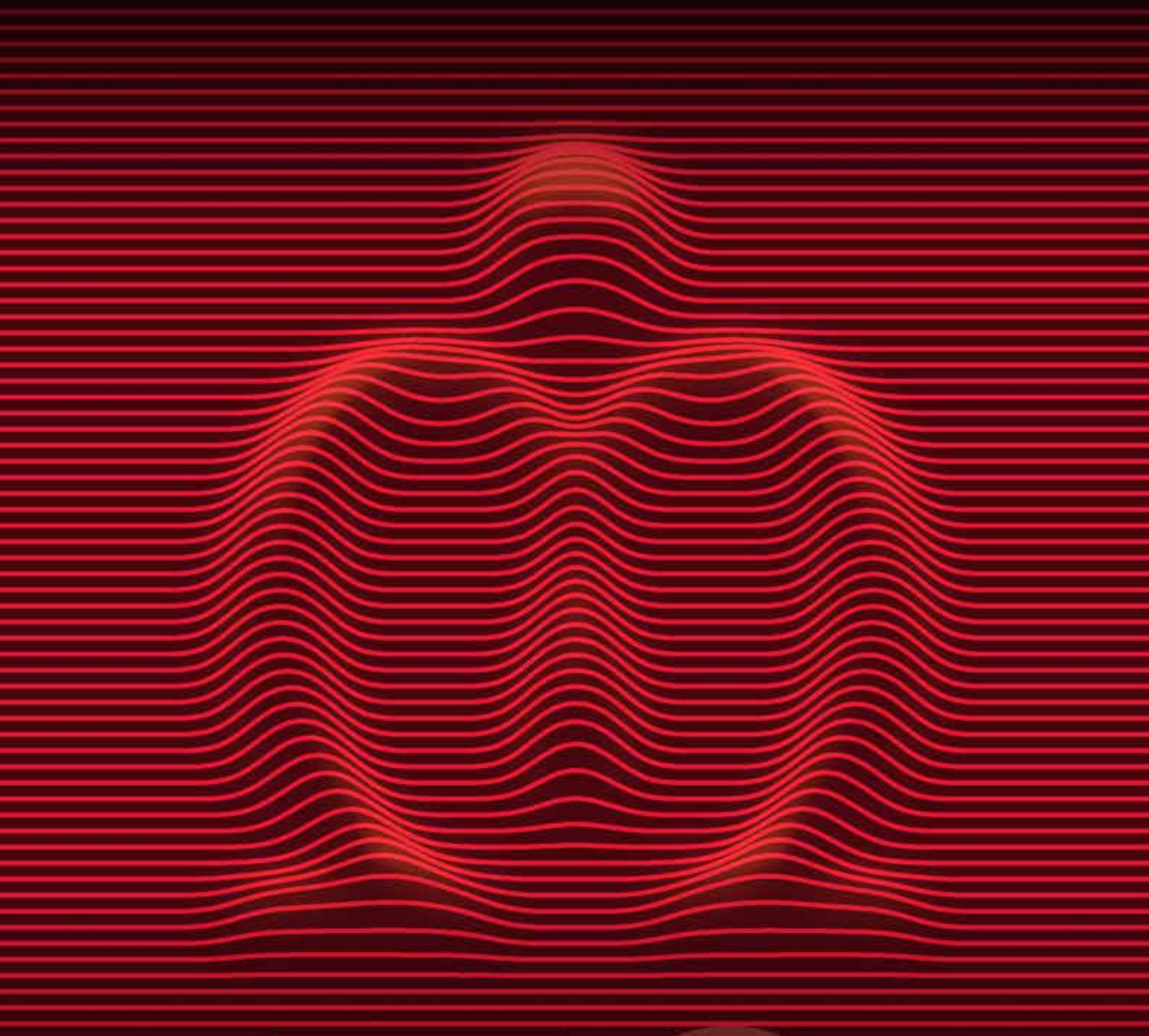


MATHEMATICAL INSTITUTE

SERBIAN ACADEMY OF SCIENCES AND ARTS

MATHEMATICAL INSTITUTE

Serbian Academy of Sciences and Arts

Belgrade, 2016

CONTENTS

Introduction

The Mathematical Institute of the Serbian Academy of Sciences and Arts, MISANU, an institutional member of the European Mathematical Society, is a unique center for research in pure and applied mathematics, mechanics and computer science in Serbia. That is very well reflected in various forms such as national and international scientific projects, conferences, workshops and seminars as well as informal research groups.

In the first 60 years the Institute did not have a large permanent staff, but in the last 10 years many new researchers have been hired. Besides Belgrade, another two Institute's departments have been established in Novi Sad and Niš. At the moment, MISANU employs more than 45 PhDs and 25 PhD students. Still, the Institute relies very heavily and successfully on its numerous associate members who always have played an essential role, not only as heads of projects and seminars, but in managing the Institute as a whole. They are scholars from all over Serbia, which is an opportunity for MISANU to keep close contacts with all our universities, and particularly with faculties of science and mathematics and schools of engineering. More recently, thanks to orientation to multidisciplinary research, Institute's projects have involved collaborators from the medical school in Belgrade and faculties in the field of humanities.

The Institute is run by the Managing Board and by the director elected by the Managing Board, with the approval of the Academy. Since 2010, when the new Law on the Serbian Academy of Sciences and Arts was adopted, the Managing Board consists of 5 members appointed by the Academy, Institute and Serbian government. All main decisions concerning scientific policy are made by the Scientific Council of the Institute, composed of all employed PhDs with research positions and three representatives of the Academy.

One of the most stimulating factors for gathering in the Institute has been its rich library. Its valuable holdings include more than 15000 books and hundreds of mathematical journals, many from their inception. Researchers have also used on-line access to (semi) public IT resources, like a parallel cluster system, a data-flow based supercomputer, or data bases with scientific content.

Another activity that made MISANU a popular place among mathematicians has been traditional weekly sessions of colloquia and seminars. Their chairpersons are expected to stimulate colleagues to lecture on their and other people's results and organize discussions on important issues for the scientific work in Mathematical sciences.

The last decade in the development of the Institute testifies to the intense opening of new directions for multidisciplinary research in information processing and security, digital humanities, etc., and novel approaches in presentations of the corresponding results. In 2013, the National council for science and technological development ranked the Institute as the second best domestic research institution, measured by the number of papers per researcher, while the award of the Serbian Academy in the field of mathematics and related sciences was assigned to a group of five Institute's research professors. In the same year the international project Webometrics announced that MISANU, measured by influence on the Internet, was among the 5% of the best world research centers.

2013 award of The Serbian Academy in the field of mathematics and related sciences was given to a group of five research professors at The Mathematical Institute *(From left to right: Dr. Slobodan Simić, Dr. Zoran Ognjanović, Mr Veroljub Dugalić, Dr. Nenad Mladenović, Dr. Miodrag Mihaljević, Dr. Zoran Marković, Dr. Dragoš Cvetković and Dr. Nikola Hajdin)*

The Institute launched in 2012, with the Center for promotion of science, the biggest national festival for popularization of science, May Month of Mathematics and in 2011, with Mathematical High School a program of monitoring the progress of young mathematical talents. Currently, MISANU is preparing, in collaboration with universities from Novi Sad, Niš, Kragujevac and Novi Pazar, a common doctoral school in mathematics. These activities illustrate efforts to realize the mission of the Mathematical Institute of the Serbian Academy of Sciences and Arts, which is defined as:

- maintaining the highest level of scientific research in the fields of mathematics, mechanics and computer science,
- mobilizing mathematical resources in Serbia, offering research infrastructure and improving communication between groups having similar scientific interest,
- discovering ways and means of applying scientific results
- solving problems posed by sciences and industry,
- organizing all sorts of scientific and expert training and participating in organization and delivery of doctoral studies,
- organizing international collaborations and supporting participation in domestic and international scientific conferences,
- supporting the education of young people of exceptional talent,
- popularization of mathematical sciences,

and can be seen as the Institute's orientation toward Responsible Research and Innovation, a modern approach to science which involves communication and cooperation with all societal actors.

1. ABOUT THE INSTITUTE

1.1 Founders of the Institute

Dr. Anton Bilimović

Dr. Radivoj Kašanin

Dr. Bogdan Gavrilović

Dr. Milutin Milanković

Dr. Vojislav Mišković

Dr. Nikola Saltikov

Dr. Jovan Karamata

1.2 Brief History of the Institute

Dr. Zoran Marković
Mathematical Institute SANU

The Mathematical Institute of the Serbian Academy of Sciences and Arts was founded in 1946 as the first institute of the Academy. At the time of its founding, in a country devastated by the war, the Institute had to start practically from zero, but there was a historical background on which to build.

Scientific research in mathematics began in Serbia near the end of the 19th century. It was performed by a handful of professors of Belgrade University who received their degrees from the best universities in Germany, Austria-Hungary and France. They received a significant boost after the World War I with the arrival of emigrants from Russia, some of whom were prominent mathematicians.

Mathematician's Club 1926 *(From left to right sitting: Dr. Nikola Saltikov, Dr. Mihailo Petrović, Dr. Pavle Popović, Dr. Bogdan Gavrilović, Dr. Vladimir Petković and Dr. Milutin Milanković. Standing: Dr. Miloš Radojčić, Dr. Tadija Pejović, Dr. Viječeslav Žardetski, Dr. Anton Bilimović, Dr. Petar Zajončkovski, Dr. Jeleinko Mikailović, Dr. Radivoje Kašanin and Dr. Jovan Karamata)*

The predecessor of the Institute was the so called "Mathematician's Club", established in the twenties. It gathered all research-oriented mathematicians from Belgrade University, organized monthly lectures (colloquium talks) and, from 1932, started publishing the first international mathematics journal in Serbia: Publications Mathematique de l'Université de Belgrade. At their disposal they had a rich collection of materials in the Mathematics Seminar of the Belgrade University, established in 1895. By 1946, however, all this was gone. In 1944, just two days before the liberation, the library was burned together with all the written records of the Club's activities. The last volume of Publications was also burned in the printing shop, during the bombardment in 1941, and only one copy remained in the house of the editor.

The founders and the first seven members of the Institute, all former members of the Mathematician's Club, saw the Institute as the best means for rebuilding mathematics in Serbia. They immediately elected another seven members and started with monthly lectures, which soon turned into weekly meetings. The new library was started at the same time and by 1947, Publications reappeared, now with a modified name: Publications de l'Institute Mathematique. The aim was the promotion of international cooperation and establishment of closer ties with scientific institutions from all over the world.

The most difficult problem, however, was the shortage of young members. The founding members, all very prominent personalities and internationally known scientists, were of quite advanced age, only one being under 60. In 1949 the Institute obtained its first young assistants and, from that time, steady growth continued over the decades.

From the beginning, the Institute had a concept which is very modern today. Rather than employing a large staff, as research institutes frequently do, the idea was to have members employed at other institutions while the Institute provides only the infrastructure for research: the library, colloquiums, seminars and courses, publications, international cooperation etc. Such decision was probably prompted by the specific way in which Universities in Serbia are organized, where mathematicians are not grouped in one department but divided into different schools (Faculties).

The first seat of the Institute in Brankova street, No 15, in period 1946 - 1948 *(Photo by Jeremija Stanojević, via Belgrade City Museum)*

After the rapid growth of the University network in Serbia, the Institute now has collaborators employed at over 40 different institutions, mostly Faculties of the state Universities in Belgrade, Novi Sad, Niš, Kragujevac, Novi Pazar and Kosovska Mitrovica as well as a number of private Universities.

In the fifties and sixties the Institute always employed a handful of young assistants who were encouraged to transfer to Universities after receiving their degrees. The Institute actually provided important support in creating Mathematics departments at all our Universities. From the seventies, when legislation started mandating the minimum number of permanent members for scientific institutes, the Mathematical Institute had permanently employed scientists, but their number was always kept near the legal minimum. In 2001., the Ministry of science changed the way it finances the scientific projects, and the Institute started hiring more people. Currently the Institute employs about 70 researchers (45 Ph.D.'s and 25 graduate students) out of whom at least ten are abroad (as graduate students, postdocs, visiting professors etc.). At the same time, however, the Institute engages about 250 researchers on its projects with

Defense of PhD Thesis of PhD Candidate Veljko Vujičić in 1961 *(From left to right: Dr. Danilo Rašković, Dr. Tatomir Anđelić, Dr. Anton Bilimović and Dr. Konstantin Voronjec)*

another 150 being more loosely associated with the Institute. As always, these part-time members play prominent role in managing the Institute, being members of the Managing Board and Scientific Council or taking the positions of project leader, seminar chairman, editor, etc.

The founding fathers had, among them, a colorful combination of degrees in mathematics as well as in astronomy or different kinds of engineering. Consequently, they considered mechanics (including applications in mechanical and civil engineering), astronomy and theoretical physics as parts of applied mathematics.

They and their pupils were in a position to impose on the Technical School of the Belgrade University a very extensive and rigorous mathematical curriculum, which was later copied by all newly founded Universities in Serbia. Thanks to this, our engineers are now among the mathematically best educated engineers in the world. In fact, quite a few of them are doing research on projects at the Institute, some of them being among the leaders.

In its first two decades, Analysis and its applications in Mechanics absolutely dominated the research activities at the Institute. But in principle, the institute was never sectarian: research in any branch of mathematics was always warmly welcomed, as long as it was of high quality.

Over the decades various branches had their ups and downs, based mainly on personal agility and ability to attract graduate students through seminars and other activities. In the seventies, for example, Logic progressed from virtual nonexistence to the

status of the most vigorous group.

In the eighties Geometry and Topology became more prominent. In the nineties, we witnessed the rejuvenation of Analysis and Mechanics. Currently, mathematical foundations of Computer Science and some other applied disciplines (Cryptology, Optimization, Graph Theory) are enjoying a rapid growth. Scientific policy generally encouraged variety and only occasionally gave special support in cases where groups were falling behind or new disciplines were being established. In that way Mathematics in Serbia not only grew during the past 70 years from less then 20 researchers to more than 400, but also expanded in scope tremendously, covering now practically all branches of modern mathematics and its applications, and thus keeping pace with the explosive development of Mathematics in the second half of the 20th Century.

The Institute recognized quite early that computer science was important for further development of mathematics. In the mid-sixties the Computer Center of the Institute was created and an IBM 360 was acquired, the best scientific computer of the time.

The part of the IBM 360/44 Computer, produced in 1965 and installed at the Faculty of Mathematics as one among the three IBM computers in Europe during the sixties.
(Photo via Museum of Science and Technology)

After the initial enthusiasm and some interesting results, however, the whole idea slowly deteriorated. One reason was certainly the limited aptitude of mathematicians for managing the Big Science (the upkeep of IBM 360 was comparable to that of a major installation in physics, not to mention eventual replacement). Another reason stemmed from political circumstances. The dissolution of Yugoslav federation began in the late sixties with the dissolution of Federal Scientific Research Fund. The seventies, a time of economic prosperity in Yugoslavia financed by foreign loans, saw the downfall of Yugoslav science.

The industry, as well as the government, abandoned research and development in favor of purchasing or licensing foreign technology, which brought expensive applied research to a virtual standstill. The advent of personal computers facilitated the decision to close down the Computer Center in 1985 and start building a network of PCs. The interest of the Institute in computer science was redefined at that time to include only those areas of research that can be done on a PC. Fortunately, very soon this came to mean almost everything of some interest for mathematicians.

As a collateral benefit, the Institute entered the field of digitization in late 80's. It started with desktop publishing of the Publications and continued with its retrodigitization. In the next 20 years the Institute established extensive collaboration with a number of domestic and foreign cultural institutions which resulted in a number of very successful domestic and international projects with tangible results.

Currently, with the gradual economic recovery of the country, the circumstances are permitting the Institute to reenter the field of practical applications of research results. Such applications are both a source of inspiration for further research and a source of supplement to never sufficient government financing. The most prominent example of such activities at this moment is a cooperation with Telekom Srbija in the field of information and cyber security. Another source of supplement financing since 2004 have been European projects (FP6, FP7, H2020, etc.) which also nudged the Institute more toward applied research.

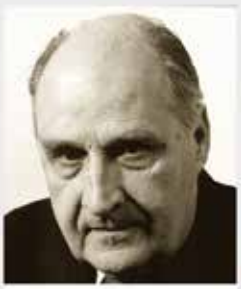
The Institute acquired an independent status in 1961 but remained, willingly, to be under the auspices of the Academy. In 2010, with the new Law on the Serbian Academy of Sciences and Arts, the Institute again became a part of the Academy. In 2007 the Academy acquired a new building for its institutes, across the street, and enabled the Mathematical Institute to solve its long lasting problem of insufficient space.

1.3 Governing of the Institute: Timeline

Dr. Anton Bilimović
Director 1947 - 1949

Dr. Jovan Karamata
Director 1949 - 1951

Dr. Radivoj Kašanin
Director 1951 - 1958



Dr. Miodrag Tomić
Director 1958 - 1961

Dr. Tadija Pejović
Director 1961 - 1968

Dr. Đuro Kurepa
Acting Director 1968 - '69

Dr. Veljko Vujičić
Acting Director 1969

Dr. Tatomir Anđelić
Director 1969 - 1978

Dr. Mirko Stojaković
Director 1978 - 1981

Dr. Stevo Komljenović
Director 1981 - 1985

Dr. Zoran Marković
Director 1985 - 2014

Dr. Zoran Ognjanović
From 2015

Managing Board

Dr. Teodor Atanacković
Chairman 2010 - Present

Scientific Council

Dr. Radoš Cvetković
President 2010 - Present

1.4 Award of the Institute

On 16th of August, 2012, the Managing Board of the Mathematical Institute decided to establish an award for outstanding contribution to the development of the Institute and mathematics in Serbia.

On 31st of October, 2014, the MI SANU Award was given to Academician Bogoljub Stanković for outstanding contributions to Serbian mathematics.

Dr. Bogoljub Stanković

On 14th of September, 2012, the MI SANU Award was given to Teodor Von Burg for outstanding results in the International Mathematical Olympiad.

Математички
институт САНУ

додељује

ПОВЕЉУ

академику

Богољубу Станковићу

за изванредан допринос развоју Математичког института
и математике у Србији

У Београду, 31. октобра 2014

Академик Теодор Атанацковић
Председник Управног одбора

Др Зоран Марковић
Директор

2. RESEARCH

2.1. National Projects

2.1.1. Fundamental Research (2011-2015)

Dynamics of hybrid systems with complex structures. Mechanics of materials (Project 174001)

Project Leader: **Professor Katica (Stevanović) Hedrih**

Home page of the Project activities: http://www.mi.sanu.ac.rs/projects/174001a.htm

The project has produced original scientific results in the following research themes:

1. Elements of mathematical phenomenology and applications (in Mechanics, in nonlinear dynamics in general, in integration of scientific knowledge in reduction of number of models of dynamical systems.
2. Analytical mechanics of discrete fractional order systems; Derived a series of theorems.
3. Nonlinear and rare phenomena in dynamics of hybrid systems with coupled structures of rigid and deformable bodies; Transfer of energy through a system and subsystems; Synchronization of subsystems.
4. Models of biodynamical oscillators; Phenomenon of transfer of signals, information and energy through their complex structures; Oscillations of DNA helix chains and discrete continuum models of Zona Pelucida.
5. Mechanics of discrete continuum models. Dynamics of coupled structures of deformable bodies and discrete continuum layers with different constitutive relations: Linear elastic, nonlinear elastic, visco-elastic, hereditary and fractional order properties.
6. Phenomenom of dynamics of systems with friction and vibro-impact system; Theory of collision of rolling bodies; Dynamics of billiards.
7. Mechanics of damage and fracture.
8. Control of systems with delay and theorems of stability.
9. Continuation of doctoral research in accordance with scientific based themes by young PhD students. 13 Ph.D. Students, younger than 30 years of age, are included in the project team and its scientific research. All of them were participants of the two year seminar. So far, 12 Ph.D. Students completed all courses at doctoral study programs; 5 candidates defended their doctoral dissertations.

Other topics considered in the framework of the project are: nonlinear transformation, rheonomic system, nonholonomic constraints, mass moment vectors, gyro-rotor dynamics, approximation, amplitude-frequency characteristic, stability, synchronization, theory of collision, vibro-impact system, dynamics of billiards, energy analysis, non-local theory and applications, biomechanical oscillators, control motion. The project collaborators participated in the conferences ENOC 2011 and 2014, IUTAM ICTAM 2012, ESMC 20012, Mini-symposium Nonlinear Dynamics 2012, 2014, 2015, etc. A member of the project was awarded EuroMech Young scientist prize Roma 2011.

Viscoelasticity of fractional type and shape optimization in a theory of rods (Project 174005)

Project Leader: **Dr. Dušan Zorica**

Home page of the Project activities: http://www.mi.sanu.ac.rs/projects/174005e.htm

The foci of the project are modelling the behaviour of viscoelastic materials, described by the fractional order constitutive equations, as well as the static and dynamic stability shape optimization problems in the rod theory. Another research areas covered by the project are variational principles of fractional order and modelling the behaviour of heat conducting materials, again described by the constitutive equations of fractional order.

The constitutive equations of viscoelastic materials are formulated to be in accordance with the Second Law of Thermodynamics, i.e., satisfying the Calusius-Duhamel inequality. This implies that the restrictions on the model parameters and functions are determined. Further, these constitutive equations are coupled with the equations of deformable body and initial-boundary value problems are analyzed, and the existence and regularity of the solutions in the appropriate function and distribution spaces are proved. Constitutive equations of viscoelastic body are used in order to determine mechanical properties of various materials used in dentistry.

Constitutive equations of time-fractional order, describing the hereditary material properties, as well as the constitutive equations corresponding to the non-locality characteristics of materials play an important role in the rod theory. Both types of constitutive equations are used in order to model curvature-moment relation, foundation-rod interaction, and compressibility of rod's neutral axis. Static and dynamic stability of rods with various constitutive equations is considered. As a result, critical load parameters are obtained. In the case of static stability problems, the post-critical behaviour of rods is analyzed as well, especially the stability of the equilibrium configurations that bifurcates from the initial configuration.

Advanced Techniques of Cryptology, Image Processing and Computational Topology for Information Security (Project 174008)

Project Leader: **Dr. Miodrag Mihaljević**

Home page of the Project activities:
http://www.mi.sanu.ac.rs/projects/174008e.htm

This research project was a continuation of fruitful research activities and achievements within the Institute in the areas of information processing and the related topics of cryptology and information security.

The project research activities were within the following three main directions: (a) Design and security evaluation of advanced cryptographic techniques based on joint effects of pseudo-randomness, randomness and dedicated coding; (b) Improvements of existing and development of new methods for shape characterization, further enhancement of their applicability and particularly regarding processing of 3D images and the biometric; (c) Advance in computational topology including applications towards partitioning and covering of discrete structures of potential interest for the topics (a) and (b).

The project outcomes are presented by more than 200 reported research results, including: (i) more than 50 papers published in prestigious international Journals, (ii) 10 monographs and monograph chapters; (iii) over 10 internationally granted patents and technical solutions at national level.

The importance and its position on the priority lists of research and social priorities from the international and national points of view, is a direct implication of the information security significance, focused towards development of trustful and secure information society.

Accordingly, importance of the realized research activities and achieved results appeare as a direct implication of importance of cryptology, biometric, and certain topics of mathematics for developing advanced mechanisms for information security which reduces the overheads introduced by the information security mechanisms.

The project was successfully realized due to integrated research activities of cryptology, image processing, and particular topics of “pure” mathematics. All the disciplines have benefited: the application oriented ones were provided with certain sophisticated mathematical tools, and “pure” mathematics is related to certain practical and novel challenges.

Also, the project was a platform for an extensive international collaboration and education of young researchers (Ph.D. students). The international collaboration was a framework for achieving top level results, and it was mainly related to the following institutions: Research Centre for Information Security (RCIS), National institute AIST, Tokyo, The University of Tokyo, University of Exeter, Uppsala University, and Technical University (TU) Berlin. The focus of the educational dimension of the project was on the following issues: Education of young researchers (Ph.D. students) and their involvement in research activities in the domains relevant for the current and future information security systems.

Mathematical Models and Optimization Methods for Large-Scale Systems (Project 174010)

Project Leader: **Dr. Nenad Mladenović**

Home page of the Project activities:
http://www.mi.sanu.ac.rs/projects/174010e.htm

The main goal of researchers gathered in this project is consideration of real-world large scale systems whose characteristics need to be improved by using mathematics and optimization methods. Such large-scale systems appear in industry, telecommunication, transportation, medicine, electronics, education, chemistry, social sciences, in public and private sector, etc. In the process of getting solutions of good quality, there are some steps, common for all kind of optimization problems. Those steps are:

- modelling, or extracting important components from the reality, and making symbolic or mathematical
  model of the problem;
- Find solution method(s) to solve the model;
- Make computer implementation of the methods;
- Repeat previous steps until decision maker is satisfied with the final solution.

Most of the real-world problems belong to the area of global optimization (discrete, continuous and mixed). In the last 60 years, some classes of optimization problems that share the same properties are recognized and theoretical results, as well as solution methods, are developed for each of those classes.

Therefore, scientist from this area, including members of our research team, usually try to recognize the group where the problem under consideration belongs to. However, most of the real-world optimization problems are NP-hard. Roughly speaking, this means that there is no exact solution method that could solve the problem in reasonable time, even if the most powerful computers are used. In such cases, mathematical programming does not help and researchers switch to heuristics or simulation.

The members of our team have made significant contribution to the optimization in the area of so-called meta-heuristics, in developing, and applying Variable neighbourhood search and Genetic Algorithms. Some of them are world recognized experts in the field of meta-heuristics.

Geometry, Education and Visualization with Applications (Project 174012)

Project Leader: **Dr. Zoran Rakić**

This project is a continuation of consecutive successful geometric projects established by academician Mileva Prvanović more than thirty years ago. In the beginning, the classical differential geometry was developed. Later in eighties, the research was enlarged by topics in modern differential geometry intertwined with global analysis, topology, and algebra. The leader of geometric project in the period 1991-2005 was prof. Neda Bokan. The project obtained its current name at the beginning of the project period, 2002-2005, motivated by new trends and our cooperation with Technical University of Berlin and Zusse Institute, Berlin.

In the period 2006-2016, the leader of the project was prof. Zoran Rakic. In this project period some colleagues from the fields of mathematical physics, topology, Hopf algebras, and theory of probability and statistics, joined us and introduced new topics to our research.

The subject of the research now includes several topics in differential geometry, its applications in mathematical physics, topology, Hopf algebras, and theory of probability and statistics, as well as the visualization, and education.

We attained a high level of development in differential geometry which resulted in a large number of papers published in international journals, monographs, invited, and plenary lectures given at international conferences and seminars. Several scientific international and national meetings were organized and their proceedings were published by the members of this project. The scientific value of the project is confirmed by eminent institutions and individuals.

Approximation of integral and differential operators and applications (Project 174015)

Project Leader: **Academician Gradimir V. Milovanović**

Home page of the Project activities: http://www.mi.sanu.ac.rs/projects/174015e.htm

Approximation of integral and differential operators and their corresponding applications are the main subject of research in this project. The research is focused on approximation of various classes of integral and differential operators, construction and analysis of interpolation and quadrature processes, and on solving integral equations, ordinary and partial differential equations. Special attention is paid to the methods for solving boundary and initial-boundary problems for partial differential equations. Constructive problems and stability, and convergence of difference schemes are investigated. Recent progress in the weighted polynomial approximation is used in order to obtain efficient and stable methods for solving Fredholm integral equations of the second kind. Quadrature rules with maximal trigonometric degree of exactness, as well as, several standard and nonstandard quadratures of Gaussian type with respect to nonclassical, and exotic weight functions, are considered.

Special attention was paid to the problem of multiple orthogonality in the spaces of algebraic and trigonometric polynomials, as well as to the corresponding optimal sets of quadrature rules. Also, several new methods for integration of certain types of highly-oscillating functions were derived, so as some types of optimal quadratures in Sard's type. Integral representations of special functions enable constructions of fast and efficient algorithms for calculating special functions and integral transformations.

The main researchers in this project are Gradimir V. Milovanović, Boško S. Jovanović, Aleksandar S. Cvetković, Marija P. Stanić, and Nenad P. Cakić. In addition, 12 young researchers are involved in realisation of the project. Five of them defended their PhD dissertation during period of realisation of the project. While working on this project, researchers published more than 110 scientific papers in reputable international mathematical journals.

Geometry and Topology of Manifolds, Classical Mechanics and Integrable Dynamical Systems (Project 174020)

Project Leader: **Dr Vladimir Dragović**

This project is envisioned as a complex, multidisciplinary project in the areas of geometry and topology, with applications both in mathematical physics, classical mechanics, and in computational and discrete geometry. It is meant to ensure a high international level of research quality and intensive international collaboration.

The following themes are focal for the project: a) geometry and dynamics of integrable and closely related systems, especially those coming from the classical mechanics and geometry, such as geodesic flows, rigid body systems, and billiards, applications of the theory of Lie groups, symplectic, and algebraic geometry in classical mechanics; b) extremal problems, varying from general problems of mathematical programming and optimal control to the calculus of variations with applications in mechanics; c) problems of matrix pencils completion in the theory of linear systems control; d) configuration spaces, including those appearing in geometrical and topological combinatorics, such as polygonal configuration spaces occurring in robotics; e) problems of embeddings and of mass partitions when the action of the associated symmetry group is not free; f) the smooth rigid group actions on manifolds.

The project maintains strategic partnerships with several prestigious research centers, like SISSA (Italy) and the Steklov Mathematical Institute of the Russian Academy of Sciences, in particular Boris Dubrovin, the Mathematics Area Coordinator of SISSA and Valery Kozlov, the Director of the Steklov Institute and Vice-President of the Russian Academy of Sciences and their research groups.

The Project plays an active role in both national and international scientific community. The main activities include two research seminars (Mathematical Methods in Mechanics and Combinatorics in Geometry, Topology, and Algebra), the organization of six high-level international conferences (International Conference Geometry, Dynamics, Integrable Systems – GDIS08, GDIS2010, GDIS2011, GDIS2013, GDIS2014, GDIS 2016), as well as helping young people to be shaped as scientists, so as in popularization of mathematics in a regional framework.

The activities of special societal interests and benefits include training of young people, starting from elementary and high school (through association with the Mathematical High School) till the PhD preparation, and an intensive work on popularization of Mathematics (the project “Viva Math” and similar other activities).

Representations of logical structures and formal languages and their application in computing (Project 174026)

Project Leader: **Dr Silvia Ghilezan**

Home page of the Project activities: http://www.mi.sanu.ac.rs/projects/174026e.htm

Mathematical logic comprises both the mathematical study of logical systems and the applications of formal logic to other areas of science, mathematics, computer science, artificial intelligence, cognitive science, and medicine.

Extending the several decades long tradition of successful research in mathematical logic, this project spans over all fundamental areas of mathematical logic: proof theory, model theory, set theory, category theory, classical and non-classical logics, type theory with relevant applications in computer science and logical design.

The project comprises connected research and activities directed towards: (a) Representation of logical structures with applications; (b) Spectral representation of discrete functions with applications; (c) Logical and formal systems for sequential and concurrent models.

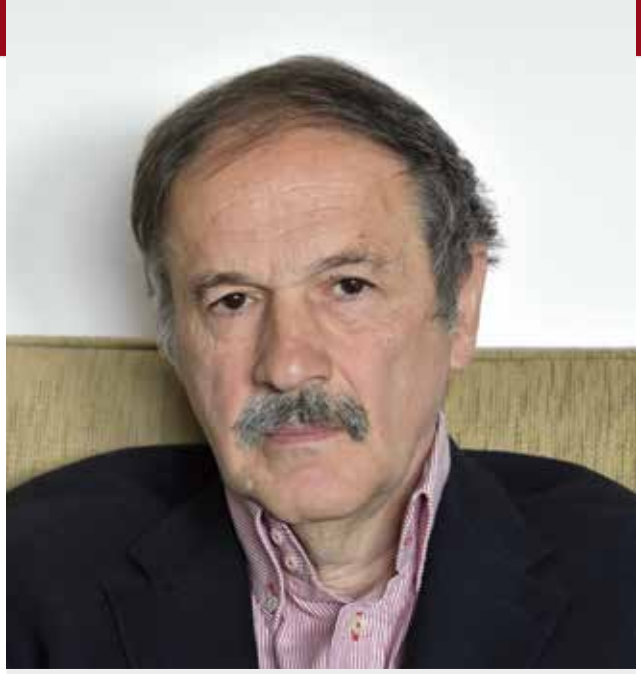
The comprehensive project team consists of over sixty researchers from the Institute and from all five state universities in Belgrade, Novi Sad, Niš, Kragujevac, and Novi Pazar, and two private universities. The team has recognized expertise and well-established international collaboration. The project has been dynamically driven towards high-quality research, promotion of early-stage researchers, and internationalization.

High-quality research. The project results have been published in highly competent and competitive journals, books and monographs, as well as communicated at prestigious international conferences. Seminars for dissemination are organized on a regular basis in all project centers. Due to its scientific and professional diversity, the project has had a significant impact on the development of research in mathematical logic with relevant applications in the national framework. A part of the project results has been summarized and published in “Logic in Computer Science II”, in the edition of Zbornik radova, Matematički institut SANU.

Promotion of early-stage researchers. The participation of early-stage researchers and doctoral students is significant. During the project life, twelve doctoral students graduated, and each year, new doctoral students were appointed to the project.

Internationalization. Project members have taken part in EU funded projects such as FP7, FP6, COST, TEMPUS, ERASMUS and bilateral projects, thus ensuring that the project boosted research closely related to the state-of-the-art of international research. Three new annual conferences are established: VLP - Probabilistic Logics and Applications, TINKOS - Information Theory and Complex Systems and LAP - Logic and Applications. Renowned international conferences RDP 2011 and TYPES 2016 are organized. The project members with their intensive professional activities, acting world-wide as invited and guest speakers, editors, program committee members, reviewers for journals, conferences and doctoral thesis, have contributed to the internationalization, dissemination and promotion of the project results.

Graph theory and mathematical programming with applications to chemistry and computer science (Project 174033)



Project Leader: **Dr. Slobodan Simić**

Home page of the Project activities: http://www.mi.sanu.ac.rs/projects/174033e.htm

Spectral Graph Theory is an important multidisciplinary area of Science that uses the methods of Linear Algebra to solve problems in Graph Theory. On the other hand, it has been used to model and treat problems in Chemistry, Computer Science, Physics, Operational Research, Combinatorial Optimization, Biology, Bioinformatics, Geography, Economics, and Social Sciences, among others. Besides classical and well documented applications to Chemistry, the graph eigenvalues and eigenvectors are used in various fields of Computer Science.

The subject of the research within this project consists of selected topics in graph theory, mathematical programming, and some of their interaction fields. Important part of the research is devoted to the theory of graph spectra, structural graph theory, non-linear programming, and global optimization. The unifying discipline for graph theory and mathematical programming is combinatorial optimization, where the attention is paid to interactions of graph spectra and semidefinite programming. Significant part of the research involves the applications of graph theory in mathematical chemistry, computer science, and engineering.

Applications in chemistry include the study of mathematical properties of molecular structure descriptors, especially those based on graph spectra and graph metrics. Applications in computer science are related to the internet topology and search engines, multiprocessor interconnection networks, and quantum computing. In all of the areas, a special attention is paid to the design of algorithms and the study of their complexity. Considerable attention is paid to the work with doctoral students, both the members of the project team and the non-members.

The development and the use of relevant sophisticated software have a special role in this project, so that it has all characteristics of a theoretical-experimental project. The project has about 30 researchers, and it represents a continuation of similar projects from the last few decades. In particular, the project No. 1389 “Graph theory and mathematical programming with applications to chemistry and transportation in the period 2001-2005, and the project No. 144015G “Graph theory and mathematical programming with applications to chemistry and engineering” (http://www.mi.sanu.ac.rs/projects/project144015.htm) in the period 2006-2010.

All the research has original character, verified by publication in refereed scientific journals, proceedings and monographs. The positive trends from the previous period in publishing monographs, organizing conferences, presenting invited lectures, researchers visit abroad, and other activities are continued, with an aim to confirm high international position of the group of researchers involved in the project. An important objective is also the application of research results, i.e., development and usage of a suitable research software (newGRAPH, smallGRAPHS, Mathematica).

2.1.2. Interdisciplinary Research (2011-2015)

Development of new information and communication technologies, based on advanced mathematical methods, with applications in medicine, telecommunications, power systems, protection of national heritage and education (Project III044006)

Project Leader: **Dr. Zoran Ognjanović**

Home page of the Project activities:
http://www.mi.sanu.ac.rs/projects/044006e.htm

Following the Serbian National Strategy for Scientific and Technological Development (2009-2014), and realizing that transfer of recognized theoretical results to research areas with more practical applications is crucial, but missing, the Institute decided to mobilize the existing experts, Ph.D. and post-doctoral students, providing them with directions on how to devote more efforts to the research that is directly relevant for ICT. As a practical action, the interdisciplinary project III44406 involves development of new information and communication technologies, based on advanced mathematical methods, with applications in medicine, telecommunications, power systems, protection of national heritage and education. It includes more than 180 researchers from almost 40 Serbian faculties and institutes.

The project connects fundamental research groups in mathematical logic and knowledge based systems, graph theory, operational research, cryptology, etc. with researchers in medicine, computer science, engineering, telecommunications, arts, and humanities.

The main project objectives are: to strengthen the S&T base in Serbia for the development of ICT as the core of the knowledge-based society and economy, to utilize the knowledge of advanced mathematical methods, commonly unfamiliar to engineers, for obtaining novel or significantly improving the existing ICTs, and to help reduce the digital divisions by unlocking the innovation and creativity of the partners.

Besides a number of new technical solutions, monographs, journal and conference papers (the list of the project results can be found at http://www.mi.sanu.ac.rs/projects/20151209_SviRadovi.html) during the project realization, more than 35 PhD thesis have been defended. Project collaborators have organized numerous conferences (RDP 2011 - Rewriting, Deduction and Programming in Novi Sad, annual conferences Probabilistic logics and applications in Belgrade, Logic and application in Dubrovnik and The National Conference Digitization of Cultural Heritage and Digital Humanities in Belgrade, TINKOS 2014 - The National Conference on Information Theory and Complex Systems in Niš, Mathematical Data Science Workshop in Belgrade, The Ninth SEEDI Conference: Digitization of cultural and scientific heritage in Belgrade etc.) and have formed the core teams which participate in the following international projects: Collaborative EuropeaN Digital/Archival Infrastructure (CENDARI) FP7-INFRA-2011-1.1.3; New Understanding of Communication, Learning and Engagement in Universities and Scientific Institutions – NUCLEUS H2020-ISSI-2014-1; IPA Non-Standard Forms of Teaching Mathematics and Physics: Experimental and Modeling Approach; Tempus Project Visuality & Mathematics: Experiential Education of Mathematics through Visual Arts, Sciences and Playful Activities; COST-actions Colour and Space in Cultural Heritage, Medieval Europe Medieval Cultures and Technological Resources, and Cryptography for Secure Digital Interaction; a bilateral project Dataflow Supercomputing For Application Speedups And Energy Savings between Serbia and Slovenia etc.

2.2. International Projects and Collaborations

2.2.1. International Projects

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

Home page of the Project: http://nucleus-project.eu/

NUCLEUS is a four-year project (2015 - 2019) funded by the European Union's Horizon 2020 programme. With a consortium of 24 international partners, led by Rhine-Waal University, its goal is to overcome institutional barriers to responsible research and innovation (RRI). The project addresses how RRI can be implemented by the "nucleus" of a university or research institution, namely, the governance that directs the policy and culture of an organisation. By developing the "DNA" for practical implementation of RRI, the project will contribute strategies that have been tested, demonstrated, and refined by an international network of partners.

Collaborative EuropeaN Digital/Archival Infrastructure (CENDARI)

Home page of the Project: www.cendari.eu

CENDARI was a four-year project (2011 - 2015) funded by the European Union through the Seventh Framework Programme (FP7). Trinity College led the project in partnership with 13 institutions from 7 European countries. The project brought together leading historians, archivists and IT specialists in order to develop a digital infrastructure that will facilitate and enhance the research process in the field of humanities, with special emphasis on medieval European culture and the First World War. MISANU was one of the leading technical partners.

Secure, interoperable, cross border m-services contributing towards a trustful European cooperation with the non-EU member Western Balkan countries (SWEB)

SWEB was a two-year project (2007 - 2008) funded by the European Union through the Sixth Framework Programme (FP6). It was based on a consortium of 12 participants and the coordinator was Fraunhofer Institute for Open Communication Systems (FOKUS) from Germany. The overall objective of the SWEB project was to develop a secure, interoperable, open, affordable platform upon which two secure cross border government services will be built: 1) Residence Certification Service as a specific example for a secure municipal document exchange service and 2) Electronic/Mobile Invoicing, which has a pivotal role in all the stages of handling Value Added Tax (VAT) for European Member States.

The European research network on types for programming and verification (EUTYPES)

Home page of the Project: http://www.cost.eu/COST_Actions/ca/CA15123

EUTYPES is a four-year project (2016 - 2020) supported by COST Action CA15123. It is based on a participation of 22 COST countries. The main objective of this Action is to develop and use expressive

type systems as a basis for improved programming techniques, methods, and tools to implement computer artifacts and verify them. This COST Action will give a strong impetus to research on type theory and its many applications in computer science.

Colour and Space in Cultural Heritage (COSCH)

Home page of the Project: http://www.cosch.info/

COSCH

COLOUR & SPACE IN CULTURAL HERITAGE

COSCH is a four-year project (2012 - 2016) supported by COST Action TD1201. It is based on a participation of 28 COST countries. The main objective of this Action is to realize an interdisciplinary cooperation, on a concerted European level, to prepare a novel, reliable, independent and global knowledge base facilitating the use of today's and future optical measuring techniques for the documentation of European heritage.

Cryptanalysis of ubiquitous computing systems (CRYPTACUS)

Home page of the Project: http://www.cost.eu/COST_Actions/ict/IC1403

CRYPTACUS is a four-year project (2014 - 2018) supported by COST Action IC1403. It is based on a participation of 29 COST countries. The main objective of the Action is to improve and adapt the existent cryptanalysis methodologies and tools to the ubiquitous computing framework. Cryptanalysis, which is the assessment of theoretical and practical cryptographic mechanisms, designed to ensure security and privacy, will be implemented along four axes: cryptographic models, cryptanalysis of building blocks, hardware and software security engineering, and security assessment of the real world systems.

Cryptography for Secure Digital Interaction

Home page of the Project: http://cryptoaction.eu/

This is a four-year project (2014 - 2018) supported by COST Action IC1306. It is based on a participation of 32 COST countries, 1 near neighbor country, and 1 international partner country. The main objective of this Action is to increase cooperation between European experts in cryptography with the main goal of designing, analyzing, and implementing secure protocols that allow citizens and entities to interact securely with each other.

Behavioural Types for Reliable Large-Scale Software Systems (BETTY)

Home page of the Project: http://www.behavioural-types.eu/

BETTY is a four-year project (2012 - 2016) supported by COST Action IC1201. It is based on a participation of 22 COST countries and 1 international partner country. The main objective of this Action is to develop improved programming languages and tools, based on behavioral type theory, for the implementation of reliable large-scale distributed software systems.

Medieval Europe - Medieval Cultures and Technological Resources

Home page of the Project: http://www.medioevoeuropeo.org/

This was a four-year project (2011 - 2015) supported by COST Action IS1005. It was based on a participation of 25 COST countries. The main objective of the Action was to increase accessibility to and integration of medieval research results and tools through improved technological instruments and skills.

Visuality & Mathematics: Experiential Education of Mathematics through Visual Arts, Sciences and Playful Activities

Home page of the Project: http://vismath.ektf.hu/

This was a three-year project (2012 - 2014) funded by the support of the European Union's program TEMPUS 530394-2012. With a consortium of 8 international partners, led by Eszterhazy Karoly College, its goal was to enhance Serbian national education, as well as to make mathematics become more appealing subject to students, through connecting mathematics with arts. The project was about making mathematics more visual and adventurous by illustrating Math with the tools of arts.

Doctoral School towards European Knowledge Society

Home page of the Project: http://projects.tempus.ac.rs/en/project/725

This was a two-year project (2007 - 2009) funded by the European Union's program TEMPUS JEP -41099-2006. With a consortium of 5 international partners, its goal was to contribute to the reorganization of doctoral training towards structured programs and training in a wide range of transferable skills in courses and modules.

Applied and Computational Agebraic Topology (ACAT)

Home page of the Project: http://www.mi.sanu.ac.rs/collaborations/acat.pdf

ACAT is a two-year project (2016 - 2017) approved by the Ministries of Sciences of Slovenia and Serbia as a part of bilateral cooperation between the two countries. In recent years, ACAT came into focus as one of the mathematical fields with great promise for applications in sciences and technology. The general project goals are (1) the exchange of ideas and building the expert base for joint projects in selected areas of ACAT, (2) training of young scientists in the area of ACAT, and (3) integration into the European ACAT networks.

The Development of Hybrid Heuristics for Combinatorial Optimization Problems

Home page of the Project: http://www.mi.sanu.ac.rs/collaborations/matheur.htm

This is a two-year project (2016 - 2017) approved

by the Serbian Ministry of education, science and technological development and the Centre national de la recherche scientifique from France as a part of bilateral cooperation between the two countries. The project goal is to establish cooperation between the two teams on the development of hybrid methods for solving difficult combinatorial optimization problems.

Data flow Supercomputing for Application Speedups and Energy Savings

Home page of the Project: http://www.mi.sanu.ac.rs/collaborations/DataFlow.html

This was a two-year project (2014 - 2015) approved by the Ministries of Sciences of Slovenia and Serbia as a part of bilateral cooperation between two countries. The goal of the project was to establish the cooperation between researchers from Serbia and Slovenia in the field of applied dataflow supercomputing. The objective of this project was to provide a set of algorithms, tools and needed skills for scalable and an order of magnitude faster data analytics to scientific and industry worlds, enabling them, with great reduction of energy consumption, to cope with Big Data (exascale data) by utilizing native DataFlow Computing paradigm.

Algebraic Aspects of Graph Theory

Home page of the Project: http://www.mi.sanu.ac.rs/collaborations/graphs2.htm

This was a two-year project (2014 - 2015) approved by the Ministry of education, science and technological development of Serbia and the Slovenian research agency as a part of bilateral cooperation between the two countries. The goal of the project was to establish cooperation between researchers from Serbia and Slovenia in the field of algebraic graph theory, to enhance our understanding of it, and to obtain new relevant scientific results.

Applications of Graph Spectra in Computer Science

Home page of the Project: http://www.mi.sanu.ac.rs/collaborations/graphs.htm

This was a two-year project (2013 - 2014) approved by the Ministries of Sciences of Portugal and Serbia as a part of bilateral cooperation between the two countries. The goal of the project was to establish cooperation between researchers from Serbia and Portugal in the field of spectral graph theory, and thereby, to publish papers with emphasis on application of this theory to computer sciences.

2.2.2. International Collaborations

Besides the international projects, the Institute is also involved in other forms of international cooperation.

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Belgrade unit of Zentralblat Math

Home page of the Unit: http://www.mi.sanu.ac.rs/regional/ZblSajt.htm

Belgrade unit of Zentralblat Math was established in 1996. The unit covers mathematical journals and other mathematical publications (monographs, collection of papers, etc.) from Serbia, Montenegro, Republika Srpska, Macedonia. They are reviewed mainly by Serbian mathematicians. More than 7000 reviews were sent to the Zbl center in Berlin by Jun 2014. In the frame of the cooperation with EMIS center in Berlin, our institute has been hosting a mirror (replica) of EMIS site. So, it is possible to search Zentralblat Math database without going to Berlin.

Almost 20 years the Editorial Board was led by prof. Neda Bokan. The current board of Belgrade Zbl unit involves: Marko Nedeljkov (Editor-in-Chief), Dragan Đorđević, Miroslav Ćirić, Miroslava Antić, Dragan Urošević, Miodrag Spalević, Srboljub Simić.

European Mathematical Society (EMS)

Home page of the Society: http://www.euro-math-soc.eu/

EMS promotes the development of all aspects of mathematics in Europe, in particular mathematical research, relations of mathematics to society, relations to European institutions, and mathematical education. The EMS has as its members around 60 national mathematical societies in Europe, 40 mathematical research centres and departments, and 3000 individuals.

Dr. Marko Nedeljkov Editor-in-Chief

Dr. Neda Bokan

South-Eastern European Digitization Initiative (SEEDI)

Home page of the Initiative: http://www.ncd.matf.bg.ac.rs/seedi/

SEEDI presents an international effort to develop awareness about digitization of cultural and scientific heritage in the South-Eastern Europe. It was established by the participants of the Third International Conference “New Technologies and Standards: Digitization of National Heritage 2004” (Mathematical Faculty Belgrade, Serbia), after the round table organized to facilitate the future cooperation. The goal of SEEDI is to contribute gathering and spreading specific and interdisciplinary knowledge about digitization from various institutions from the region and the European Union. The goal shall be implementation through several measures: conferences and workshops, the journal “Review of the National Centre for Digitization”, the SEEDI web-site and mailing list. The SEEDI involves researchers from more than 15 countries from the region and the whole Europe.

Finally, some cooperation agreements should be mentioned, such as: 1) agreement signed between Mathematical Institute of the Serbian Academy of Sciences and Arts and Institute of Computational Technologies (Novosibirsk), Matrosov Institute for System Dynamics and Control Theory (Irkutsk), and Institute of Computational Modelling (Krasnoyarsk) of the Siberian Branch of Russian Academy of Sciences, 2) agreement with Moscow Aviation Institute (MAI), Moscow, in 2013, etc.

2.3. Colloquiums and Seminars

2.3.1 Colloquiums

The Mathematics Colloquium of the Mathematical Institute SANU

Chairman: **Dr. Zoran Petrić**

Home page of the Colloquium:
http://www.mi.sanu.ac.rs/colloquiums/mathcoll.htm

Brief history: Since 1946, when the Mathematical Institute of the Serbian Academy of Sciences and Arts was founded, the talks both in mathematics and mechanics were presented in Veće regularly until 1961. A seminar stemming from Veće is the Mathematics Colloquium (initially Colloquium for Mathematical Analysis, and then Colloquium for Theoretical Mathematics).

The Chairmen of these seminars / the Mathematics Colloquium were:

- Borivoje Rašajski
- Đuro Kurepa
- Stanimir Fempl (12.05.1975 - 08.11.1976. during Kurepa's visit to the USSR)
- Đuro Kurepa (08.11.1976. - 13.09.1984.)
- Slaviša Prešić (13.09.1984. - 01.02.1989.)
- Žarko Mijajlović (01.02.1989. - 01.09.1991.)
- Bogoljub Stanković (01.09.1991. - 01.12.1994.)
- Rade Živaljević (01.12.1994. - 01.10.2000.)
- Stevan Pilipović (01.10.2000. - 28.10.2015.)
- Zoran Petrić (28.10.2015. -)

Aim and scope: The Mathematics Colloquium is a general mathematical seminar, the role of which is to organize talks aimed at a broad audience, including young mathematicians in particular. Together with Mechanics Colloquium, it takes broad responsibilities for creation of the scientific programme at the Mathematical Institute tailored for all mathematical centers in Serbia.

Foreign scientists, who visit not only Mathematical Institute but also Universities in Serbia, as a general rule give lectures at the Mathematical Institute. Thus the Mathematics Colloquium plays an important role in organizing mathematical research activities in Serbia. The meetings are organized regularly on Fridays at 2 pm. These include one-hour presentations.

The Colloquium of Mechanics

Chairman: **Dr. Vladimir Dragović**

Home page of the Colloquium:
http://www.mi.sanu.ac.rs/colloquiums/mechcoll.htm

Dr. Vlatko Brčić
Chairman of the Colloquium of Mechanics (1973 - 1984)

The Colloquium of Mechanics is one of the two historic colloquiums of MISANU, together with the Colloquium of Mathematics. Its formal and essential role in the organization of the Institute evolved and changed during the past seven decades, along with the changes of the Institute itself.
One of its most distinguished permanent benchmarks and the most important public activity has been the organization of the Mechanics Colloquium. The Mechanics Colloquium has earned reputation of one of the most prestigious regular scientific tribunes in the broad area of Mechanics, with the longest continuous tradition nationwide.
From the founding of MISANU 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 MISANU, Academician Anton Bilimović.
Up to 1961, the seminar talks in the field of the Mechanics, including Theoretical Mechanics, Dynamics of Fluids, Stability of Motion, Astronomy, were part of the Mathematics Colloquium. According to Academician Konstantin Voronjec, the Head of the Colloquium of Mechanics in 1971, the time of 25th anniversary of the Institute, more than one hundred such talks were held.

The Colloquium of Mechanics was founded in 1961. Until March 2016, there were 1283 meetings of its Mechanics Colloquium. On average, 24 meetings, with about 4-5 foreign speakers are organized annually.

The principal tasks of the Colloquium of Mechanics include:

- organization of weekly lectures, the Mechanics Colloquium, which range from expository lectures in pure and applied mechanics to original research reports;
- organization of public presentation and evaluation of scientific projects supported by the Ministry of Science;
- supporting and organizing visits of foreign scientists;
- organization and support of workshops, mini conferences, presentations of books, software, video lectures etc;
- monitoring the seminars and other research activities in the field of mechanics within the Institute.

The Mechanics Colloquium meets weekly, keeping the tradition from the very early days of its establishment, on Wednesday at 6 pm. Currently, The Head of the Colloquium of Mechanics is Professor Vladimir Dragović, with Dr. Božidar Jovanović as the Deputy, and Dr. Katarina Kukić as the Secretary.

In the period from 1961 to 1965 the Colloquium of Mechanics Colloquium was headed by academician Tatomir P. Anđelić (1903-1993) and Prof. Danilo Rašković (1910-1985). The Head of the Colloquium of Mechanics from 1965 to 1973 was Academician Konstantin Voronjec (1902-1974); from 1973 to 1984, Prof. Vlatko Brčić (1919-2000); from 1984 to 2000, Prof. Veljko Vujičić; from 2000 to 2006, Academician Vladan Đorđević; from 2006 to 2010, Academician Teodor Atanacković; from 2010 to 2012, Prof. Katica Stevanović Hedrih, and from 2012 Prof. Vladimir Dragović.
In the period from 1975 to 1994, the Secretary of the Colloquium of Mechanics 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, and from 2012 Dr. Katarina Kukić.

Computer Science and Applied Mathematics Colloquium

Chairwoman: **Dr. Vera Kovačević Vujičić**

Home page of the Colloquium:
http://www.mi.sanu.ac.rs/colloquiums/csamcoll.htm

The Computer Science and Applied Mathematics Colloquium was founded in 2012 with the aim to support growing interest in computer science and its interconnections with mathematics.

The Colloquium activities include:

- regular weekly lectures, organized through the meetings of the Seminar on Computer Science and Applied Mathematics. Topics of the lectures range from research reports in computer science and applied mathematics to computational studies and new software developments;
- visits of foreign mathematicians and computer sciencists;
- promoting young researchers through presentations of their doctoral theses;
- presentations of books, mathematical software, and video lectures.

The head of the Computer Science and Applied Mathematics Colloquium is Vera Kovačević Vujčić with the assistance of Tatjana Davidović.

2.3.2 Seminars

Seminar for Mathematical Logic

Chairman: **Dr. Predrag Tanović**

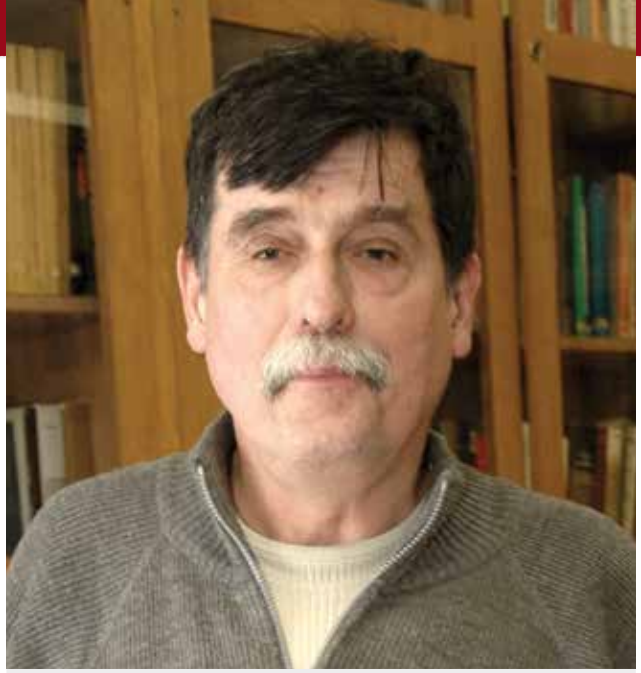
Home page of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar1.htm

The study of mathematical logic in Serbia was initiated in the mid-sixties by a group of mathematicians and philosophers. It was formalized at the Mathematical institute in a form of a seminar established by Professor Slaviša B. Prešić. The seminar has been continuously active for over 40 years. During the seventies and eighties it was the fastest growing mathematical group, attracting a large number of graduate students. Some of them continued their studies at prestigious European and North American universities and made brilliant research careers there. In former Yugoslavia, the seminar had, for years, close relations with the fellow logicians from Zagreb.

Members of the seminar are distinguished and senior logicians, as well as graduate students. All are encouraged to give lectures of general interest and talks about their own results. The discussions are about logical foundations of mathematics and philosophy, numerous connections of logic with classical mathematical disciplines and computer science, the role of logic in the teaching of mathematics, etc.

Traditionally, the attention is paid to all main areas of logic: model theory, proof theory, set theory, and recursion theory. For a long period of time, lectures in these areas were absolutely dominated, while in the past decade, the number of lectures on topics in algebra, topology, combinatorics and computer science related to logic have significantly increased. Especially, graduate students working in logic are expected to give expository lectures on some of advanced topics as part of their studies, while PhD candidates are expected to present their results in series of talks. Occasionally, short courses are organized. Visiting logicians from abroad are most welcomed.

Seminar for Probability Logic



Chairman: **Dr. Miodrag Rašković**

Home page of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar17.htm

Probabilistic logic (or probability logic) is a common name for the branch of mathematical logic devoted to the study of reasoning in the presence of uncertainty, where uncertainty is represented in terms of probability. We can found traces of reasoning about probability in the work of scholars such as Gottfried Wilhelm Leibnitz, George Boole and many others, but the modern era of probability logic started with the work of Jerome Keisler in the mid-seventies of the XX century.

Aleksandar Kron (1938-2000), Serbian logician and philosopher, one of the founders of the Seminar for mathematical logic at the Mathematical Institute of the Serbian Academy of Sciences and Arts, studied relationship between multi-valued logics and probability theory. The founder and the main representative of the modern probability logic in Serbia is Miodrag Rašković. His work started in the early eighties of the XX century with development of the so called middle model technique and its application to solving various problems proposed by Jerome Keisler.

In 2004, Miodrag Rašković, Zoran Marković, Zoran Ognjanović, Nebojša Ikodinović and Dragan Radojević initiated an informal seminar for probability logic at the Mathematical Institute of Serbian Academy of Sciences and Arts.

In the years that followed, a number of younger researchers joined the group. Due to the steady growth in the number of participants (mostly graduate students) and the corresponding scientific output, the informal research group has naturally evolved into an official seminar of the Mathematical Institute. The seminar has been held weekly (Thursday at 3 pm) at the Mathematical Institute since its establishment in 2008.

The aim of the seminar is to provide a permanent research forum for all researchers interested in the reasoning under uncertainty. Completion and decidability techniques are frequently discussed in great detail, with the particular emphasis on their application to specific open problems. Graduate students are encouraged to present contemporary work of the renowned researches in the field. Fruitful discussions at such presentations often lead to new results and better understanding of the considered phenomena.

Seminar for Combinatorics in Geometry, Topology and Algebra (CGTA)

Chairman: **Dr. Rade Živaljević**

Home page of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar3.htm

Seminar for Combinatorics, Geometry, Topology, and Algebra (CGTA) was created spontaneously around 1985 by a group of Belgrade mathematicians with different mathematical interests and background (originally under the name GTA-seminar).

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

The seminar provides an informal and friendly environment for disseminating mathematical ideas and introducing young mathematicians into the research in mathematics (Project “Viva Math”-“Živa Matematika”).

Among the visitors and friends of the seminar we acknowledge a special contribution by 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.

Over the years, the seminar and the associated CGTA graduate courses covered numerous topics, including: the theory of Lie groups, algebraic curves, vector bundles and characteristic classes, dihedral and cyclic homology, theory of group actions, Borsuk-Ulam type theorems and applications, discrete and computational geometry, automorphisms of free groups, hyperplane arrangements, stable homotopy theory, knot invariants, theory of convex polytopes and algebraic geometry (toric varieties, Newton polyhedra), diagrams of spaces (Goresky - Mac Pherson type formulas), knot invariants, configuration spaces, invariants of three and four manifolds, toric topology and combinatorics, applied and computational algebraic topology (ACAT), etc.

The seminar emphasizes the interplay of ideas from different mathematical fields, affirming the unity of mathematics and its applications. This orientation has eventually led to the creation of The Centre for Dynamical Systems, Geometry and Combinatorics, http://www.mi.sanu.ac.rs/dsgc/dsgc.htm, as a joint project with the seminar Mathematical Methods of Mechanics and the associated Dynamical Systems group led by Vladimir Dragović.

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

Chairman: **Dr. Milan Božić**

Homepage of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar12.htm

From December 1981 until May 1992 this seminar was named The Seminar for the History and Philosophy of Mathematics and Mechanics. After the eighteen months break, the seminar began again under its present name.

The basic goals of the seminar are the analysis of the central ideas of mathematics and mechanics and study of Serbian mathematics and mechanics, in particular. The main topics of the seminar are, therefore, taken from the history of mathematics and mechanics in Serbia.

This study will continue until a satisfactory book on the history of science in Serbia appears. The first chairman was dr Dragan Trifunović. From 1993 to 2002, the chairman was dr Rade Dacić.

Since 2002 the chairman has been dr Milan Božić.

Seminar on Computer Science and Applied Mathematics

Chairpersons: **Dr. Vera Kovačević Vujčić, Dr. Milan Dražić**

Home page of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar2.htm

The Seminar on Applied Mathematics was founded in 1973, among the first seminars of the Mathematical Institute. In 2012, its name was changed to the Seminar on Computer Science and Applied Mathematics.

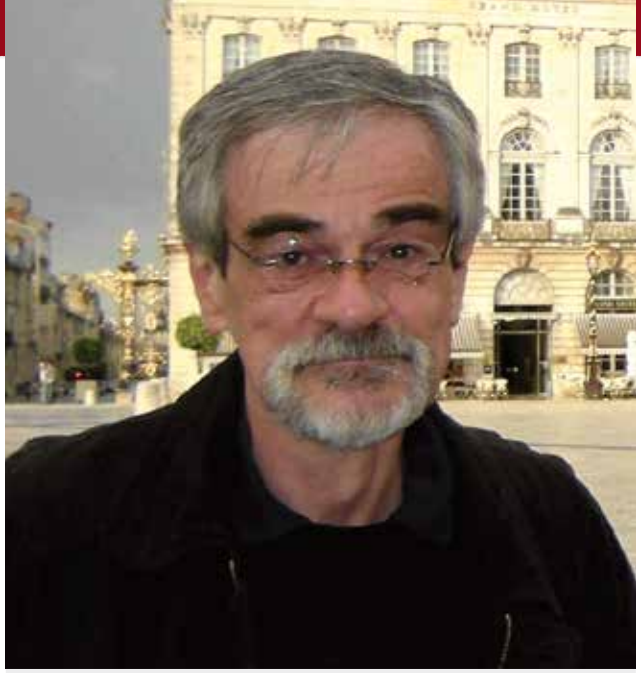
From the very beginning, one of the main goals of the Seminar was to encourage interaction between mathematics and other sciences, bringing together mathematicians, and scientists, as well as the practitioners from other disciplines.

Interaction between researchers from scientific institutions and industry has also been strongly supported. Seminar meetings are devoted to both presenting new scientific results as well as describing real-life problems that require mathematical knowledge to be solved. Various topics have been covered, including numerical analysis and its applications, mathematical programming and the calculus of variations, system theory, graph theory and applications, astronomy and geophysics, fuzzy sets and logic, decision support systems, meta-heuristics, neural networks, artificial intelligence, data mining, computer security and cryptography, software engineering, digitalization, e-business, e-learning, information systems, and information and communication technologies.

The Seminar on Computer Science and Applied Mathematics meets regularly once a week from October to May. Since 1995 some lectures of the Seminar are organized jointly with the Faculty of Organizational Sciences. The IEEE Chapter on Computer Science (CO-16) Belgrade, Republic of Serbia, has been supporting the organization of the Seminar starting with the year 2008.

Seminar is included into activities of the Yugoslav Society for Industrial and Applied Mathematics and established acknowledged international collaboration. The guests of the Seminar have been many world-known experts in the field of applied mathematics and computer science.

Seminar for General Proof Theory



Chairman: **Dr. Kosta Došen**

Home page of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar18.htm

General proof theory addresses the question “What is a proof?” by dealing with questions related to normal forms of proofs, and in particular, with the question of identity criteria for proofs. It deals with the structure of proofs, as exhibited, for example, with the help of the typed lambda calculus in the Curry-Howard correspondence, and not with their strength measured by ordinals, which is what one finds in proof theory that arose out of Hilbert’s programme.

A large part of general proof theory belongs to the field of categorial proof theory. Fundamental notions of category theory like the notion of adjoint functor, and very important structures like Cartesian closed categories, came to be of central concern for logic in that field. Through results of categorial, proof theory called coherence results, which provide a model theory for equality of proofs, logic finds new ties with geometry, topology and algebra.

In general, proof theory looks for an algebra of proofs, and for that, it concentrates on the operations of this algebra, which come with the inference rules. As an equational theory, the algebra of proofs involves the question of identity criteria for proofs, the central question of general proof theory. (This question may be found, at least implicitly, in Hilbert’s 24th problem; see: http://www.mi.sanu.ac.rs/~kosta/Dosen_General%20Proof%20Theory%20nov2011.pdf). This is still a young branch of logic to whose developement contributed the Belgrade school, too.

The seminar started in the autumn of 2011, and its chairman is Kosta Dosen. It is not expected to meet more than once a month during the academic year.

Mathematical Methods of Mechanics

Chairman: **Dr. Vladimir Dragović**

Home page of the Seminar:
http://www.mi.sanu.ac.rs/mmm/

The everlasting connection between mathematics, mechanics, and physics was a spiritus movens of many fundamental mathematical ideas in the last third of the 20th century. Inspired by that connection, the Seminar on Mathematical Methods of Mechanics was initiated, in MISANU in Spring 1993, to facilitate a more active and organized participation in this stream of ideas. There were two main initial tasks of the Seminar. First, to contribute to the organization of the postgraduate studies in these scientific fields in cooperation with the Chairs of Geometry and of Mechanics of the Faculty of Mathematics. The second task was to organize, conduct, and stimulate research, and also to provide a forum where the original research results could be reported. Most frequently, the subjects of talks were about integrability and nonintegrability of dynamical systems, simplectic geometry, Lie groups and algebras, qualitative analysis of differential equations, algebraic curves...

The seminar was initiated by Vladimir Dragović, who has been the chairman from the very beginning. During some periods, the duty of the chairman was carried out by Nikola Burić (1994) and Darko Milinković (2000). For the first few years, the acivities of the Seminar included senior researchers Veljko Vujičić, Stevo Komljenović, Rade Živaljević…

Four PhD theses by Božidar Jovanović, Borislav Gajić, Milena Radnović, and Katarina Kukić were completed within the Seminar.

In more than 20 years of its operational history, the Seminar organized several courses: Mathematical Methods of Mechanics by Vladimir Dragović in 1993 and 1994; Nonintegrable Systems by Nikola Burić in 1995; in 1997 four courses: Theory of Solitons; Algebraic Curves and Nonlinear Equations; Rigid-Body Dynamics and Geometry; Symmetries in Mechanics; in 1998 and 1999 Schemes and cohomologies and nonlinear equations of mechanics; in 2002 Darko Milinković: Mirror Symmetries.

The list of several other more recent courses include Božidar Jovanović: Lie Groups; Jelena Grbić: Theory of Homology; Jovo Jarić: Continuum Mechanics; Milena Radnović, Borislav Gajić, Božidar Jovanović: Introduction to Algebraic Geometry; Victor Buchstaber: Toric Topology (jointly organized with CGTA Seminar); Borislav Gajić, Gordana Stojanović, Božidar Jovanović: Dynamical Systems...

Starting from 2008, the Seminar has been active in the organization of the series of the international conferences: GDIS-Geometry, Dynamics, Interable Systems, jointly with Academician Valery V. Kozlov, Vice-President of the Russian Academy of Sciences and Alexey Borisov of the Regular and Chaotic Dynamics.

In 2012, the Seminar organized a mini-symposium on Algebraic Geometry, and in 2013 a mini-symposium devoted to its 20th anniversary.

As a highlight, at the end, let us mention that the Seminar organized a mini - course by Academician Sergei Petrovich Novikov (1970 Fields medal) in 2011. The title of the course was: Integrable systems and a new discrete complex analysis.

Seminar on Geometry, Education and Visualization with Applications

Chairwoman: **Dr. Stana Nikčević**

Home page of the Seminar:
http://www.mi.sanu.ac.rs/seminars/seminar15.htm

The Seminar has been held weekly at MISANU since 2001.

A main goal of the Seminar is to set up a meeting point in which specialists working in the different areas of geometry and related topic, exchange their views and discuss their problems, by sharing their experience and their ideas.

The lectures given at the Seminar cover numerous topics including the smooth manifolds and sub-manifolds endowed with different structures, their geometry and applications to the general theory of relativity and cosmology, geometry and topology of fiber bundles, symmetric and homogeneous spac-es, curvature invariants, affine differential geometry, Lie groups and algebras and their actions, quantum groups, applications of p-adic, adelic methods in mathematical physics, biology and other complex systems, knot theory, various aspects of visual geometry, softwares and their use in education and research, improvement of education and teaching of mathematics, especially geometry.

2.4. Research centres

CAMMIT - Centre for Advanced Mathematical Methods in Information Technologies

Dr. Miodrag Mihaljević
Mathematical Institute SANU

Home page of the Center:
http://www.mi.sanu.ac.rs/CAMMIT/CAMMIT.htm

The Institute's experts performing research in a number of mathematical areas (Cryptology, Graph theory, Logic in Computer Science and Artificial Intelligence, Numerical methods, Optimization, Digitization of heritage and computer aided training, etc.,), which are the foundation of many strategic Information Society Technologies (IST) priorities, have joint their efforts within CAMMIT. The cumulative achievements of CAMMIT members include publication, during the last five years, of more than 500 papers in the leading international journals with over 10000 citations.

A mission of CAMMIT is to provide a framework for developing the applications of those numerous theoretical results.

CAMMIT has been established as a unit within Mathematical institute, and its goals include the following:

- to mobilize the existing experts and new young researchers and to provide them with directions how to devote more efforts to research activities which are of direct relevance for IST, including very practical applications which would be usable by local companies and government (like e-government, e-learning and e-business),
- to improve work conditions and access to hi-tech equipment,
- to ensure better career opportunities and help avoiding the brain drain,
- to develop the infrastructure for collaboration with European partners and prepare foundation for future international cooperation, etc.

The first result of this orientation is that the Institute participates in the following EU FP6-projects: "Wireless Ad-Hoc Broadband Monitoring System", "Types for Proofs and Programs", "Secure interoperable cross border m-services contributing towards a trustful European cooperation with the non-EU member Western Balkan countries", and "MInisterial NEtwoRk for Valorising Activities in digitization", where the Institute has a cooperation agreement.

Centre "Dynamical Systems, Geometry and Combinatorics" - DSGC-synergy

Dr. Rade Živaljević
Mathematical Institute SANU

Home page of the Center:
http://www.mi.sanu.ac.rs/dsgc/dsgc.htm

The Centre for Dynamical Systems, Geometry and Combinatorics (DSGC-synergy) is the result of the unification of the Discrete Geometry group, led by Rade Živaljević, and the Dynamical Systems group led by Vladimir Dragović. This process has begun in 1998 with the organization of the conference Geometric Combinatorics in Kotor, Montenegro, as a satellite conference of the International Congress of Mathematicians in Berlin, http://poincare.matf.bg.ac.rs/konferencije/satellite/. The conference, organized by R. Živaljević, S. Vrećica and V. Dragović, created the environment and gave new impetus to the already existing collaboration of the two research groups, and the associated seminars (CGTA and MMM) and scientific projects.
The conference "Geometric Combinatorics" was (at the time) one of the most exciting mathematical events organized on the territory of former Yugoslavia. As a satellite conference of an international congress of mathematicians, it was able to provide the participation of some of the invited speakers and other distinguished, world reputed mathematicians. This in turn led to a prolonged collaboration with some of the leading experts and their research groups (Prof. Boris Dubrovin, SISSA-Trieste; Prof. Herbert Edelsbrunner, IST Austria, Prof. Günter M. Ziegler, FU-Berlin, Prof. Jiří Matoušek, Charles University, Prague, etc.).
This tradition was continued by the co-organization of highly successful sequence of GDIS conferences (GDIS = Geometry, Dynamics, Integrable Systems), http://www.mi.sanu.ac.rs/~gdis2016/previous.html. These remarkable events illustrate a long term cooperation of the Belgrade Dynamical Systems group (led by Vladimir Dragović) with some of the leading research teams in this area including the groups from Steklov Mathematical Institute RAS (Moscow), SISSA (Trieste), University of Lisbon (GFMUL), ICTP (Trieste) etc.

The Centre has co-organized numerous workshops, mini conferences, visits of leading experts, lecture series, and regional projects. The most recent, among the collaborative projects co-organized by the Centre, is the Serbia-Slovenia bilateral project "Applied and Computational Algebraic Topology" (led by Rade Živaljević, MISANU, and Petar Pavešić, Univ. of Ljubljana).
The Centre aims at the high level, coordinated research in the area of Dynamical Systems, Geometry, Mechanics, Geometric/Algebraic/Topological Combinatorics, and Applied and Computational Geometry and Topology. In the period 2011-2016 there were two research projects of the Ministry of Education, Science and Technological Development of the Republic of Serbia, directly associated with the Centre activities:

1. Geometry and Topology of Manifolds, Classical Mechanics and Integrable Dynamical Systems, led by Vladimir Dragović;

2. Manifolds and discrete structures in Topology, Geometry and Globar Analysys, led by Siniša Vrećica.

The Centre also serves as the host for the project "Viva Math" (Živa Matematika") that focuses on popularization of mathematics and on organization of introductory research lectures and mini courses for talented university and high school students.
Two permanent research seminars with long tradition are formally associated with the Centre: Combinatorics in Geometry, Topology, Algebra (CGTA) http://www.mi.sanu.ac.rs/seminars/seminar3.htm, which celebrates 30th anniversary in 2016 and Mathematical Methods of Mechanics, which marked its 20th anniversary in 2013.
http://www.mi.sanu.ac.rs/mmm/

3. LIBRARY

Mrs. Branka Bubonja
librarian of the Institute

Home page of the Library:
http://www.mi.sanu.ac.rs/main_pages/library.htm

The Library of the Mathematical Institute has the status of specialized and central library in the field of mathematics, mechanics and computer science. The Library collects and keeps necessary scientific literature, documentation, and information.

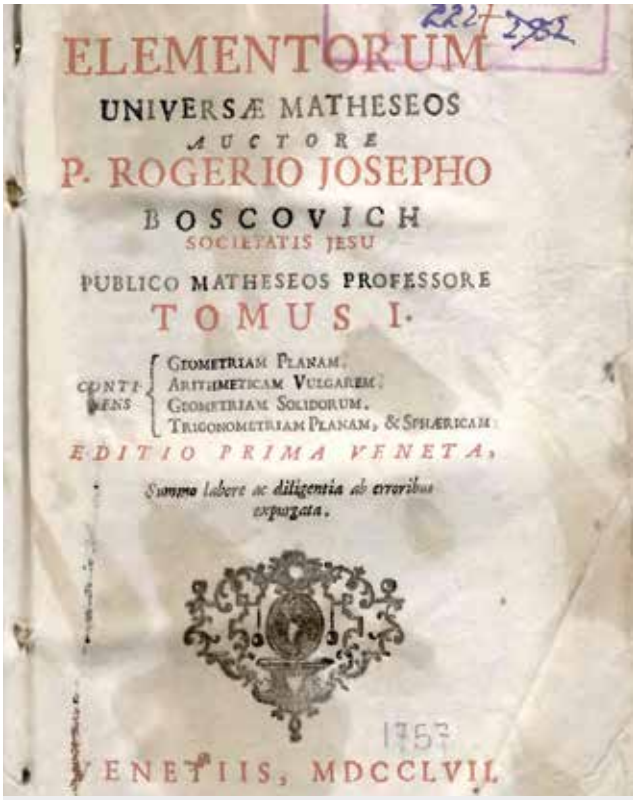
The Library holdings consists of books, journals, and data-bases, as well as their various electronic editions. The total amount of books is 15252. Most of them were purchased, the rest was received as a gift or aquiered by exchange or due to the collaboration with the referative journal Zentralblatt für Mathematik.

The library contains 618 journals with about 65000 issues in the paper form, but recently, most of them can be obtained via electronic access. The majority of journals are obtained by exchange with other libraries and institutions and therefore some journals are still arriving in printed versions. The Institute sends two periodicals, the journal Publications de l'Institut Mathematique and the Yugoslav Journal of Operations Research (for which the institute is co-publisher), and two nonperiodical publications Zbornik Radova and Posebna izdanja, to almost 300 addresses worldwide for exchange.

The library provides two reference databases: Zentralblatt für Mathematik, published by the European Mathematical Society, and Mathematical Reviews (MathSciNet), published by the American Mathematical Society.

The Serbian Ministry of Science has provided Serbian scientists with free on-line access to about 35000 journals, through KOBSON data-base. Among those journals, quite a few are very important for mathematics, computer science and mechanics, and some of them are available in Serbia for the first time.

The Library catalog is available via Internet (www.mi.sanu.ac.rs/Library).


ELEMENTORUM
UNIVERSÆ MATHESEOS
AUCTORE
P. ROGERIO JOSEPHO
BOSCOVICH
SOCIETATIS JESU
PUBLICO MATHESEOS PROFESSORE
TOMUS I.
CONTINENS
GEOMETRIAM PLANAM,
ARITHMETICAM VULGAREM,
GEOMETRIAM SOLIDORUM,
TRIGONOMETRIAM PLANAM, & SPHÆRICAM
EDITIO PRIMA VENETA,
Summo labore ac diligentia ab erroribus expurgata.
VENETIIS, MDCCLVII.

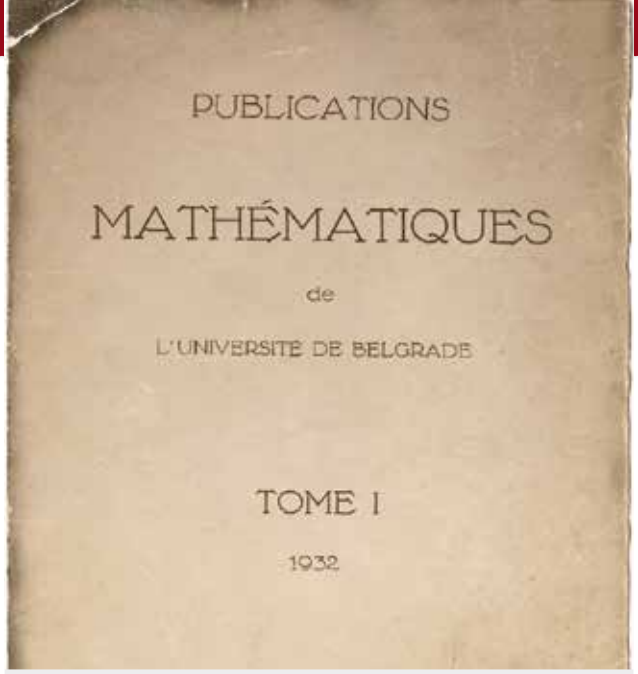
Cover Page of the Book ''Elementorum Universae Matheseos - Tomus I'', Ruđer Bošković, 1757

4. PUBLICATIONS

4.1. Journals

All issues of the journals published by the Institute are on-line available via Internet (www.mi.sanu.ac.rs/Library ELIB).

Publications de l'Institut Mathematique



Home page of the Journal:
http://publications.mi.sanu.ac.rs/home

Editors in Chief

Dr. Žarko Mijajlović

Dr. Gradimir Milovanović

Dr. Stevan Pilipović

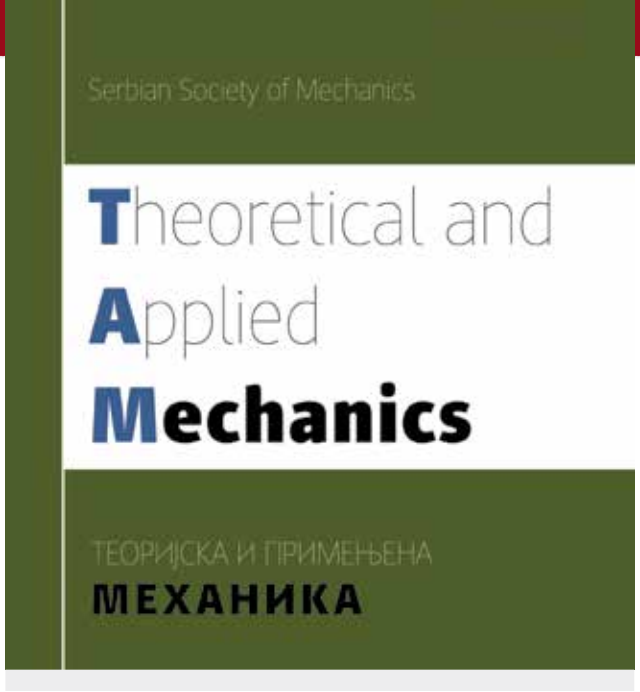
This is the first Serbian scientific journal in the field of mathematics established in the year 1932 under the name **Publications Mathematiques de l'Université de Belgrade**. It was founded by Belgrade University foundations Luka Ćelović-Trebinjac and Pavle and Katarina Kurtović. Seven volumes were published until World War II, the eighth volume was lost in the German bombardment of Belgrade in April 6th, 1941. Immediately after the founding of the Mathematical Institute in 1946, the publication of the journal was restarted in 1947 under the new name **Publications de l'Institut Mathematique**. Due to some organizational issues of the Mathematical institute, new series of the journal started in 1961.

More then 2000 articles were published until these days. The scope of the journal in the beginning was broader, not only in mathematics, but articles referring to mechanics and astronomy were published, too. Most prominent Serbian and Yugoslav scientists in these fields published their papers in the journal, including Đuro Kurepa, Jovan Karamata, Mihailo Petrović, Milutin Milanković, Anton Bilimović, Josip Plemelj, Sibe Mardešić, and others.

Some of the leading world mathematicians published their articles in the Publications: Paul Montel, Paul Erdos, Waclaw Sierpinski, Saharon Shelah, and others. Most of the papers are in English, but papers written in Russian, French, and German are also accepted.

There is an extensive exchange program with scientific institutions all over the world, whereby the library of the Institute receives more than 200 journals.

Theoretical and Applied Mechanics



Dr. Vladimir Dragović, Dr. Božidar Jovanović, Dr. Borislav Gajić
Mathematical Institute SANU

Home page of the Journal:
http://www.mi.sanu.ac.rs/tam/

Theoretical and Applied Mechanics is an open access peer reviewed journal.

Theoretical and Applied Mechanics (TAM) publish original scholarly work in all fields of theoretical and applied mechanics. TAM selects high quality research articles, which represent the broad spectrum of interest in mechanics.

TAM is one of the oldest Serbian journals in mechanics. It was established in 1975 as a journal of former Yugoslavian Society of Mechanics, and it was published jointly with Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade until 1996. Since 2006, the Journal has been published under the auspices of the Serbian Society for Mechanics. Since 2015, it has been published jointly with the Mathematical Institute of the Serbian Academy of Sciences and Arts.

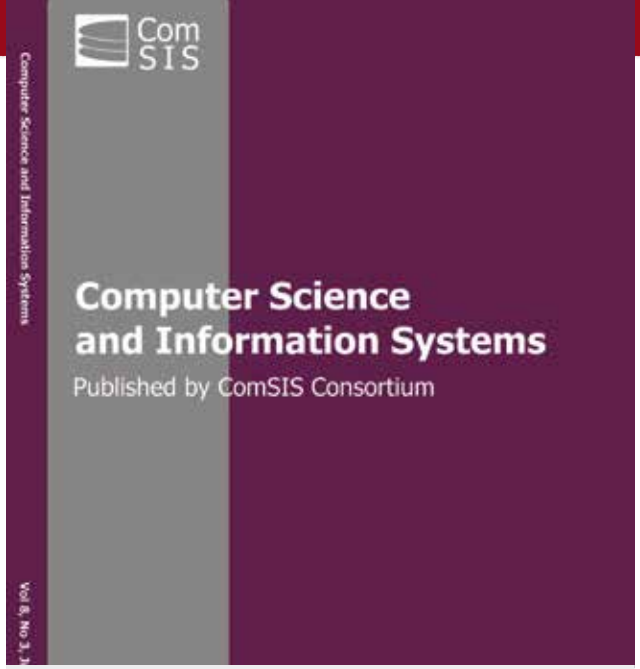
For volumes 1-21 (years 1975-1995), Editor-in-Chief was Prof. Veljko Vujičić, and its title was *Teorijska i primenjena mehanika*. For volumes 22-26 (years 1996-2001), Editors-in-Chief were Academicians Teodor Atanacković and Djordje Djukić. For volumes 27-41 (years 2002-2014), Editor-in-Chief was Prof. Milan Mićunović. Starting with volume 42 (year 2015), Editor-in-Chief is Prof. Vladimir Dragović.

Occasionally, TAM publishes issues dedicated to selected topics of wider interest. The publication of such an issue is announced in advance. Besides research papers, articles can be purely expository, surveys, or historical notes.

ComSIS

Dr. Mirjana Ivanović
University of Novi Sad, Faculty of Sciences
Dr. Ivan Luković
University of Novi Sad, Faculty of Technical Sciences

Home page of the Journal:
http://www.comsis.org/

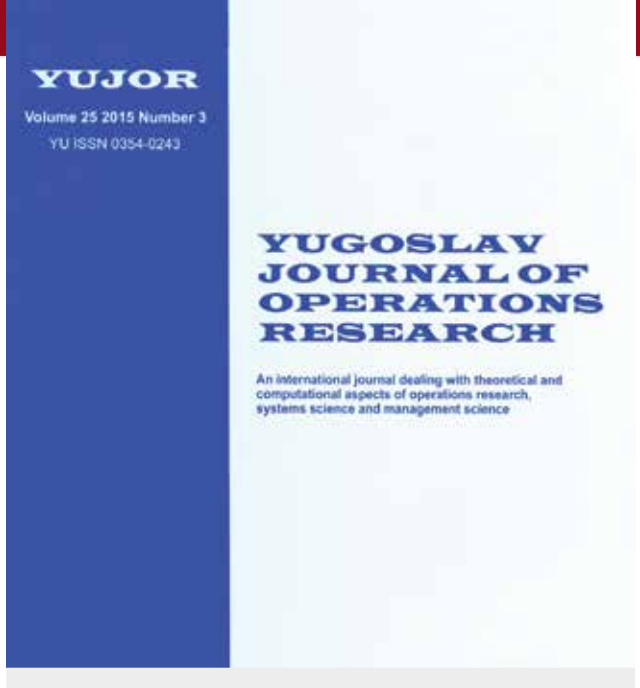


In the field of computing and computer science in Serbia, the last two decades have been marked by intensified research activities and development. The research community in this field became larger, and as a natural consequence, the need appeared for establishing an appropriate scientific journal in Serbia. The primary goal of the journal was raising the quality of the research community in the field of computing and computer science.

The idea of forming such a journal was first put forward by one of the leading Yugoslav figures in the field of information systems, Dr. Branislav Lazarević, professor at the Faculty of Organizational Sciences in Belgrade. With unselfish assistance from his close associates, especially Prof. Dr. Dragana Bečejski Vujaklija, in early 2003, Prof. Lazarević gatherd the initiating board for founding the journal, composed of representatives from ten academic institutions fostering the field of computing and computer science: Faculty of Organizational Sciences, Faculty of Mathematics, Mathematical Institute of the Serbian Academy of Sciences and Arts and Faculty of Electrical Engineering from Belgrade, Faculty of Sciences and Faculty of Technical Sciences from Novi Sad, Technical Faculty from Zrenjanin, Faculty of Economics from Subotica, as well as Faculty of Economics and Faculty of Sciences from Podgorica. At the first meeting of the initiating board in September 2003, the journal was named Computer Science and Information Systems, abbreviated to ComSIS. The journal was officially registered in the same year, and Prof. Lazarević was unanimously elected for Editor-in-Chief. At the same time, the Managing Board and the Editorial Board were constituted. English was selected as the official language of the journal, the journal Web site was put up, and it was decided that ComSIS would be a non-profit open-access journal. The main topics covered by the journal are computer science, information systems, and software engineering.

Prof. Branislav Lazarević was Editor-in-Chief until the end of 2004. Subsequently, the role was taken over by Dr. Vladan Devedžić, also professor at the Faculty of Organizational Sciences, until the end of 2005. Prof. Vladan Devedžić put special emphasis on improving the international reputation of the journal and initiated the registration of the journal for coverage in the international SCI journal index, maintained by Thomson Reuters. From 2006 to 2009 the role of Editor-in-Chief was fulfilled by Dr. Ivan Luković, professor at the Faculty of Technical Sciences in Novi Sad. The main challenges in this period were establishing a constant influx of quality submissions and meeting the strict criteria of Thomson Reuters, with the goal of ensuring the coverage of the journal by the SCI index. In August 2008, the ComSIS journal received official confirmation of coverage in the JCR / SCI Expanded index, which represents an important turning point in the life of the journal. This made ComSIS the first SCI-indexed journal in the field of computing and computer science across the region of former Yugoslavia. Around this time, the Faculty of Sciences from Podgorica left the consortium of founders, while the School of Computing from Belgrade joined. In November 2008, Prof. Branislav Lazarević passed away, leaving a lasting mark on what ComSIS is today. From 2009, the Editor-in-Chief of the journal is Dr. Mirjana Ivanović, professor at the Faculty of Sciences in Novi Sad. After inclusion in the SCI index, the first two-year impact factor for 2010 was published in June 2011. This event marked the start of a period of intense international and national interest for the journal. The challenge of this period, still lasting today, is in maintaining and improving the subsequent values of the impact factor, and ensuring a high standard of journal operation in the environment of a high influx of submissions and requests for organizing special issues and sections. Today's demands require organizational restructuring of the journal, a task which is being diligently worked on by the journal boards, with the goal of continued improvement of the journal's international reputation.

YUJOR



Dr. Nenad Mladenović
Mathematical Institute SANU

Home page of the Journal:
http://yujor.fon.bg.ac.rs/index.php/journal

Yugoslav Journal of Operations Research, YUJOR, is an international journal which deals with theoretical and computational aspects of Operations research, Systems science, and Management science. Being part of Open Journal Systems since 2013, it provides immediate open access to its content. It is double peer reviewed, and is covered by SCOPUS.

Established in 1991, it has been published without interruption twice a year, and from 2015, three times, with more than 370 articles.

Its Editorial Board includes 43 prominent scientists from all over the world, e.g. Prof. Dr. Bernard Roy, Paris; Prof. Dr. Dominique de Werra, Lausanne; Prof. Dr. Pierre Hansen, Canada; Prof. Dr. Jurgen Guddat, Berlin; Prof. Dr. Anatoly S. Antipin, Moscow; Prof. Dr. Vera Kovačević Vujičić, Serbia; Prof. Dr. Nenad Mladenović, Serbia; Prof. Dr. Dragoš Cvetković, Serbia; Prof. Dr. Angelo Sifaleras, Greece; Prof. Dr. Anton V. Eremeev, Omsk; Prof. Dr. Alain Hertz, Canada; Prof. Dr. Biswajit Sarkar, Korea; Prof. Dr. Shashi K. Mishra, India; Prof. dr Prof. Dr. Silvano Martello, Italy; Prof. Dr. George L. Nemhauser, Atlanta; Prof. Dr. Jakob Krarup, Copenhagen; Prof. Dr. Sandor Komlosi, Hungary.

VisMath - Visual Mathematics

Home page of the Journal:
http://www.mi.sanu.ac.rs/vismath/

Dr. Ljiljana Radović
Editor-in-Chief

The international multidisciplinary electronic journal VisMath, established in 1999, is an art and science open access journal. It has four issues per year published in English, in HTML. Visual Mathematics published more than 100 papers dedicated to visual representations of mathematical structures. The aim of Visual Mathematics is to show the beauty of mathematics in its broad sense and establish connections between sciences and arts. The current Editor-in-Chief of the Journal is Mrs. Ljiljana Radović.

Dr. Slavik Jablan
Initiator of the Journal

4.2. Books and Non-periodic Editions

Mrs. Branka Bubonja
Mathematical Institute SANU

Dr. Vladan Đorđević
Editor-in-Chief

Since 2000, the Committee for Non-Periodic Publications of the Institute has given its full attention especially to the following non-periodic publications:

- Posebna Izdanja (Special Editions), monographs in English summarizing results published in the well-known mathematical journals and
- Zbornik radova (Collection of Papers) published in English, contains various collections of papers, such as proceedings of conferences organized by the Mathematical Institute. Another type of papers in Zbornik radova is introductory papers from various mathematical areas, prepared in such a way to be a good introduction to narrower fields of mathematics, stimulating interest and research in these fields.

For many years Editor-in-Chief of the Committee was Academician Bogoljub Stanković and from 2015 it is Academician Vladan Đorđević.

In the last 10 years the Institute has published:

1. Generalized Semigroups and Cosine Functions/ Marko Kostić. Beograd: Matematički institut SANU, 2011.-Posebna izdanja 23
2. Login in Computer Science/editor Zoran Ognjanović. Beograd: Matematički institut SANU, 2009.-Zbornik radova, knj. 12 (20)
3. Applications of Graph Spectra/editors Dragoš Cvetković and Ivan Gutman. Beograd: Matematički institut SANU, 2009.-Zbornik radova, knj. 13 (21)
4. Selected Topics on Applications of Graph Spectra/editors Dragoš Cvetković and Ivan Gutman. Beograd: Matematički institut SANU, 2011.-Zbornik radova, knj. 14 (22)
5. Selected Topics on Image Processing and Cryptology/editor Miodrag Mihaljević. Beograd: Matematički institut SANU, 2012-Zbornik radova, knj. 15 (23)
6. Mechanics, Integrability and Control/editors Teodor Atanacković and Vladimir Dragović. Beograd: Matematički institut SANU, 2013-Zbornik radova, knj. 16 (24)
7. Selected Topics in Combinatorial Analysis/Editors Miloš Kurilić, Stevo Todorčević. Beograd: Matematički institut SANU, 2015-Zbornik radova, knj. 17 (25)
8. Logic in Computer Science II/editor Silvia Ghilezan. Beograd: Matematički institut SANU, 2015-Zbornik radova, knj.18 (26).

while, in cooperation with the Center for the Promotion of Science, the Institute published (Serbian translations):

1. Smem li da brojim?: matematičke priče/Ginter Cigler (Gunther M Ziegler). Beograd: Centar za promociju nauke: Zavod za udžbenike: Matematički institut SANU, 2012.
2. Živa teorema/Sedrik Vilani (Cedric Villani). Beograd: Centar za promociju nauke: Matematički institut SANU, 2013.
3. Transparentnost i briga o novcu poreskih obveznika/Franci Demšar. Beograd: Matematički institut SANU: Centar za promociju nauke, 2014.
4. Nedovršena igra: priča o rađanju verovatnoće/Kit Devlin (Keith Devlin). Beograd: Centar za promociju nauke: Matematički institut SANU, 2015.

4.3. Electronic Editions

eCatalog of Cultural Monuments in Serbia

Home page of the eCatalog:
http://spomenicikulture.mi.sanu.ac.rs/

The presentation Cultural Monuments in Serbia is a result of the joint endeavor of a multidisciplinary team of the National Center for Digitization, led by the Institute's members, with the aim of providing models for developing an electronic catalog of cultural monuments in Serbia and digitizing the corresponding documentation. In addition, by digitizing cultural resources - some of which cannot be presented in classical paper publications - and making them available online, this project also supports the heritage preservation and research.

The catalog combines records from various Serbian heritage institutions including bibliographic references for further study. The presentation contains documentation on 1300 most important cultural monuments.

Old maps, engravings and photographs from the collection of the City Museum of Belgrade

Home page of the Collection:
http://www.mi.sanu.ac.rs/muzej.beograd/

This is a partial presentation of the material that can be found on the CD with the same title. In addition to this material, the CD also contains more detailed scans of the maps, engravings, and photographs, audio recordings of the music related to the history of Belgrade, and movie clips showing objects in Belgrade, pictured on the engravings and photographs as they look today.

Only the engravings and photographs chosen for the promotion can be enlarged (by clicking on them), however not to the highest deegre because it would take too much time to load. CD can be ordered in the Mathematical institute of the Serbian Academy of Sciences and Arts (in Belgrade).

Serbia Forum, digital library of Serbian cultural heritage

Home page of the Digital Library:
http://www.serbia-forum.org

The digital platform Serbia Forum was developed by the Mathematical Institute as an extension of the system Austria Forum, made by the Graz University of Technology.

This platform is currently being used by prominent cultural institutions in Serbia such as the Serbian Academy, Matica Srpska, The Museum of the Serbian Orthodox Church, etc. to present their most important digital collections. The Serbia Forum platform was also used to develop the current version of the Digital National Library of Serbia.

Electronic editions of Serbian mathematical journals - ELIB

Homepage of the eLibrary:
http://elib.mi.sanu.ac.rs/pages/main.php

Digitization of mathematical journals printed in Serbia started in 1995 with the oldest (founded in 1932) and most important one - Publications de l'Institut Mathematique. As Internet became more and more popular, in the year 2002, an Internet database and the corresponding presentation of freely accessible full-text mathematical journals were created.

The following journals have been involved so far: Bulletin of International Mathematical Virtual Institute, Bulletin, Classe des Sciences Mathématiques et Naturelles, Sciences mathématiques, Computer Science and Information Systems, Filomat, IMVI Open Mathematical Education Notes, Istraživanje matematičkog obrazovanja, Journal of International Mathematical Virtual Institute, Kragujevac Journal of Mathematics, Matematički Vesnik, Matemtički kolokvijum, Nastava Matematike, Publications de l'Institut Mathématique, Publications of Department of Astronomy, Review of the National Center for Digitization, The Teaching of Mathematics, Theoretical and Applied Mechanics, VisMath, Yugoslav Journal of Operations Research and Zbornik Radova, with 764 issues and 9436 full-text articles.

Journal	Issues	Papers
Bulletin of International Mathematical Virtual Institute	7	75
Bulletin. Classe des Sciences Mathématiques et Naturelles. Sciences mathématiques	15	113
Computer Science and Information Systems	32	435
Filomat	74	1360
IMVI Open Mathematical Education Notes	4	11
Istraživanje matematičkog obrazovanja	5	21
Journal of International Mathematical Virtual Institute	4	17
Kragujevac Journal of Mathematics	23	359
Matematički Vesnik	178	2448
Matemtički kolokvijum	9	54
Nastava Matematike	51	427
Publications de l'Institut Mathématique	119	2336
Publications of Department of Astronomy	16	96
Review of the National Center for Digitization	27	339
The Teaching of Mathematics	35	164
Theoretical and Applied Mechanics	30	140
VisMath	67	295
Yugoslav Journal of Operations Research	54	541
Zbornik Radova	26	242
Total: 19 Journals	766	9473

The corresponding presentations of journals are dynamically generated from the database and can be searched by: authors' names, titles, titles of special sections within the journals, key words and words contained in abstracts.

5. OTHER ACTIVITIES

5.1. Popularization of Science

May Month of Mathematics - M3

Home page of the Activity:
http://m3.cpn.rs/

Mathematical Institute of the Serbian Academy of Sciences and Arts, together with the Center for the Promotion of Science, is the organizer of the May Month of Mathematics, the biggest domestic manifestation of science promotion. The manifestation was first held in 2012, and it consists of exhibitions, workshops, lectures, and other events dedicated to mathematics.

Project “Digitarijum”

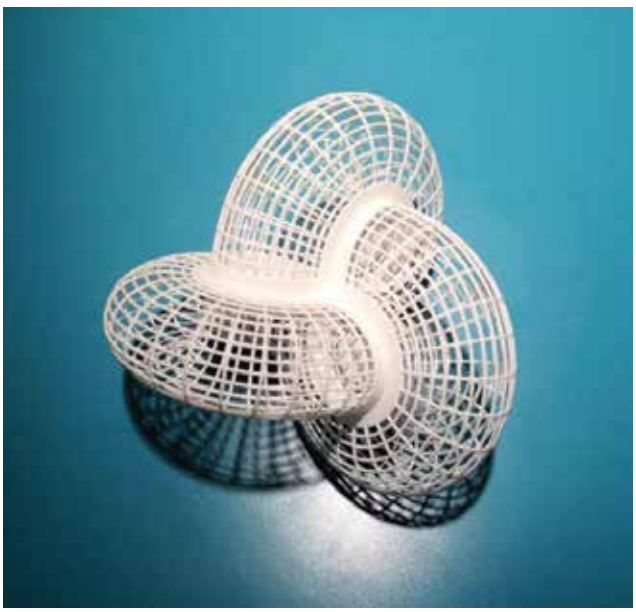
Home page of the Activity:
http://digitarijum.rs/

The project ‘DIGITARIJUM: Implementation of Digitization of Scientific and Cultural Heritage in School Curriculum’ was developed for students, teachers and young researchers by the Mathematical Institute of Serbian Academy of Sciences and Arts , and under the patronage of the Center for Promotion of Science in 2015. The project presents a unique initiative to popularize the science, technology, and culture among the young people, through the interaction between the digitization of heritage and educational work.

Viva Math Project

Home page of the Activity:
http://www.rade-zivaljevic.appspot.com/ziva-matematika/index.html

One of the important activities of the centre “Dynamical Systems, Geometry and Combinatorics” is the work on the popularization of mathematics. The associated project “Živa Matematika” (“Viva Math or Math Alive Project”) gathers together a group of active research mathematicians, sharing strong conviction that the education of general public about the importance and beauty of mathematics is as important as the research itself. The projects have covered a broad spectrum of activities, from popular lectures and workshops for elementary school children and general audience, to introductory lectures and mini courses, preparing young, talented, pupils and students for research in selected areas of contemporary mathematics.



5.2. Societies

The Institute supports work of the following societies:

- The Serbian Scientific Mathematical Society
  Home page of the Society: http://snmd.mi.sanu.ac.rs/
- Yugoslav Society for Applied and Industrial Mathematics (JUPIM)
  Home page of the Society: http://www.mi.sanu.ac.rs/societies/jupim.htm
- Serbian Society of Mechanics
  Home page of the Society: http://www.ssm.org.rs/english/indexeng.html
- Društvo za čistu i primenjenu logiku
  Home page of the Society: https://drustvozalogiku.wordpress.com/
- South Slovenian Academy of Nonlinear Sciences
  Home page of the Society: http://www.mi.sanu.ac.rs/jann/

5.3. Conferences

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

- Symposium on Operations Research (SYM-OP-IS)
- Logic and application, Dubrovnik, Croatia
- Probabilistic logics and applications, Belgrade, Serbia
- National Conference on Information Theory and Complex Systems TINKOS
- International Conference Geometry, Dynamics, Integrable Systems – GDIS
- New Technologies and Standards: Digitization of National Heritage
- SEEDI Conference: Digitization of cultural and scientific heritage

5.4. Administration

Administrative staff of the Institute in 2016
(from left to right: Milica Milinković, Branka Bubonja, Gordana Nastić, Dragan Aćimović, Biljana Marić and Zorica Vučković Denić)

Mathematical Institute has always kept its administrative staff to a bare minimum.

Currently, it has just six members of administration: Mrs. Gordana Nastić (administrative secretary to the Director, Managing Board and Scientific Committee; personnel, etc.), Mrs. Milica Milinković (accounting, finances), Mrs. Branka Bubonja (library, publications exchange), Mr. Dragan Aćimović (technical support), Mrs. Biljana Marić (filling, mail, etc.) and Mrs. Zorica Vučković Denić.

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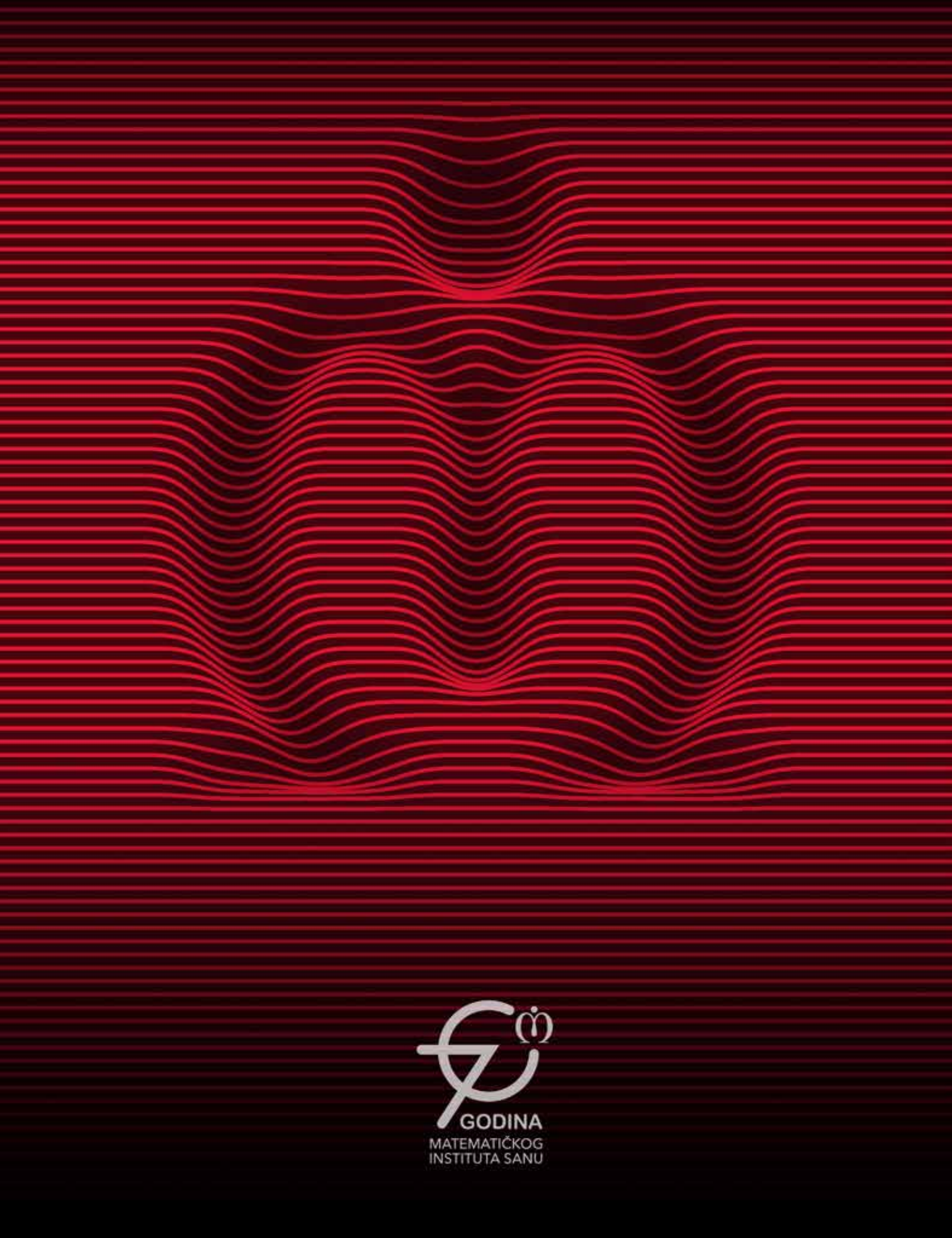
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