-person meetings, in Belgrade in 2022 and in Ankara in 2023. The main fields of collaboration are applied and computational topology.

BILATERAL COLLABORATIONS — ASIA

Collaborations and projects with institutions in India

During the collaboration with AIST Japan, the MISASA was a participant in the five-year (2009–2014) Japan–India project where the partner institutions were Indian Statistical Institute, Kolkata, and Indian Institute of Technology, Roorkee.

In June 2022, the MISASA hosted the India–Serbia workshop on selected topics of Artificial Intelligence and Information Technology techniques and applications.

During the period 2022–2024, the first bilateral joint project, Session Types: Applications, Foundations and Flow Security (STAFFS), was financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia and the Ministry of Science and Technology of the Republic of India. The project brought together the theoretical computer science and logic research groups of the MISASA and the Indian Institute of Technology Delhi.

Collaborations and projects with institutions in China

The joint activities of the MISASA Computer Science Department with China began in 2021, when the first Chinese two-year project was awarded. Since 2025, a five-year Chinese national project has been underway. The partner institution of these two projects in China is the Shandong Computer Science Centre of the Shandong Academy of Sciences.

These projects have focussed on information security and have included enhancing the synergy between machine learning, blockchain, and information security.

These joint activities and achieved results have positioned the MISASA as a highly respected institution in advanced techniques of cryptology and blockchain at the regional and international level. The Centre for Combinatorics of Nankai University and the MISASA carried out a Chinese project on graph theory (2024–2025).

Besides computer science, information security, discrete mathematics, and graph theory, there have also been joint publications and collaborations in materials science, robotics, nanostructures, and biotechnologies.

Recent bilateral projects supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia and the People’s Republic of China are:

- ▶ Reinforcement Learning for Graph Theory (2024–2026);
- ▶ Hydrogel Ionotronics for Soft Robotic Applications (2024–2026) and
- ▶ Advanced Analytical and Numerical Methods for Analysis of Functionally Graded Micro/Nanostructures (2018–2019).

Collaborations and projects with institutions in Japan

Since 1997, the MISASA has had extensive international cooperation with Japanese research centres. The longest of these has been with the University of Tokyo and the National Institute for Advanced Industrial Science and Technology (AIST), predominantly from 1997 to 2019.

All the projects in Japan were related to information security, with Academician Miodrag Mihaljević as the main contributor from the

MISASA. This collaboration resulted in many outstanding publications and patents.

Furthermore, the MISASA topology group collaborates with the topology research group at Osaka Metropolitan University.

Collaborations and projects with institutions in Southeast Asia

The MISASA research groups in set theory, logic, and topology collaborate, publish jointly, and exchange visits with their colleagues from the National University of Singapore.

The MISASA and the Vietnamese Institute for Advanced Studies in Mathematics in Hanoi, Vietnam, have a cooperation agreement. Specific contacts, established through joint participation in international conferences and forums, exist with colleagues from the Philippines, Myanmar, and Cambodia.

BILATERAL COLLABORATIONS — CENTRAL AND SOUTH AMERICA AND AFRICA

Collaborations and projects with institutions in Latin America and the Caribbean

Despite geographical distance, the MISASA has significant scientific and educational connections with colleagues from Argentina, Brazil, Chile, Costa Rica, Cuba, Mexico, Panama and Uruguay.

The MISASA has active MOU agreements with the Institute for Cybernetics, Mathematics and Physics in Havana, Cuba, and with the University of the Republic in Montevideo, Uruguay.

Most of our ties with this region are based on personal connections of our researchers who speak Spanish or who have spent part of their academic career there, and which have remained active through occasional visits and joint participation in conferences around the world.

Mathematicians from Argentina and Chile participated in May, the Month of Mathematics, while the MISASA researchers also served as invited speakers at events dedicated to promoting mathematics.

Collaborations and projects with institutions in Africa

Over the last decade, the MISASA has begun developing scientific and educational contacts with colleagues from African countries. Interest among African researchers in publishing in our journals and participating in

our conferences has also increased over the last years.

The MISASA volunteered in two EMS-led initiatives aimed at supporting the capacity-building and training of African mathematicians. Also, our researchers have participated in and promoted our doctoral programmes in several conferences held in Africa.

Limited by the lack of funding opportunities, our collaboration with colleagues from this continent relies heavily on individual contacts and friendships of our research staff, mainly in Morocco, Cabo Verde, Tanzania, Tunisia, Mauritius, Nigeria, and South Africa.

Chinese-Serbian Centre for Advanced Research and Education (CS-CARE)

Text prepared by Dr Miodrag Mihaljević



Presentation by M. Mihaljević at the “Shandong Computer Science Centre”, Jinan, China
(Courtesy of M. Mihaljević)

Building on fruitful joint activities carried out since 2020 with the Shandong Computer Science Centre (SCSC) of Qilu University of Technology (Shandong Academy of Sciences), the Founding Assembly of the Chi-

nese-Serbian Centre for Advanced Research and Education (CS-CARE) was held on 10 July 2025 at the Mathematical Institute of SASA in Belgrade. At this Assembly, the founders of the Association — the Mathematical Institute of SASA, Belgrade; the Telecommunications Company Telekom Srbija a.d., Belgrade and the Jinan Institute of Supercomputing Technology, Jinan, People’s Republic of China — unanimously adopted the *Founding Act of the Association*. CS-CARE was established as a voluntary, non-governmental, and non-profit association. It was registered as a legal entity on December 4th, 2025.

The objectives of CS-CARE are as follows:

- ▶ Basic and applied scientific research;
- ▶ Technological research and development;
- ▶ Research projects under contracts with legal entities;
- ▶ Development projects under contracts with legal entities;
- ▶ Scientific and research education;

- ▶ Specialized scientific and research education by contracts with legal entities;
- ▶ Organization of scientific and research conferences;
- ▶ Organization of educational events;
- ▶ International cooperation in scientific research and education;
- ▶ Organization of donor and humanitarian activities;
- ▶ Holding general and special meetings and gatherings at which topics and issues of interest to the members are discussed;
- ▶ Organization of seminars, lectures, forums, courses and other forms of education in the areas of the Association's goals and tasks, independently or in cooperation with other organizations;
- ▶ Publishing books, journals and other publications;
- ▶ Cooperation with state bodies and organizations, universities, schools, and other professional associations and organizations in the People's Republic of China, in the Republic of Serbia, and abroad.



Signing of the document on the establishment of the China-Serbia Centre for Advanced Research and Education (CS-CARE), 2025 (Courtesy of M. Mihaljević)



Building of the "Shandong Computer Science Centre" housing the supercomputer, Jinan, China (Courtesy of M. Mihaljević)

DEPARTMENTS, COLLOQUIA, AND SEMINARS

DEPARTMENTS

*Department of Mathematics of the
Mathematical Institute of the Serbian
Academy of Sciences and Arts*

Head of the Department: Dr Silvia Ghilezan



**Dr Silvia
Ghilezan**
(Courtesy of S.
Ghilezan)

The Department of Mathematics is one of the founding divisions of the Mathematical Institute of SASA. Its principal role is to foster fundamental research in the field of mathematics. Sharing the values of the Institute and the international mathematical community, the Department is committed to excellence in research and education, the popularisation of mathematics, the advancement of borderless research, the promotion of open science, and awareness of environmental impact.

Building on eight decades of research at the Mathematical Institute of SASA across all core areas of mathematics, the Department conducts cutting-edge research in fundamental areas and problems, as well as in emerging areas in mathematics arising from societal

and technological developments. Research in the Department focuses on a comprehensive range of topics, including: mathematical logic (set theory, proof theory, modal and probabilistic logics, model theory, recursion theory, type theory), mathematical analysis (differential and integral calculus, differential and integral equations, functional analysis, geometric function theory, generalised functions, distributivity equations), algebraic topology (homology theory, stable homotopy theory, knot invariants, configuration spaces, topological combinatorics, manifolds), algebra (theory of Lie groups, theory of group actions, automorphisms of free groups, algebraic structures, representation theory, combinatorial games), discrete mathematics (graph theory, spectral graph theory), category theory, differential geometry, combinatorics and combinatorial geometry (additive combinatorics), operations research, mathematical physics, complex systems (generalised entropies), history and philosophy of mathematics, mathematical aspects of music theory, and didactics of mathematics.

As a fundamental discipline, mathematics finds applications across other branches of science. In view of these interconnections, the Department promotes collaboration with other Institute departments, academic institutions in Serbia and abroad, as well as with industry.

The Department of Mathematics currently comprises around thirty researchers based in Belgrade, with branches in Novi Sad, Niš, and Kragujevac. It is run by Silvia Ghilezan as Head of the Department, with Zoran Petrić as Deputy Head and Luka Milićević as Secretary. It builds upon the research results achieved in fundamental and interdisciplinary projects

at national and international levels. These projects have brought together a broad range of experts, early-career researchers, and PhD students in specialised teams that have successfully contributed to producing high-quality research, disseminating results, and fostering international collaboration. The project results have been published in leading journals, books, and monographs, and presented at prestigious international conferences. The implementation of these projects has also led to a significant number of successfully defended PhD theses.

In the past five years, among the Department numerous achievements, several published monographs and proceedings deserve special mention:

- ▶ *Probabilistic Extensions of Various Logical Systems* (Springer, 2020);
- ▶ *Principles and Practice of Declarative Programming* (ACM, 2021);
- ▶ *Types for Proofs and programmes* (Leibniz-Zentrum für Informatik, 2022) and
- ▶ *A Hidden Harmony: Mathematics and Music through the Ages* (Mathematical Institute of SASA, 2024).

Researchers from the Department are recognised as the most prolific authors within the Mathematical Institute, reflecting the Department's leading role in advancing mathematical knowledge both nationally and internationally. In the past five years, Department members have coordinated or participated in prestigious projects of the Science Fund of the Republic of Serbia, including:

- ▶ Graphical Languages – GWORDS;
- ▶ Approximate Algebraic Structures of Higher Order: Theory, Quantitative Aspects and Applications – A-PLUS;
- ▶ Logical Foundations for Probabilistic Methods in Artificial Intelligence – ProMetAI;

- ▶ Advanced Techniques of Mathematical Aggregation and Approximative Equations Solving in Digital Operational Research – AT-MATADOR;
- ▶ Model-theoretical and Ramsey-theoretical Phenomena in Mathematical Structures: Similarity and Diversity – SMART and
- ▶ Artificial Intelligence for Trustworthy Block-Chain of the Science – AI4TrustBC.

At the international level, Department researchers have participated in projects funded through Horizon framework programmes, COST Actions, and bilateral collaborations, ensuring that their work is closely connected to state-of-the-art international research. International projects, either ongoing or recently completed, include:

- ▶ Horizon frameworks (LeTSGEPs – Leading Towards Sustainable Gender Equality Plans in research institutions, TaRDIS – Trustworthy and Resilient Decentralised Intelligence for Edge Systems);
- ▶ COST Actions (EUROProofNet – European Research Network on Formal Proofs (CA20111), EUGAIN – European Network For Gender Balance in Informatics (CA19122), SEADDA – Saving European Archaeology from the Digital Dark Age (CA 18128), G2NET – A network for Gravitational Waves, Geophysics and Machine Learning (CA17137)) and
- ▶ Bilateral projects (ITEMICS – Information-theoretic Entropic Measures In Complex Systems – Theory And Applications (with Austria), STAFFS – Session Types: Applications, Foundations and Flow Security (with India), Discrete Morse theory and its applications (with Slovenia), Modern trends in chemical graph theory (with Slovenia), Multidimensional Persistence and Toric Topology (with Turkey)).

The Department members have held distinguished academic and research positions

abroad, at the University of Toronto, the University of Paris, the Free University of Berlin, the Mathematical Sciences Research Institute Berkeley, the Technical University of Lisbon, Ecole Normale Supérieure de Lyon, the University of Oregon, Abdullah Al Salem University, among others.

More than half of the Department's researchers are early-career researchers who, together with PhD students, form the driving force of the Department, and their involvement is planned to increase further. Researchers who have obtained their PhD degrees abroad are endorsed to join the Department, following in the footsteps of colleagues who have recently joined after completing their doctoral studies at Cambridge University, the University of Gent, the Free University of Brussels, and Université Paris Diderot.

The Department supports the professional activities of its members, who participate worldwide as keynote, invited, and guest speakers, journal and book editors, programme chairs, programme committee members, reviewers for journals, conferences, and doctoral theses, and project evaluators, among other roles. These activities, in turn, significantly contribute to the internationalisation, dissemination, and promotion of the Department's research and results.

The researchers of the Department are actively participating in more than ten seminars, some of which were founded as the core activity of the Mathematical Institute of SASA more than 65 years ago. The seminars are held on a regular basis at the Mathematical Institute of SASA in Belgrade and in the branches in Novi Sad, Niš and Kragujevac, supported by a video conferencing and recording system. The seminars chaired by Department members include the Mathematical Colloquium, which accommodates

talks in all areas of mathematics, while more specialised seminars include the Mathematical Logic Seminar, the Probability Logic Seminar, the Mathematics and Music Seminar, the Seminar for the History and Philosophy of Mathematics, Mechanics and Astronomy, the Mathematical Analysis with Applications Seminar, and the Student Seminar. Occasionally, there are short courses and thematic seminars, which, through a series of lectures, systematically present contemporary research in related areas. The exchange of ideas is particularly intense in the Mathematics Colloquium, with a general mathematics audience, and at the Student Seminar, which, in an informal and friendly atmosphere, gathers young researchers whose early career interests revolve around mathematics, mechanics, computer science, and related fields.

In the past five years, the Department members have chaired, organised and hosted numerous conferences, workshops and other scientific events, including:

- ▶ Geometry, Probability and Topology in Applications;
- ▶ Approximate Algebraic Structures and Arithmetic Combinatorics;
- ▶ Modern problems of analysis;
- ▶ Conference Branislav Petronijević (1875–1954);
- ▶ Kosta Došen — 70 years since birth;
- ▶ Chinese–SouthEastEuropean Conference on Discrete Mathematics and Applications;
- ▶ Joint Mathematical Meeting of Serbia and Montenegro and
- ▶ AESIM–CIMPA School Introduction to Number Theory and Algebraic Curves.

The Department regularly supports the organisation of the annual events: Conference on Logic and Applications, Symposium

on Operational Research, and Artificial Intelligence Conference.

Positive trends — such as publishing monographs with international scientific publishers, organising international conferences, delivering invited lectures, conducting research visits abroad, and engaging in other scholarly activities — are expected to continue, further confirming the international prestige of the Department researchers.

Through seminars and internships, the Department will continue to support students and early-career researchers, helping them promote and exchange ideas, develop scientific interests, and acquire the skills necessary for conducting research in math-

ematics, mechanics, computer science, and related fields. The Department also actively supports, and will continue to contribute to, Open Science and Citizen Science initiatives.

The Department of Mathematics aims to continue pursuing excellence in fundamental research across mathematics and its applications, while further strengthening interdisciplinary research at the interface of academia and industry.



On the occasion of the 75th anniversary of Professor Zoran Marković and Professor Žarko Mijajlović
(Photo by Dragan Aćimović)

*The Department of Mechanics of the
Mathematical Institute of the Serbian
Academy of Sciences and Arts*

**Head of the Department: Dr Božidar
Jovanović**



**Dr Božidar
Jovanović**
(Photo by
Dragan
Aćimović)

In 2021, three departments of the Mathematical Institute of SASA were established, mainly associated with the corresponding colloquia of the MISASA. The Department of Mechanics has grown out of the Mechanics Colloquium, founded in 1961.

There has been a strong group of researchers in mechanics since the very foundation of the Mathematical Institute. This group was led by one of the Institute's founders and its first director, Academician Anton Bilimović (1879–1970).

Currently, there are about 20 researchers in the Department of Mechanics, a third of whom are PhD students. It is run by Božidar Jovanović as Head of the Department, Ivana Atanasovska as Deputy Head of the Department, and Marijana Babić as Secretary.

Mechanics is said to be at the intersection of mathematics and physics and is closely related to the engineering sciences. As such, mechanics interacts closely with almost all

areas of mathematics. Let us mention only geometry, mathematical physics, the theory of optimal control, dynamical systems, and astronomy – it was Professor Bilimović who first translated Euclid's *Elements* into Serbian. There are also applications in various engineering problems. Therefore, the research within the Department of Mechanics is closely intertwined with the research carried out in other Departments of the Mathematical Institute of SASA.

In addition to the Mechanics Colloquium, researchers of the Department are active in the following seminars: Mathematical Methods of Mechanics; CGTA (Combinatorics, Geometry, Topology, Algebra); Mechanics of Machines and Mechanisms – Models and Mathematical Methods; Geometry and Visualisation; Relativity Theory and Cosmological Models; Biomechanics, Bioengineering and Mathematical Biology; Differential Geometry, Continuum Mechanics and Mathematical Physics and other seminars, colloquia and departments of the MISASA. The Centre for Dynamical Systems, Geometry and Combinatorics, DSGC–synergy, is also part of the Department of Mechanics.

Special attention is devoted to the training and education of young researchers and in the last five years special courses, both international and national, have been organised:

- ▶ Belgrade Summer School on Dynamics (2021);
- ▶ Mathematical Methods of Mechanics (2022/23) and
- ▶ Linear and Nonlinear Waves (2024).

Furthermore, mini-courses, such as Oriented matroids and Gale transform, Lie groups and sub-Riemannian geometry, and various popular and educational lectures within the MISASA seminars are also offered. The members of the Department are also actively engaged in the popularisation of mathematics and

mechanics through the Institute's activities: M3 – May Month of Mathematics and the Summer Internship.

The research carried out within the Department of Mechanics can be grouped into two broader areas of interest:

- ▶ Classical mechanics, mathematical physics, integrable systems, geometry, and discretization;
- ▶ Applied mechanics and engineering.

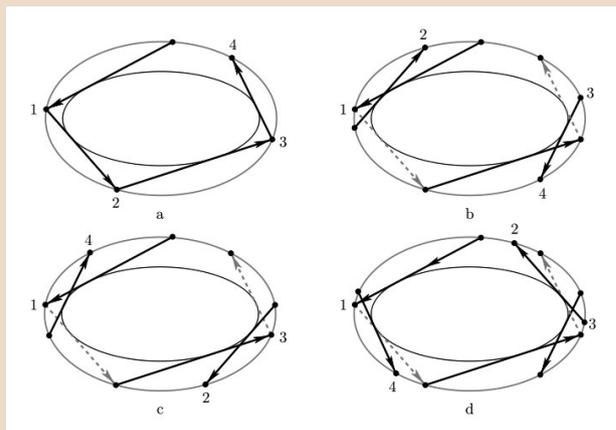
The research topics include: symplectic geometry, Lie groups, and algebraic geometry in mechanics; billiards; rigid body dynamics; nonholonomic mechanics; geodesic flows and sub-Riemannian geometry; matrix pencil completion problem; polyhedral products in combinatorics and topology and the theory of convex polytopes; mathematical analysis and applications in mechanics; fluid dynamics; dynamical systems and biomechanics; mechanics of materials and continuum mechanics; applied engineering mechanics.

Accordingly, two international series of conferences are organised by researchers from the Department:

- ▶ GDIS – Geometry, Dynamics, and Integrable Systems (co-organised by the Steklov Mathematical Institute, Moscow) and
- ▶ ICME – International Conference on Mathematical Modelling in Mechanics and Engineering.

The Mathematical Institute of SASA, through the Department of Mechanics and the Mechanics Colloquium, has also co-organised a number of conferences, including:

- ▶ Serbian Congress of Theoretical and Applied Mechanics (Serbian Society of Mechanics);
- ▶ Conference on Nonlinearity (Serbian Academy of Nonlinear Sciences) and
- ▶ Mathematical Physics Meeting (Institute of Physics, Belgrade).



The Mathematical Institute SANU is internationally recognized for its significant results in the field of integrable billiards. Here we present Figure 1 from the recently published paper [V. Dragović, M. Radnović, “Magical Billiards: The Case of Elliptic Boundaries,” *Sbornik Mathematics*, 216:5 (2025), 83–105]: a standard billiard trajectory (a) and three trajectories of the magic billiard with the same initial segment: (b) flipping over the long axis; (c) flipping over the short axis; (d) the half-turn around the centre. In each case the consecutive points of impact with the boundary are numerated (Source: <https://www.mathnet.ru/eng/sm10181>).

The members of the Department have established strong international collaboration and participate in both international (NSF, Simons Foundation – USA, Fundação para a Ciência e a Tecnologia – Portugal, Australian Research Council, COST Actions, bilateral projects with China and Bulgaria) and national projects (Science Fund of Serbia). The results of the Department are published in highly respected journals with a long tradition, such as *Bulletin of the American Mathematical Society*, *Communications in Mathematical Physics*, *Russian Mathematical Surveys*, *Advances in Mathematics*, *Sbornik Mathematics*, *Archive for Rational Mechanics and Analysis*, *Proceedings of the London Mathematical Society*, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, thereby ensuring international visibility and a positive reputation for Serbian mathematics and mechanics.

*Department of Computer Science of the
Mathematical Institute of the Serbian
Academy of Sciences and Arts*

**Head of the Department: Dr Andreja
Tepavčević**



**Dr Andreja
Tepavčević**
(Courtesy of A.
Tepavčević)

The Department of Computer Science of the Mathematical Institute of SASA traces its origins to the purchase of an IBM 360 computer in 1968, which at the time was the most powerful machine in Belgrade. Computer science at the Institute initially developed as an extension of research in mathematical logic, while also promoting the use of mathematics as a tool for addressing applied research and development challenges. The Department of Computer Science is organisationally closely connected with the Computer Science and Applied Mathematics Colloquium, which was founded in 2012. The Colloquium was founded on a series of achievements, including successful fundamental research projects, advances in technological development, specialized projects commissioned by state and economic institutions in Serbia, as well as international collaborations. By way of illustration, the following projects were carried out:

- ▶ Mathematical Logic, Combinatorics and Information Processing: Fundamentals and Applications of Computing (1996–2000);
- ▶ New Methods in Cryptology and Information Processing (2006–2010);
- ▶ Development of New Information and Communication Technologies, Using Advanced Mathematical Methods, With Applications in Medicine, Telecommunications, Energy, National Heritage Protection and Education (2011–2019).

As the Institute celebrates its 80th anniversary, the Department of Computer Science brings together some thirty researchers, including more than 10 PhD students. It is run by Andreja Tepavčević as Head of the Department and Lazar Velimirović as Deputy Head of the Department.

The people from the department are building on past achievements while expanding into new areas of research and application, with a strong focus on the following fields:

- ▶ Security and privacy in the digital space and blockchain technology;
- ▶ Optimisation techniques;
- ▶ Parallelisation of algorithms;
- ▶ Machine learning and decision theory;
- ▶ Natural language processing;
- ▶ Selected mathematical methods of interest for computing;
- ▶ Digitisation of our cultural, historical, scientific, and educational heritage with applications;
- ▶ Geoinformation systems;
- ▶ Implementation of IT retraining programmes in Java and Python.

Members of the Department have published more than 650 scientific articles, most of which appeared in leading international journals. According to Scopus, these works have

been published more than 8,600 times in major international publications.

The department's associates have also engaged in intensive international cooperation with institutions in China, Australia, the USA, Canada, Brazil, Italy, Spain, Switzerland, and many other countries from the European Union and the Western Balkans. More than two decades of cooperation with institutions in Japan, including the University of Tokyo and the National Institute for Advanced Industrial Science and Technology (AIST), is of special importance.

The basic achievements in the areas mentioned above are outlined below.

Security and privacy in the digital space and blockchain technology

The Mathematical Institute of SASA recognized the growing importance of research in the field of cryptology in the early 1990s and was among the first academic institutions to implement basic research and technological development projects in this field. Research activities in the field of cryptology were later extended to information security, then to blockchain technology, and most recently to the synergy of machine learning, blockchain, and information security. In the field of cryptology and its applications to information security and privacy in the digital space, the main activities included the following:

- ▶ Evaluation of the security of cryptographic techniques for information security and privacy;
- ▶ Construction of cryptographic techniques for encryption and authentication with low implementation complexity that at the same time achieve high levels of cryptographic security and reduce system overhead caused by the application of cryptographic mechanisms;

- ▶ Application of results from error-correcting codes to enhance the cryptographic security of encryption and authentication techniques;
- ▶ Improving some decoding techniques using approaches developed in cryptology;
- ▶ Advanced components and mechanisms for achieving security and privacy in the digital space.

In the field of blockchain technology, the main activities included the following:

- ▶ Advanced techniques for blockchain technology, including (i) blockchain consensus protocols that allow flexibility in the selection of necessary resources for participants in public blockchain networks, and in particular in reducing the energy required for the operation of blockchain infrastructure, and (ii) distributed blockchain infrastructures;
- ▶ The improvement of existing and the development of new specialized applications of blockchain technology.

Achievements in the field of security and privacy in the digital space and blockchain technology are presented in more than 300 references, including scientific articles in international journals, book chapters, collections of papers in international conferences, and various national publications, and include more than 40 technical solutions and 8 internationally recognized patents. These results have been cited more than 2000 times according to the Scopus database. As an additional illustration of the international recognition of the results, it is worth noting that Dr Miodrag Mihaljević, a member of the Department of Computer Science, has been included in the ranking list colloquially known as the "World's Top 2% Scientists by Stanford University" for career achievements over the last five consecutive years.

The associates of the Department have also carried out extensive international cooperation for almost three decades, in projects with the European Union, Japan, the United States, India, Singapore and China, including, among the most notable, collaborations with the University of Tokyo and the National Institute for Advanced Industrial Science and Technology (AIST) in Japan, and the Shandong Computer Science Centre in China.

The most significant current projects include the following:

- ▶ Application of Artificial Intelligence in Blockchain Technology (project of the Science Fund of the Republic of Serbia);
- ▶ Advanced Techniques for Blockchain Technology and Information Security (a project funded by the Shandong Computer Science Centre of the Shandong Academy of Sciences, China);
- ▶ Applications of Blockchain Technology in Telecom Systems (a project financed by Telekom Serbia).

Optimisation techniques

The main activities of the group that is engaged in optimisation are aimed at the following directions: Modelling of optimisation problems; Development of methods for determining the optimal (exact) solution, which usually involves the application of an existing solver, such as CPLEX or Gurobi and their incorporation into the proposed algorithm, as well as the development of completely original methods based on branching and bounding, branching and cutting, and similar methodologies, which use information on the problem under consideration and incorporate it into the rules of the adopted methodology; Implementation of efficient heuristic and/or metaheuristic methods for determining an approximate high-quality solution (better than the currently best or

one that deviates as little as possible from the known optimal solution) in the shortest possible time.

To solve a large number of combinatorial optimisation problems, some of the most well-known metaheuristics have been successfully applied:

- ▶ Variable Neighborhood Search (VNS);
- ▶ Tabu Search (TS);
- ▶ Greedy Stochastic Adaptive Search Procedure (GRASP);
- ▶ Bee Colony Optimisation (BCO) method;
- ▶ Ant Colony Optimisation (ACO);
- ▶ Genetic Algorithms (GA), and many others.

In addition to concrete implementations of the mentioned metaheuristics, the group is also working on their improvement, modification and hybridisation with the idea of increasing their efficiency when applied to complex problems and large instances.

The algorithms developed have been incorporated into a new consensus protocol for blockchain systems based on the Proof of Useful Work principle, within the project Application of Artificial Intelligence in Blockchain Systems (a project of the Science Fund of the Republic of Serbia).

As part of the conducted research, a comprehensive set of optimisation methods was developed, aiming to enhance the infrastructure and utilisation of electric vehicles (EVs), particularly in relation to urban contexts, through hybrid models combining the Analytic Hierarchy Process (AHP), fuzzy dynamic programming, the p-median method, and genetic algorithms. Multi-criteria decision-making systems were created to address technical and user-driven demands, from optimal routing and charging schedules to estimating the optimal numbers and

locations of charging stations. Specific factors taken into consideration were location safety, access, power grid capacity, and user preferences, in addition to models being validated through real-world case studies. This multidisciplinary approach not only enables user-driven, customised planning but also offers new criteria for commercial fleet use, such as secondary grid regulation participation. This scientifically sound model is a contribution to research on smart EV infrastructure management by positioning optimisation methods close to the challenges and changing patterns of urban area use on the path toward sustainable mobility.

A major output of this research area is the book *Multi-criteria Decision Making for Smart Grid Design and Operation*, which focuses on the utilisation of multi-criteria decision-making (MCDM) approaches in the planning and operation of smart grids from the Society 5.0 perspective. The book offers a hands-on perspective on a variety of MCDM approaches as they apply to real-world case studies — from assessing the efficiency of smart grid projects to optimising electric vehicle charging schedules. The book clearly communicates the decision-making rationale in multi-criteria decision-making, various aspects of performance, and uncertainty in modern power systems, and is intended for researchers, energy professionals, system planners, policymakers, and other stakeholders engaged in smart grid development.

Parallelisation of algorithms

Optimal utilisation of available computing resources is of great importance for efficiently solving various problems, not only in mathematics and other sciences, but also in practice. Activities in algorithm parallelization began with the acquisition of transputer

boards in the late 1980s. Among the more significant projects developed on transputers, we highlight the finding of new prime numbers and the calculation of kinematic and dynamic models of robots. At the beginning of the 21st century, the first IBM cluster arrived, and shortly after, others that were part of the wider AEGIS grid network. They were, among other things, intensively used for the parallelization of metaheuristic methods, as well as hybrids between metaheuristics and exact optimisation methods. In addition to standard multi-core and many-core multiprocessor systems, the Mathematical Institute of SASA also has a Maxeller Field-Programmable Gate Array (FPGA) board with over 2000 arithmetic-logic units that operates on the principle of data-flow operations.

Machine learning and decision theory

The main activities have been directed towards exploring the possibilities for applying machine learning algorithms in electric power and telecommunication systems. The application of machine learning algorithms in these areas contributes to technological progress and a simpler transition to Industry 4.0, with a focus on environmental protection, mitigation of climate change, reducing electricity consumption and optimising the operation of the systems under consideration. In addition, this research contributes to a smoother transition from fossil to renewable energy sources and the preservation of sustainability. Machine learning models in the field of sustainability also contribute to the monitoring and control of factors influencing climate change, such as pollution, environmental footprint, and available biocapacity.

In addition to these applications, traditional machine learning models have been devel-

oped to anticipate how factors such as education, energy sector developments and environmental conditions shape the dynamics of digitisation — an essential foundation for driving the transformation towards a digital society. This research area has also been complemented by multi-criteria decision-making (MCDM) approaches, which support more informed decision-making and system evaluation in such evolving societies. Furthermore, machine learning has been applied in the field of image and text classification, and CAPTCHA research has been conducted in order to obtain the necessary scientific knowledge that enables safer development of Industry 4.0, which includes digitisation as a key component.

As part of our innovation activities, two significant projects with the support of the European Bank for Reconstruction and Development's Green Innovation Voucher programme have been completed. The first project focussed on creating an Advanced Energy Management System (AdEMS), which is a digital platform allowing users to track and forecast their energy usage in real-time. Using advanced techniques of big data and data analytics, the system detects hidden patterns and correlations in energy consumption, contributing to optimised energy usage and cost reduction efforts, as well as greater integration of renewable energy sources. The second project, Smart Water Management System (SWaMS) was developed as an entirely novel solution to address challenges of water utilities in Serbia and the region more broadly. This system uses artificial neural networks for failure prediction and real-time data analysis that leads to operational optimisation of the infrastructure, reduction of water losses, improved energy efficiency, and better decision-making accuracy. This leads to a longer-term,

cost-effective, and sustainable solution for utility companies and their stakeholders in the water management domain as a whole.

Research is also being conducted on applying reinforcement learning to the construction of new mathematical objects and on surrogate optimisation for computationally expensive numerical simulations. This work is carried out within the project "Lazy walk counts and the spectral radius of threshold graphs," funded by the Science Fund of the Republic of Serbia.

Natural language processing

The MISASA has recently initiated research in Natural Language Processing (NLP), opening a new and dynamic field within its scientific activities. As one of the most rapidly developing and widely applied areas of computer science, NLP introduces fresh perspectives and opportunities for innovation.

Current activities include:

- ▶ Digitisation of historical texts: the development of algorithms and models for processing old periodicals and other cultural materials, thereby creating extensive and diverse language resources in Serbian;
- ▶ Information extraction from medical texts: the design and implementation of pipelines for named entity and relation extraction to support a deeper understanding of scientific publications, medication instructions, and hospital discharge summaries;
- ▶ Sentiment analysis for psychology research: the implementation of classifiers for analysing online resources relevant to social listening, user profiling, and well-being assessment.

With a strong focus on health and psychology, the NLP group collaborates with the

Faculty of Pharmacy and the Faculty of Medicine (University of Belgrade), the Faculty of Philosophy (University of Novi Sad), as well as other NLP groups in Serbia and civil society organisations that promote the ethical and responsible development of AI and NLP.

From June 2024 to June 2025, in partnership with the National Library of Serbia, the NLP group participated in the GovTech programme supported by the Innovation Fund of the Republic of Serbia. The team implemented the project Digitisation of Textual Cultural Heritage, whose results and innovations have been recognized by the UNDP's Local Language Acceleration programme.

In addition, the group is involved in clinical language modelling for patients with Alzheimer's disease and contributes to broader dementia research through the project Data Story About Dementia, carried out with the Complexity Science Hub in Vienna as part of Bilateral Cooperation with the Republic of Austria 2024–2026.

Selected mathematical methods of interest for computing

The current research in this domain began as basic research in the field of algebra, especially universal algebra, lattice theory, and ordered set theory. It started with dealing with the problem of the representation of algebraic lattices via a lattice of weak congruencies. Later, research on lattice-valued fuzzy sets and fuzzy logic and applications in various fields commenced. Omega-algebraic structures are now in focus, which enable the observation of approximate identities and the solution of approximate equations. This is directly related to the closure systems on the lattice of weak congruencies of the initial algebra, by taking the factor algebra that fulfills the required identities. One of the impor-

tant applications in this framework is the approximate solution to linear equations and systems of equations, which can be applied in various fields, and more recently in digital forensics, which is associated with COST action CA17124 – Digital forensics: evidence analysis via intelligent systems and practices. Research within Omega-algebras and related topics has resulted in the publication of more than thirty papers in the world's leading journals in these fields, including Information Sciences, Fuzzy Sets and Systems, Soft Computing, International Journal of Computational Intelligence Systems, Kybernetika, the International Journal of Fuzzy Systems, and others. Currently, the researchers are working on the project "Advanced Techniques of Mathematical Aggregation and Approximative Equations Solving in Digital Operational Research," financed by the Science Fund of the Republic of Serbia.

Digitisation of cultural, historical, scientific, and educational heritage

The goal of these activities, which rely on numerous projects and experience gained over nearly 40 years, is to develop a comprehensive and multi-layered heritage digitisation system. The system encompasses several interconnected processes, from developing digital catalogs and converting analog materials into digital form, to standardized documentation and preservation of digital objects. In parallel, the infrastructure of software tools and solutions intended for various types of processing of digitised materials is being developed, enabling the long-term sustainability, precision, and uniformity of digitisation procedures. Particular emphasis is placed on the long-term preservation of digitised materials, as well as on the development and interconnection of the software and physical

network of information systems intended for managing digital content.

The digitisation projects carried out by the Mathematical Institute of SASA hold significant social importance – they preserve cultural heritage, increase its accessibility, enable new forms of education, stimulate the development of research in digital humanities, and strengthen cooperation between scientific and cultural institutions. This lays the foundations for future generations of digital repositories, virtual museums, and platforms to be used in the scientific, educational, and cultural systems of Serbia and the wider region.

Building upon a standardized technical and multimedia base developed over several decades, the Institute has established close cooperation with cultural institutions and scientific organisations both in Serbia and abroad, as exemplified by the signing of a memorandum of understanding with the United Nations Development Programme (UNDP). Multidisciplinary project teams – using 3D scanners, drones, photogrammetry, and other modern technologies and devices developed, acquired, and applied by the Institute – have worked at numerous locations across Serbia, including monasteries in Kosovo and Metohija, Studenica, Sopoćani, Rača and Mileševa, monuments in Sombor, Bač, Knjaževac, Gornji Milanovac, Pirot, Bajina Bašta, Belgrade, Novi Sad, and Niš. In the past decade, with the support of the Ministry of Culture, projects for digitising several hundred movable and immovable cultural objects have been implemented in Novi Pazar, Arilje, the Rudnik-Takovo region, the Museum in Smederevo, Aleksinac, the Gallery of Matica Srpska, etc.

A significant part of these activities includes the creation of multimedia presentations of digital content, enabling modern interpretation, promotion, and broad application of publicly available digitised cultural heritage for scientific use, education, and more. Almost all processed digitised materials are freely accessible through the Institute's website. In particular, in cooperation with our colleagues from Niš, brought together in the ARhiMeda group founded in 2012, more than 50 mobile applications have been developed. The Institute for the Advancement of Education has recommended these applications for use in the curricula of primary and secondary schools. Since 2023, these activities have continued through the project "Development of Software Tools and Multimedia Technologies for Digital Presentation, Preservation, and Management of Cultural Heritage" conducted together with the Institute of Mathematics and Informatics in Sofia, within the framework of joint research projects of the Serbian and Bulgarian Academies of Sciences. The goal of this project is the development of innovative software solutions for mobile and web-based services for the interactive presentation of digitised heritage.

Geoinformation Systems

The Department of Computer Science has recently started a new research direction focussed on the application of Geoinformation Systems (GIS) in the energy sector and urban sustainable development. This new line of research has produced over 10 scientific publications. This body of work also incorporates GIS with Multi-Criteria Decision-Making (MCDM) methods and augmented reality technology to enhance theoretical and practical decision support.

Implementation of IT retraining programmes in Java and Python

The IT retraining programmes for Java and Python programming were completed successfully twice with the United Nations Development Programme (UNDP), with one of the major training providers being the Mathematical Institute of SASA. These programmes helped support workforce development in Serbia through high-intensity and practice-oriented courses designed for junior programming positions. Via a structured

blend of technical training and soft skills training, these programmes exemplified the power of focussed retraining programmes addressing the increasing need for qualified staff in the ICT workforce. The findings and experiences from the first round of delivery were published in the scientific paper *Lessons Learned from Delivering Programming Courses Online for Retraining Serbian Workforce through UNDP Programmes* at the 10th IEEE Global Humanitarian Technology Conference (GHTC 2020) in Seattle, USA.

COLLOQUIA

Mathematics Colloquium

Chairperson: Dr Zoran Petrić

Brief history



Dr Zoran Petrić
(Photo by Dragan Aćimović)

Since the founding of the Mathematical Institute of SASA in 1946, lectures in mathematics and mechanics were held within *Veće Matematičkog instituta* (Scientific Committee of the Mathematical Institute) on a regular basis until 1961. A seminar that grew out of *Veće* is the Mathematics Colloquium (initially the Colloquium for Mathematical Analysis, and



Lecture by Prof. Dr Miloš Adžić at the meeting of the Department (Photo by Dragan Aćimović)

later the Colloquium for Theoretical Mathematics).

The chairmen of these seminars of the Mathematics Colloquium were: Borivoje Rašajski, Đuro Kurepa, Stanimir Fempl, Slaviša Prešić, Žarko Mijajlović, Bogoljub Stanković, Rade Živaljević and Stevan Pilipović.

Aim and scope

The Mathematics Colloquium is a general mathematical seminar whose role is to organise talks aimed at a broad audience, with particular emphasis on young mathematicians. Together with the Mechanics Colloquium and

the Computer Science and Applied Mathematics Colloquium, it carries broad responsibility for shaping the scientific programme at the Mathematical Institute of SASA, tailored to all mathematical centres in Serbia.

Recent activities

During the last five years, 142 talks have been delivered at the colloquium. Among the foreign speakers, the following were guests at the colloquium: Nikolai Erokhovets, Mehmetcik Pamuk (December 2020), Andras Joysef Tobias (April 2021), Ioana-Claudia Lazar (June 2021), Jim Stasheff (October 2021), Luca Ghidelli (November 2021), Krzysztof Krupinsky (December 2021), Reihane Zoghifard (February 2022), Gyula Katona (May 2022), Semra Pamuk, Tane Vergili, Karl Sigmund (September 2022), Frol Zapolsky (November 2022), Ivan Limonchenko (December 2022), Darji Udayan (March 2023), Edeghagba Eghosa Elijah (April 2023), Alexey Semenov (June 2023), Miklos Simonovits (November 2023), Matteo Verzobio (December 2023), Nikolai Tiurin, Lev Beklemishev (April 2024), Adam Skalski, Jeffrey Bergfalk (June 2024), Michael Benedikt (July 2024), Zoltan Vidnyansky, Ying Zhang (September 2024), Stanislav Speranski, Margaret Bayer (October 2024), and Stephan Klaus (December 2024).

The Mathematics Colloquium is a co-founder of the series *Mihailo Petrović Alas Lectures*, whose aim is to promote young Serbian mathematicians who have completed part of their education abroad by offering them an opportunity to share their knowledge with colleagues in Serbia. The first invited speaker in this series was Luka Milićević, who delivered a one-semester course (Spring 2019) entitled *Additive Combinatorics*. The second invited speaker of this series was Boriša Kuzeljević, who delivered a one-semester course (Spring 2023) entitled *An Introduction to Independence Proofs*.

The Mechanics Colloquium

Chairperson: Dr Borislav Gajić



Dr Borislav Gajić
(photo by Dragan
Aćimović)

The Mechanics Colloquium is one of the historic colloquia of the MISASA. Its formal and fundamental role in the organisational structure of the Institute has evolved over the past eight decades, in step with changes in the Institute itself. One of its most prominent hallmarks and its most important public activity has been the organisation of research talks in mechanics.

The Mechanics Colloquium has earned its reputation as one of the most prestigious regular scientific meetings in the broad field of Mechanics, with the longest continuous tradition nationwide. Since the establishment of the MISASA in 1946, there has always been an important group of researchers in the field of mechanics, whose first leader was the founder and the first director of the MISASA, Academician Anton Bilimović (1879–1970).

Up to 1961, the seminar talks in the field of mechanics, including Theoretical Mechanics, Fluid Dynamics, Stability of Motion, and Astronomy, were part of the Mathematics Colloquium. According to Academician Konstantin Voronjec, Head of the Mechanics

Colloquium in 1971, at the time of the 25th anniversary of the Institute, more than one hundred such talks were held. The Mechanics Colloquium was founded in 1961. By November 2025, there had been 1500 meetings. On average, 23 meetings with about four foreign speakers are organised each year.

The Mechanics Colloquium meets weekly, on Wednesdays at 6 pm, thus maintaining the tradition established in its earliest days.

The main tasks of the Mechanics Colloquium include:

- ▶ Organisation of weekly lectures, which range from expository talks in pure and applied mechanics to reports on original research results;
- ▶ Organisation of the public presentation and evaluation of scientific projects supported by the Ministry of Science;
- ▶ Support and organisation of visits by foreign scientists;
- ▶ Organisation and support of workshops, mini-conferences, presentations of books, software, video lectures, etc.;
- ▶ Monitoring of seminars and other research activities in the field of mechanics within the Institute.

Currently, the Head of the Mechanics Colloquium is Dr Borislav Gajić, and Andrijana Dekić is the Secretary of the Colloquium.

In the period 1961–1965, the Mechanics Colloquium was headed by Academician Tatomir P. Anđelić (1903–1993) and Prof. Danilo Rašković (1910–1985). From 1965 to 1973, the Head of the Mechanics Colloquium was Academician Konstantin Voronjec (1902–1974); from 1973 to 1984, Prof. Vlatko Brčić (1919–2000); from 1984 to 2000, Prof. Veljko Vujičić (1929–2020); from 2000 to 2006, Academician Vladan Đorđević; from 2006 to 2010, Academician Teodor Atanacković; from 2010 to 2012, Prof. Katica Stevanović Hedrih;

from 2012 to 2016, Prof. Vladimir Dragović, and from 2016 to 2025, Prof. Božidar Jovanović.

In the period 1975–1994, the Secretary of the Mechanics Colloquium was Dr Dragi Radojević (1947–2015). From 1994 until 2010, the secretaries were Dr Borislav Gajić, Dr Božidar Jovanović, and Dr Milena Radnović; from 2010 to 2012, Dr Srdjan Jović, from 2012 to 2017, Dr Katarina Kukić, from 2017 to 2021, Dr Tatjana Jakšić Krüger, and from 2021 to 2023, Marijana Babić.



Lecture by Prof. Dr Vladimir Dragović at the meeting of the Department of Mechanics, 2025
(Photo by Dragan Aćimović)

Computer Science and Applied Mathematics Colloquium

Chairwoman: Professor Vera Kovačević Vujčić

The Computer Science and Applied Mathematics Colloquium was founded in 2012 with the aim of supporting the growing interest in computer science and its connections with mathematics.

The activities of the Colloquium include regular weekly lectures, organised through meetings of the following seminars:

- ▶ Seminar on Computer Science and Applied Mathematics — Topics of the lectures range from reports on research in computer science and applied mathematics to computational studies and new software developments. The meetings are held on Tuesdays at 14:15 at the Mathematical Institute of SASA.
- ▶ Seminar for Decision Making – Theory, Technology and Practice — The seminar addresses current research in the field of decision-making theory, with an emphasis on linking the theoretical and methodological framework with practical applications in different domains. The seminar is held on Thursdays at 13:00 on the premises of the Mathematical Institute of SASA in Niš (Pariske Komune Street).
- ▶ Artificial Intelligence Seminar — Topics of the seminar range over logics and formal methods, reasoning, knowledge representation, natural language processing, machine learning, computational intelligence, artificial neural networks, and applications of artificial intelligence in different fields. The AI Seminar is held online on Wednesdays at 19:00.

In the period 2012–2025, the Computer Science and Applied Mathematics Colloquium has supported and participated in the organisation of several tutorials and conferences. The first activities in that direction were the organisation of tutorials “Dataflow Supercomputing” and “Data Mining from Social and Knowledge Networks,” held in 2013 by a group of experts from the University of Belgrade, Imperial College, Stanford University and the Mathematical Institute of SASA. In 2014, the Colloquium organised two courses on software verification, as well as an intensive course in parallel programming on the cluster. In 2015, it participated in the organisation of the mini-course “Existential Polytime and Polyhedral Combinatorics,” held at the Mathematical Institute of SASA by Professor Jack Edmonds.

In 2016, the Computer Science and Applied Mathematics Colloquium contributed to the celebration of the 70th anniversary of the Mathematical Institute of SASA by organising 16 invited lectures covering various areas of mathematics and computing. It also actively participated in the organisation of the international conference “Spectra of Graphs and Applications,” which was held from May 18–20, 2016, in honour of Professor Dragoš Cvetković on the occasion of his 75th birthday. In November 2018, the Computer Science and Applied Mathematics Colloquium organised a one-day meeting with six invited lectures in pure and applied mathematics in honour of the 70th birthday of Professor Gradimir Milovanović. Forty years of the scientific work of Professor Veljko Milutinović in computing were marked in March 2019 with a ceremonial meeting.

The Computer Science and Applied Mathematics Colloquium takes an active role each year in the organisation of the Symposium on Operations Research (SYMOPIS), while in 2015 and 2021 it was its principal organiser. It has also actively participated in the organisation

of the International Conferences on Variable Neighborhood Search: ICVNS 2016, ICVNS 2017, ICVNS 2018, ICVNS 2019, ICVNS 2021, ICVNS 2022, ICVNS 2024 and ICVNS 2025. The Computer Science and Applied Mathematics Colloquium has supported the international conferences “Path to a Knowledge Society – Managing Risk and Innovation:” PaKSoM 2021, PaKSoM 2022, PaKSoM 2023, PaKSoM 2024 and PaKSoM 2025, the Virtual International Conferences on Science, Technology and Management in Energy: eNergetics 2015, eNergetics 2016, eNergetics 2017, eNergetics 2018, eNergetics 2019, eNergetics 2020, eNergetics 2021, eNergetics 2022, eNergetics 2023, eNergetics 2024, eNergetics 2025, as well as the Artificial Intelligence Conferences AI 2023, AI 2024 and AI 2025.

One of the important activities of the Computer Science and Applied Mathematics Colloquium is a research internship programme for students interested in developing metaheuristic algorithms for optimisation problems. In the period 2020–2025, twenty-one students have successfully completed the internship program. Another activity of the Colloquium aimed at students is participation in the evaluation of high-level achievements of PhD, MSc and BSc students in the field of computer science and the awarding of the best of them. The Colloquium also promotes young researchers by giving them the opportunity to present their results at its seminars.

In the period 2012–2025, the guests of the Computer Science and Applied Mathematics Colloquium have been many world-renowned experts in the field of applied mathematics and computer science.

The head of the Computer Science and Applied Mathematics Colloquium is Professor Vera Kovačević Vujčić with Dr Tatjana Davidović as the deputy.

Prof. Dr Nenad Mladenović at the SYMOPIS 2021 conference
(Courtesy of V. K. Vujčić)



Opening of the conference dedicated to Artificial Intelligence at the Serbian Academy of Sciences and Arts, 2024
(Courtesy of V. K. Vujčić)



Participants of the conference Spectra of Graphs and Applications, 2016
(Courtesy of V. K. Vujčić)

SEMINARS

Mathematical Logic Seminar

Chairperson: Dr Predrag Tanović



Dr Predrag Tanović
(Photo by Dragan
Aćimović)

The study of mathematical logic in Serbia was initiated in the mid-1960s by a group of mathematicians and philosophers from the University of Belgrade. This work was continued at the Mathematical Institute of SASA in the form of a seminar established by Professor Slaviša B. Prešić. This seminar has been continuously active for more than 55 years. In the former Yugoslavia, the seminar had close relations with logicians from Zagreb for a long time. During the 1970s and 1980s, it was the fastest-growing mathematical group in Serbia, attracting a large number of graduate students. Some of them continued their studies at prestigious European and North American universities and went on to have outstanding research careers. Among them are invited speakers at the International Congress of Mathematicians (ICM), Dr Stevo Todorčević and Dr Ilijas Farah.

Seminar members are encouraged to give lectures on topics of general interest and present their own results. In particular, doctoral students working in logic are expected

to give lectures on advanced topics related to their studies as well as to present their results. Occasionally, short courses are organised. Guest logicians from abroad are welcome.

The seminar covers topics in the foundations of mathematics and philosophy, numerous connections between logic and classical mathematical disciplines and computer science, the role of logic in the teaching of mathematics, etc. Traditionally, attention has been paid to all major areas of logic: set theory, model theory, proof theory, and recursion theory. For a long period of time, lectures in these areas were predominant, while in the last three decades, the number of lectures on topics in algebra, topology, combinatorics, and theoretical computer science related to logic has significantly increased.

Seminar for Computational Logic

Chairperson: Dr Nebojša Ikodinović



Dr Nebojša
Ikodinović (Courtesy
of N. Ikodinović)

Dr Miodrag Rašković (1951–2025), Dr Zoran Marković (1948–2025), Dr Zoran Ognjanović, Dr Nebojša Ikodinović, and Dr Dragan Radojević initiated an informal seminar on the relationship between mathematical logic and

probability theory, which was held weekly, at the Mathematical Institute of SASA, starting in 2004. Over time, many young researchers joined the group. Due to the growing number of seminar participants, primarily post-graduate students, as well as an increasing number of research results, the informal research seminar became an official seminar of the Mathematical Institute of SASA under the name Seminar on Probabilistic Logics. Since 2008, when it was established, the Seminar has been held regularly, typically on Thursdays. From 2008 to 2025, the head of the Seminar was Dr Miodrag Rašković.

The main goal of the Seminar is to serve as a forum bringing together all researchers interested in reasoning under uncertainty. Accordingly, the seminar covers a wide range of fields, including primarily mathematical logic and computational logic, as well as their applications in medicine, computer science, engineering, telecommunications, social sciences, etc. The Seminar particularly encourages students to prepare survey lectures on advanced topics and current research problems. The creative discussion that follows such lectures leads to a deeper understanding of the respective topic and often to new results.

Seminar Geometry and Applications

Chairpersons: Dr Zoran Rakić and Dr Ivan Dimitrijević



Dr Zoran Rakić
(Courtesy of Z. Rakić)



Dr Ivan Dimitrijević
(Courtesy of I. Dimitrijević)

The Seminar on Geometry was established in the second half of the 1980s at the Faculty of Mathematics, University of Belgrade. In the mid-1990s, it began to meet at the Mathematical Institute of SASA. The Seminar followed the dynamic development of the Chair of Geometry and was initiated by Prof. Dr Neda Bokan and Prof. Dr Novica Blažić.

The goal of the seminar Geometry and its Applications has always been closely tied to improving the quality of teaching geometry courses and promoting more intensive scientific research in geometry at universities in Serbia — particularly in differential geometry and its numerous applications.

Over the years, the Seminar has featured presentations of scientific papers by its members and numerous guests from Serbia and abroad, presentations of doctoral theses by younger colleagues prior to their defenses, as well as thematic lectures and advanced courses in various areas of geometry and its applications. More precisely, during this period, the Seminar has presented the results of about twenty doctoral dissertations in the field of geometry and related areas.

The work of the Seminar was closely linked with research projects of the Ministry of Science:

- ▶ Differential Geometry and Applications (1992–2000) and
- ▶ Geometry, Education, and Visualization with Applications (2000–2019).

During the existence of the latter project, the Seminar bore its name. The project leaders were Professors Neda Bokan and Novica Blažić (1992–2005), and Zoran Rakić (2006–2019). During this period, the Seminar was also led by Professors Mirjana Đorić, Stana Nikčević, Srđan Vukmirović, Miroslava Antić, and Ivan Dimitrijević.

Throughout all these years, the Seminar has presented a wide range of topics in geometry and related disciplines: Riemannian and pseudo-Riemannian geometry, the theory of submanifolds, left-invariant metrics on manifolds, Lie groups and algebras, holonomy groups, affine differential geometry, integrable systems, complex manifolds with additional structure, cosmological nonlocal models, Schwarzschild metrics, synthetic geometry, noncommutative geometry, p-adic and adelic quantum-mechanical systems and applications of p-adic numbers in biological systems, quantum groups, topology, computational geometry, and visualization of geometric objects and their applications in education.

For many years, the Seminar received significant support from Academician Mileva Prvanović and Professor Branko Dragović, who was a long-term collaborator and later became a member of the Seminar.

During this period, the members of the Seminar greatly improved the level and organisation of mathematical conferences, bringing them up to internationally recognized standards. Such conferences included: Workshop on Contemporary Geometry and Related Topics (2002

and 2005), as well as the series Geometrical Seminar, which began in the 1980s. Starting from the XVII Geometrical Seminar (Zlatibor, 2012), these conferences have reached a notable international level, gathering around 120–130 participants, of which about 80 were from abroad. The next conference in the series, XXIII Geometrical Seminar, is planned for 2026, also in Zlatibor. Members of the Seminar have also played an important role in organising international conferences and congresses both in Serbia and abroad, notably the series Mathematical Physics Meeting: School and Conference on Modern Mathematical Physics (2001–2024) — eleven conferences — and the series Conferences on Nonlinearity (2021, 2023, 2025).

Among the guests and friends of the Seminar, we would like to acknowledge the collaboration



XIX Geometrical Seminar Conference, Zlatibor, 2016
(Courtesy of Z. Rakić)



Group photo after the seminar held on 28
November 2019 (Courtesy of Z. Rakić)

and contributions of colleagues from thematically related seminars: Vladimir Dragović, Božidar Jovanović, Borislav Gajić, Rade Živaljević, Đorđe Baralić, Ivan Limonchenko, Zoran Petrić, Miodrag Mateljević, Miljan Knežević, Marek Svetlik, Predrag Jovanović, Duško Borka, and Vesna Borka-Jovanović, as well as distinguished mathematicians from abroad, including: Emil Molnár, Peter Gilkey, Anatoly Fomenko, Bang-Yen Chen, Lieven Vanhecke, Alfred Gray, Masafumi Okumura, Dmitri Alekseevsky, Oldřich Kowalski, Louis Kauffman, David Blair, Mikhail Zelikin, Leopold Verstraelen, Udo Simon, Bernd Wegner, Graham Hall, Luc Vrancken, Marian Ioan Munteanu, Ivko Dimitrić, Stefan Ivanov, Ryszard Deszcz, Barbara Opozda, Radu Miron, Josef Mikeš, Vladimir Balan, Yuri Nikolayevsky, Eduardo García-Río, Konrad Polthier, Andrey Mironov, Iskander Taimanov, Andrei Vesnin, Taras Panov, Vladimir Rovenski, Alexey Tuzhilin, Alexandr Ivanov, Dmitry Millionshchikov, Fedor Popelensky, Alexander Zheglov, Stefano Marchiafava, Fabio Gavarini, Stefano Trapani, Paola Matzeu, Salvatore Capozziello, Marisa Fernández, Nicolas Andruskiewitsch, Eduardo Hullet, Eberhard Malkowsky, Dmitry Polyakov, Yuri Nikonorov, Nikolay Tyurin, Ilja Gogić, and many others.

We would like to take this opportunity to thank all members, guests, and friends of the Seminar, whose work and dedication to geometry — and to mathematics in general — have ensured its continuous existence for nearly forty years.

Finally, let us remember our dear colleagues who were members of the Seminar but are no longer with us: Novica Blažić, whose untimely passing in 2005 was a great loss for both the Seminar and the Chair of Geometry; Slavik Jablan, who passed away in 2015; Academician Mileva Prvanović, who left us in 2016 and Stana Ž. Nikčević, who passed away at the end of 2023.

Combinatorics in Geometry, Topology and Algebra (CGTA)

Chairperson: Dr Rade Živaljević



Dr Rade Živaljević
(Courtesy of R. Živaljević)

The Seminar on Combinatorics, Geometry, Topology, and Algebra (CGTA) was established around 1985 by a group of Belgrade mathematicians with diverse mathematical interests and specializations (originally under the name GTA-seminar).

The members of the founding group were Sava Krstić (MISASA), Aleksandar Lipkovski (Belgrade University), Aleksandar Vučić (Belgrade University), Siniša Vrećica (Belgrade University) and Rade Živaljević (MISASA).

From its inception, the seminar has served as a forum for disseminating mathematical ideas and introducing young mathematicians to research in:

- ▶ Topological, geometric, and algebraic combinatorics;
- ▶ Discrete, computational, and algebraic geometry;
- ▶ Algebraic topology, with particular emphasis on applications to problems in discrete geometry and combinatorics.

Over its forty years of activity, the seminar has been a meeting place not only for domestic mathematicians but also for many

distinguished foreign colleagues. Among them, we especially wish to acknowledge Imre Bárány, Victor M. Buchstaber, Herbert Edelsbrunner, Kiyoshi Igusa, Duško Jojić, Jiří Matoušek, Sergey Melikhov, Taras Panov, Yuri P. Solovyov, Svjetlana Terzić, Victor Vassiliev, Volkmar Welker, Günter M. Ziegler, and many others.

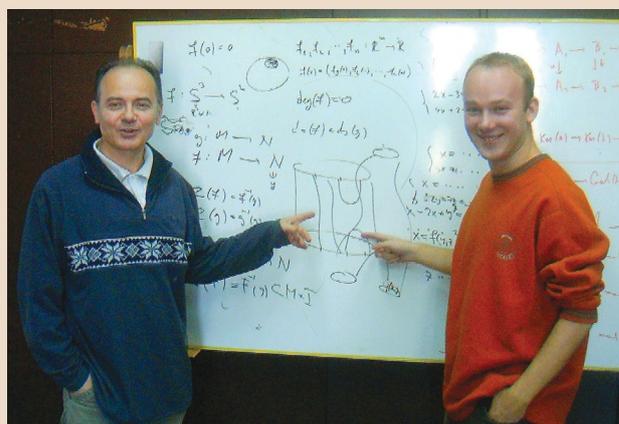
In addition to regular research talks, over the years the seminar, its thematic lecture series, and the associated CGTA courses have covered numerous topics, including: the theory of Lie groups, algebraic curves, vector bundles and characteristic classes, dihedral and cyclic homology, the theory of group actions, Borsuk–Ulam type theorems and their applications, discrete and computational geometry, automorphisms of free groups, hyperplane arrangements, stable homotopy theory, knot invariants, the theory of convex polytopes and algebraic geome-

try (toric varieties, Newton polyhedra), diagrams of spaces (Goresky–MacPherson type formulas), configuration spaces, invariants of three- and four-manifolds, toric topology and combinatorics, applied and computational algebraic topology (ACAT), and many others.

The seminar emphasises the interplay of ideas from different mathematical fields, affirming the unity of mathematics and its applications. In line with this orientation, the Centre for Dynamical Systems, Geometry and Combinatorics was created as a joint project with the Seminar on Mathematical Methods of Mechanics (MMM), founded by Vladimir Dragović.



Celebration of the 30th anniversary of the Seminar (KGTA) (V. Dragović, V. Grujić, K. Došen, S. Terzić, M. Marjanović, A. Vučić, D. Jojić, R. Živaljević)
(Courtesy of R. Živaljević)



KGTA Seminar, 2009 (R. Živaljević, Đ. Baralić)
(Courtesy of R. Živaljević)

Seminar for the History and Philosophy of Mathematics, Mechanics, and Astronomy

Chairperson: Dr Milan Božić



Dr Milan Božić
(Courtesy of M. Božić)

This Seminar was founded as a workshop on the history of Mathematics, with an emphasis on Mathematics in Serbia, around half a century ago, at the beginning of the 1980s. The first chairperson was Dr Dragan Trifunović, a prominent scholar in this field.

A decade later, at the beginning of the 1990s, Dr Rade Dacić became the chairperson.

Since 2002, the Seminar has been chaired by Dr Milan Božić. In that year, it was decided that the name should be changed to include Philosophy and sciences such as Mechanics and Astronomy, which are close to Mathematics and have been studied at the Mathematical Faculty of the University of Belgrade since the founding of the biggest and oldest University in Serbia.

As the scope of the Seminar has broadened, the participants and keynote speakers have grown in number and diversity of origin. This includes participants from almost all countries that emerged from the former Yugoslavia, as well as participants from many other countries around the world.

Currently, the Seminar convenes on Tuesdays at noon during the academic year and covers many interdisciplinary topics, combining, for example, methodology, education, and the popularization of science.

Stochastics with Applications

Chairperson: Dr Ljiljana Petrović



Dr Ljiljana Petrović
(Courtesy of Lj. Petrović)

The Seminar was founded in 1996 under the name *Stochastics*. Regular meetings of the seminar were held until 2008. The co-chairs were Dr Svetlana Janković and Dr Slobodanka Janković.

In 2023, the name of the Seminar was changed to *Stochastics with Applications*. Meetings of the seminar are devoted to a wide range of topics, including probability, stochastic processes, stochastic calculus, stochastic differential equations and statistics, with applications in various areas such as artificial intelligence, mechanics, stochastic dynamical systems, complex systems, mathematical physics, economics, etc. The goal of this Seminar is to bring together researchers working in different areas where stochastic methods are applied and to strengthen interaction between mathematics and other scientific disciplines. The Seminar provides a forum for the presentation of

results not only by established researchers but also by postdoctoral and PhD students.

Among the notable contributions to the Seminar, we would like to acknowledge those made by Persi Diaconis (Stanford University), Zoran Pop-Stojanović (Florida University), Jordan Stoyanov (Bulgarian Academy of Science), Michael Oberguggenberger (University of Innsbruck), Richard Kenyon (Yale University), Sandro Coriasco (University of Turin) and many others.

The Seminar meetings are held twice a month on Thursdays at 11 a.m. during the academic year. The lectures are recorded for the archive of the Mathematical Institute of SASA.

The Seminar Mathematics and Music

Chairperson: Dr Vesna Todorčević



Dr Vesna Todorčević (Archive of the Faculty of Organizational Sciences)

The Seminar Mathematics and Music was founded in 2018 and has since been held regularly by the Mathematical Institute of SASA in Belgrade. The lectures aim to present numerous, sometimes not so obvious, connections between mathematics and music, which have existed since the very beginnings of both disciplines, as well as relationships between mathematics and other branches of art and philosophical thought. In addition

to the mathematical aspects of music theory, the topics presented have included, among others, the concepts of harmony, melody, rhythm, and algorithmic composition.

Drawing on the connections between mathematics, music, and computer science, the Seminar is also devoted to the popularization of mathematics. Moreover, through a series of lectures by musicians, writers and visual artists, it examines a variety of links between mathematics and other arts, thereby significantly broadening both the audience and the methodological frameworks employed. This thematic and methodological diversity, especially with regard to its diachronic approach, is clearly reflected in the consistently high attendance at the Seminar.

The lecturers, as well as the participants of the Seminar, come from a very wide array of academic and artistic fields: they are mathematicians, musicologists and musicians, composers, computer scientists and programmers, philosophers and theologians, classicists and historians of science, visual artists and writers, ranging from students to established professionals. The sheer number of lectures — more



Panel within the Seminar Mathematics and Music: Women Pioneers of Mathematics in Serbia (from left to right: Prof. Dr Vesna Todorčević, Prof. Dr Neda Bokan, Prof. Dr Desanka Radunović and Prof. Dr Vera Kovačević Vujčić) (MISASA Archives)

than 100 — and the professional diversity of their speakers attest to the intensity and ambitious academic goals of this Seminar.

We hope to continue and maintain the multi-disciplinary character of the Seminar, which

bears witness to the deep and enduring connections between mathematics and other realms of human creativity.



Promotion of the proceedings *A Hidden Harmony: Mathematics and Music through the Ages* on the occasion of the fifth anniversary of the Seminar Mathematics and Music, Mathematical Institute of the Serbian Academy of Sciences and Arts, 8 November 2024 (Photo by Dragan Aćimović)

Student Seminar

Chairperson: Dr Luka Milićević



Dr Luka Milićević
(Courtesy of L. Milićević)

The Student Seminar serves as a platform for students and more experienced researchers to connect, share their experiences and interests, and foster collaboration. Unlike seminars that focus on specific mathematical topics,

the Student Seminar has a more general mission. The seminar aims to enhance students' presentation and communication skills, familiarize them with academic practices, and help them identify research centres and groups aligned with their scientific interests. Although the Mathematical Institute of SASA had a well-established tradition of maintaining ties with students in Serbia and abroad even before establishing the Student Seminar, the seminar has significantly strengthened these ties. In addition, seminar contributors have actively participated in organising the event *May, the Month of Mathematics*, engaged in activities at the Petnica Science Centre, and taught at the Mathematical Grammar School in Belgrade. Since its inception in 2017, meetings of the Student Seminar at the Mathematical Institute of SASA have typically been held on Fridays around noon, just before the Math-

ematics Colloquium, the Institute's main seminar. This scheduling has earned the Student Seminar its informal nickname "The Little Colloquium." The seminar features talks by undergraduate, master's, and PhD students, covering a wide range of topics in mathematics, computer science, mechanics, and their applications. Its primary goal is to support students in initiating their scientific work, offer additional academic training, facilitate the exchange of relevant information, and assist young researchers at the early stages of their careers.

Throughout its existence, the seminar has hosted students from all mathematics departments in Serbia, as well as numerous students studying at various universities abroad. A key aspect of its mission is to cultivate scientific connections among young researchers. The Student Seminar also serves as a means through which the Institute supports former students of the Mathematical Grammar School who signed the Good Intentions Memorandum — students who previously took part in high school Olympiads in mathematics and computer science. Notably, at the end of 2023, a New Year gathering was held, gathering many students who had been involved in various seminar activities over the preceding period. The Student Seminar also features presentations by finalists for various Mathematical

Institute Student Awards, which recognize the best PhD and master's theses, as well as outstanding student papers in mathematics and computer science. These awards were established in 2017, while the award for the best high school thesis for students of the Mathematical Grammar School



was first presented in 2018. The high school laureates also have the opportunity to give a lecture at the seminar. The evaluation committees consist of established scientists from the Mathematical Institute of SASA and university professors.

Since 2020, the Institute has been organising student research internships in mathematics, mechanics, computer science, and other fields covered by the Student Seminar. During these internships, students work on open problems under the guidance of experienced researchers from the Institute. The goal of these projects is to give students firsthand experience of scientific research and insight into the working environment of the Institute, while also familiarizing them with the Institute as a potential place to pursue their future academic careers.

Mathematical Analysis with Applications Seminar

Chairperson: Dr Vladimir Božin

The Mathematical Analysis with Applications



Dr Vladimir Božin
(Courtesy of V. Božin)

Seminar was founded in 2022 under the leadership of Vladimir Božin, with Bogdan Đorđević as secretary. The seminar showcases research results in analysis and its numerous applications in related fields.

The seminar focuses on topics in complex and harmonic analysis, quasiconformal mappings, matrix analysis, operator theory, dynamical systems, and functional and stochastic analysis. Applications in topology, Teichmüller spaces, quantum mechanics and quantum information theory have also been discussed in various invited lectures.

Participants are primarily researchers from the Mathematical Institute of SASA working in analysis, as well as members of the Departments of Analysis and Complex Analysis at the Universities of Belgrade and Niš. The seminar is also frequently conducted via online streaming, which enables the participation of international guests who are unable to deliver their lectures in person.

The seminar maintains close collaboration with the Complex Analysis Seminar at the Faculty of Mathematics in Belgrade, which has a long-standing tradition. Among its distinguished guests have been researchers who began their careers at that seminar thirty years ago, such as Vladimir Marković and Dragomir Šarić, with Šarić delivering the opening lecture at the Institute's seminar in 2022.

The Novi Sad Seminar

Chairperson: Dr Marko Janev



Dr Marko Janev
(Courtesy of M. Janev)

The Novi Sad Seminar of the Mathematical Institute of SASA aims to promote collaboration between researchers from the Novi Sad branch of the MISASA and other researchers from the MISASA (Belgrade, Niš, Kragujevac) in the fields of mathematics, mechanics, and informatics. Additionally, its goal is to contribute to the visibility of the results achieved by these researchers. The seminar covers various topics within all the mentioned fields and their subfields.

As presenters at the seminar, researchers from the MISASA are welcome, as well as all other researchers, both established and those who are just beginning their research careers, from both within the country and abroad, who wish to present their original results.

The seminar takes place once a month.

Seminar Mathematical Methods of Mechanics

Chairperson: Dr Vladimir Dragović



Dr Vladimir Dragović (Courtesy of V. Dragović)

The everlasting connection between mathematics, mechanics, and physics has driven many fundamental ideas in mathematics during the last third of the 20th century. Inspired by this connection, the Seminar on Mathematical Methods of Mechanics was established at the MISASA in the spring of 1993 with the aim of encouraging more active and organised participation in these contemporary developments.

Let us highlight two principal initial tasks of the Seminar. The first one was to contribute to the organisation of postgraduate studies in these fields in cooperation with the Chairs of Geometry and of Mechanics of the Faculty of Mathematics in Belgrade. The second task was to organise, coordinate, and stimulate research, as well as to provide a forum for discussion and verification of original research results.

Most frequently, the subjects of talks have been integrability and nonintegrability of dynamical systems, symplectic geometry, Lie groups and algebras, qualitative analysis of differential equations, algebraic curves, etc.

The Seminar was initiated in 1993 by Vladimir Dragović, who has served as its chair since its inception. In 1994 and 2000, the duties of

chairperson were performed by Nikola Burić (1959–2016) and Darko Milinković, respectively. During the first few years, senior researchers Veljko Vujičić (1929–2020), Stevo Komljenović (1930–2020), and Rade Živaljević participated actively in the work of the Seminar. Four PhD theses have been completed within the Seminar (by Božidar Jovanović, Borislav Gajić, Milena Radnović, and Katarina Kukić), all under the supervision of Vladimir Dragović.

Over more than thirty years of its activity, the Seminar has organised many special courses:

- ▶ Mathematical Methods of Mechanics by Vladimir Dragović in 1993 and 1994;
- ▶ Nonintegrable Systems by Nikola Burić in 1995;

four courses in 1997:

- ▶ Theory of Solitons;
- ▶ Algebraic Curves and Nonlinear Equations;
- ▶ Rigid-Body Dynamics and Geometry;
- ▶ Symmetries in Mechanics;

in 1998 and 1999:

- ▶ Schemes and Cohomologies.

The organiser of the 1997–1999 courses was Vladimir Dragović, with the active participation of doctoral students at the time: Božidar Jovanović, Borislav Gajić, and Milena Radnović.

The following courses have been organised since 2000:

- ▶ Mirror Symmetries by Darko Milinković;
- ▶ Lie Groups and Algebras by Božidar Jovanović;
- ▶ Some Aspects of Classical Homology Theory by Jelena Grbić (jointly organised with the CGTA Seminar);
- ▶ Continuum Mechanics by Jovo Jarić;
- ▶ Introduction to Algebraic Geometry by Milena Radnović, Borislav Gajić, Božidar Jovanović;

- ▶ Toric Topology by Victor Buchstaber (jointly organised with the CGTA Seminar);
- ▶ Dynamical Systems by Borislav Gajić, Gordana Stojanović, Milena Radnović;
- ▶ Introduction to Optimal Control – Pontryagin’s Maximum Principle by Vladimir Janković.

The list of several other more recent courses includes:

- ▶ Introduction to Analytical Mechanics and Symplectic Geometry and Algebraic Curves and Applications in Classical Mechanics by Borislav Gajić and Božidar Jovanović;
- ▶ Introduction to Classical Mechanics and the Theory of Stability by Vladimir Dragović, Borislav Gajić, and Božidar Jovanović;
- ▶ Mathematical Methods in Mechanics by Borislav Gajić and Božidar Jovanović and Linear and Nonlinear Waves by Teodor Vrećica.

Since 2008, the Seminar has been actively involved in organising a series of international conferences: GDIS-Geometry, Dynamics, Integrable Systems, jointly with Alexey Borisov (1965–2021) and Academician Valery V. Kozlov, a former Vice-President and Act-



ing President of the Russian Academy of Sciences. To date, nine conferences in this series have been held: in 2008 and 2010 in Serbia, 2011 in Portugal, 2013 in Russia, 2014 in Italy, 2016 and 2018 in Russia, and 2022 and 2024 in Serbia.

In 2012, the Seminar organised a mini-symposium on Algebraic Geometry, and in 2013, 2018, and 2023 mini-symposia devoted to its 20th, 25th, and 30th anniversaries. The Seminar organised the Belgrade Summer School on Dynamical Systems in 2022 and a summer internship in 2023. Finally, let us highlight that in 2011 the Seminar organised a minicourse by Academician Sergei Petrovich Novikov (Fields Medal, 1970). The title of the course was: Integrable Systems and a New Discrete Complex Analysis.



Seminar meeting marking the 30th anniversary of the Seminar “Mathematical Methods of Mechanics,” 2023 (Courtesy of V. Dragović)

Academician Sergei P. Novikov, Fields Medal laureate (1970), during his stay in Belgrade from 4 to 11 June 2011 as a guest of the Seminar “Mathematical Methods of Mechanics” of the Mathematical Institute of the Serbian Academy of Sciences and Arts. The photograph captures a meeting with Patriarch Irinej (Archive of the Serbian Orthodox Church)

Seminar on Theory of Relativity and Cosmological Models

Chairperson from 2017 to 2025: Dr Žarko Mijajlović



Dr Žarko Mijajlović
(Courtesy of Ž.
Mijajlović)

At the February 2017 session of the Scientific Council of the Mathematical Institute of SASA, approval was given for the establishment of the Seminar for Theory of Relativity and Cosmological Models within the Department of Mechanics.

The proposal to establish the Seminar was made by Prof. Žarko Mijajlović and Dr Miloš Milovanović. Žarko Mijajlović was appointed head of the Seminar, and Miloš Milovanović secretary, a role he performed during 2017. From 2018 to 2022, the secretary was Tatjana Jakšić Kruger, and since 2023, this role has been held by Nikola Mutavdžić. Between 15 and 20 meetings are held every year, except during the coronavirus period, when only two meetings were held in 2020 and seven in 2021. Over 120 Seminar sessions were held during this period, with between 10 and 25 attendees at each.

Before the Seminar was established, informal meetings of groups of researchers interested in this field were held at the Faculty of Mathematics and at the Mathematical Institute for three consecutive years. The core of this group consisted of Prof. Ilija Lukačević, Dr Dragi Radojević, Prof. Žarko Mijajlović and Dr

Miloš Milovanović. In a given semester, there would be 7–8 meetings with 5–10 attendees. The topics were mostly of a survey character, but there were also research presentations that were later published, while graduate students presented their master's theses.

Interest in this field began two decades ago, when the Faculty of Mathematics introduced courses in the theory of relativity and cosmological models into the regular (undergraduate) programme (for mathematicians and astronomers), as well as into the master's and doctoral programmes. Interest in this field was solid: each year 7–12 fourth-year students in the theoretical mathematics programme enrolled in this course, and several master's theses were defended. This awakened a certain enthusiasm for this field among the older generation of researchers in the mathematical sciences. Several scientific papers were published on this topic, and thus the idea arose of establishing first an informal seminar and then an official seminar of the Mathematical Institute.

Of course, this seminar is not the only place in our country where topics from the general theory of relativity and cosmology are discussed. Within the existing seminars in geometry, mechanics and astronomy, topics from this field are occasionally presented, and master's and doctoral theses are written. However, the members of the Seminar are primarily interested in the connection between the general theory of relativity and what its most significant application, cosmology is probably. In other places, e.g., at geometry seminars, purely mathematical (geometric) aspects of the general theory of relativity (GR) are mostly studied, without going too far, for example, into astrophysical interpretations and applications, while the situation at seminars organised by non-mathematicians is reversed. Hence, it is understandable that there is a diversity of professional backgrounds among the audience participating in the work of the Seminar, and the lecturers

have included mathematicians, physicists, astronomers, theoretical physicists and philosophers. In addition to original and survey lectures, several short courses were held, i.e., thematic blocks of lectures, usually consisting of four lectures, for example, on the general theory of relativity, field theory and time. The Seminar is held on the premises of the Mathematical Institute, on Wednesdays at noon, as announced. The titles of all lectures, together with abstracts and the names of the lecturers, can be found on the website of the Seminar.

Seminar Mechanics of Machines and Mechanisms — Models and Mathematical Methods

Chairperson: Dr Ivana Atanasovska



Dr Ivana Atanasovska
(Courtesy of I. Atanasovska)

Theory of machines and mechanisms covers machine design theory and methodology, kinematics of mechanisms, rotor dynamics, computational kinematics, multibody dynamics, nonlinear vibrations, linkages and cams, gearing and transmissions, transportation machinery, control and reliability of mechanical systems, including hydraulic and pneumatic systems, experimental research, robots and the robotization of processes, mechatronics, micro and nano-mechanisms, as well as prospective fields of interdisciplinary research in the science of mechanisms and machines and other scientific fields, such as bio-inspired

design and materials science. In this framework, the mechanics of machines and mechanisms is a broad research area encompassing various topics in theory and application.

The Seminar Mechanics of Machines and Mechanisms — Models and Mathematical Methods primarily includes lectures and presentations on scientific contributions in areas such as: the dynamics and stability of models of machines and other real complex mechanical systems and structures, as well as kinematics, nonlinear oscillations, and nonlinear phenomena in their mechanics. The elastodynamics of the models of machines and complex structures, their load capacity, and dimensioning based on new scientific knowledge of mathematics and continuum mechanics are also the subject of the Seminar. Lectures dealing with multi-criteria optimisation of the shapes of complex system structures and new descriptions of constitutive relations of materials, as well as fracture mechanics and damage mechanics, are welcome. The Seminar also includes presentations and discussions in the field of developing mathematical methods and models, as well as the application of numerical methods and computer techniques in all other scientific areas related to the mechanics of machines and mechanisms, such as coupled problems in science and engineering, biomimetics, and mechanics of materials.

The current chair of the Seminar Mechanics of Machines and Mechanisms — Models and Mathematical Methods is Dr Ivana Atanasovska, with Dr Stepa Paunović as Secretary. Within the framework of its permanent activities, the main objectives of the Seminar Mechanics of Machines and Mechanisms — Models and Mathematical Methods are: to organise lectures and research reports in applied mathematics and mechanics within the mechanics of machines and mechanisms; public presentation and evaluation of scientific projects; visits by foreign researchers and scientists; workshops, mini-confer-



Award ceremony of the prize named after Prof. Vladan Đorđević at the ICME 2024 conference
(Courtesy of I. Atanasovska)

ences, presentations of books, video lectures, etc. The foundation of the Seminar Mechanics of Machines and Mechanisms — Models and Mathematical Methods has enabled the strengthening of existing forms of cooperation and the establishment of new ones with scientists and researchers from different scientific branches within the engineering sciences, who traditionally focus on applying theoretical mechanics and various mathematical methods to solve real problems. In the period from June 2018 to May 2026, more than 100 meetings and lectures were held as part of the Seminar's activities. The lecturers were prominent scientists from different universities and institutes in Serbia, as well as from abroad. The activities of this permanent Seminar have enabled the development of new forms of cooperation and new research groups that are preparing joint participation in calls for scientific and research projects at the national and international level, as well as involvement in solving problems faced by industry in Serbia. An important contribution of the Seminar's work was active participation in several international projects funded through the European Union's COST calls, which particularly motivated young researchers to be more actively engaged in research on current top-

ics and cooperate at the international level in solving real problems.

In the previous period, a particularly significant contribution of the Seminar and its members was the establishment of a new series of international conferences on mathematical modelling in mechanics and engineering, which are held biennially (International Conferences on Mathematical Modelling in Mechanics and Engineering). In their first two editions (2022 and 2024), these conferences met with a strong response from the domestic and international scientific community and established a tradition of gathering hundreds of researchers and scientists from the broader scientific field of the application of mathematics in engineering sciences every other September at the Mathematical Institute of SASA. A special contribution of these activities is the establishment of an award named after Academician Prof. Vladan Đorđević, which is awarded every two years within the framework of the conference to young researchers with outstanding contributions in the field of fluid mechanics. The founder and chair of this conference series is Dr Ivana Atanasovska, the head of the Seminar Mechanics of Machines and Mechanisms — Models and Mathematical Methods, in collaboration with active members of this Seminar at the MISASA.



Lecture by Dr Corneliu Birtok Baneasa at the Seminar Mechanics of Machines and Mechanisms
(Courtesy of I. Atanasovska)

Seminar on Biomechanics, Bioengineering and Mathematical Biology

Chairperson: Dr Anđelka Hedrih



Dr Anđelka Hedrih
(Courtesy of A.
Hedrih)

The Seminar on Biomechanics, Bioengineering and Mathematical Biology was established at the end of 2021 with the aim of bringing together scientists from different disciplines who study complex biological systems from both theoretical and experimental perspective. Lectures are held in Niš, in Belgrade and online. The founder and the chair of the Seminar is Dr Anđelka Hedrih with Dr Đorđe Jovanović as Secretary.

The seminar aims to facilitate the exchange of scientific knowledge and experience, to promote young researchers and PhD students, and to present the latest results in the fields of biomechanics, bioengineering and mathematical biology. The seminar's activities include lectures, mini-symposia, scientific discussions and workshops, with participants from Serbia and abroad, as well as collaboration with professional associations. The seminar covers a wide range of topics — from mathematical modelling of physiological processes and biomechanical models of living systems, to bioengineering, bioinformatics and quantum phenomena in biology.

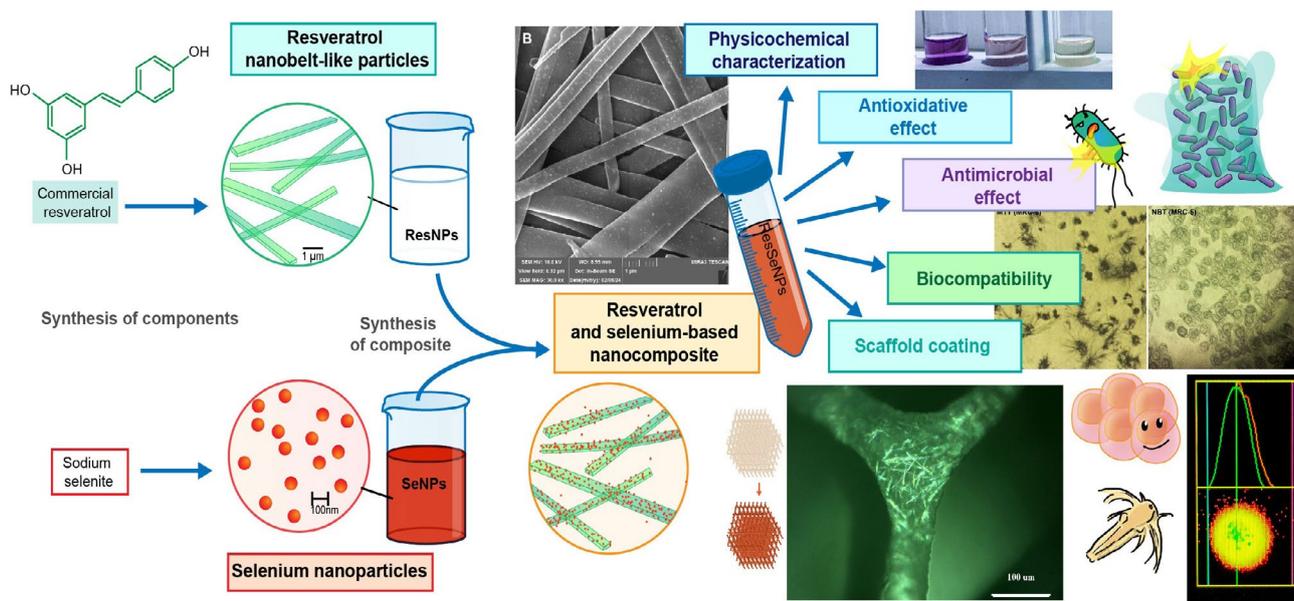


Lecture by Ivana Vasić (Vitra Labs) entitled
Investigating the Relationship Between Cell Structure
and Signaling in Human Induced Pluripotent Stem
Cells, Science Club Niš, 16 August 2023
(Courtesy of A. Hedrih)

Topics in biomechanics include: biological oscillators, rheological models in biology and medicine, clinical and sports biomechanics, growth and remodelling of biological tissues, synchronization phenomena in biological systems, and the biophysics of molecular interactions. Topics in mathematical biology include: mathematical models of organisation within different biocenoses, and epidemiological modelling. Topics in bioengineering mainly include experimental research in the fields of medicine and pharmacy, as well as the development of novel biomedical materials and technologies applicable in clinical practice.



Lecture by Petar Vranić (Mathematical Institute of
the Serbian Academy of Sciences and Arts, Belgrade,
Serbia) entitled GIS as a Decision Support System
in Biology, Regional Center Niš, 12 October 2023
(Courtesy of A. Hedrih)



Graphical abstract of the lecture by Dr Nina Tomić (Institute of Technical Sciences of the Serbian Academy of Sciences and Arts) entitled Composite Material Based on Resveratrol and Selenium Nanoparticles, held on 28 April 2025 (Author: Dr Nina Tomić)

Seminar for Differential Geometry, Mathematical Physics and Continuum Mechanics

Chaipersons: Dr Nenad Vesić and Dr Danilo Karličić



Dr Nenad Vesić
(Courtesy of N. Vesić)



Dr Danilo Karličić
(Courtesy of D. Karličić)

The idea for establishing this seminar arises from recognizing the profound interconnections among differential geometry, con-

tinuum mechanics, and various branches of applied physics and engineering in the broadest sense. These disciplines have not only been driving forces behind numerous pivotal mathematical advancements over the last century but have also played fundamental roles in shaping our understanding of the physical world. Founded with the objective of enhancing postgraduate studies and facilitating research endeavors, the seminar provides a structured forum for the dissemination and exploration of innovative ideas and original research findings, as well as further developing well-established theories.

The seminar began as an informal gathering of a group of interested researchers from the Mathematical Institute of SASA, who met in their office at the MISASA Branch in Niš. Over time, it has evolved into a

dynamic platform for scholarly exchange and collaboration. From organising specialized courses on theoretical and computational aspects of solid and fluid mechanics, multiphysics phenomena and differential geometry, to hosting both young and senior researchers from Serbia and abroad, the seminar remains dedicated to advancing knowledge and research in these fields. The following types of presentations and formats related to mathematics, mechanics, engineering, and physics are welcome:

- ▶ Presentations of original scientific contributions;
- ▶ Review lectures;
- ▶ Specialized courses on specific topics.



Meeting of the Seminar for Differential Geometry, Continuum Mechanics and Mathematical Physics, held at the Regional Centre for Professional Development in Niš on 28 November 2025. The photograph was taken after the lecture by Dr Stepa Paunović (Photo by Danilo Karličić)

Seminar on Computer Science and Applied Mathematics

Chairpersons: Professor Vera Kovačević Vujčić and Professor Milan Dražić



Dr Vera Kovačević Vujčić (Courtesy of V.K. Vujčić)



Dr Milan Dražić (Courtesy of M. Dražić)

The Seminar on Applied Mathematics was founded in 1973, as one of the first seminars at the Mathematical Institute. In 2012, its name was changed to the Seminar on Computer Science and Applied Mathematics. From the very beginning, one of the main goals of the Seminar was to encourage interaction between mathematics and other sciences, bringing together mathematicians, scientists, as well as practitioners from other disciplines. Interaction between researchers from scientific institutions and industry has also been strongly encouraged. Reflecting the growing interest in computer science, in recent years, almost half of the lectures have been in the field of computing and its connections with mathematics. Another important goal of the Seminar is to promote young researchers through presentations of their doctoral theses.

The Seminar meetings are devoted to both the presentation of new scientific results and the description of real-life problems

whose solution requires knowledge of mathematics and computing. Various topics have been covered, including numerical analysis and its applications, mathematical programming and the calculus of variations, operations research and management science, system theory, graph theory and applications, astronomy and geophysics, probability and statistics, fuzzy sets and logic, decision support systems, metaheuristics, neural networks, artificial intelligence, algorithms and complexity, data mining, data structures, database management, computer security and cryptography, computer communication networks, computer graphics, pattern recognition, software engineering, digitisation, e-business, e-learning, mathematical software, etc. The Seminar also welcomes presentations of books and scientific projects.

In November 2017, the Seminar marked the 20th anniversary of the first paper on the variable neighborhood search method: N. Mladenović, P. Hansen, Variable neighborhood search, *Computers & OR*, 24(11) (1997), which, according to a bibliometric analysis published in *Omega*, 73 (2017), ranked 52nd on the list of the 200 most cited papers in operations research and management science, and whose co-author Professor Nenad Mladenović was an active participant in the Seminar. In October 2020, one meeting of the Seminar was devoted to a special issue of the journal *Discussiones Mathematicae Graph Theory*, 40(2)(2020), published in honour of the late Professor Slobodan Simić, who also actively participated in the activities of the Seminar. The 50th anniversary of the Seminar on Computer Science and Applied Mathematics was celebrated through three

sessions of the Seminar held on 6, 13 and 20 February 2024. In the first session the leaders of the Seminar gave an overview of the past activities, while in the next two sessions, titled *Look into the Future I – Computer Science* and *Look into the Future II – Applied Mathematics*, 12 young researchers presented their research topics.

The guests of the Seminar included many world-renowned experts in the field of applied mathematics and computer sci-

ence. Among the visitors, we would like to acknowledge the contributions of Jack Edmonds, Panos Pardalos, Willem Haemers, Alain Hertz, Zoran Obradović, Anton Ereemeev, Alexander Strekalovskiy, Ismael Yero, Yury Kochetov, Arutyun Avetisyan and many others.

Since 1995, lectures of the Seminar have been organised jointly with the Faculty of Organisational Sciences. On behalf of the Faculty, the leaders of the Seminar are



Group photo after a lecture at the Seminar on Computer Science and Applied Mathematics in Belgrade
(Courtesy of M. Dražić)

Professor Zorica Mladenović and Professor Marijana Despotović-Zrakić. The IEEE Chapter on Computer Science (CO-16), Belgrade, Republic of Serbia, has supported the organisation of the Seminar since 2008, under the leadership of Professor Božidar Radenković.

The Seminar on Computer Science and Applied Mathematics meets regularly, from October to May, on Tuesdays at 14:15 at the Mathematical Institute. Since 2023, two sessions per year have been organised in Novi Sad and Niš. The lectures are broadcast live and recorded for the Seminar archive.



Seminar meeting in Niš, 2024.
(Courtesy of V. K. Vujičić)



Marking the 50th anniversary of the founding of the Seminar
(from left to right: Prof. Dr Milan Dražić, Prof. Dr Vera Vujičić, Prof. Dr Božidar Radenković, Prof. Dr Marijana Zrakić, Prof. Dr Zorica Bogdanović) (Courtesy of V. K. Vujičić)

Scientific Seminar Decision Making – Theory, Technology and Practice

Chairperson: Dr Lazar Velimirović



Dr Lazar Velimirović
(Courtesy of L. Velimirović)

The scientific seminar, founded in 2017, focuses on contemporary research in the field of decision-making theory, with an emphasis on linking the theoretical and methodological foundations with practical applications across different domains. The aim of the seminar is to bring together researchers, professors, doctoral and master's-level students, as well as experts from the industrial sector who work on the development and application of decision-making models in complex systems.

In addition to fundamental theoretical approaches, such as classical and multi-criteria decision analysis, game theory, risk and uncertainty analysis, the seminar also encourages the application of modern technologies and methods. Special emphasis is placed on machine learning and artificial intelligence methods to support decision-making, the use of GIS technologies for spatial analysis and spatially oriented decisions, the integration of computer models, optimisation and simulations, as well as innovative hybrid approaches that combine analytical and data-driven methods.

Special attention is paid to the application of theoretical models to solving real-world problems in the fields of engineering, telecommunications, energy, transport, economics, resource management, public policies and digital transformation processes. The seminar is also open to presentations of new methods, algorithms and tools that help improve the decision-making process under conditions of uncertainty.

Seminar in Artificial Intelligence

Chairperson: Dr Andreja Tepavčević

This seminar in Artificial Intelligence was established as a continuation of the Serbian AI Meeting held in December 2020. The seminar started in April 2021, and by the end of 2025 around 160 lectures had been held, with more than 420 participants. The AI seminar is designed to connect researchers from Serbia and the diaspora, as well as researchers from universities and scientific institutes, and practitioners.

Various scientific topics and results in the field of artificial intelligence have been presented at the Seminar ranging from traditional topics such as logic and formal methods, reasoning, knowledge representation, natural language processing, machine learning, computational intelligence, artificial neural networks, to applications of artificial intelligence in different fields. Speakers from 25 different countries — including the UK, Russia, the USA, Korea, Australia, and many EU and Western Balkan countries — have participated in the Seminar.

Since the participants come from all Serbian universities and institutes connected to AI, foreign universities, and Serbian and foreign companies, the AI Seminar has been held exclusively online. The languages of the Seminar are Serbian and English.

LIBRARY

THE LIBRARY OF THE MATHEMATICAL INSTITUTE OF THE SERBIAN ACADEMY OF SCIENCES AND ARTS

Head of Library: Kristina Milojević, MA



Kristina Milojević,
MA (Photo by
Dragan Aćimović)

The Library of the Mathematical Institute of SASA was founded in 1946 as the successor to the Library of the Mathematical Seminar of the University of Belgrade and represents the largest and most significant repository of knowledge in the fields of mathematics, mechanics, and, later, computer science. At the time of its establishment, the Library did not possess any publications, and the first monographs were acquired by the members of the Institute themselves. The Library's collection gradually expanded through further purchases, acquisitions, and exchanges. The long-standing tradition of exchange with numerous mathematical institutions has continued for over eighty years and remains one of the most important means of acquiring materials, especially scientific journals.

The first tasks related to the maintenance of the Library's collection were carried out by junior associates of the Institute, for whom this was a unique opportunity to familiarize

themselves with the scholarly literature. The first acting librarian, appointed in 1950, was Boško Tomić, who also served as the Institute's secretary. In 1952, translator Vojislav Popović took over the position and remained in the role until 1963. He was succeeded by Ilija Bratić, who served as librarian until his retirement in 1992. Rajko Petronijević briefly held the position (1992–1993), after which Branka Bubonja became librarian, serving until 2020. Following this, Kristina Milojević assumed the role.

Today, in terms of its formal organisation, the Library functions as a centralized scientific library. It collects, processes materials in accordance with established cataloguing principles, preserves them, and makes them available for use in the fields of mathematics, mechanics, and computer science. In 1995, the process of transitioning from a card catalogue to an electronic one began and was completed in 1997. At that time, the collection was converted into digital format, and

the Library's entire holdings became searchable through the online catalogue, available on the Institute's website. Following the most recent review of the collection, the Library's holdings comprise approximately 12,000 monographs and 618 journal titles, in total more than 60,000 volumes, of which only 18 journals are obtained by purchase. Since 2025, the Library has been incorporated into the COBISS cataloguing system, which will, with further development, provide greater visibility for the Library's rich collection not only to the researchers of the Institute, but also to the broader public interested in mathematical, mechanical, and computer sciences.

In addition to scientific journals and databases available via the Serbian Library Consortium for Coordinated Acquisition (KoBSON), the Library provides access to two specialized mathematics databases: Zentralblatt für Mathematik and Mathematical Reviews (MathSciNet).

In 2020, the Institute established its institutional repository, where research papers authored by collaborators of the Institute are deposited. Since its establishment, over 4,000 research papers have been deposited, providing open access to research results across all fields of mathematics, mechanics, and computer science.

ARCHIVES

THE ARCHIVES OF THE MATHEMATICAL INSTITUTE OF THE SERBIAN ACADEMY OF SCIENCES AND ARTS: FROM ADMINISTRATIVE DOCUMENTATION TO SCIENTIFIC HERITAGE

Text prepared by Dr Marija Šegan-Radonjić, Secretary of the Archive

The Archives of the Mathematical Institute of SASA comprises a complex and diverse body of materials that brings together institutional administrative records and scientific documentation. These documents trace the development of mathematics and related disciplines in Serbia from the Institute's founding in 1946 to the present day.

Historical Development

Until recently, the Archives of the MISASA was not formally recognized as a separate organisational unit; rather, it was considered



Conversation between Academician Bogoljub Stanković and Professor Žarko Mijajlović, recorded on March 3, 2016, MISASA Archives
(Photo by Dragan Aćimović)

part of the Institute's administrative operations. Archival materials were managed by the Secretariat and Accounting Department, which oversaw legal, personnel, and administrative affairs in accordance with relevant regulations and the guidelines of the State Archives. It is assumed that during the Institute's early years, this role was handled by the Secretariat of the Institute and the relevant services of the Serbian Academy of Sciences, of which the Institute was a part from 1946 to 1961.

Even after the adoption of the Law on Independent Financing in 1954, the Institute continued to rely on the Academy's services, as it did not have its own accounting department. This is evidenced by the fact that in 2023–2024, administrative documentation of

the Institute for the period 1954–1968 was transferred from the Archives of SASA.

For the first time, the 2021 Regulation on Internal Organisation and Job Systematization established the positions of Head and Secretary of the Archives of the MISASA within the organisation of the Institute's scientific work, thereby granting archival activities an official place in the institutional structure.

Administrative Records

Currently, the administrative archive is under the jurisdiction of the State Archives of Serbia. It is stored in several rooms of the Institute, but in 2025, specialized archival cabinets were purchased to consolidate the majority of the collection in one location, as far as the available space allows. Part of the material has been inventoried and classified in the archival register (1946–2023), indicating that the collection consists of more than 500 archival units.

The materials are diverse in form, including books, folders, binders, and notebooks. In terms of content, they include legal, personnel, financial, and administrative documentation, such as statutes, founding documents, registry logs, contracts, payroll lists, financial statements, reports, public procurement records, and accreditation documents. In addition, the collection contains a significant body of scientific and professional documentation, including minutes of meetings of governing and scientific bodies, project contracts, correspondence with ministries, and materials relating to international cooperation, conferences, and seminars.

A useful starting point for research can be found in documents published in the Institute's publications and on its official website. However, the digital copies available there mostly contain titles only, without additional

metadata or descriptive elements, which makes them difficult to search. Particularly noteworthy is the digitisation project carried out in 2018, during which part of the archival materials from the period 1946–1961 were processed and published in the Institute's Digital Archive. As the primary goal was to present the content for research purposes, working copies intended for online publication were created, rather than master copies for long-term preservation.

Scientific Materials and Personal Collections

Unlike the administrative documentation, the scientific materials produced by the Institute members have not yet been fully systematized. So far, only the archive of Academician Dragoš Cvetković, which was entrusted to the Institute for permanent safekeeping in 2012, has been thoroughly processed. This collection includes teaching materials and notes in mathematics, documentation on collaborations with universities, extensive records on national and international projects (federal and European programmes), as well as manuscripts, correspondence, and working materials created in collaboration with prominent mathematicians and colleagues.

The existence of other personal collections — such as those of academicians Vojislav Mišković (1892–1976) and Miloš Radojčić (1903–1975) — as well as other types of scientific materials, such as lithographed lecture notes by professors of mathematics at the Great School and the University of Belgrade, is documented in papers published in the journal *NCD Review*.

Oral History – Audio and Video Interviews

A special segment of the archival heritage of the MISASA consists of initiatives aimed at

preserving the memories of distinguished scientists through audio and video interviews.

The idea of recording these interviews grew out of activities undertaken in the 1990s. Between 1994 and 1996, Dr Rade Dacić (1930–2016), who was then head of the Seminar on the History and Philosophy of Mathematics at the Institute, organised a series of conversations with prominent scientists in the fields of mathematics and related disciplines, in collaboration with the Museum of Science and Technology in Belgrade. Some of these conversations were recorded on audio cassettes, which are now preserved in the Institute's archives.

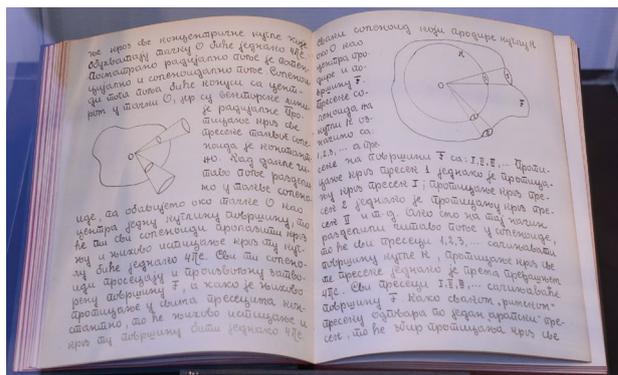
In 2020, in collaboration with the Institute of Musicology SASA, these recordings were digitised to preserve the originals and make them accessible to the broader scientific community. The official website of the Institute features the memories of five scientists: Nenad Janković (1911–1997), Miodrag Tomić (1912–2001), Viktor Saljnikov (1927–2006), Bogoljub Stanković (1924–2018), and Slaviša Prešić (1933–2008).

Building on this initiative, in 2016, professors Žarko Mijajlović and Zoran Ognjanović launched an internal institutional project called Interviews with Mathematicians in Serbia. They organised a series of video interviews with long-standing collaborators and members of the Institute. Among the interviewees were Academicians Nikola Hajdin (1923–2019), Bogoljub Stanković, Dragoš Cvetković, and Zoran Knežević, as well as professors Veljko Vujičić (1929–2020), Koriolan Gilezan (1929–2023), Nedeljko Parezanović, Branka Alimpić, Zoran Marković (1948–2025) and Rade Živaljević. The unedited video material from these interviews is currently preserved in the Institute's archives.

Future Perspectives

The Archives of the MISASA serve as a unique link between administrative documentation, scientific heritage, and intangible testimonies of the development of mathematics and related disciplines in Serbia over more than eight decades. In addition to preserving the institutional memory of the Institute's formation and operations, the Archives contain exceptionally valuable sources for studying scientific processes, research projects, international collaborations, and the individual contributions of distinguished scholars.

Systematizing, digitising, and properly presenting this material to both the academic community and the general public is crucial for advancing research on the history of science in Serbia. These processes ensure the preservation and enhancement of a rich archival legacy, stimulate new interdisciplinary research, and contribute to a deeper understanding of the role of the Mathematical Institute of SASA in the advancement of mathematics, natural sciences, and technical disciplines in both national and international contexts.



Notes by student Borivoje J. Pujić from professor Milutin Milanković's lectures held in 1910–1914, MISASA Archives (Photo by Branko Bubonja)

COMPUTING CENTRE

THE COMPUTING CENTRE OF THE MATHEMATICAL INSTITUTE OF THE SERBIAN ACADEMY OF SCIENCES AND ARTS

*Head of the Computing Centre:
Dr. Vanja Korać*

The Computing Centre of the Mathematical Institute of the Serbian Academy of Sciences and Arts is the main organisational unit responsible for maintaining, planning, and developing the local network, software, and network services at the Mathematical Institute of SASA. In addition, the Computing Centre provides support for a wide range of services to both Institute staff and external collaborators.

Recognising at a very early stage the importance of computer science for the further development of mathematics, the Institute established the Computing Centre in 1968. It was equipped with one of the most advanced computers of that time — the IBM-360/44. Since the Institute did not have adequate premises to accommodate such a computer, the Computing Centre initially operated at the Faculty of Mathematics.



Dr Vanja Korać
(Photo by Dragan
Aćimović)

After purchasing the first IBM (XT, AT) PCs between 1985 and 1987, the Computing Centre entered a new phase of its development. In 1989, the first computers for parallel computing — transputers — were procured. To establish a networked information system, the Institute also acquired the first HP ProLiant server in Serbia, with a hard drive of what was then an impressive 700 MB.

In 1991, the first local network was set up with the Novell Netware 3.10 server, which was used to store user data, while in 1994 the first Linux server was installed, establishing modem communication that enabled e-mail services. In the first half of 1995, the MISASA received the domain `mi.sanu.ac.yu` and launched its first website.

In 2000, as a result of cooperation with the Leibniz Institute for Information Infrastructure, an EMIS server was set up to serve as a mirror site and provide access to the Zentralblatt MATH database. In 2006, CISCO active network equipment was installed, and

in the same year, the IBM cluster HS21 was procured within the framework of a scientific incentive programme organised by the Ministry of Science.

Following its relocation to 36 Knez Mihailova Street in 2008, the MISASA continued to advance its computing infrastructure, relying on state-of-the-art equipment and tools for virtualization, the integration of storage systems and backup solutions, as well as advanced optical communication equipment. In 2018, the Institute acquired professional video-conferencing equipment and launched

a comprehensive platform designed to support e-learning, the distribution of video-conference sessions, and the development of educational digital content. The team that runs the Computing Centre consists of Dr Vanja Korać, Head of the Computing Centre (since 2000), Dragan Aćimović, Technical Support (since 2014), Božo Vuković, Administrator of the e-education platform (since 2018), and Aleksandra Arsić, Web Administrator (since 2016).



The MISANU Computing Center in the SASA building, 2006 (Photo by Vanja Korać)



GRID configuration. In the photo: Bojan Marinković, Tatjana Jakšić Krüger, Vanja Korać, and three colleagues from the SCL-Grid Operations Team (Courtesy of Vanja Korać)



Digital activities in the Computing Center. In the photo: Dragan Aćimović and Vanja Korać (Photo by Sofija Kasavica)



The new Computing Center in 2025 (Photo by Vanja Korać)

PUBLICATIONS

THE PUBLISHING ACTIVITIES OF THE MATHEMATICAL INSTITUTE OF SASA: SERIAL PUBLICATIONS

Text prepared by Kristina Milojević, MA

The publishing activity of the Mathematical Institute of SASA was inherited from the Mathematicians' Club, which had been publishing *Publications Mathématiques de l'Université de Belgrade* since 1932. By the beginning of the Second World War, seven volumes had been published, while the eighth was lost during the bombing of Belgrade on April 6, 1941. In 1947, the Mathematical Institute took over the publication of the journal under a new title, *Publications de l'Institut Mathématique* and introduced a new numbering system. Interestingly, before the war, articles in *Publications* were published only in German and French, whereas after the war English and Russian were also introduced. Today, *Publications* is recognized as one of the leading journals in the field of mathematics. The digitisation of *Publications* was completed in 2006, and all volumes are now freely available online.

Alongside *Publications*, which was published in foreign languages, the Institute regularly issued another journal in Serbian until 1954 — *Zbornik radova Matematičkog instituta* (Proceedings of the Mathematical Institute). The first issue was published in 1951 at the initiative of Jovan Karamata. The journal was conceived as a collection of works in Serbian covering didactics and the methodology of teaching mathematics, book reviews, texts about the Institute's members and collaborators, as well as materials on the Institute's activities and history. Although the articles were written in Serbian, abstracts were published in foreign languages. Since 1997, papers in the *Proceedings* have been predominantly published in English. Today, *Proceedings* is classified as a non-serial publication, and the entire collection is freely available online.

The Institute is also a co-publisher of several leading journals in mathematics, computer science, and mechanics: *Yugoslav Journal of Operational Research* (YUJOR), *Computer Science and Information Systems* (ComSIS), and *Theoretical and Applied Mechanics* (TAM).

PUBLISHING ACTIVITIES OF THE MATHEMATICAL INSTITUTE – TIMELINE

1947	Publications de l'institut Mathématique de l'Académie Serbe des Sciences
1949	Classic Scientific Writings
1949	Special Editions
1951	Collection of Papers of the Mathematical Institute
1954	Almanac of Our Sky, until 1960
1954	Collection of Papers of the Institute for Astronomy and Numerical Methods, until 1954
1958	Notes et travaux de la Section d'astronomie de l'Institut mathématique, until 1959
1972	Contemporary Computing Techniques and Applications, published until 1989
1975	Theoretical and Applied Mechanics
1977	Mathematical Horizons
1977	History of Mathematical and Mechanical Sciences, published until 1992
1991	Yugoslav Journal of Operations Research
1999	Visual Mathematics, published until 2015
2004	Computer Science and Information Systems

Publications de l'Institut Mathématique

Editors-in-Chief: Academician Dr Gradimir V. Milovanović and Academician Dr Stevan Pilipović



Academician
Dr Gradimir
V. Milovanović
(Courtesy of G. V.
Milovanović)

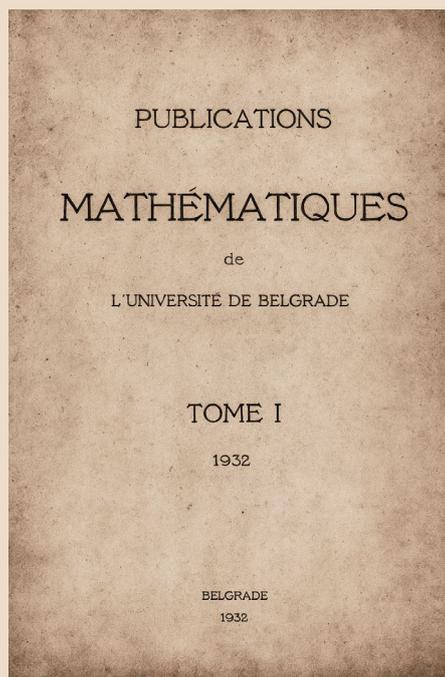
Publications de l'Institut Mathématique is the oldest Serbian scientific journal in the field of mathematics. It was founded in 1932 under the title *Publications Mathématiques de l'Université de Belgrade*, thanks to the endowments of Luka Čelović-Trebinjac and Pavle and Katarina Kurtović. Seven volumes were published before World War II; the eighth volume was lost during the German bombing of Belgrade on April 6, 1941.

Shortly after the founding of the Mathematical Institute of SASA in 1946, the journal resumed publication in 1947 under its present name *Publications de l'Institut Mathématique*. Due to organisational restructuring within the Institute, a new series of the journal began in 1961. To date, more than 2600 scientific articles have been published.

The early scope of the journal was broad, encompassing not only mathematics but also mechanics and astronomy. Many distinguished Serbian and Yugoslav scientists published their work in the journal, including Anton Bilimović, Jovan Karamata, Đuro

Kurepa, Sibe Mardešić, Milutin Milanković, Mihailo Petrović and Josip Plemelj. Leading international mathematicians such as Paul Montel, Paul Erdős, Waclaw Sierpiński, and Saharon Shelah have also contributed.

Most articles are published in English, though papers in Russian, French, and German are also accepted. The journal maintains an extensive exchange programme with scientific institutions worldwide, through which the Institute's library receives more than 200 journals.



Front cover of the journal *Publications* from 1932 (MISASA Archives)

Theoretical and Applied Mechanics

Editor-in-Chief: Dr Vladimir Dragović

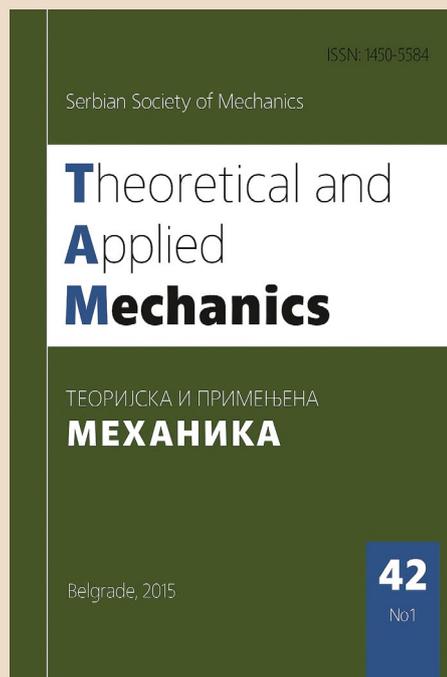
Theoretical and Applied Mechanics (TAM) is an open-access, peer-reviewed journal that publishes original scholarly work across all areas of theoretical and applied mechanics. The journal features high-quality research articles reflecting the broad spectrum of contemporary interest in mechanics. From time to time, TAM publishes special issues devoted to selected topics of wider significance, which are announced in advance. In addition to research articles, these issues may also include review papers. TAM currently publishes one volume per year, consisting of two issues released in June and December.

TAM is one of the oldest Serbian journals in the field of mechanics. Established in 1975 as a joint publication of the former Yugoslav Society of Mechanics and the Mathematical Institute of SASA, it was published under their joint auspices until 1996. Since 2006, the journal has been published under the auspices of the Serbian Society for Mechanics, and since 2015, it has again been jointly published with the Mathematical Institute of SASA.

From its founding until Volume 21 (1975–1995), the Editor-in-Chief was Prof. Veljko Vujičić. For Volumes 22–26 (1996–2001), the Editors-in-Chief were Academicians Teodor Atanacković and Đorđe Đukić. Prof. Milan Mićunović served as Editor-in-Chief for Volumes 27–41 (2002–2014). Since Volume 42 (2015), the Editor-in-Chief has been Prof. Vladimir Dragović.

Volumes 1–21 (1975–1995) were published under the Serbian title *Teorijska i primenjena mehanika* (Theoretical and Applied Mechanics), after which the title was changed to *Theoretical and Applied Mechanics*.

Since 2016, the journal has been indexed in Math-Net.Ru, SCOPUS, and the Web of Science Emerging Sources Citation Index (ESCI).



Front covers of the journal *Theoretical and Applied Mechanics* (TAM) from 1994 and 2015
(Source: TAM)

BOOKS AND NON-PERIODICAL PUBLICATIONS

Editor-in-Chief: Academician Dr Stevo Todorčević



Academician Dr Stevo Todorčević
(Courtesy of S. Todorčević)

In addition to journals, the Institute has been engaged in publishing other kinds of publications. In 1949, a committee for the publication of *Klasični naučni spisi* (Classical scientific writings) and *Popularna izdanja matematike* (Popular mathematics editions) was established. The main goal of these series was to present to the domestic audience the significance of “the sources of mathematical culture.” Within the Classical Writings series, by 1957, three major works had been translated into Serbian from classical and foreign languages: 13 books of Euclid’s Elements, Lobachevsky’s Geometrical Researches on the Theory of Parallels, and Hilbert’s The Foundations of Geometry. All editions in this series have been fully digitised and are available on the Institute’s official website.

The monograph by Jovan Karamata, *Teorija i praksa Stieltjes-ova integrala*, inaugurated the series *Posebna izdanja Matematičkog instituta* (Special Editions of the Mathematical Institute), edited by Vojislav Mišković. This series remains active, with the latest monograph

published in mid-2020. This series has also been digitised and is available on the Institute’s official website.

In addition, there are other series of the Mathematical Institute of SASA that have been digitised and are available on the Institute’s website:

- ▶ *Istorija matematičkih i mehaničkih nauka* (History of Mathematical and Mechanical Sciences);
- ▶ *Matematički vidici* (Mathematical Horizons);
- ▶ *Savremena računarska tehnika i njena primena* (Modern Computer Technology and Its Applications);
- ▶ *Ostala izdanja* (other editions whose content does not fit into the above series).

Between 2020 and 2025, the Mathematical Institute of SASA published seven mono-



Monograph by Prof. Zoran Lučić, Pythagorean Arithmetic, published in the series Mathematical Perspectives, 2025 (MISASA Library)

graphs within the series Special Editions of the Mathematical Institute, Proceedings of the Mathematical Institute and Mathematical Horizons.

Special Editions of the Mathematical Institute

- ▶ Eberhard Malkowsky and Vladimir Rakočević. *Summability Methods and Applications*, 2020.
- ▶ Marko Kostić. *Abstract degenerate Volterra integro-differential equations*, 2020.

Proceedings of the Mathematical Institute

- ▶ Dynamics of Hybrid Systems of Complex Structures. Edited by Katica (Stefanović) Hedrih, 2022.
- ▶ Topics in Operator Theory. Edited by Dragan S. Djordjević, 2022.
- ▶ A Hidden Harmony: Mathematics and Music Through the Ages. Edited by Vesna Todorčević, 2024.
- ▶ Selected Topics in Combinatorial Analysis Part II. Edited by Boriša Kuzeljević, 2025.

Mathematical Horizons

- ▶ Zoran Lučić, *Pitagorejska aritmetika*, 2025.

ELECTRONIC EDITIONS OF THE MATHEMATICAL INSTITUTE OF SASA

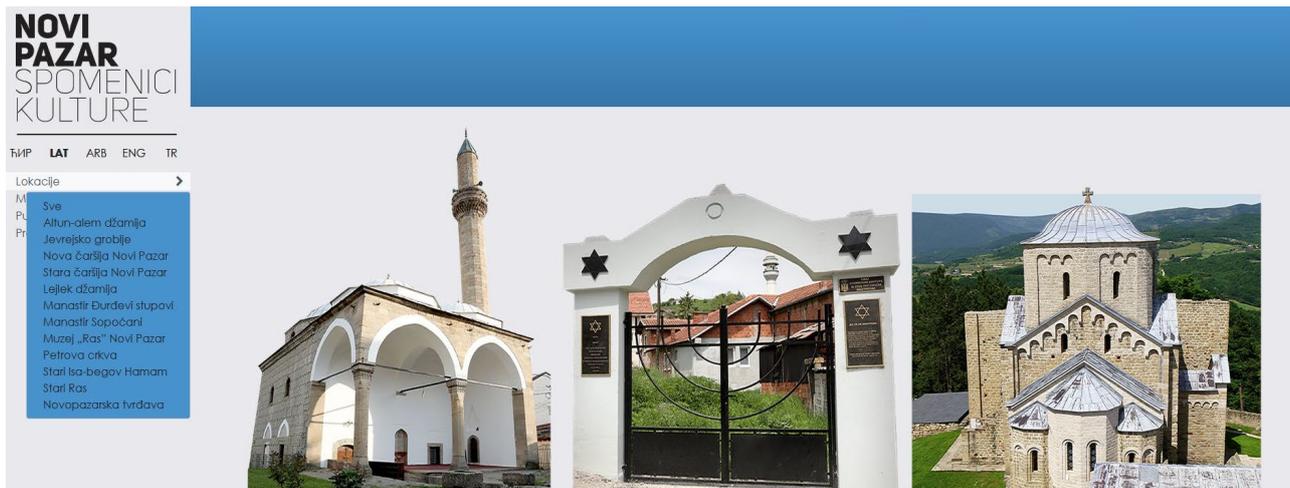
Text prepared by Maja Novaković, MA, and Dejan Vukelić, MA

Old Maps, Engravings and Photographs from the City Museum of Belgrade

In late 1995, the Mathematical Institute of SASA launched a pilot initiative to present two collections from the Belgrade City Museum — the collection of old maps and engravings, and the collection of 19th-century photographs — to the public through new electronic media. The result of the project was a CD containing digital scans of maps, engravings, and photographs, audio recordings of music related to the history of Belgrade, and video clips showing contemporary views of locations depicted in the engravings and photographs.

eCatalog of Cultural Monuments in Serbia

The eCatalog of Cultural Monuments in Serbia was created through the joint efforts of a multidisciplinary team from the National Centre for Digitisation. Launched in 2004, the project sought to establish a model for developing a digital repository of cultural monuments in Serbia, as well as for digitising the accompanying documentation. By digitising cultural resources — many of which cannot be adequately presented in traditional print publications — and making them accessible online, the project has contributed to the preservation, accessibility, and study of cultural heritage. The catalog integrates records from various Serbian heritage institutions and includes bibliographic references for further research. It currently contains documentation on 1300 cultural monuments across Serbia.



Main page of the digital presentation of the cultural heritage of Novi Pazar (MISASA)

Electronic Editions of Serbian Mathematical Journals – ELIB

The digitisation of Serbian mathematical journals began in 1995 with the oldest and most significant one, *Publications de l'Institut Mathématique* (launched in 1932). With the growing use of the Internet, an online database offering free access to full-text mathematical journals was launched in 2002. Today, ELIB includes a wide range of journals, such as *Bulletin of International Mathematical Virtual Institute*, *Computer Science and Information Systems*, *Filomat*, *Kragujevac Journal of Mathematics*, *Matematički Vesnik*, *Matematički kolokvijum*, *Nastava matematike*, *The Teaching of Mathematics*, *Theoretical and Applied Mechanics*, *VisMath*, *Yugoslav Journal of Operations Research*, and *Zbornik radova Matematičkog instituta*, among others — amounting to around 1400 issues and 19,000 full-text articles. Journal presentations are dynamically generated from the database and can be searched by author, title, keywords, section titles, and terms from abstracts, making ELIB a key resource for accessing Serbian mathematical literature.

Serbia-Forum

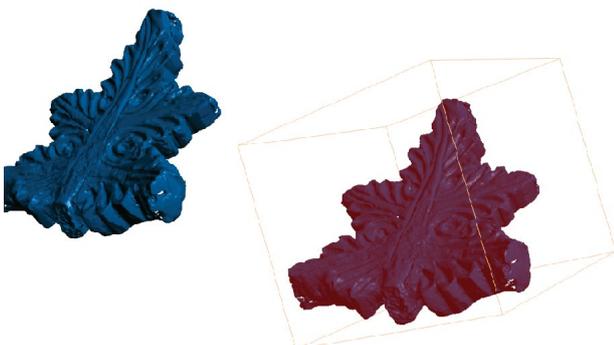
Serbia-Forum is a platform developed by the Mathematical Institute of SASA for the presentation, documentation, and cataloging of cultural heritage. The portal is used by several national cultural institutions. For example, the National Library of Serbia uses the platform for the Digital National Library of Serbia, which includes books, old manuscripts, periodicals, cartographic material, etc. Within Serbia-Forum, presentations of national heritage digitisation projects, implemented by the Institute either independently or in cooperation with the Ministry of Culture, are regularly published. These include projects from Kosovo and Metohija, Arilje, Mileševa, Smederevo, Bač, etc.

Cultural Monuments of Novi Pazar

The digital presentation of the cultural heritage of Novi Pazar is the result of efforts aimed at preserving and presenting digitised content and enhancing its accessibility through the creation of a multilingual digital guide. The digitisation of certain cultural monuments and sites — including, among others, Stari Ras with Sopoćani, the Novi Pazar For-



Digitized issues of Filmske sveske (1968–1986), a journal for film theory and film studies (MISASA)



3D model of a bronze leaf, a piece of furniture, Bregovina, Prokuplje, 6th century, National Museum of Toplica, Prokuplje (MISASA)



Digitized editions of Documents on the Foreign Policy of the Kingdom of Serbia: 1903-1914 (MISASA)

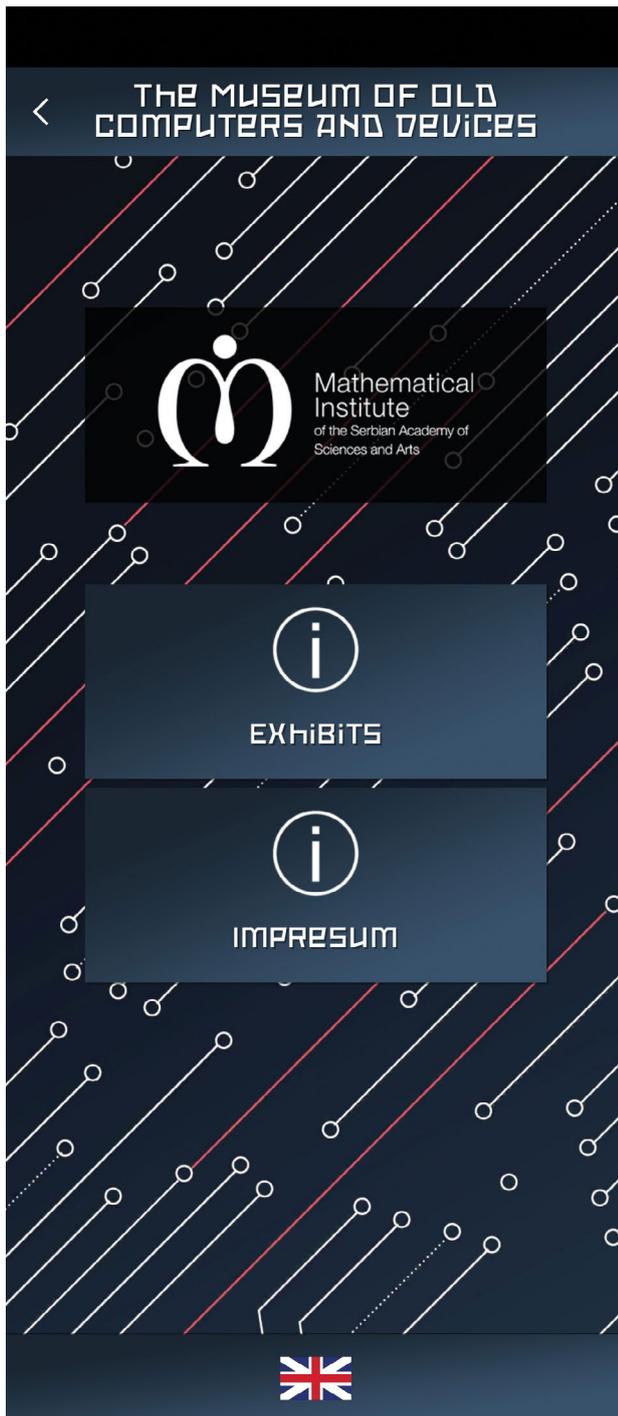
tress with its hammam, the Stara čaršija, the Altun-alem Mosque, and the Jewish cemetery — nurtures the multiculturalism of this area and provides guidelines for understanding and inclusion of minority cultural groups. This presentation enables the general public to access the cultural heritage of Novi Pazar with the aim of preserving, promoting, and presenting this heritage.

Digitisation of the journal Filmske sveske (1968–1986)

The digitisation of the journal *Filmske sveske* (Film Volumes) is the first endeavour of the Faculty of Dramatic Arts in the field of digital humanities with the aim of preserving important segments of film theory and thought in Serbia. The project was created in synergy between the Faculty of Dramatic Arts and the Mathematical Institute of SASA. The content of *Filmske sveske* consists of 84 issues that provide a detailed account of the main lines of development within film theory worldwide, with special reference to domestic film and theoretical production. The importance of this project is manifold. The digitised journal serves both as a repository of information and as evidence of the growing awareness of its significance as part of intellectual, theoretical, and cultural heritage.

“Documents on the Foreign Policy of the Kingdom of Serbia — 1903-1914” – Digitisation and Internet presentation

The project “Documents on the Foreign Policy of the Kingdom of Serbia — 1903-1914” – digitisation and Internet presentation was realised in cooperation with the Serbian Academy of Sciences and Arts and the Mathematical Institute of SASA, and with the support of the Ministry of Culture and Information. It is a digital presentation of the edition of the same name, created over a period of



Cover page of the mobile application Virtual Museum of Old Computers and Devices (MISASA)

more than three decades. The material collected was critically processed by renowned historians and archival experts. The edition mostly refers to the diplomatic correspondence of the Ministry of Foreign Affairs of the Kingdom of Serbia in the period between the May Coup and the outbreak of the First World War. Altogether, it contains seven books, with 25 volumes and 42 tomes, and about 31,000 pages. The process of digitisation has made this source, of first-class importance for understanding the international position and socio-political circumstances in Serbia, more visible and accessible to both the scholarly and the general public.

Collected Mathematical Works of Branislav Petronijević

This project presents a comprehensive digital repository of the mathematical and scientific works of Academician Branislav Petronijević (1875–1954). A distinguished philosopher and mathematician, Petronijević authored more than 400 publications, many of which were originally published abroad in German, French, and English. His writings encompass mathematical analysis, geometry, logic and algebra, mechanics and physics, cosmography, as well as the philosophy and history of mathematics and the exact sciences. Drawing on his *Résumé des travaux philosophiques et scientifiques* (1896–1936), the repository features a chronologically organised bibliography and provides digital access to his works, making a significant part of Petronijević's scientific legacy accessible to a wider research community. This initiative was made possible through the support of the Library of the Serbian Academy of Sciences and Arts, the Audio-visual Archive and Centre for Digitisation of SASA, the National Library of Serbia, Matica srpska, the University Library "Svetozar Marković," and several international partners.

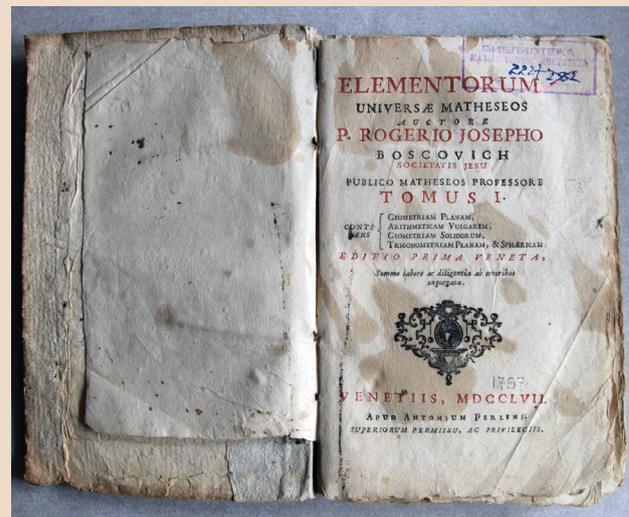
Virtual Museum of Old Computers and Devices

The Virtual Museum of Old Computers and Devices is a mobile application developed to present, preserve, and promote the technological heritage housed at the Mathematical Institute of SASA in Belgrade. The physical Museum of Old Computers and Devices was established in 2020 at the initiative of Dr Zoran Ognjanović and Dr Vanja Korać. Located at the MISASA, it features a unique collection of historical computing devices, including iconic models such as the NEC D8088D, ZX Spectrum 48k, and Commodore 64. The collection comprises items donated or gifted by Institute members and collaborators, as well as devices acquired and preserved by the Institute over the years. The virtual museum extends the mission of the physical exhibition into the digital environment. Through the mobile application, users can explore detailed descriptions, technical specifications, and historical context of individual devices.

Digitised Books

The Mathematical Institute of SASA maintains a growing digital collection of rare and historical books, spanning the 18th to the 21st centuries. This electronic resource preserves significant works in mathematics, physics, logic, and related disciplines, making them accessible to researchers, students, and the wider public. Among the oldest digitised titles are Ruđer Bošković's *Elementorum Universae Matheseos* (1757) and *Elementi Di Matematiche Pure* (1775), alongside works by Diderot and d'Alembert, Vasilije Damjanović, and Zaharije Orfelin. The 19th-century collection includes Serbian publications by Atanasije Stojković, Jovan Došenović, Dimitrije Nešić, and Bogdan Gavrilović. The 20th- and 21st-century corpus features works by Kosta Stojanović, Milutin Milanković, Mihailo Marković, Dragoš Cvetković, and others. Together, these digitised editions form an invaluable repository of Serbia's scientific and cultural heritage.

Rogerio Boscovich, *Elementorum universae matheseos*, Venetiis 1757, MISASA Library (Photo by Dejan Vukelić)



OTHER ACTIVITIES

PROMOTION OF MATHEMATICS, COMPUTER SCIENCE AND MECHANICS

Text prepared by Dr Đorđe Baralić

The Mathematical Institute of SASA has, over the last decade, become one of the leading institutions in the promotion of science in Serbia and abroad. Popularization of mathematics, mechanics and computer science is an integral part of our mission and of our contribution to Serbian society and to humanity as a whole. It also is one of the pillars of our international collaboration. Every year our researchers take part in over a hundred projects, events, seminars, lectures and workshops aimed at increasing awareness of the importance and significance of the mathematical sciences throughout the history of civilization and in modern times.

May, Month of Mathematics

The M3 initiative is the most extensive and longest-running continuous science promotion programme in Serbia, having started in 2011. Jointly organised with the Centre for Science Promotion, it has become a national event over the past decade that celebrates the mathematical sciences, taking place simultaneously in various locations across the country. Highly regarded by children, teachers, and the general public, M3 creates

a vital connection between the MISASA and future researchers, students, and the media. Approximately 100,000 individuals visit and participate in M3-related programmes annually. Each year, M3 features exhibitions, lectures by distinguished mathematicians, scientists, entrepreneurs, and artists, workshops for children, film screenings, scientific cafés, and various other activities. A new theme and slogan are chosen each year to raise public awareness of the importance of mathematics and its applications across different fields and aspects of human life.

Women in Mathematics Day

Since 2020, the MISASA has celebrated Women in Mathematics Day to honour the achievements of women in this field and raise awareness of their contributions. In particular, alongside the events held worldwide on May 12 to commemorate the birthday of Iranian mathematician Maryam Mirzakhani — the first woman to receive the prestigious Fields Medal in 2014 — the MISASA, in collaboration with the Seminar for Mathematics and Music and the Mechanics of Machines and Mechanisms — Models and Mathematical Methods Seminar, organises two to three panel discussions, round tables, and talks. These events aim to highlight the work of female mathematicians, computer scientists, and engineers in Serbia and the former Yugoslavia, while also promoting greater inclusivity in science.

Bridge of Mathematics

The Bridge of Mathematics is a two-day event held every May in the charming town of Vrnjačka Banja, the capital of Serbian tourism. Organised by the Young Mathematician Society, it has received support from the MISASA since its inception. Our involvement in shap-

ing the programme for this festival includes teacher training, public lectures, and a special mathematics quiz known as the Bridge of Mathematics. This quiz connects children from Serbia, North Macedonia, Bosnia and Herzegovina, Romania, and Turkey. The event is a successful part of our efforts to support and build partnerships with enthusiasts in mathematics, STEM initiatives, and the promotion of science in rural areas and locations outside major university centres.

Collaboration with the Mathematical Society of Serbia

The Mathematical Society of Serbia (DMS) is the largest network of mathematicians and computer scientists in the country, uniting researchers, educators, and enthusiasts. DMS is dedicated to supporting the development of the mathematical sciences and fostering international collaboration. Its most significant activities focus on enhancing the teaching of mathematics, computer science, and artificial intelligence (AI), as well as organising competitions for elementary and secondary school students in these fields. DMS collaborates with the Mathematical Institute of the SASA on various initiatives to promote mathematics. The MISASA researchers actively participate in the State Seminar for the Teaching of Mathematics and in preparing national teams for international Olympiads in mathematics and informatics.

Collaboration with the Children's Innovation Centre

After several years of successful collaboration, the Children's Innovation Centre (DIC) in Belgrade and the MISASA signed a Memorandum of Understanding (MOU) to strengthen their partnership. DIC provides space for mathematics and AI workshops for children during Vukobratović Days of Robotics, its main annual event celebrating robotics and the pioneering work of Miomir Vukobratović, a Serbian engineer in the field. At the same time, DIC teams contribute to initiatives such as M3 through workshops that highlight the relevance of the mathematical sciences to robotics and motion planning.

Collaborations with Schools and Science Clubs in Serbia

The MISASA is continually exploring ways to support enthusiastic teachers and schools that organise their own science festivals, particularly M3 and the International Day of Mathematics. It has established meaningful collaborations with various institutions, including the Mathematical Grammar School in Belgrade, Palanačka Gimnazija in Smederevska Palanka, the First Kragujevac Gymnasium, Zemunska Gimnazija in Zemun, Elementary School "Dositej Obradović" in Orahovac, Elementary School "Svetozar Marković" in Velika Hoča, Elementary School "Milun Jakšić" in Banje, and Gymnasium and Elementary School "Branko Radičević" in Kosovska Mitrovica. Additionally, collaborations extend to Regional Science Clubs in Novi Sad, Niš, and Kragujevac.



May Month of Mathematics (M3), "Milun Jakšić" Primary School, Banje (AP Kosovo and Metohija, Serbia), 2025 (Courtesy of Đ. Baralić)



May Month of Mathematics (M3), "Milun Jakšić" Primary School, Banje (AP Kosovo and Metohija, Serbia), 2025 (Courtesy of Đ. Baralić)



May Month of Mathematics (M3), "Branko Radičević" Primary School, Kosovska Mitrovica, 2025 (Courtesy of Đ. Baralić)



May Month of Mathematics (M3), National Museum in Kragujevac, 2025 (Courtesy of Đ. Baralić)

PROMOTION AND TRANSFER OF KNOWLEDGE

Expert Advisor: Biljana Nedeljkov, MA



Biljana Nedeljkov,
MA (Courtesy of B.
Nedeljkov)

The rapid development of digital technologies and social networks has introduced new standards in the way knowledge and information are shared and communicated. Promotion and transfer of knowledge are becoming important fields that connect academic institutions not only with industry and citizens, but also with other scientific disciplines.

As one of the leading research centres in the fields of mathematics, mechanics, and computer science, the Mathematical Institute of SASA actively follows current developments in science and society. Recognizing the importance of increasing the visibility of our researchers and their achievements, we are dedicated to building the Institute's national brand and presenting it beyond the boundaries of the scientific community.

Through our presence on social media, our work on multidisciplinary projects, and international collaboration, we strive to make the excellence of our researchers more visible, accessible, and recognizable to the broader public.

CONFERENCES

The Institute participates in the organisation of the following national and international conferences:

- ▶ Artificial Intelligence Conference;
- ▶ Congress of the Serbian Society of Mechanics;
- ▶ Congress of Young Mathematicians;
- ▶ Digitisation of Cultural Heritage, Old Records from the Natural and Social Sciences and Digital Humanities;
- ▶ Geometry, Dynamics, Integrable Systems (GDIS);
- ▶ Joint Mathematical Meeting of Serbia and Montenegro;
- ▶ Logic and Applications (LAP);
- ▶ Mathematical Modelling in Mechanics and Engineering (ICME);
- ▶ Serbian Mathematical Congress (SMAK);
- ▶ Symposium on Operational Research (SYM-OP-IS);
- ▶ Virtual International Conference on Science, Technology and Management in Energy (eNergetics);
- ▶ Virtual International Conference Path to a Knowledge Society – Managing Risks and Innovation (PaKSoM).

ADMINISTRATION



Head of the Secretariat:
Gordana Nastić
(Photo by Dragan Aćimović)



Head of Accounting: **Milica
Milinković**
(Photo by Dragan Aćimović)



IT Technical Support: **Dragan
Aćimović**
(Photo by Vanja Korać)



Administrative and support staff. From left to right: **Katarina Pešić, Slobodanka Traživuk, Sofija Kasavica, Kristina Milojević, and Biljana Marić** (Photo by Dragan Aćimović)

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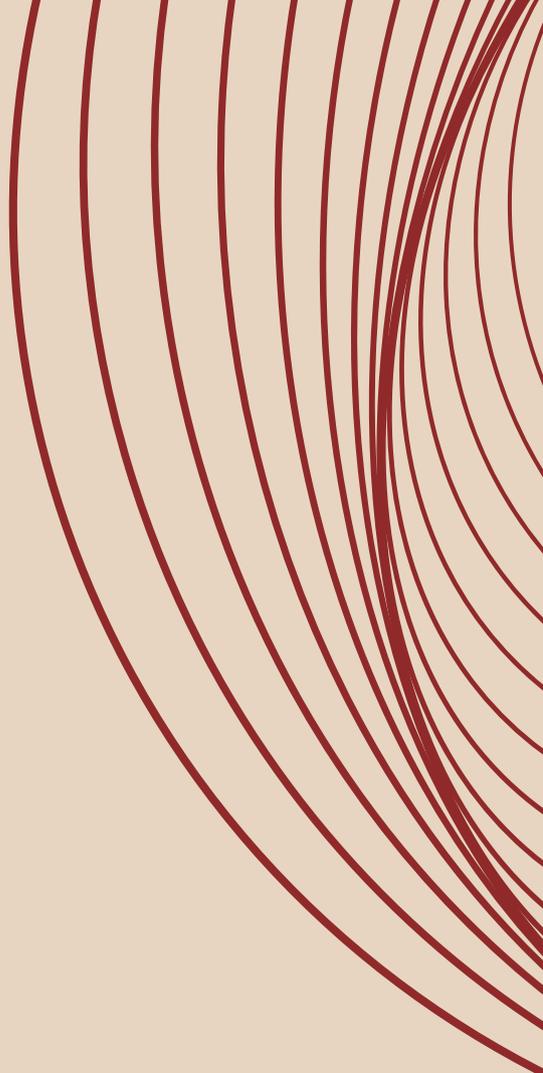
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[et al.]]. – Belgrade : MISASA, 2026 (Belgrade : Dosije
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