AKADEMIJA NAUKA I UMJETNOSTI BOSNE I HERCEGOVINE
АКАДЕМИЈА НАУКА И УМЈЕТНОСТИ БОСНЕ И ХЕРЦЕГОВИНЕ
ACADEMY OF SCIENCES AND ARTS OF BOSNIA AND HERZEGOVINA

International Scientific Conference

MODERN ALGEBRA AND ANALYSIS AND THEIR APPLICATIONS

PROGRAMME • ABSTRACTS • BIOGRAPHIES

Academy of Sciences and Arts of Bosnia and Herzegovina

September 20-22, 2018

ACADEMY OF SCIENCES AND ARTS OF BOSNIA AND HERZEGOVINA
DEPARTMENT OF NATURAL SCIENCES AND MATHEMATICS

INTERNATIONAL SCIENTIFIC CONFERENCE „MODERN ALGEBRA AND ANALYSIS AND THEIR APPLICATIONS"

Sarajevo
Academy of Sciences and Arts of Bosnia and Herzegovina
September 20-22, 2018

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ABSTRACTS
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SARAJEVO, 2018

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PROGRAMME

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PROGRAMME

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International Scientific Conference
„ MODERN ALGEBRA AND ANALYSIS AND THEIR APPLICATIONS"
20-22 September 2018, Sarajevo
Academy of Sciences and Arts of Bosnia and Herzegovina
www.anubih.ba

PROGRAMME

1st DAY: THURSDAY, SEPTEMBER 20, 2018

ARRIVAL OF LECTURERS AND TRANSFERS TO THE HOTEL
Accommodation for lecturers is provided in Hotel Holiday Sarajevo
Zmaja od Bosne 4, Sarajevo 71000

2nd DAY: FRIDAY, SEPTEMBER 21, 2018

8:30-9:00 **Registration of participants**

9:00-9:30 **Opening speeches**

9:30-9:50 **Prof. Dr. Vlastimil Dlab F.R.S.C.**
Carleton University, Ottawa, CA
"S*emigroup algebras of inverse semigroups*"

9:50-10:10 **Prof. Dr. Alain Escassut, Monique Chicourra**
Department of Mathematics, University Clermont Auvergne, Aubiere, FR
"*Banach algebras of ultrametric Lipschitzian functions*"

10:10-10:30 **Academician Stevan Pilipović, et al.**
Department of Mathematics and Informatics, University of Novi Sad, Novi Sad, RS
"*On the convolution in the non-quasi-analytic class of ultradistributions*"

10:30-10:50 **Prof. Dr. Viacheslav A. Artamonov**
High Algebra Department, Lomonosov Moscow State University, Moscow, RU
"*Polynomially complete quasigroups and their application in cryptography"*

10:50-11:20 **COFFEE BREAK**

11:20-11:40 **Prof. Dr. Mirjana Vuković, corresponding member of ANUBiH**
Department of Natural Sciences and Mathematics, Academy of Sciences and Arts of Bosnia and Herzegovina, Sarajevo, BA
"From Krasner's corpoid and Bourbaki's graduations to Krasner's graduations and Krasner-Vuković's paragraduations"

11:40-12:00 **Prof. Dr. Irina N. Balaba, Prof. Dr. Alexander V. Mikhalev**
Department of Mathematics, Physics and Information Technologies, Tula State Lev Tolstoy Pedagogical University, Tula, RU;
High Algebra Department, Lomonosov Moscow State University, Moscow, RU
"*Graded division rings***"**

12:00-12:20 **Prof. Dr. Nadiya Gubareni**
Institute of Mathematics, Częstochowa University of Technology, Częstochowa, PL
"*Mixed matrix problems in the theory of representations***"**

12:20-12:40 **Prof. Dr. Alexander E. Guterman**
Lomonosov Moscow State University, Moscow, RU
"On the values of permanent function"

12:40-14:00 **LUNCH**

14:00-14:20 **Prof. Dr. Alexei Pantchichkine**
Institute Fourier, University Grenoble-Alpes, Gières, France, FR
"*Constructions of p-adic L-functions and admissible measures for Hermitian modular forms***"**

14:20-14:40 **Prof. Dr. Nikolay I. Dubrovin**
Vladimir State University, Vladimir, RU
"*Automorphisms of the module formal sums***"**

14:40-15:00 **Prof. Dr. Svjetlana Terzić, corresponding member of CANU**
University of Montenegro, Podgorica, ME
"*On rational homotopy of the based loops on compact homogeneous spaces***"**

15:00-15:20 **Prof. Dr. Mirna Džamonja**
University of East Anglia, Norwich, GB
"*Logic of chains***"**

15:20-16:00 **DISCUSSION and CLOSING REMARKS**

16:00-19:00 **FREE TIME**

19:30 **DINNER in one of Sarajevo restaurants**

3rd DAY: SATURDAY, SEPTEMBER 22, 2018

- **Sightseeing of Sarajevo old town monuments (guided tour)**
- **Lunch in one of old town's *ćevabdžinica* (restaurant with traditional food *ćevapčići*)**

ABSTRACTS

POLYNOMIALLY COMPLETE QUASIGROUPS AND THEIR APPLICATION IN CRYPTOGRAPHY

Viacheslav A. Artamonov
High Algebra Department, Lomonosov Moscow State University
Moscow, Russia

Abstract

Large order cryptographically suitable quasigroups have important applications in the development of crypto-primitives and cryptographic schemes. They present new perspectives of cryptography and information security. From algebraic point of view polynomial completeness is one of the most important characteristic for cryptographically suitable quasigroups.

In the present paper we give a survey of some recent results concerning properties of polynomially complete quasigroups, problem of their recognition from their Latin square and a problem of construction of those quasigroups of sufficiently large order.

2010 *Mathematics Subject Classification:* 20N05, 08A40, 08B10.
Key words and phrases: universal algebra, quasigroups, Latin square, polynomial completeness.

GRADED DIVISION RINGS

Irina N. Balaba
Department of Mathematics, Physics and Information Technologies
Tula State Lev Tolstoy Pedagogical University
Tula, Russia

Alexander V. Mikhalev
High Algebra Department, Lomonosov Moscow State University
Moscow, Russia

Abstract

In this talk we present some results from the graded division rings, that is, graded rings in which every nonzero homogeneous element is invertible. Even though that the graded division rings are not division rings in the usual sense the graded modules over graded division rings have properties similar to those of the linear spaces. We consider the properties of the graded linear spaces and its endomorphism rings. A central problem in the study of operator rings of linear spaces and endomorphism rings of modules is the characterization of their isomorphisms. Isomorphisms of rings of linear transformations of vector spaces over division rings were characterized by Baer (see [R. Baer, Linear Algebra and Projective Geometry, Academic, New York, 1952]). We show that each isomorphism of graded rings of linear transformations is induced by some semi-linear transformation of linear spaces, and each anti-isomorphism of graded rings of linear transformations is induced by some anti-semilinear transformation. As consequences we obtain the grading of matrix rings over division rings.

2010 *Mathematics Subject Classification:* 16W50.
Key words and phrases: graded rings, graded division rings, endomorphism rings, semi-linear isomorphism.

SEMIGROUP ALGEBRAS OF INVERSE SEMIGROUPS

Vlastimil Dlab
Carleton University
Ottawa, Canada

Abstract

The lecture, supplemented with a number of illustrations, will present some results in the theory of representations of finite semigroups. The main objects of study are finite semigroup of partial monomorphisms defined on a set endowed with a particular structure. In order to be able to exploit some of the fundamental results of the representation theory of finite-dimensional associative algebras, such as classification of the representations of the hereditary algebras in terms of Dynkin and Euclidean diagrams, we shall introduce the concept of a graph semigroup. Graph semigroups prove to be very effective in dealing with the representations of full subsemigroups of inverse semigroups introduced by V. V. Vagner in his geometrical considerations as a natural generalization of groups. One can, in particular, devise an algorithm to describe all indecomposable projective representations of any semigroup of partial isomorphisms of a finite set X X that are compatible with a given relation on X contained in a total order on X. Thus, the "classical" symmetric semigroup of all partial isomorphisms of a given finite set X, as well as the semigroup of all partial isomorphisms preserving a given partial order of X, or a partition of X, are covered by this scheme. The algorithm yields an explicit description of the structure of regular representations of such a given semigroup by exhibiting a complete set of primitive orthogonal idempotents of the respective semigroup algebra and thus presenting the quivers of the respective semigroup algebra. It is at this stage that one can consider questions related to the representation type of a given semigroup and provide in some cases a complete classification of all indecomposable representations.

2010 *Mathematics Subject Classification:* 20M18, 18A20, 20M99, 05C20, 47A65.
Key words and phrases: partial monomorphisms of sets with a structure, inverse semigroup, graph semigroup, quiver of a semigroup algebra, classification of indecomposable representations.

AUTOMORPHISMS OF THE MODULE FORMAL SUMS

Nikolay I. Dubrovin
Vladimir State University
Vladimir, Russia

Abstract

Besides Tychonoff topology on a direct product of discreet skew fields a variety of other topologies are defined and studied which correspond to given filters on the support. The main result in this paper -- the description of continuous linear operators of a space of formal sums (theorem 2.4).

Theorem.

1. Every T- automorphism is an automorphism of the space $K\{G\}_K$ and maps any T- basis into a T- basis.
2. The inverse mapping to T-automorphism is also T-automorphism. Moreover, the set of all T-automorphisms is a subgroup in the group of automorphisms $\mathrm{Aut}K\{G\}_K$.
3. If $\{\beta_h | h \in G\}$ and $\{\gamma_h | h \in G\}$ are two T - bases, then the mapping $q : K\{G\} \to K\{G\}$, given by

$$\sum_{h\in G}{}^{\mathsf{T}}\ \beta_h k_h \to \sum_{h\in G}{}^{\mathsf{T}}\ \gamma_h k_h$$

will be T - automorphism.

2010 *Mathematics Subject Classification:* 20F60, 16W60, 47S99.
Key words and phrases: continuous linear operators, formal power series, right ordered group.

LOGIC OF CHAINS

Mirna Džamonja
University of East Anglia
Norwich, United Kingdom

Abstract

We discuss a topic that bridges many areas of research in discrete mathematics and mathematical logic. First order logic of chains was discovered by Carol Karp (see the volume [2]) and revisited in recent work of Mirna Džamonja with Jouko Väänänen [1]. The results have shown that the logic, defined through a singular cardinal of countable cofinality, behaves very much like the first order logic. In our new joint work, we study higher order versions of the logic of chains and their fragments to defend the idea that in this context we can also recover similarities with the ordinary first order logic. Moreover, we make connections between the logic of chains and computational models, including tree automata and transfinite Turing machines.

References:

[1] Mirna Džamonja and Jouko Väänänen, Chain models, trees of singular cardinality and dynamic EF games, Journal of Mathematical Logic (2011) vol. 11 (1), pg. 61-85.
[2] Kueker, David (ed.) Infinitary logic: in memoriam Carol Karp, Lecture Notes in Math., Vol. 492, Springer, Berlin (1975).

2010 *Mathematics Subject Classification:* 03E04, 54E99.
Key words and phrases: chain logic, singular cardinal, strong logic.

BANACH ALGEBRAS OF ULTRAMETRIC LIPSCHITZIAN FUNCTIONS

Alain Escassut

Monique Chicourra

Department of Mathematics, University Clermont Auvergne
Aubiere, France

Abstract

We examine Banach algebras of bounded uniformly continuous functions and particularly Lipschitzian functions from an ultrametric space E to a complete ultrametric field K: prime and maximal ideals, multiplicative spectrum, Shilov boundary and topological divisors of zero. We get a new compactification of E similar to the Banaschewski's one and which is homeomorphic to the multiplicative spectrum. On these algebras, we consider two norms: a norm letting them to be complete and the norm of uniform convergence (which is weaker), for which prime closed ideals are maximal ideals. When E is a subset of K, we also examine algebras of Lipschitzian functions that are derivable or strictly differentiable. Finally, we examine certain abstract Banach K-algebras in order to show that they are algebras of Lipschitzian functions on an ultrametric space through a kind of Gelfand transform.

2010 *Mathematics Subject Classification:* 46S10, 12J25.
Key words and phrases: ultrametric topologic algebras, multiplicative spectrum, stone compactification, Lipschitzian functions.

MIXED MATRIX PROBLEMS IN THE THEORY OF REPRESENTATIONS

Nadiya Gubareni
Institute of Mathematics, Częstochowa University of Technology
Częstochowa, Poland

Abstract

In this talk we consider some matrix problems, i.e. the problems of reducing a family of matrices by some family of admissible transformations. Such kind of problems often arise in mathematics and in particular in the theory of representation of algebras, rings and species.

Following to R. B. Warfield, Jr. a ring is of bounded representation type if there is an upper bound on the number of generators required for indecomposable finitely presented right modules. Analogously we can define flat matrix problem of bounded representation type.

Flat matrix problem of mixed type over a discrete valuation ring with its skew field of fractions was considered by A. G. Zavadskii and U. S. Revitskaya. In this talk we study flat matrix problems of bounded representation type which are considered over discrete valuations rings with their common skew fields of fractions and extensions of these skew fields.

We show the connection of considered flat matrix problems of mixed type with representations of (D,O)-species, which are generalizations of species as introduced by P. Gabriel in 1972, of bounded representation type. We also give the classification of such (D,O)-species in terms of diagrams which are similar to Dynkin diagrams.

2010 *Mathematics Subject Classification:* 16G20, 16G60, 16P40, 16D70, 16D90.
Key words and phrases: mixed matrix problems, discrete valuation rings, species, (D,O)-species, species of bounded representation type, rings of bounded representation type.

ON THE VALUES OF PERMANENT FUNCTION

Alexander E. Guterman
Lomonosov Moscow State University
Moscow, Russia

Abstract

The classes of $(0,1)$ and $(-1,1)$-matrices are very important in algebra and combinatorics and in various their applications.
An important matrix function is the permanent:

$$\operatorname{per} A = \sum_{\sigma \in S_n} a_{1\sigma(1)} \cdots a_{n\sigma(n)},$$

here $A = (a_{ij}) \in M_n(\mathsf{F})$ is an $n \times n$ matrix over a field F and S_n denotes the set of all permutations of the set $\{1, \ldots, n\}$.
While the computation of the determinant can be done in a polynomial time, it is still an open question, if there are quick algorithms to compute the permanent. Thus different bounds for permanent became actual, see [1, 2, 3].
In this talk we discuss the values that permanents of $(-1,1)$ and $(0,1)$-matrices can attain.
The talk will be based on series of joint results with M. Budrevich and K. Taranin.

References:

[1] H. Minc, Bounds for permanents and determinants. – Linear and Multilinear Algebra, **9** (1980), 235–239.
[2] H. Minc, Theory of permanents 1978–1981. – Linear and Multilinear Algebra, **12** no. 4 (1983), 227–263.
[3] H. Minc, Theory of permanents 1982–1985. – Linear and Multilinear Algebra, **21** no. 2 (1987), 109–148.

2010 *Mathematics Subject Classification:* 15A15, 15B35.
Key words and phrases: permanent, $(0,1)$-matrices, $(-1,1)$-matrices, upper bounds.

CONSTRUCTIONS OF p-ADIC L-FUNCTIONS AND ADMISSIBLE MEASURES FOR HERMITIAN MODULAR FORMS

Alexei Pantchichkine
Institute Fourier, University Grenoble-Alpes
Gières, France

Abstract

For a prime p and a positive integer n, the standard zeta function $L_F(s)$ is considered, attached to an Hermitian modular form $F = \sum_H A(H)q^H$ on the Hermitian upper half plane H_m of degree n, where H runs through semi-integral positive definite Hermitian matrices of degree n, i.e. $H \in \Lambda_m(\mathsf{O})$ over the integers O of an imaginary quadratic field K, where $q^H = \exp(2\pi i \mathrm{Tr}(HZ))$. Analytic p-adic continuation of their zeta functions constructed by A. Bouganis in the ordinary case, is extended to the admissible case via growing p-adic measures. Previously this problem was solved for the Siegel modular forms. Main result is stated in terms of the Hodge polygon $P_H(t): [0, d] \to \mathbb{R}$ and the Newton polygon $P_N(t) = P_{N,p}(t): [0, d] \to \mathbb{R}$ of the zeta function $L_F(s)$ of degree $d = 4n$. Main theorem gives a p-adic analytic interpolation of the L values in the form of certain integrals with respect to Mazur-type measures.

2010 *Mathematics Subject Classification:* 11F67, 11F85, 11F33.
Key words and phrases: automorphic forms, classical groups, p-adic L-functions, differential operators, non-archimedean weight spaces, Fourier coefficients.

ON THE CONVOLUTION IN THE NON-QUASI-ANALYTIC CLASS OF ULTRADISTRIBUTIONS

Stevan Pilipović
Department of Mathematics, University of Novi Sad,
Novi Sad, Serbia

Bojan Prangoski
Department of Mathematics and Informatics, Faculty of Mechanical Engineering
Skopje, Macedonia

Jasson Vindas
Department of Mathematics, Ghent University
Ghent, Belgium

Abstract

We have studied the convolution of ultradistributions in several papers. The most complicated case is related to the non-quasi-analytic class which needs a new parametrix method. Moreover the analysis of ε type tensor products in the quasi-analytic class is needed in order to obtain the most general definition of convolution in this class.
As a consequence, we obtain the extensions of certain classes of global pseudo-differential operators. Actually this is the most important result of our investigations in this domain.

2010 *Mathematics Subject Classification:* Primary: 46E10, 46F05; Secondary: 46E40, 46F10, 46F15, 44A35.
Key words and phrases: topological linear spaces of: continuous analytic functions, (ultra-) distributions, spaces of vector- and operator- valued functions, operations with distributions, Analytic functions, convolutions.

ON RATIONAL HOMOTOPY OF THE BASED LOOPS ON COMPACT HOMOGENEOUS SPACES

Svjetlana Terzić
University of Montenegro
Podgorica, Montenegro

Abstract

The rational homotopy theory of a simply connected topological space X of finite type is algebraically modeled using minimal model theory due to the famous results of Quillen and Sullivan [2], [3]. For X being a manifold its minimal model can be constructed starting from the de Rham algebra of differential forms on X and when X is a formal manifold its minimal model can be constructed from its rational cohomology algebra. Due to the theorem of Milnor and Moore, the rational Pontrjagin homology ring of the based loop space on X is completely determined by the minimal model for X [1]. In this talk we will present some problems and the results which are concerned with the rational homotopy of the based loop spaces of the simply connected compact homogeneous spaces of positive Euler characteristic, formulated and obtained in terms of the corresponding minimal model theory.
In particular, we present the computation of rational Pontrjagin homology ring of the based loop spaces on some compact homogeneous spaces G/H, when H is not a total subgroup of G.

References:

[1] J. Milnor and J. Moore, *On the structure of Hopf algebras*, Annals of Math. 81 (1965), 211–264.
[2] D. Quillen, *Rational homotopy theory*, Annals of Math. 90 (1969), 205–295.
[3] D. Sullivan, *Infinitesimal computations in topology*, Publ. I. H. E. S 47 (1977), 269–331.
[4] S. Terzić, *Rational homotopy groups of generalized symmetric spaces*, Math. Zeit. 243 (3), 491-523, 2003.

2010 Mathematics Subject Classification: 57T20, 55P62 (Primary); 55P35, 57T35 (Secondary).
Key words and phrases: homogeneous spaces, based loop spaces, Pontrjagin homology ring.

FROM KRASNER'S CORPOID AND BOURBAKI'S GRADUATIONS TO KRASNER'S GRADUATIONS AND KRASNER-VUKOVIĆ'S PARAGRADUATIONS

Mirjana Vuković
Academy of Sciences and Arts of Bosnia and Herzegovina
Sarajevo, Bosnia and Herzegovina

Abstract

The lecture, supplemented with a short history of graduation related to Krasner's notion of a corpoid [2] and general graded group in Krasner's sense [5] (see also [6]), will present some results in the theory of Krasner-Vuković's paragraded group including examples of paragraduations which are not graduations ([7-9]).

The first relatively general definition of graded groups was given by Bourbaki [1]. But this definition was not general enough, because it was formulated with some unnecessarily restrictive conditions – it was based on the notion of the Abelian graded group. It is a very good definition, although there is no need to limit it to the Abelian case.

However, a little is known that all started earlier, during 1940's, with the abstract notion of a corpoid, introduced by Krasner, while he investigated valued fields and observed connection to their valuation rings, via the notion of equivalence of valuations. Corpoid is actually the homogeneous part of a graded field, graded by an arbitrary non-empty set, with induced operations among which the induced addition is, naturally, a partial operation. Corpoid first appeared in a series Krasner's Comptes Rendus notes in 1944 and 1945 ([2-4]). The abstract notion of corpoid led Krasner to a development of a general graded theory ([2-5]).

Leaving aside the Bourbaki's hypothesis of commutativity, Krasner reintroduce the notion of more general graduation and showed that these graded structures are characterized by both the underlying abstract group and the homogeneous part (or even only by the homogeneous part) equipped with the operation(s) induced by operation(s) of the structure. So, characterization axioms give way to three study methods of graded structures (groups, rings, modules) in principle equivalent: i) *the non-homogeneous methods*; ii) *the semi-homogeneous methods* and iii) *the homogeneous methods* ([5, 7]).

It is well known that Bourbaki's and Krasner's general graded structures (groups, rings, modules) compose the categories that are not closed with respect to direct sum and direct product. The aim of a new concept in our joint papers ([8]) and monograph ([7]) was to introduce the algebraic structures which generalize the classic graded structures and have in each of the three cases: groups, rings and modules, the property of closure with respect the direct sum and the direct product.

In this way we developed a theory of paragraded structures, which generalizes, not only, the theory of graded structures as it is exposed in Bourbaki ([1]), but also the previous results of M. Krasner ([5]). Some new results and some examples of paragraduations which are also graduations, as well as some examples of paragraduations which are not graduations are presented.

References:

[1] N. Bourbaki: *Algèbre,* Chap. II, 3*ème édit*. Herman, Paris (1962).

[2] M. Krasner: *Une généralisation de la notion de corps-corpoïde. Un corpoïde remarquable de la théorie des corps valués,* C. R. Acad. Sci., Paris 219 (1944), 345-347.

[3] M. Krasner: *Hypergroupes moduliformes et extramoduliformes,* C. R. Acad. Sci., Paris*,* 219 (1944), 473-476.

[4] M. Krasner: *Théorie de la ramification dans les extensions finies des corps valués*: *Hypergroupe d'inertie et de ramification*; *Théorie extrinsèque de la ramification,* C. R. Acad. Sci., Paris, 220 (1945), 28-30.

[5] M. Krasner: *Anneaux gradués géneraux*, Colloque d'Algèbre Rennes, 1980, 209-308.

[6] M. Krasner: *Le vieux qui est noef,* Revue Romaine de Math. pure et appliquées, T. XXVII, 443-472.

[7] M. Krasner, M. Vuković: *Structures paragraduées* (*groupes, anneaux, modules*), monograph, Queen's Papers in Pure and Applied Mathematics, No. 77, Queen's University, Kingston, ONT., Canada, 1987, pp. 163.

[8] M. Krasner, M. Vuković: *Structures paragraduées* (*groupes, anneaux, modules*) *I*, Proc. Japan Acad. Ser.A, 62 No. 9 (1986), 350-352; *Ibd. II,* Ser. A, 62, No.10 (1986), 389-391; *Ibd. III,* 63, Ser. A, 63, No.1 (1986), 10-12

[9] M. Vuković: *Structures graduées et paragraduées,* Prepublication de l' Institut Fourier, Université de Grenoble I, No. 536 (2001), 1-40.

2010 *Mathematics Subject Classification:* 08A05, 18A22, 20J15.

Key words and phrases: graded group, corpoid, group theory and gneralization, general algebraic system.

BIOGRAPHIES

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Professor Viacheslav Alexandrovich Artamonov was born in Tula in 1946. He graduated from Faculty of Mechanics and Mathematics in 1968 in Lomonosov Moscow State University. In 1971 he received the degree of a candidate of physico-mathematical sciences from Faculty of Mechanics and Mathematics.

His scientific advisor was Prof. A. G. Kurosh. In 1991 V. A. Artamonov received the degree of a doctor of physico-mathematical sciences from Faculty of Mechanics and Mathematics. In 2016 V. A. Artamonov was elected as a Head of Department of Higher Algebra. In 2013 he was also elected as a Head of Department of Informatics and Mathematics in Russian Foreign Trade Academy.

Professor Artamonov is the author of more than 140 papers in algebras and its applications. His scientific interests are: universal algebra, group and ring theories, symmetries of quasicrystals, information security.

Professor V. A. Artamonov is a member of editorial boards of the following journals: Communications in Algebra, Asian-European mathematical journal, Algebra and Discrete mathematics, Quaisgroups and related systems, Fundamental and Applied mathematics.

Prof. Dr. IRINA NIKOLAEVNA BALABA

Department of Mathematics, Physics and Information Technologies
Tula State Lev Tolstoy Pedagogical University
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e-mail: ibalaba@mail.ru

Professor Irina Nikolaevna Balaba was born in 1958 in Baku, Soviet Union.

After graduating from the school in Baku, she became a student of the Faculty of Mechanics and Mathematics of Lomonosov Moscow State University. She was a student of Alexander Vasilevich Mikhalev. She graduated from Moscow State University in 1980, and post-graduate study at High Algebra Department in 1983. There she defended her Candidate's thesis in 1986 and her Doctor's thesis in 2012.

She started her mathematical career as an Assistant in Tula State University in 1984. Since 1989 she has been working in Tula State Lev Tolstoy Pedagogical University. She took up a post of the senior researcher, associate professor, head of the department and professor.

She is the author or co-author of more than 100 publications, including 4 textbook. She has delivered many fundamental courses of lectures in different areas of algebra, geometry and elementary mathematics.

Her Ph.D. (Candidate's) thesis was related to Computer Algebra. Now her research interests lie in the area of Graded rings. The results obtained by her (often in cooperation with her colleagues) deal with the following matters: graded equivalence in full subcategories of category of graded modules; graded radicals of graded rings; graded rings of quotients; graded Baer–Kaplansky problem.

Prof. Dr. VLASTIMIL DLAB, F.R.S.C

Distinguished Researcher and
Professor Emeritus
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Professor Vlastimil Dlab was born in 1932 in the North-Bohemian village of Bzi, Czechoslovakia. In 1956 he graduated from the Charles University in Prague (RNDr.). There he started his mathematical career in algebra and received CSc. (Candidate of Science) in 1959, and DSc. (Doctor of Science) in 1966.

For several years, he held a position at the University of Khartum. In 1965 he was invited to the Institute for Advanced Studies in Canberra where he stayed for three years. Returning from Australia to the Charles University where he was to be appointed Professor, the political situation in Czechoslovakia led him to accept an offer from Carleton University in Ottawa, Canada. He has been working there ever since, with numerous stays at other research centers and universities all around the world.

He has been associated with Carleton University, as professor of mathematics, as Department chair (1971-74 and 1994-1997), director of Ottawa-Carleton Institute of Mathematics and Statistics (1992-94). He served as Chairman of the Research Committee of the Canadian Mathematical Society (1973-77). In 1977, he was elected a Fellow of the Royal Society of Canada (Academy of Science). He is a Professor Hospitus of the Normal University in Beijing and Charles University in Prague.

Prof. Dlab is a specialist on modern algebra with important contributions across the field. His recent work has been on representation theory and theory of quasi-hereditary algebras. He has written over 130 research papers, 5 books, a large number of papers on education of mathematics and edited over a dozen of Proceedings of international conferences.

He was Editor-in-Chief of *Canadian Journal of Mathematics* (1988-94) and *Mathematical Reports of the Academy of Science - Comptes rendus mathématique* (1998-2008), and Member of a number of Editorial Boards, including *Communications in Algebra* (1984-94), *Algebra and Representation Theory* (1997-2018), *Algebra and Discrete Mathematics* (2002-18), *Southeast Asian Bulletin of Mathematics* (1984-present) and *Czechoslovak Mathematical Journal* (2006-present).

Prof. Dr. NIKOLAY IVANOVICH DUBROVIN

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Nikolay Ivanovich Dubrovin was born on December 7, 1952 in Vladimir (180 km from Moscow). He graduated from Kolmogorov's boarding school of the Lomonosov Moscow State University - (MGU), where he studied mathematics at the Faculty of Mechanics and Mathematics of the MGU.

In 1979 he completed postgraduate studies by defending the candidate dissertation under the title "Non-commutative valuation rings" and in 1992 he obtained the doctorate of physical and mathematical science by defending his doctoral dissertation "Non-commutative arithmetic rings" at the High Algebra Department of MGU, both under the mentorship of Alexander Vasilevich Mikhalev.

The range of scientific and academic interests of Nikolay Dubrovin covers the following fields: ring theory, embedding right-ordered groups into the field, extending the valuation from group to field, Skew groups, embedding a group algebra into a field.

Since the end of his studies, Nikolay Dubrovin has been working at the Institute of Applied Mathematics, Physics and Informatics of the Vladimir State University. Since 1994, he is professor, and since 2000 the Head of the Department of Algebra and Geometry.

Prof. Dr. MIRNA DŽAMONJA

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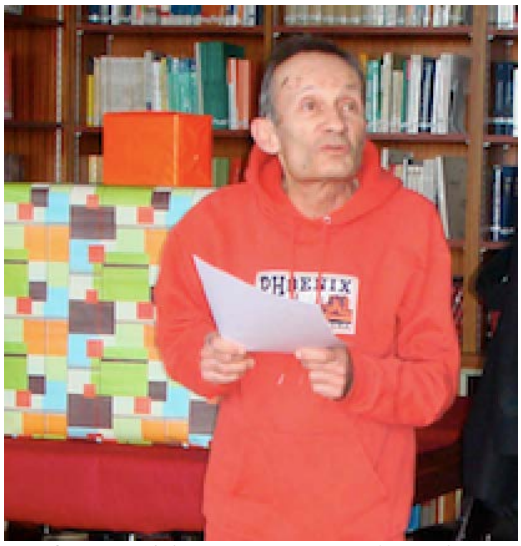
Professor Mirna Džamonja was born in 1965 in Sarajevo. She now shares her time between England, as a Professor of Mathematics at the University of East Anglia, Norwich (UEA) and France, as an Associate Member of the Institute for the Philosophy of Sciences and Technology (IHPST), Université Panthéon-Sorbonne, Paris 1. She specialises in mathematical logic, especially set theory and its connections with other subjects of mathematics and computer sciences, as well as the philosophy of mathematics and foundations of mathematics and computer sciences.

Mirna Džamonja got her B.Sc. in Mathematics at the University of Sarajevo in 1988, when she won the Golden badge of the University. She continued her studies in the Department of Mathematics at the University of Wisconsin-Madison, USA (UW-Madison), with an M.A. in 1990 and Ph.D. in 1993 (with Kenneth Kunen). She went on a two year postdoc at the Hebrew University of Jerusalem, Israel, with Saharon Shelah and Menachem Magidor. Then she taught for three years at UW-Madison, to finally move to UEA in 1998. She was elected Professor of Pure Mathematics at UEA in 2010 and in 2015 she was named Associate Member of IHPST. Over the years she was an Invited Professor at CUNY (New York), UW-Madison, Université Paris VII and K. Goedel Center in Vienna.

Professor Džamonja's work includes papers in set theory, model theory, combinatorics, measure theory, theory of order, Banach spaces, topology and functional analysis, as well as computer sciences and philosophy. She is a leader on the questions of universality and combinatorial principles and an important contributor to the theory of singular cardinals. She proved the consistency of the existence of a universal uniform Eberlein compact with the negation of GCH, answering a question in functional analysis which was open for almost 30 years, and she developed the theory of forcing at the successor of singulars. She obtained a Forchheimer Fellowship (Israel, 1994) and an EPSRC Advanced Fellowship (UK, 2002) and Leverhulme Trust Fellowship (UK, 2014) and Simons Foundation Fellowship (UK, 2015). She served as the Chair for the Association's for Symbolic Logic Committee for Logic in Europe, President of the European Set Theory Society, editor in numerous journals, including as a co-editor in chief of Sarajevo Journal of Mathematics, and member of the EPSRC Peer Review College. She has had fifteen Ph.D. students and many Masters' students.



Prof. Dr. ALAIN ESCASSUT

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Professor Alain Escassut was born in 1943, in France. He studied at the University of Bordeaux. He achieved his Ph.D. in 1970, supervised by Jean Fresnel, on algebras H(D) of analytic elements on an ultrametric complete algebraically closed field K defined by Marc Krasner and showed that most of algebraic properties are linked to T-filters on the set D, like the problem of analyticity.

Working as Maître-Assistant or Maître de Conference at the University of Bordeaux, he then examined the link between algebras defined by J. Tate, called affinoid algebras and algebras of analytic elements H(D): they were called Krasner-Tate algebras; they are very simple algebras, among the set of Krasner algebras H(D). That was his These de Doctorat d' Etat.

Following works by Bernard Guennebaud, he then examined the continuous semi-multiplicative seminorms of Banach algebras on a complete ultrametric field. Particularly, for Krasner algebras H(D), they are characterized by circular filters. That study led him to many results of ultrametric holomorphic calculus, particularly regarding idempotents and the spectral semi-norm. It is also the basis of all Berkovich theory.

Appointed Professor at the University Blaise Pascal of Clermont-Ferrand in 1987, he examined applications of the ultrametric Nevanlinna Theory in joint works with A. Boutabaa, defining the affinely rigid sets that were proven to be the Unique Range Sets for polynomials (with L. Haddad, A. Boutabaa) and finally Unique Range Sets for all entire functions in the ultrametric field, a generalization by W. Cherry and C. C. Yang.

An ultrametric version of the Kakutani problem (Corona problem) was examined. Several successive solutions were given, (certain with Nicolas Mainetti). The final solution was given in 2015 for proving the density of the "open unit disk" inside the set of all continuous multiplicative semi-norms whose kernel is a maximal ideal.

Applications of the *p*-adic Nevanlinna Theory were given to meromorphic functions: branched functions, small functions, exceptional values (with K. Boussaf, J Ojeda, and J-P. Bézivin) and recently, a new ultrametric Nevanlinna Theory out of a hole was made in joint works with Ta Thi Hoai An and applications to meromorphic functions sharing some sets CM or IM.

New works on Banach algebras of ultrametric Lipschitzian functions are being made, in a joint work with Monique Chicourrat: maximal ideals, multiplicative spectrum and applications, in connection with ultrafilters on the set of definition.

Professor Alain Escassut advised four Students in Ph.D. and five Habilitations. His books published with WSCP: Analyic Elements in *p*-adic Analysis, Ultrametric banach Algebras, Value Distribution in p-adic Analysis.

Prof. Dr. NADIYA GUBARENI

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Professor Nadiya Gubareni was born in 1951. In 1973 she graduated from the Faculty of Mechanics and Mathematics of Kiev State University in Kiev, Ukraine, and got her M.Sc. (Diploma) in Mathematics. In 1979 she defended her Ph.D thesis entitled *Structure of semiperfect right hereditary and right Noetherian rings of bounded representation type* under supervisor Dr. V. V. Kirichenko. In 1998 she defended her D.Sc. (Habilitation) thesis entitled *Elaboration of computational methods, algorithms and structures for solving the problems of computer tomography with limited number of projection data* in the Institute of Modelling Problems in Energy, Ukrainian Academy of Science, Kiev, Ukraine.

During the years 1973-2004 she held research positions in the Institute of Modelling Problems in Energy, Ukrainian Academy of Science, Kiev, Ukraine. From 1995 she works as a lecturer in Częstochowa University of Technology, Poland. From 1999 to present she is in the position of a professor in the Institute of Mathematics of Częstochowa University of Technology and now she is a Chair of the Department of Applied Algebra. Since then she gives many fundamental courses of lectures in different areas of analyses, algebra, geometry and computer science.

Her major research interests are the following domains in mathematics and computer science: theory of non-commutative algebras, rings and modules over them; mathematical methods and algorithms in computer tomography; asynchronous methods and parallel algorithms.

Nadiya Gubareni is an author and co-author of more than 80 publications including 2 text-books and 8 monographs, and presented the results of her research work at more than 50 international conferences in Mathematics and Computer Science.

Prof. Dr. ALEXANDER GUTERMAN

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Professor Alexander Guterman was born in 1975 in Moscow, Russia. He received his Ph.D. in 2001 and a habilitation (D. Sci. degree) in 2009 from Lomonosov Moscow State University where he is working as a full professor at the Faculty of Higher Algebra, Department of Mathematics and Mechanics. He delivers a number of different courses and lectures in abstract algebra, linear algebra, algebraic methods in economics, ring theory and combinatorial matrix theory.

A number of young researchers defended their M.Sc. and Ph.D. thesis under the supervision of Professor Guterman. At the moment 12 M.Sc. students and 4 Ph.D. students are working under his supervision.

Alexander Guterman's research interests are mostly in linear algebra and its applications, combinatorics, tropical mathematics, combinatorial optimization, noncommutative rings, finite-dimensional algebras and semirings.

Professor Guterman is a member of Moscow Mathematical Society and International Linear Algebra Society. He delivered invited talks and lectures on many international conferences in his research area, was a member of scientific and organizing committees for several international conferences.

He held appointments as a visiting professor at many universities over the world including Ecole Polytechnique in Paris, Stockholm University, University of Lisbon, University College Dublin, University of Manchester, Leibniz Center for Informatics, Germany, University of Ljubljana, University of San-Paolo, Brazil, Saint-Jones University of Newfoundland, Canada, University of South Florida, USA, Max Plank Institute, Leipzig, and others.

Professor Guterman has more than 100 papers in the well-known professional journals, including Linear Algebra and its Applications, Linear and Multilinear Algebra, International Journal on Algebra and Computations, Mathematical Inequalities and Applications, Applied Mathematics and Computation, Semigroup Forum, and Journal of Algebra.

Prof. Dr. ALEXANDER VASILEVICH MIKHALEV

Moscow State University – Lomonosov
High Algebra Department
Moscow, Russia

Professor Alexander Vasilevich Mikhalev was born in 1940 in Briansk, Russia. He graduated from the Faculty of Mechanics and Mathematics of *Moscow State University – Lomonosov* (1961) in domain of mathematics. There he completed his Candidate's thesis in 1967 and his: Doctor's thesis in 1990. He is professor at the Higher Algebra Department and Head of the Computational Methods Laboratory at the Faculty of Mechanics and Mathematics. He was Pro-Rector of the University.

Alexander Mikhalev has been working at *Moscow State University – Lomonosov* for more than 40 years. He is the author of more than 250 publications, including 9 monographs and 10 textbooks. He has delivered many fundamental courses of lectures.

He has been a research supervisor to 100 seekers of Candidate and Doctor Degree. He worked with many students and professors from around the world.

He has solved many open problems, as well: *the Bair – Koplansky problem; the Schreier - Van-der Varden problem* (*together with I. Z. Golubchik*) and *the Herstein's problem* (*together with K. I. Beidar, W. Martindale*). *Together with V. K. Zakharov he has solved the problem of Riss – Padon as well as the Maltsev problem of elementary equivalence of linear and algebraic groups* (*with K. I. Beidar and E. I. Bunina*).

He is (or was) member of the Editorial boards of many journals, such as: I. G. Petrovsky Seminar Works, Abel's Groups and Modules, Fundamental and Applied Mathematics, South-east Asian Bulletin of Mathematics, Journal of Egyptian Mathematical Society.

A. Mikhalev is a recipient of the *Premium of the USSR Council of Ministers for Applied Research* (1982), full member of *the International High School Academy* (1996) and *the Russian Academy of Natural Sciences* (2002). In 2003 he was entitled the *Honorary Scholar of Russian Federation.*

At one magnificent University such as *Lomonosov Moscow State University*, it is hard to say who is the best, but it can be said that Alexander Vasilevich Mikhalev is among the best and the most important mathematicians who have contributed enormously to the development of mathematics in the USSR and in the world at large.

Prof. Dr. ALEXEI PANTCHICHKINE

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Alexei Pantchichkine was born in 1953 in Ordzhonikidze, USSR (Russia)

He finished High School in Moscow region with Golden Medal (1971) and got his Diploma in Mathematics (1976) as well as all diplomas and degrees at Department of Mathematics of the Moscow State University: PhD in 1979 (under the direction of Prof. Yu. I. Manin) and Habilitation in 1990. He was there Assistant professor (1979-87), Associated professor (1987-1992). Since 1992 he is Full professor of the University of Grenoble Alpes, promoted to the Exceptional Class Full Professor in 2011.

Prof. Pantchichkine was: visiting researcher and professor at many prestigious universities and institutes, as well University of Oxford, UK (1984-1985), Membership of Institute of Advanced Study, Princeton, USA (1999-2000), Japan University of Sapporo (JSPS-CNRS,1994-1995).

Since 1989 he had a number of extended research stays at German's universities in: Goettingen, Bielefeld, Heidelberg, Mannheim, Max-Planck-Institute in Bonn, and University of Padova (Italy), Tongji University in Shanghai (China).

He was co-organizer of workshops and conferences, as well "*Workshop p-adic analysis*" (Institute for Advanced Study in Mathematics, Hanoi, Vietnam), "*Modular Forms Workshop*" (University of Hawaii at Manoa (USA) with Simons foundation (AMS), 28th Journées Arithmétiques (Grenoble, France).

His principal domain of research is the algebraic number theory, with a special reference to the arithmetic of automorphic forms and the theory of complex and *p*-adic zeta functions. He is the founder of new mathematical directions: *Arithmetic of automorphic p-adic L-functions*, *Algorithmic arithmetic of function fields, Solution of a problem of Coleman-Mazur and* author of new mathematical notions: *Panchishkin distributions, Panchishkin condition for the existence of motivic p-adic L-functions*.

Since 1975 Prof. Pantchichkine published 80 publications in different prestigious journals and 8 books in Number Theory (*Springer Verlag*) and in Teaching in Mathematics (*Gordon and Breach*, *Mir Editors,* MCNMO Editors, Moscow) (in Algebra and Number Theory).

Since 2001 he is a Member of a research group in Cryptology in the Fourier Institute, Grenoble France and co-author of a patent number FR 02/12429, with R. Gillard, F. Leprevost and X. F. Roblot.

From 1986 he was mentor of 15 PhD Thesis (Moscow State University and University of Grenoble).

Academician STEVAN PILIPOVIĆ

member of the Serbian Academy of Sciences and Arts (SANU)
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Professor Stevan Pilipović was born in 1950 in Novi Sad, Serbia. After secondary school he became a student of Mathematics at the Faculty of Sciences of the University of Novi Sad. He got: in 1973 B.S., in 1977 M.S. and in 1979 Ph.D. in Mathematics.

After graduating he was teaching assistant, Assistant professor, Associate professor, and since 1987 he is a Full-time professor. Since 2009 he is a member of the Serbian Academy of Sciences and Arts (SANU), and since 2015 a president of the Novi Sad Branch of the SANU.

Research interests of academician Stevan Pilipović are: Generalized functions, Integral transformations, Pseudo-differential operators, Hyperfunctions, Microlocal analysis, Linear and nonlinear equations with singularities. Dynamical systems.

He published five monographs and more than 200 papers in renowned international and domestic journals and proceedings.

Stevan Pilipović is a Leader of the scientific seminar of Mathematical Colloquium at the Mathematical Institute of SANU, Belgrade as well as an editor and editor-in-chief in several international and domestic journals: Journal of Pseudo-Differential Operators and Applications, Birkhäuser (Basel); Integral Transforms and Special Functions, Taylor & Francis (London); Publication de l'Institute Mathematique (Belgrade) - one of the three Editors-in-Chief.

He was a visiting researcher and visiting professor at a number of different universities, including: Faculty of Mathematical Sciences of Tokyo University, University Paris 7; Ervin - Schrödinger Institute in Vienna, as well as invited lecturer at many scientific centers: Budapest University, Steklov Institute of RAN, Institute of mathematics of Bulgarian Academy of Sciences; Imperial College London, City College London, Max Plank Institute Leipzig, University of Helsinki, University of Kanpinas, University of Ghent.

Prof. Stevan Pilipović is a member of American Mathematical Society, London Mathematical Society, and Mathematical Society of Serbia.

He was mentor and co-mentor of 31 doctoral theses and of 22 magister theses. He works with many students and professors from Japan, USA, Italy, France, Austria, Spain, and all former Yugoslav republics.

Prof. Dr. SVJETLANA TERZIĆ

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Professor Svjetlana Terzić was born in 1970 in Podgorica, Montenegro. She finished her High School in Podgorica and got her Academic Degrees: B.Sc.Math at *University of Montenegro* (1993), M.Sc.Math at *University of Belgrade* (1996) and Ph.D.Math at *Lomonosov Moscow State University* (1998). She was Post-doc at *Ludwig Maximillians University,* Munich, Germany (2000-2002).

Svjetlana Terzić started her academic career at *The University of Montenegro*: as a Teaching Assistant 1993, and after was an Assistant Professor (2000-2005), an Associate Professor (2005-2010) and since 2010 is a Full-time Professor. From 2011, Professor Terzić is an Associate member of the Montenegrin Academy of Sciences and Arts.

Professor Terzić's research areas are Algebraic topology and Differential Geometry.

She participated in numerous conferences: Satelite conference of ICM, Daejeon, Korea (2014), International conference, Skolkovo, Moscow (2015), International Chinese-Russian conference Beijing, China (2015), Southampton, UK (2015), XIX Geometrical Seminar, Zlatibor, Serbia, (2016), Mini conference celebrating of 30 years of CGTA seminar, Belgrade, Serbia (2016), The Princeton-Rider Workshop, Princeton, USA (2017), Symposium on mathematics and its applications, Belgrade, Serbia (2017), International conference "*Algebraic topology, Combinatorics and Mathematical Physics"* in honour of V. Buchstaber on occasion of his birthday, Moscow (2018) and held invited talks at many universities: Faculty of Mechanics and Mathematics, Moscow State University and Steklov Mathematical Institute, Russian Academy of Sciences, SISSA Trieste, University of Oxford, Mathematical Faculty, University Ljubljana, School of Mathematics, University of Southampton, University of Manchester, University of Aberdeen, Mathematical Institute, SANU.

Professor Terzić was supervisor for about 20 undergraduate thesis, 3 master thesis and co-supervisor for one PhD thesis at the School of Mathematics of the *University Nica.*

In addition, she is one of editors of *Sarajevo Journal of Mathematics* and *Matematički Vesnik.*, as well as reviewer for the journals: Publication de l'Institute Mathematique, Contemporary Mathematics, Proceedings of the Steklov Institute of Mathematics, Annali di Matematica Pura ed Applicata, Mathematica Slovaka, Mathematische Zeitschrift, Sbornik Mathematics. Besides, she was Vice Dean for international relations at the *Faculty for Natural Sciences and Mathematics* (2004-2007) and Vice President of the Mathematical and Physical Society of Montenegro.

Prof. Dr. MIRJANA VUKOVIĆ

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Mirjana Vuković was born in 1948 in Bosnia and Herzegovina. She attended primary school in different cities of former Yugoslavia. After graduating from the "*Third Gymnasium"* in Sarajevo, she became a student of the Department of Mathematics of the University of Sarajevo, where she graduated as one of the best students with the *Golden Badge* (1971). She got her M.A. in 1975 and Ph.D. in 1979. Immediately after graduation, she started there her mathematical career as an Assistant of two academicians M. Bajraktarević and F. Vajzović (1972) and was Assistant professor (1979-1984), Associate professor (1984-1989), and since 1989 a Full-time professor. From 2012 she is a corresponding member of the Academy of Sciences and Arts of Bosnia and Herzegovina.

In addition, she acquired education at the most famous universities in the world, such as: *Moscow's State University – Lomonosov,* Moscow, Russia, *University "Pierre et Marie Curie"*, Paris, France. But she was visiting researcher and visiting professor at several universities as well: *Institute Joseph Fourier*, Grenoble, France, *Fields Institute,* Toronto, Canada, *Tsukuba University* Tsukuba, Japan, *Charles University*, Prague, Czech Republic, *Technical University Vienna* and *Jochannes Kepler University*, Linz, Austria, *MI SANU*, Belgrade, *University Novi Sad,* Serbia, *University of Maribor*, Slovenia, etc.

Mirjana Vuković works in several different domains of Analysis, but her principal domain is Algebra. Together with eminent French mathematician Marc Krasner she introduced extra- and para- graded structures (groups, rings, modules) developing the theory which is generalizing the corresponding *Bourbaki-Krasner's graded structures* and has in each of the three cases the property of closure with respect to the direct product and direct sum [*Structures paragraduées* (*groupes, anneaux, modules*), Queen's Papers in Pure and Appl Math., Queen's Univ., can be found in over 154 libraries around the world].

She is the author or co-author of more than 100 publications, including 1 monograph, 9 (text-) books and delivered many fundamental courses of lectures in different areas of analysis and algebra.

Prof. Vuković was a member of many academic and expert councils and commissions of the Faculty and University of Sarajevo and East-Sarajevo, including: Head of Division of Algebra, Department Chair, Vice-Dean of the Faculty and Vice-Rector of the University of Sarajevo. She is a recipient of: *The April Sixth Award* of the City Sarajevo, *The highest Republic prize for scientific work* "*Veselin Masleša,"* in Mathematics. Since 2014 is one of two Editors in Chief of "*Sarajevo Journal of Mathematics,* etc.

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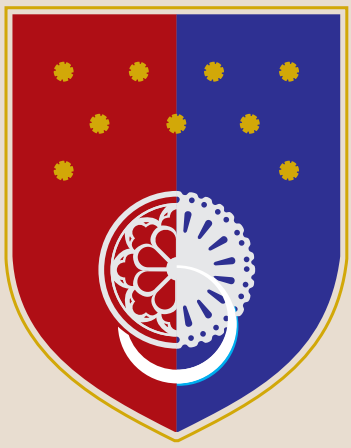

Ministarstvo za obrazovanje,
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Kantona Sarajevo

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