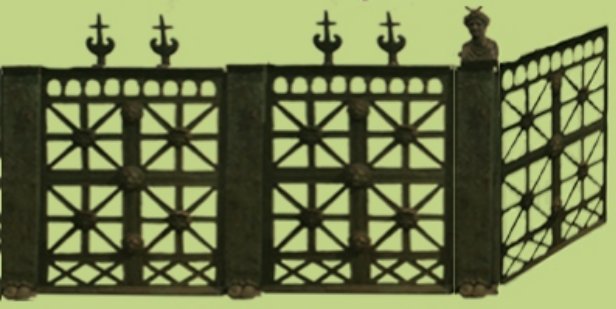
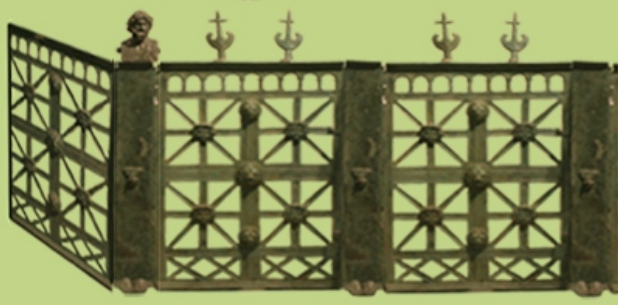
CaCNAS:FA 2021





CLASSICAL AND CONSTRUCTIVE NONASSOCIATIVE ALGEBRAIC STRUCTURES: FOUNDATIONS AND APPLICATIONS

In the memory of

Nebojša Stevanović (1962-2009)

June 30 - July 2, 2021

Abstract booklet

Introduction to nonassociative algebra
OR
Playing havoc with the product rule?

Bernard Russo (2012)

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CaCNAS:FA 2021

Classical and Constructive Nonassociative Algebraic Structures:

Foundations and Applications

Organized by

Center for Applied Mathematics, CAM-FMEN
Faculty of Mechanical Engineering
University of Niš, Serbia

International Chair in Mathematical Physics and Applications (ICMPA-UNESCO Chair)
University of Abomey-Calavi, Benin

Government College University, Lahore, Pakistan

Department of Mathematics
Faculty of Sciences COMSATS
University Islamabad, Abbottabad Campus, Pakistan

Held as an online meeting hosted by the Faculty of Mechanical Engineering,
University of Niš, Serbia, June 30 – July 2, 2021

Local Organizing Committee:
Melanija Mitrović, Full Professor (Chair); Branislav Randjelović, Assistant Professor,
Vukašin Pavlović, PhD student; Milan Pavlović, Lecturer; Milena Rajić, Assistant Professor; Ana Kitić,
PhD student; Jovan Milić, MSc; Nikola Kostić, PhD student, Gordana Jović, PhD student

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Preface

CLASSICAL AND CONSTRUCTIVE NONASSOCIATIVE ALGEBRAIC STRUCTURES: FOUNDATIONS AND APPLICATIONS – CaCNAS:FA 2021

This event is dedicated to the memory of

Nebojša Stevanović (1962-2009)

Introduction to nonassociative algeba
OR
Playing havoc with the product rule?

(Bernard Russo, 2012)

...For modern mathematics, thick intertwining of very many directions and subdisciplines is typical. So the algebraic structures, ***nonassociative algebras among them, are percolating other branches of mathematics accommodating special demands and purposes, and acquiring new features and properties to serve 'for the simplification of theoretical constructions'.*** (Bernard Russo, 2012).

This year 2021 edition of the conference on *Classical and Constructive Nonassociative Algebraic Structures: Foundations and Applications* – **CaCNAS: FA 2021** is the first of its series among the set of conferences entitled, "Algebra without Borders". The organizers will strive to hold it every two years in a country, to truly live to its name.

As a specificity, the **CaCNAS:FA 2021**, (see http://cacnas.masfak.ni.ac.rs/), is offered in the memory of professor Nebojša Stevanović (1962-2009), for his significant contribution to this field. He was a member of the Department of Mathematics, Physics and Informatics at the Faculty of Civil Engineering and Architecture, University of Niš, Serbia. He was one of the founders of the first paragliding club in Niš, "Albatross", one of the oldest paragliding clubs in Serbia. He was the first President of the Paragliding Association of Serbia. Professor Nebojša Stevanović's life was marked by a wish to conquer both algebraic and heavenly spaces – he *sailed* the structures of groupoids, especially those of the Abel-Grassmann's law, and semigroups, just as he sailed the skies as a true sportsman and paraglider. He published his works in numerous renowned journals, participated in international and domestic conferences, reviewed the papers from his area of interest, was quoted many times, and so forth.

CaCNAS:FA 2021 is organized by higher training and research institutions from three continents: Europe (Center of Applied Mathematics of the Faculty of Mechanical Engineering Niš, CAM-FMEN, Serbia), Africa (International Chair in Mathematical Physics and Applications (ICMPA-UNESCO Chair), University of Abomey-Calavi, Benin) and Asia (Government College University, Lahore, and Department of Mathematics, Faculty of Sciences, COMSATS University Islamabad, Abbottabad Campus, Pakistan).

Organizers of this event are: Academician Mahouton Norbert Hounkonnou (the President of the Network of African Science Academies, NASAC), Professor Melanija Mitrović (Head of the CAM-FMEN,University of Niš), Professor Mujahid Abbas (Government College University, Lahore), and Professor Madad Khan (Faculty of Sciences, COMSATS University Islamabad, Abbottabad Campus). Paraphasing Barut, (A. O. Barut, Foundation of Physics 24(11), Nov. 1994, p.1571), they are convinced that *the first principles of things will never be adequately known. Science is an open ended endeavor, it can never be closed. We do science without knowing the first principles. It does in fact not start from first principles, nor from the end principles, but from the middle. We not only change theories, but also the concepts and entities themselves, and what questions to ask. The foundations of science must be continuously examined and modified; it will always be full of mysteries and surprises*.

The history of nonassociative algebraic structures can be traced at least to the middle of the 19th century. The theory of nonassociative algebraic structures is an enormously broad and greatly advanced area. Interesting new algebraic ideas arise, with challenging opportunities to discover connections to other areas of mathematics, natural sciences and engineering. Besides, computer-assisted methods proved useful in the development of the theory of nonassociative algebraic structures, e.g., in finding proofs, constructing examples and applications. In this conference, the speakers try to present a brief overview of the origins of nonassociative algebraic structures, a selection of current research topics and future directions, some generalizations within the framework of classical, fuzzy and intuitionistic logic, and further applications. The topics include the following:

- Groupoids (binary systems) and their generalizations (AG-groupoids, quasigroups, loops, neutrosophic groupoids, Smarandanache groupoids);
- Nonassociative algebras and their generalizations (left almost algebras);
- Ordered nonassociative algebraic structures (logical algebras);
- Applications within natural sciences and engineering;
- Computer-aided development and transformation of the theory of nonassociative algebraic structures.
- Algebraic geometry and its relations with quiver algebras,
- Enumerative combinatorics
- Representation theory
- Fuzzy Logic and Foundation Theory
- Fuzzy Algebraic Structures
- Group amalgams
- Graph theory
- Actions of groups on various geometric objects, such as diagram geometric and buildings
- Constructive nonassociative algebraic structures.

Prominent experts in the field coming from respectable universities from all over the world (more than 20 represented countries) will take part in this conference. There will be 9 keynote, 20 invited and 18 contributed talks.

The speaker abstracts and BIOs are grouped in alphabetical order in this booklet. We are thankful for their inspiring talks and contributions to the scientific discussion.

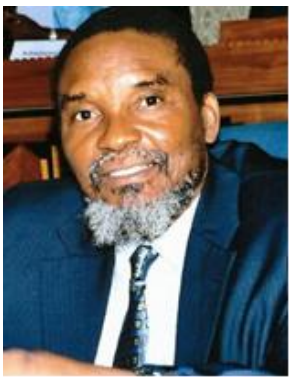
Organizers

Nebojša R. Stevanović was a Professor at the Department of Mathematics, Physics and Informatics, Faculty of Civil Engineering and Architecture, University of Niš. He was born on 4th June 1962 in Babušnica, a town and municipality located 65 km southeast of Niš. He finished his elementary school with the highest grades. In 1977, he enrolled in the first grade of Vocational High School for Mathematics and Technology, to become a computer programmer. Once again, he finished high school with the highest grades and enrolled at the Faculty of Philosophy in Nis, Department of Mathematics, which he graduated from as one of the best students in his generation. In 1990, he started his teaching-scientific work at the Faculty of Civil Engineering and Architecture in Niš. During the same year he started his postgraduate studies at the Faculty of Sciences, University of Novi Sad. After passing all the exams in 1993, he applied for his master's thesis entitled *Abel-Grasman's groupoids and semigroups*. He defended his master's thesis at the end of 1994 and acquired the title of Master of Mathematical Sciences in the field "Algebra and Mathematical Logic". He defended his doctoral dissertation entitled *Grupoids with Abel-Grassman's law* at the Faculty of Sciences and Mathematics, University of Niš. His research interests include theory of semigroups, theory of groupoids, especially Abel-Grassmann ones. He and his co-authors published papers in renowned scientific journals, participated in international and domestic conferences, and reviewed papers in his scientific field. His works have been cited countless times. His works are still "alive" - the citation does not stop. Along with his successful teaching and scientific career, he also conquered the heavens. He was a pioneer of paragliding in Serbia. He was a member of PC ALBATROS, from Niš and one of its founders. He was the first president of the Paragliding Association of Serbia. He died on March 11, 2009..

Organizers

Melanija Mitrović is a Full Professor at the Department of Mathematics and Informatics of the Faculty of Mechanical Engineering, University of Niš. She has received her BSc and MSc degrees at the Faculty of Philosophy, University of Niš, and her PhD degree at the Faculty of Mathematics and Sciences, University of Niš, in 2000. She is lecturing at all three levels of higher education in Serbia, as well as abroad. She is a member of the Faculty Council since 2015, Quality Board, Committee for the Student Evaluation of Educational Quality (2009- 2015), Deputy Vicehead of the Department of Mathematics and Informatics (2005-2010). She is visiting professor at Malardalen University, (Sweden), Bar- Ilan University, (Israel), TU Wien, (Austria), UTAD, (Portugal), University of Minho, (Portugal), Politecnico, (Italy). She works in the field of algebra and its applications to engineering. She is the head of the Center of Applied Mathematics of the Faculty of Mechanical Engineering Niš, CAM-FMEN (http://camfmen.masfak.ni.ac.rs), around which, among other activities, she develops an interdisciplinary research group investigating applications of algebraic structures to problems in engineering science. She is a member of the Serbian Mathematical Society and Board of the Serbian Society of Logic. Major lines of her research, professional work and expertise are in basic classical and constructive algebraic structures, especially within areas of semigroup and semiring theory, Witt and Virasoro algebras, groups and representations. Her innovating work within the theory of constructive semigroups with apartness positions her among the pioners of the constructive algebra in Serbia. Outside of Serbia, she is recognized as the mother of the novel *theory of constructive semigroups with apartness*, *considered* as a new algebraic theory. It is worth pointing out that the definition of semigroups with apartness is taken and modified from artificial intelligence area, which, in turn, makes Professor Mitrović most recent research interests focus, beside growing the theory, on possible applications in real life. She published her works in renowned outstanding international journals. She refereed for renowned journals in mathematics. She is invited as plenary speakers at highly ranking international conferences in a regular basis to communicate about her research results. She often acts as the chair of organizing committees and a program committee member of prestigious international conferences. For example, she was member of the Program Committee and reviewer of the conferences organized by: University of Auckland ("Developments in Language Theory"), University of Dijon ("Discrete Mathematics and Theoretical Computer Science"), University of Novi Sad. She was the chair of the Organizing Committee and member of the Program Committee of the Workshop "Theoretical Computer Science – from Foundation to Applications", TCS-FP 2009; as well as "Constructive Mathematics: Foundations and Practice", CMFP 2013 – both organized at the Faculty of Mechanical Engineering, University of Niš. In connection with the CMFP 2013, organization, she got IMU/CDC Support (Conference Grant Support), as the first Serbian mathematical conference ever cofinanced by IMU (International Mathematical Union, Berlin). In addition, CM:FP 2013 was the first conference on constructive mathematics (mathematics with intuitionistic logic) organized at the Western Balkan region. She is a guest speaker at leading universities worldwide. She serves as an international jury member for doctoral theses. She is author of a well-known scientific monograph, at national level, on semigroup theory. Her works in the field of algebra so far has made a significant contribution to its development, which is reflected in the expansion of existing knowledge (classical semigroup theory and semiring theory) and in the establishment of completely new theory of constructive semigroups with apartness. She received the Award *Povelja* of the Faculty of Mechanical Engineering Niš in 2019 for her permanent work connected to the promotion of the faculty and University of Niš algebraic group.

(http://camfmen.masfak.ni.ac.rs/CV/CV_Melanija_Mitrovic.pdf)



Dr. Sc in 1992 from catholic University of Louvain in Belgium, **Mahouton Norbert Hounkonnou** is a Full Professor of Mathematics and Physics at the University of Abomey-Calavi, Benin Republic. His works deal with noncommutative and nonlinear mathematics including differential equations, operator theory, coherent states, quantization techniques, orthogonal polynomials, special functions, graph theory, nonassociative algebras, nonlinear systems, noncommutative field theories and geometric methods in Physics. He authored and reviewed books. Further, he refereed and served as an associate editor for renowned journals in mathematics and mathematical physics. He published over 200 main research papers in outstanding ISI-ranked peer reviewed journals and international conference proceedings in the fields of mathematics and mathematical physics. He is a visiting professor at African, Asian, European and North American Universities. Together with his peers at the international level, he founded the International Chair in Mathematical Physics and Applications (ICMPA -UNESCO Chair) of the University of Abomey-Calavi where he created multiuniversity master degree and PhD programmes in mathematics with connections, motivations or applications to physics, and in physics with important relations to mathematics. The best African students from over 13 French and English speaking countries are selected to follow these graduate programs, which attract prominent and leading mathematicians and mathematical physicists worldwide who come to give lectures and supervise student's research, what has substantially increased international collaboration with African, Asian, American, European and Indian mathematicians. The ICMPA-UNESCO Chair presently hosts the international conference and school series on Contemporary Problems in Mathematical Physics, which are held every two years and each year since 1999 and 2005, respectively. These activities have led to a significant network of researchers connected with the ICMPA-UNESCO Chair, that benefits from the resources available in mathematics and mathematical physics in Africa. Professor Hounkonnou supervised 34 PhD and 38 M. Sc. students from various countries including Belgium, Benin, Burkina-Faso, Burundi, Cameroun, Democratic Republic of Congo, Niger, Nigeria, Senegal, Togo, Zambia, etc. Professor Hounkonnou was awarded a series of recognitions for the excellency of his work such as the Prize of the Third World Academy of Sciences (TWAS) in 1996, the Tokyo University of Science President Award in 2015, and the 2016 World Academy of Sciences C. N. R. Rao Prize for Scientific Research *"for his incisive work on noncommutative and nonlinear mathematics and his contributions to world-class mathematics education "*. He was a member of UNESCO Scientific Board for International Basic Sciences Programme (IBSP), NANUM 2014 Award Committee Member of the International Congress of Mathematicians (ICM 2014) as reviewer for region Africa, and member of the InterAcademy Partnership working group on Harnessing Science, Engineering and Medicine to Address Africa's Challenges. He is TWAS research Professor in Zambia, the chair of the African Academy of Sciences Commission on Pan-African Sciences Olympiad (2014 - present), chair of the African Academy of Sciences Membership Advisory Committee (MAC) on Mathematical Sciences (2013 – present). Professor Hounkonnou is the co- chair of the network of African, European and Mediterranean Academies for Science Education (AEMASE III). He is the current President of the Network of African Science Academies (NASAC), President of the Benin National Academy of Sciences, Arts and Letters (2015-2020). His membership extends to InterAcademy Partnership Science Education Programme (IAP SEP), the International Association of Mathematical Physics, American Mathematical Society, London Mathematical Society, Society for Industrial and Applied Mathematics (SIAM), Academy of Science of South Africa (ASSAf), African Academy of Sciences (AAS), The World Academy of Sciences (TWAS), Scientific Council of the Centre International de Mathématiques Pures et Appliquées (CIMPA), Scientific Committee of the International Centre for Advanced Training and Research in Physics (CIFRA, Magurele-Bucharest, Romania), as well as other scientific organizations. Professor Hounkonnou is a Knight of the Benin National Order (Chevalier de l'Ordre National du Benin). Webpage: https://hounkonnou.bj

Prof Mujahid Abbas Mujahid Abbas is professor and chairperson of Department of Mathematics, Government College University, Lahore, Pakistan. He is also the director-general of Abdus Salam School of Mathematical Sciences, Lahore, Pakistan. He is working as an Extraordinary Professor in the Department of Mathematics and Applied Mathematics, UP, South Africa. He has served this department as an Extraordinary Professor and Associate Professor since August 2015. Prior to these responsibilities, he has served different universities such as Lahore University of Management Sciences, Pakistan, University of Management and Technology, Pakistan, Indiana University Bloomington, USA, University of Birmingham, UK, King Abdulaziz University, Saudi Arabia, King Saud University, Saudi Arabia, King Fahd University of Petroleum and Minerals, Saudi Arabia, Ton Duc Thang University, Vietnam, China Medical University, Taiwan and Abdus Salam International Center of Theoretical Physics, Italy in different roles such as Associate Professor, Professor, Post-doctoral fellow, Honorary senior research fellow, Visiting Professor, Consultant, Research collaborator and Research scholar. He completed his first Ph.D. in the field of Functional Analysis back in 2005 from Pakistan and second Ph.D. in the field of Soft Set Theory from Universität Politecnica De Valencia, Spain. He has produced three hundred and sixty research papers in internationally acclaimed journals. Many of my publications may be used as a benchmark, is evident from the fact that his research work has received 11991 citations so far. An h-index of his research publications is 47 and i-10-index is 251. His cumulative impact factor is 236.144. He initiated several new concepts which were later employed by many researchers to obtain some interesting results in related areas of research. Moreover, he was Highly Cited Researcher in the years 2015-2019 and is NRF rated mathematician. Besides three book chapters which appeared in the books published by Birkhauser, John Wiley & Sons Inc., USA, and CRC Press, Taylor & Francis group, He has authored three books (published) including his recent book titled “Background and recent developments of metric fixed point theory” published by CRC Press, Taylor’s and Francis Group. He has won three consecutive research productivity awards by Council of Science and Technology, Government of Pakistan. Pakistan Academy of Sciences has also awarded him a gold medal in recognition of his research contribution. He has supervised 16 Master and 9 Ph.D. students. He has presented his research work through different seminars and conferences in several countries including UK, Italy, Sweden, Turkey, Nigeria, Jordan, Saudi Arabia, Qatar, South Africa, Pakistan, Thailand, Korea and USA. He is serving as a member of the Editorial and Advisory Boards of several journals and is a member of various Scientific Committees of national and international conferences. More details can be accessed through the following links**:**

https://scholar.google.com.pk/citations?user=8H9zFMsAAAAJ&hl=en

www.gcu.edu.pk

Dr. Madad Khan is currently working as an associate Professor at the Department of Mathematics COMSATS University Islamabad, Abbottabad Abbottabad Campus. He remains Head of Department and graduate program coordinator for 05 years. He has published 100+ papers in internationally reputed Journals. He did post doctorates from University of Chicago (8 th in world ranking), USA and University of Birmingham (61 th in world ranking), UK in 2015 and 2013. He visited University of Oxford (5 th in word ranking) and University of Cambridge, UK. He visited Jeju National University, Korea for post doctoral research work. He did PhD in 2008 form QAU, Islamabad, Pakistan. He did M.Phil, MSc and B.Sc with distinction. He is working on genetic algebra, computational Mathematics, fuzzy mathematics and semigroups/AG-groupoids. He is invited as a speaker at 3 rd and 4 th High Mile conferences on non-associative Mathematics organized by university of Denver Colorado, USA. He is an invited Speaker in 2017 IEEE International Conference on INnovations in Intelligent SysTems and Applications (INISTA 2017) Gdynia, Poland, July 3-5, 2017, invited Speaker in Logic, Algebras and Applications, Jeju National University, Jeju, Korea, January 2018 and invited Speaker in International Conference on Uncertainty Mathematics, School of Mathematics, Northwest University Xi'an, China, in 2018, 2019 and 2020. He produced 3 PhDs and 40 M.Phils students. 3 PhD and 5 M.Phil are currently working under his supervision. He is member of BoS of six universities including Allama Iqbal university, COMSATS, Hazara, Abottabad and Sardar Bahadur Khan Women universities and Shaheed Benazir Bhutto University, Sheringal Dir. He is Executive Member of Pakistan Mathematical Society. www.pakms.org.pk . He is member of Selection board of five universities, COMSATS, Hazara, Abottabad, Muzaffar Abbad University Azad universities and University of Karachi. He is member DTRC committees at the Department of Mathematics, Department of Civil Engineering, COMSATS University Islamabad and Islamia College University Peshawar, Pakistan He has international Academic Collaborations with 36 Professors in USA, UK, Canada, Italy, Poland, Romania, Albania, Japan, China, Iran, Korea and Turkey. He organized several national and international conferences. He is external examiner of 6 universities in Pakistan for graduate theses evaluation. He published 4 books from USA and Belgium. 50 copies of my printed books are available in 15 Romanian libraries. His books are available on line. His Bio Data is published in a Book "S. Florentin, The Encyclopedia of Neutrosophic Researchers, Pons Editions, Brussels, Belgium 2016" on its 100 page. This book is available online. He Hosted (Invited) 4 Professors from Korea, China, Brazil and USA to Pakistan for joint research work of mutual interest

Program Committee

Chengming Bai is a professor and the Director of Chern Institute of Mathematics, Nankai University, China. He is also the chair of the Key Laboratory of Pure Mathematics and Combinatorics, Ministry of Education of China and a member of the Standing Committee of International Colloquium of Group Theoretical Methods in Physics. He has been interested in the study of certain algebraic systems which are related to mathematical physics and Lie theory, and their applications. He has published more than 100 peer-reviewed papers

Wieslaw A. Dudek is a Professor at Faculty of Pure and Applied Mathematics at the Wroclaw University of Science and Technology (Poland). His research interests are universal algebra, n-ary groups, Menger algebra of multiplace functions, quasigroups,BCK-algebras, fuzzy sets and applications of graphs. He is co-author of two monographs: Algebras of multiplace functions, (de gruyter, 2012) and Graphs for the analysis of bipolar fuzzy information (Springer, 2021). He is the editor-in-chief of the journal 'Quasigrops and Related Systems' and an editorial member of several mathematical journals. By Scopus, his h-index is 21.

Prof. Dr Časlav Mitrović graduated from the Faculty of Mechanical Engineering, Belgrade University where he defended his final work "Analysis of Aircraft Maneuvers in Vertical Plain" with mark 10 on July 11th 1984. He defended his master thesis "Theoretical analysis and methods of main helicopter rotor aerodynamic calculation" in Februrary 1991 on the Faculty of Mechanical Engineering in Belgrade Aeronautical Engineering Department and defended his doctor's dissertation "Unsteady lift modulation and viscous effects simalution by using singularity method" on December 5th, 1997 on the Faculty of Mechanical Engineering in Belgrade - Ph.D. of Science. Prof. Dr Caslav Mitrovic is a full professor at the University of Belgrade, Faculty of Mechanical Engineering, Republic of Serbia. His work deals with Aerodynamic Constructions, Aerodynamics, Flight Mechanics, Programming and Information Science in Mechanical Engineering. At the moment, he lectures Flight Mechanics, Project Management and Aviation Legislation on the Aviation module, as well as the following subjects: Programming, Engineering Communications, Computer Tools, Basic WEB Design, Advanced WEB design in mechanical engineering and Software Engineering on the I.T. module. He authored over 200 papers and books and has worked on numerous projects in the field of aviation. He is a regular reviewer of several journals, of which the Journal of Aerospace Engineering published by ASCE (American Society of Civil Engineers) and the Journal of Applied Engineering Science published by the Institute for Research and Design in Commerce and Industry can be singled out. He has worked as avisiting professor on the High Technical Mechanical School in Zemun from 1992 to 2007, and on Drexler University in Philadelphia, Pennsylvania, and as a lectures and examiner in the Aviation Staff Training Centre of Aviation Academy. Prof. Dr Caslav Mitrovic is the director of the Qualifications Agency of the Government of the Republic of Serbia and the president of the Commission for the Center for Information and Communication Technologies. He was the head of the Center for Teaching Quality and Accreditation from December 2015 to May 2018 of the faculty of Mechanical Engineering in Belgrade, reviewer of the Commission for Accreditation and Quality Assurance of the Republic of Serbia and Director of the Alumni Foundation of the Faculty of Mechanical Engineering from December 2011 to May 2018. He is a member of the Serbian Chamber of Engineers, DOTS (AMTS) - Association of Technical Maintenance Systems, European Federation of National Maintenance Societies, International Council of Aeronautical Sciences, American Institute of Aeronautics and Astronautics, Serbian Society of Mechanics, Serbian Aerocosmonautical Society. He has participated in construction projects and classic construction airplane testing projects, and he has worked on composite glider projects and has taken part in developing and constructing composite helicopter main and tail rotor blades. He has used that knowledge in the construction of the Cooling Tower composite blades and has participated in methodology development of helicopter rotor and cooling tower blades balancing. He has participated in the research, re-projecting, construction and testing of the T-55 tank's cooling system, as well as the dust removing system. He has participated in the development of preliminary design of a great number of aircrafts of different purposes. By decree of the President of the Republic of Serbia from February 12, 2021, for specia merits for the Republic of Serbia and its youth in the field of educational activities and industrial development, Prof. Dr Caslav Mitrovic was awarded a gold medal for merits.

Vladimir Rakočević is a Full Professor at the Department of Mathematics of the Faculty of Sciences and Mathematics at the University of Niš in Serbia, and a Corresponding Member of the Serbian Academy of Sciences and Arts (SANU) in Belgrade, Serbia. He earned his Ph.D. in mathematics at the Faculty of Sciences of Belgrade University, Serbia, in 1984; the title of his thesis was Essential Spectra and Banach Algebras. He was a visiting professor at several universities and scientific institutions in various countries. Furthermore, he participated as an invited or keynote speaker in numerous international scientific conferences and congresses. He is a member of the editorial boards of many journals of international repute. His list of publications contains more than 190 research papers in international journals, and he was included in Thomson Reuters' list of Highly Cited Authors in 2014. He is the (co-)author of eight books. He supervised 8 Ph.D., and more than 50 B.Sc. and M.Sc. theses in mathematics. His research interests include functional analysis, fixed point theory, operator theory, linear algebra and summability.

Sergey Shpectorov obtained his PhD from the Moscow State University, Russia. He had postdoctorl positions at Eindhoven University of Technology, the Netherlands, Michigan State University and Ohio State University, the USA. In 1997 he was given his first permanent academic appointment at the Bowling Green State University in Ohio, the USA. There he quickly rose through the ranks becoming Full Professor in 2003. In 2005 Sergey moved to the UK to become Professor (Chair in Pure Mathematics) at the University of Birmingham. Sergey authored over 90 research publications including one book. His research focusses on finite group theory and various related areas involving group actions. He is a co-creator of the MAPCLASS package classifying Hurwitz loci of maps between Riemann surfaces, having a given monodromy group,
and a package for computing axial algebras. In recent years, Sergey became involved in non-associative algebras, especially axial algebras, motivated by their applications to finite groups. Sergey supervised to completion 16 PhD students across four countries: the Netherlands, the USA, the UK, and South Africa. He has a broad network of collaborators spanning all habitable continents (i.e., excluding Antarctica).

Are also members of the Program Committee the organizers:

Melanija Mitrović, University of Niš

Mahouton Norbert Hounkonnou, University of Abomey-Calavi

Mujahid Abbas, Government College University, Lahore, Pakistan

Madad Khan, COMSATS University Islamabad, Pakistan

Honorary Program Committee member

Petar V. Protić is a Full Professor (retired) at the Faculty of Civil Engineering and Arhitecture, University of Niš. He graduated at the Faculty of Philosophy - Group of Mathematics, University of Niš in 1976. After graduation, in the period 1976-1987, he worked as a professor of mathematics in high school "12. feburary" in Niš. He earned his master degree in mathematics at the University of Skopje in 1983; the title of his Master thesis was On some classes of semigroups. He earned his Ph.D. in mathematics at the Faculty of Sciences, University of Novi Sad, Serbia, in 1986; the title of his thesis was Congruences on p-regular semigroups. Since 1987 till his retairment he has been working at the Faculty of Civil Engineering and Arhitecture. He was lecturing at all three levels of higher education. He is the (co-)author of three textbooks and four book of problems. He supervised two Ph.D. His research interests include theory of semigroups, theory of groupoids, especially Abel-Grassmann ones. He (and his coauthors) published his work in numerous renowned journals, participated in international and domestic conferences, reviewed the papers from his area of interest, was quoted many times, and so forth. Since 1983, as the member of Mathematical Institute SANU he was continuously was engaged at the Institute's scientific projects financed by Ministry of Science of Republic of Serbia.

Local Organizing Committee

Head of local organizing committee Melanija Mitrović

Dr Branislav Randjelović (1970) is assistant professor at Department of Mathematics, Faculty of Electronic Engineering, University of Nis. He works, also, as assistant professor at Department of Mathematics and Informatics at Faculty of teachers Education, University of K.Mitrovica, where he is a Head of department. He published more than 50 scientific papers and expert works, 10 textbooks and several publications from educational field. As participant/researcher hw worked at 6 domestic scientific projects in period 1996-2021. He was also researcher or project manager at 12 International Educational projects, financed by Swiss Development and Cooperation office, Deutshce Gemmeinschaft fur Internationale Zusammenarbeit, Euorpean Social Fund, ERASMUS+, EU IPA projects, UNDP and UNICEF. Areas of his scientific work are numerical mathematics and its applications, graph theory and its applications in various fields. In a period 2008-2012, he was working as a director of Regional center for professional development of employees in education, Nis, dealing with teacher trainings and professional developments of teachers in preschool institutions, primary schools and secondary schools. Since 2016, he is a Head of the Institute for Education Quality and Evaluation of Republic of Serbia and a member of many important working groups at Ministry of Education, Science and Technological development of Republic of Serbia. He is member of many steering committees of important international projects in Serbian education.

Vukašin Pavlović is a teaching assistant at the Faculty of Mechanical Engineering, University of Niš, Serbia. He finished his bachelor and master studies at Faculty of Mechanical Engineering, University of Niš, Serbia, in the field of Mechatronics and Control Systems, and currently is at PhD studies. His research interests are Mechatronics, Biomechatronics and Artificial Neural Networks. He is author and co-author of many scientific papers published in scientific journals and at international conferences. He was the member of organizing committee of the international workshop “Theoretical Computer Science - From Foundation to Application – TCSFA09”, international conference “Constructive mathematics: Foundation and Practice” and several Scientific-Expert Conferences on Railways- RAILCON from 2010 to 2020. During bachelor studies, he participated in the realization of students’ projects, “Eco-Workshop” and “Wont2”, which were financed by “Fabrika Duvana Niš” an affiliate of Phillip Morris International. As a PhD student, he was a researcher on project “Research and development of a new generation of wind turbines with high energy efficiency”, funded by the Ministry of Education, Science and Technological Development of Republic of Serbia and member of team on Tempus project “Improvement of product development studies in Serbia and Bosnia and Herzegovina – IPROD”. He is currently participating in the realization of the project “Roboshepherd”, which is financially supported through the Program of Cooperation between Science and Economy of the Innovation Fund from the budget of the Republic of Serbia.

Milan Pavlović, PhD is a lecturer at Academy of Technical and Educational Vocational Studies Niš, Serbia. He finished his bachelor, master and PhD studies at Faculty of Mechanical Engineering, University of Niš, Serbia, in the field of Mechatronics and Control Systems. His research interests are intelligent systems, machine vision, robotics and artificial intelligence. He is author and co-author of many scientific papers published in scientific journals and at international conferences. He was the member of organizing committee of the international conference "Constructive mathematics: Foundation and Practice", Scientific- Expert Conference on Railways-RAILCON '12 and "Mathematics for Social Sciences and Arts - ALGEBRAIC MODELING''. During bachelor studies, he participated in the realization of students' projects "Primary selection of waste", "Eco-Workshop" and "Wont2", which were financed by "Fabrika Duvana Niš" an affiliate of Phillip Morris International. As a PhD student, he was a researcher on project "Research and development of a new generation of wind turbines with high energy efficiency", funded by the Ministry of Education, Science and Technological Development of Republic of Serbia, member of teams on Tempus project "Improvement of product development studies in Serbia and Bosnia and Herzegovina – IPROD" and Horizon 2020 Shift2Rail project Smart Automation of Rail Transport – SMART. He participated in realization of international project "Waste management curricula development in partnership with public and private sector" from Erasmus + program, and several domestic projects funded by Ministry of Education, Science and Technological Development of Republic of Serbia and City of Niš-The Local Economic Development and Projects office.

Milena Rajić, PhD is a teaching assistant at Faculty of Mechanical Engineering, University of Niš, Serbia. She finished bachelor and master studies at Faculty of Mechanical Engineering, University of Niš, Serbia, in the field of Energetics and Process Techniques. Currently she is finishing second PhD in this field. She finished PhD studies at Faculty of Technical Science, University of Novi Sad, Serbia. She is author of many scientific papers published in scientific journals. Her research interests are: industrial management, process optimization, energy management, artificial intelligence applied in industrial systems. She was the member of organizing committee of the International workshop "Theoretical Computer Science - From Foundation to Application – TCSFA09", International conference "Constructive mathematics: Foundation and Practice". As a PhD student, she was a researcher on project "Research and development of energy and environmentally high-efficiency systems of polygeneration based on renewable energy sources", funded by the Ministry of Education, Science and Technological Development of Republic of Serbia, researcher on IPA project "Increasing the competitiveness of the Nis region by stimulating innovative activities in the SME sector", MC member of the "European Energy Poverty: Agenda Co-Creation and Knowledge Innovation", funded by COST European Cooperation in Science and Technology. She has been awarded with many awards and accomplishments during her studies, such as: award from "Partnership for educations and community development" for achieved academic success, demonstrated activity and achievements in improving local community, award "Investing in European values" Eurobank EFG the best student in Serbia reward for achieving extraordinary results, reward "Coca Cola Talents" the best students in Serbia.

Ana Kitić is PhD student at Mechanical Faculty in Niš, University of Niš. She is also researcher on Mechanical Faculty in Niš. She finished bachelor and master studies at Faculty of Mechanical Engineering, University of Niš, Serbia, in the field of Engineering Management. She enrolled in the doctoral academic studies at the Faculty of Mechanical Engineering in Niš in 2017, within the study programme in Mechanical Design, Product Development and Engineering Her research interests are: engineering management, Kano method, QFD method, Fuzzy logic- . She was elected the best student five times, in her first, second, third and fourth year of undergraduate studies, as well as at her master's studies. During her studies she was a member of the student organization "AIESEC", after which she became the founder and first president of the student organization "ESTIEM LG NIŠ", within which she was one of the organizers of the following events: "Nis Winners", "Green, Greener, Estiemer "," Balkan Motivation Weekend ". She is author of many scientific papers published in scientific journals.

Jovan Milić, M.sc in Engineering Management, born 21.5.1996 in Niš, is responsible for marketing and social media management in CAM-FMEN. He is a founder of „Find Raoul", humanitarian organization based in his home town. Jovan has been awarded with many prestigious awards which include: Silver medal of Republic of Serbia, St. Sava award from Serbian Ministry of Education, „11th January"award which is the most important award awarded by City of Niš, Person of the year award by Hello! Magazine, „Brothers Karic" award and many more. He is a deserving citizen of municipality of Pantelej. He has earned praise from H.R.H. Prince Alexander II Karađorđević, for his engagement and great results during high school studies. Jovan is an author of many scientific works mostly from the area of energetics and management. He was Serbian Economy Forum's youngest participant. As a high school student he competed on and won many contests in science. He was declared as a Youth hero of Serbia. Jovan also founded the Young Scientists Forum. Jovan was an ambassador of culture and entrepreneurship of City of Niš. Up to this day, he has listened to many courses on Harvard University, which include: „China's Political and Intellectual Foundations: From Sage Kings to Confucius", „Leaders of Learning", „Saving Schools" ... Jovan finished his University studies as one of the best students in generation. He participated the international project „SIETLU" which focuses on sustainable and environmentally friendly transport and logistics solutions. He founded magazine „New Millennium" with his friends.

Nikola Kostić is a teaching assistant at Academy of Technical and Educational Vocational Studies Niš, Serbia. He finished his bachelors studies at Academy of Technical and Educational Vocational Studies Niš and Faculty of Engineering University of Kragujevac , master studes at Faculty of Engineering University of Kragujevac and he is currently on PhD studies at Faculty of Mechanical Engineering, University of Niš, Serbia, in the field production information technologies and industrial management. His research interests are plasticity technologies, non conventional and conventional manufacturing technologies and industrial management. He is author and co-author of many papers published in national journals and conferences.

Gordana Jović is teaching assistant at Academy of Tehnical and Educational Vocational Studies Niš, Serbia. She graduated and received her master's degree at Faculty of Mechanical Engineering, University of Niš, Serbia, where she is currently on PhD studies in the field of mechanical construction, development and engineering. Her research interests are welding technology.

Contents

Some Research Contributions of Professor Nebojša Stevanović: Non Associative Algebraic Structures

Madad Khan

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Abstract: N. Stevanović worked jointly with P.V. Protić on LA-semigroups and has used the name Abel-Grassmann's groupoids abbreviated as AG-groupoids. They have introduced a law by which one can easily check that an AG*-groupoid is a commutative semigroup if $S=S^2$. They have introduced the concept of AG-band, that is, an AG-groupoid whose all elements are idempotents. Obviously, it cannot contain a left identity. If it contains a left identity then the structure becomes a commutative semigroup. They have defined an anti-rectangular AG-band. P. V. Protić and N. Stevanović introduced a useful technique for verification of AG-groupoids, AG*-groupoids and AG**-groupoids. They have introduced a new non-associative structure of AG-3-band. They have investigated several properties of this structure. They have constructed AG-3-band using certain type of translations. Moreover they have added many interesting results to the theory of AG-groupoids

Keywords: AG-groupoid, Left invertive law, Medial law and congruences, AG-band, AG-3-band

Madad Khan is currently working as a professor of Mathematics at the department of Mathematics, COMSATS University Islamabad, Pakistan. He did his Master and PhD from Quaid-i-Azam University Islamabad, Pakistan. He did two post doctorates from University of Chicago, USA and University of Birmingham, UK. He visited the University of Oxford and University of Cambridge, UK as an academic visitor. He visited Jeju National University, Korea for collaborative research work with Professors Song and Jun. He published 100+ paper in internationally reputed Journals. He published four books. He supervised 70 M. Phil and 3 PhD students. He remains Head of Department and Graduate Program coordinator for five years. He is member of selection boards and Board of studies of several Pakistani universities. He is member of departmental review committees of several local Universities. He is an invited and key note speaker in several conferences in USA, Poland, China, Korea and Pakistan.

Keynote speakers

Algebras induced by tensor representation of group of rotations and quarks model

Viktor Abramov

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Abstract: We show that each irreducible tensor representation of weight 2 of the rotation group of three-dimensional space in the space of rank 3 covariant tensors gives rise to an associative algebra with unity. We find the algebraic relations that the generators of these algebras must satisfy. Part of these relations has a form of binary relations and another part has a form of ternary relations. The structure of ternary relations is based on the cyclic group Z3 and a primitive cubic root of unity q. The subspace spanned by the triple products of generators is 5-dimensional and it is the space of an irreducible tensor representation of weight 2 of the rotation group SO(3). We define a Hermitian scalar product in this 5-dimensional subspace and construct an orthonormal basis for it. Then we find the representation matrix of an infinitesimal rotation. We show that constructed algebras with binary and ternary relations can have applications in the quark model and Grand Unification Theories.

Keywords: Representations of group of rotations, Algebras with cubic relations, Georgi - Glashow model.

Viktor Abramov graduated from the Faculty of Mathematics of the University of Tartu, Estonia. Then he defended his doctoral dissertation on the theory of connections on bundles and gauge theories. Currently he is a professor of geometry and topology at the Institute of Mathematics and Statistics at the University of Tartu, Estonia. His research areas are ternary Lie algebras and superalgebras, geometric aspects of Nambu theory and gauge theories.

Transposed Poisson algebras

Chengming Bai[a], Ruipu Bai[b] , Li Guo[c] and Yong Wu[d]

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[b] Hebei University, Baoding, China, bairp1@yahoo.com.cn
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[d]Hebei College of Science and Technology, Baoding, China, wuyg1022@sina.com

Abstract: We introduce a notion of transposed Poisson algebra which is a dual notion of the Poisson algebra by exchanging the roles of the two binary operations in the Leibniz rule defining the Poisson algebra. We interpret the close relationships between it and some structures such as Novikov-Poisson and pre-Lie Poisson algebras including the example given by a commutative associative algebra with a derivation, and 3-Lie algebras.

Keywords: Lie algebra, Poisson algebra, Transposed Poisson algebra

Chengming Bai is a Professor and the Director of Chern Institute of Mathematics, Nankai University, China. He is also the chair of the Key Laboratory of Pure Mathematics and Combinatorics, Ministry of Education of China and a member of the Standing Committee of International Colloquium of Group Theoretical Methods in Physics. He has been interested in the study of certain algebraic systems which are related to mathematical physics and Lie theory, and their applications. He has published more than 100 peer-reviewed papers

f-generalized Witt algebras

Mahouton Norbert Hounkonnou[a], Bignon Hugues Degbedji [a] and Melanija Mitrović[a,b]

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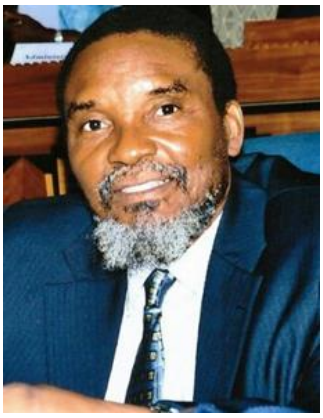
Abstract: In this talk, we consider generalized Witt algebras A_f with a basis $\{e_{x_i}, x_i \in Z\}$, endowed with the commutator $[e_{x_i}, e_{x_j}] = a\, e_{x_i} * e_{x_j} - b\, e_{x_j} * e_{x_i}$ such that the multiplication "$*$" is defined by $e_{x_i} * e_{x_j} = f(x_i, x_j)\, e_{x_i+x_j}$, where f is a skew-symmetric function, and a and b are constants. We infer the main features of these algebras and discuss their relevant properties.

Keywords: Witt algebra, Left symmetric algebra, Associator, Cohomology, Coboundary operator.



Mahouton Norbert Hounkonnou is a full Professor of Mathematics and Physics at the University of Abomey-Calavi, Benin. He published over 200 main research papers in mathematics and mathematical physics. He is a visiting professor at African, Asian, European and North American Universities. He was awarded numerous Prizes for the excellency of his work, including the 2016 TWAS C. N. R. Rao Prize for Scientific Research. His membership extends to the Benin National Academy of Sciences, Arts and Letters, Academy of Science of South Africa, African Academy of Sciences, The World Academy of Sciences, etc. Professor Hounkonnou is a Knight of the Benin National Order.

On semilattice decomposition of an Abel-Grassmann's groupoid

Madad Khan

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Abstract: In this paper we have decomposed an AG-groupoid. Let S be an AG-groupoid with left identity and a relation γ be defined on S as: $a\gamma b$ if and only if there exist positive integers m and n such that $b^m \in (Sa)S$ and $a^n \in (Sb)S$ for all a and b in S. We have proved that S/γ is a maximal separative semilattice homomorphic image of S. Every AG-groupoid S, is uniquely expressible as a semilattice Y of archimedean AG-groupoids S_α ($\alpha \in Y$). The semilattice Y is isomorphic to S/γ and the S_α ($\alpha \in Y$) are the equivalence classes of S modγ.

Keywords: AG-groupoid, Left invertive law, Medial law and congruences.

Madad Khan is currently working as a professor of Mathematics at the department of Mathematics, COMSATS University Islamabad, Pakistan. He did his Master and PhD from Quaid-i-Azam University Islamabad, Pakistan. He did two post doctorates from University of Chicago, USA and University of Birmingham, UK. He visited the University of Oxford and University of Cambridge, UK as an academic visitor. He visited Jeju National University, Korea for collaborative research work with Professors Song and Jun. He published 100+ paper in internationally reputed Journals. He published four books. He supervised 70 M. Phil and 3 PhD students. He remains Head of Department and Graduate Program coordinator for five years. He is member of selection boards and Board of studies of several Pakistani universities. He is member of departmental review committees of several local Universities. He is an invited and key note speaker in several conferences in USA, Poland, China, Korea and Pakistan.

Galois like connections for constructive sets with apartness

Melanija Mitrović[a,c], Daniel Abraham Romano[b] and Mahouton Norbert Hounkonnou[c]

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Abstract: Throughout this talk, constructive mathematics is understood as mathematics performed in the context of intuitionistic logic. More precisely, Errett Bishop-style constructive mathematics forms the framework for our work. The principal novelty in treating constructively basic algebraic structures is that *relation of apartness* becomes a fundamental notion. Being associative or nonassociative, working within classical or intuitionistic logic, in order to analyze algebraic structures it is needful to study other systems that are not algebraic structures – ordered set, relational systems, etc. A set with apartness (S, =, #) is a starting point of our consideration. The focus of this talk is on mappings and relations defined between sets with apartness. Special attention is paid to the relations which are defined by mappings and, in turn, to their role in classifying certain types of mappings.

Keywords: Set with apartness, Constructive mathematics, Errett Bishop style, Intuitionistic logic, Ordered set.

Melanija Mitrović is a full professor at the Department of Mathematics and Informatics of the Faculty of Mechanical Engineering, University of Niš. She is a member of the Faculty Council since 2015, Quality Board, Committee for the Student Evaluation of Educational Quality (2009-2015), and Vice-head of the Department of Mathematics and Informatics (2005-2010). She is visiting professor at Malardalen University, (Sweden), Bar-Ilan University, (Israel), TU Wien, (Austria), UTAD, (Portugal), University of Minho, (Portugal), Politecnico, (Italy). She is the head of the Center of Applied Mathematics of the Faculty of Mechanical Engineering Niš, CAM- FMEN. Her membership extends to the Serbian Mathematical Society, Board of the Serbian Society of Logic, and the International Chair in Mathematical Physics and Applications (ICMPA-UNESCO Chair) of the University of Abomey-Calavi. She works in the field of algebra and its applications to engineering. Among other activities, she develops an interdisciplinary research group investigating applications of algebraic structures to problems in engineering science. Major lines of her research, professional work and expertise are in basic classical and constructive algebraic structures, especially within areas of semigroup and semiring theory, Witt and Virasoro algebras, groups and representations. Her innovating work within the theory of constructive semigroups with apartness positions her among the pioners of the constructive algebra in Serbia..

Axial algebras of Jordan and Monster type

Sergey Shpectorov

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Abstract: The class of axial algebras was introduced in 2015 by Hall, Rehren and Shpectorov as a generalization of the class of Majorana algebras of Ivanov. The latter class was modelled on the Griess algebra, a 196,884-dimensional commutative, non-associative real algebra, which was used to construct the Monster finite simple group, and which arises within the moonshine vertex operator algebra. *Axial algebras* are (usually, commutative) non-associative algebras, whose defining properties are stated in terms of a fusion law, a binary operation that governs multiplication of eigenvectors of the adjoint maps of special generating idempotents, called *axes*. Examples of axial algebras are Jordan algebras related to classical groups, as well as a more recent class of Matsuo algebras that arise from partial triple systems, and in particular, from Fischer spaces of 3-transposition groups. In general, axial algebras with graded fusion laws enjoy significant automorphism groups, and this is why axial algebras are of interest to group theorists. In the lecture I will survey recent research on two classes of axial algebras: algebras of Jordan type, which have fusion law like in Jordan and Matsuo algebras, and algebras of Monster type, whose fusion law generalizes the law of the Griess algebra.

Keywords: Non-associaitve algebras, Axial algebras, Jordan algebras, Griess algebra

Sergey Shpectorov obtained his PhD from the Moscow State University, Russia. He had postdoctorl positions at Eindhoven University of Technology, the Netherlands, Michigan State University and Ohio State University, the USA. In 1997 he was given his first permanent academic appointment at the Bowling Green State University in Ohio, the USA. There he quickly rose through the ranks becoming Full Professor in 2003. In 2005 Sergey moved to the UK to become Professor (Chair in Pure Mathematics) at the University of Birmingham. Sergey authored over 90 research publications including one book. His research focusses on finite group theory and various related areas involving group actions. He is a co-creator of the MAPCLASS package classifying Hurwitz loci of maps between Riemann surfaces, having a given monodromy group,
and a package for computing axial algebras. In recent years, Sergey became involved in non-associative algebras, especially axial algebras, motivated by their applications to finite groups. Sergey supervised to completion 16 PhD students across four countries: the Netherlands, the USA, the UK, and South Africa. He has a broad network of collaborators spanning all habitable continents (i.e., excluding Antarctica).

Hom-algebra structures

Sergei Silvestrov

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Abstract: In this talk, introduction and some open problems and open directions about hom-algebra structures will be presented with focus on foundations and recent advances on graded (color) quasi Lie algebras, quasi-hom Lie algebras, hom-Lie algebras and related hom-algebra structures, and n-ary hom-algebras. Common unifying feature for these algebras is appearance of twisted generalizations of Jacoby identities providing new structures of interest for associative algebras, non-associative algebras, generalizations of Hopf algebras, non-commutative differential calculi, quantum algebras, central extensions, formal deformations and co-homology.

Keywords: Hom-algebra structures

Sergei Silvestrov is a Full Professor in Mathematics and Applied Mathematics at Mälardalen University, Västerås, Sweden. Sergei Silvestrov is the scientific research leader for MAM research environment in Mathematics and Applied Mathematics, and the group leader for two research groups, Algebra and Analysis with Applications, and Engineering Mathematics. Sergei Silvestrov obtained a degree of Doctor of Philosophy in Mathematics at Umeå University, Sweden in 1996, and then during 1996-2010, he worked as junior researcher at the Royal Institute of Technology, Stockholm, Sweden, STINT postdoctoral fellow in the University of Iowa, USA, associate professor at the Centre for Mathematics Sciences, Engineering Faculty (LTH), Lund University, Lund, Sweden. He organized and gave talks in many international conferences and was a visiting researcher or visiting Professor at several universities internationally. Sergei Silvestrov is a member of editorial boards of several international journals. Sergei Silvestrov supervised more than 20 PhD students, works actively with postdocs, and enjoys broad international cooperation in non-commutative and non-associative algebra, non-commutative analysis, matrix analysis and applications in engineering mathematics and mathematical physics.

Hilbert schemes of points on surfaces and threefolds: algebra, combinatorics, geometry and representation theory

Balazs Szendroi

University of Oxford, and Martin Powell Fellow at St Peter's College, Oxford,
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Abstract: I will explain some connections between the objects in the title: the geometry of Hilbert schemes of points on smooth and (some) singular surfaces and threefolds, various associative algebras related to quivers, the combinatorics of coloured partitions and other combinatorial arrangements, and the representation theory of (finite dimensional and affine) Lie algebras. Based on joint works with Gyenge and Nemethi; Craw, Gammelgaard and Gyenge; and Davison and Ongaro.

Keywords:

Balazs Szendroi is Professor of Pure Mathematics at the University of Oxford, and Martin Powell Fellow at St Peter's College, Oxford. He obtained his PhD in Cambridge in 1999, and has worked at the universities of Warwick and Utrecht, and since 2005 in Oxford. He specialises in algebraic geometry and its relations with quiver algebras, enumerative combinatorics and representation theory. His interests outside mathematics include ancient and modern art.

(Banach) Poisson-Lie groups, Grassmannians and KdV equations

Alice Barbora Tumpach[a,b,c]

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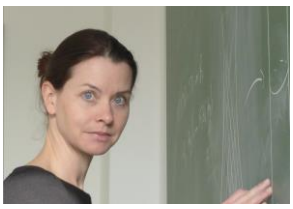
Abstract: In the first part of this talk, we introduce the theory of Poisson-Lie groups and related objects. It is addressed to a wide audience and do not require specialized background. The example of the unitary group U(n) will serve as our reference example on which we will build through this talk. We will explore the notions of (generalized) Poisson manifolds and Poisson-Lie groups in the Banach context, and we will see which difficulties are inherent in the infinite-dimensional case. The second part of the talk is devoted to the study of particular examples of Banach Poisson-Lie groups related to the Korteweg-de-Vries hierarchy. We construct a generalized Banach Poisson-Lie group structure on the unitary restricted group, as well as on a Banach Lie group consisting of (a class of) upper triangular bounded operators. We show that the restricted Grassmannian inherits a Bruhat-Poisson structure from the unitary restricted group, and that the action of the triangular Banach Lie group on it by ``dressing transformations" is a Poisson map. This action generates the KdV hierarchy, and its orbits are the Schubert cells of the restricted Grassmannian.

Keywords: Poisson Lie-groups, Grassmannians, Coadjoint orbits, Infinite-dimensional homogeneous spaces, KdV hierarchy, Loop groups



Alice Barbora Tumpach is an Associate Professor in Mathematics (University Lille 1, France) and member of the Laboratoire Painlevé (Lille 1/CNRS UMR 8524), since 2007. She received a Ph.D degree in Mathematics in 2005 at the Ecole Polytechnique, Palaiseau, France. She spent two years at the Ecole Polytechnique Fédérale de Lausanne as a Post-Doc. Her research interests lie in the area of infinite-dimensional Geometry, Lie Groups and Functional Analysis. She is author and co-author of several publications in international journals (Communications in Mathematical Physics, Journal of Functional Analysis, Annales de l'Institut Fourier, TPAMI…) in the above fields. She served as reviewer for many journals, including Mathematische Annalen, Journal of Mathematical Physics, Journal of Mathematical Analysis and Appplication, Journal of Differential Geometry, Annales de l'Institut Fourier, TPAMI…}.

Invited speakers

An Introduction to Quandle Algebras

Mohamed Elhamdadi,

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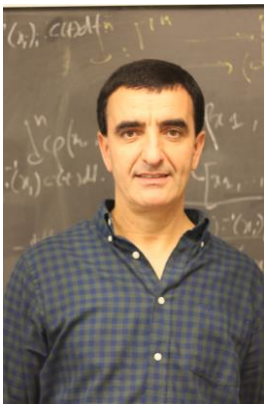
Abstract: Quandles are nonassociative algebraic structures whose axioms are motivated by the three Reidemeister moves in knot theory. They were introduced independently in the 1980's by David Joyce and Sergei Vladimirovich Matveev with the purpose of constructing invariants of knots in the three space and knotted surfaces in four space. Their main theorem changes the problem of equivalence of knots into an algebraic problem of quandle isomorphism. Recently, there has been investigations of quandles from purely algebraic point of views and their relations to some other algebraic structures such as groups, group algebras, quasigroups and Moufang loops, Lie algebra, Hopf algebras etc. We will give a detailed account about these algebraic structures and will end by stating some open questions in this field.

Keywords: Nonassociative algebras, Quandles, Knot Theory.



Mohamed Elhamdadi is a full professor of mathematics at the University of South Florida in Tampa Florida. His research lies in Low dimensional Topology, Knot Theory, Quantum Algebra, Mathematical Physics, Applied Topology, and K-Theory. He graduated from the University of Nice Sophia Antipolis, Laboratoire Jean Alexander Dieudonne', in 1996. He supervised two postdoctoral scholars, four Ph.D. students and currently supervising two other Ph.D. students. He has over 65 publications. His research in quandle theory culminated in a part by the publication of the first book on the subject coauthored with Sam Nelson. The book is titled ``Quandles: An Introduction to the Algebra of Knots," Student Mathematical Library, 74. American Mathematical Society, Providence, RI, 2015, 245 pp., ISBN-13: 978-1-4704-2213-4

Solving common types of blur effects in image recovery using parallel algorithms

Watcharaporn Cholamjiak

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Abstract: In this work, we study some convex optimization to solve image restoration. We also construct the algorithms using parallel methods combining with linesearch rule for solving the images which are blurred and noised by a common type of blurring matrixes and different interferences, respectively. We then add the inertial technique for the speed-up of the convergence. We obtain convergence theorems of our algorithms for the system of equilibrium problems, common variational inequality problems and common variational inclusion problems. Moreover, we can show that our algorithms are flexibility and good quality to use for common types of blur effects and show better efficiency when it is compared with some previous algorithms.

Keyword: Convex optimization, Parallel methods, Image restoration.

Watcharaporn Cholamjiak is currently working as an associate professor of Mathematics at School of Science, University of Phayao, Thailand. She did her Master and PhD from Chiang Mai University, Thailand. She visited Gyeongsang National University, Chinju, Korea for collaborative research work with Professors Yeal Je Cho. She published 50+ paper in internationally reputed Journals. Recently, she interested in applying optimization algorithms to solve image restoration and published many papers in this topic. She is member of Unit of Excellence in image recovery and analysis, University of Phayao. She is an invited speaker on the topic “Parallel methods to solve common types of blur effects in image restoration” in the International Conference on Applied Nonlinear Analysis & Soft Computing, India. She now interested in applying optimization algorithms to use in machine learning. Now, she is head of Unit of Excellence in Data Analytics, University of Phayao

Structure Oriented Programming for Algebra

Lars Hellström

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Abstract: Constructive methods and computer mathematics are a natural match; even if one does not subscribe to constructive foundations of mathematics, an existential claim is of little use in computational mathematics unless there is also an effective method of producing such a claimed object. This often requires nontraditional formalisations of algebraic concepts, with extra operations that on the one hand are not primitive within the traditional formalisations, but on the other hand provide an expressivity that is computationally sorely needed. It is for both proofs and algorithm implementations important that one can address matters at the proper level of abstraction, since (particularly in algebra) the hierarchy of levels wherein objects are composed from other objects often grows surprisingly deep. Yet the generic software engineering techniques currently used for dealing with abstraction, particularly Object-Oriented Programming, provide a rather poor match for the abstraction needs of algebra: prompting generality where none is needed, and elevating trivialities to problems. In this talk I explain an alternative style of "Structure Oriented Programming" that rather focuses on the algebraic structures as the primary entities.

Keywords: Computerised algebra, Software engineering, Algebraic structures, Interfaces

Lars Hellström is since 2013 senior lecturer in mathematics at Mälardalen University in Västerås, Sweden. He got his Ph.D. in mathematics at Umeå University at 2002. The key theme in his research is understanding and providing computer support for new algebraic structures, but with plenty of digressions into the borderlands between algebra, discrete mathematics, computer science, and logic as needs arise. In particular he has worked on extending the theory of equational rewriting to algebraic structures where both arity and coarity of operations can be larger than 1, and derived a complete system of rewrite rules for general Hopf algebras.

3-diagonal functional equation on ternary quasigroups and planarity of graphs

Aleksandar Krapež

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Abstract: In his PhD thesis 'Quadratic quasigroup identities' (Serbian), University of Belgrade (1985), S. Krstić used (multi)grphs to solve generalized quadratic quasigroup functional equations. In particular, he showed the fundamental role of Kuratowski Theorem on planarity of graphs in determining properties of general solutions of such equations. As a first step toward generalization of his results to functional equations on ternary quasigroups, we consider generalized 3-diagonal equation A(B(x,y,z), C(y,u,v), D(z,v,w)) = E(x,u,w). This is one of equations with a complete graph K_5 with 5 vertices as a corresponding graph. General solution of the above equation is given, confirming the important role of Kuratowski Theorem in this case as well.

Keywords: Quasigroup, Functional equation, 3-diagonal equation, General solution, (Multi)graph, Planarity of graphs, Kuratowski Theorem.

Aleksandar Krapež was born in 1950 in Zemun, Yugoslavia. In the meantime, Zemun became one of municipalities of Belgrade, Serbia, while Yugoslavia desintegrated. The few important points on his road to retirement were: He was from the first generation (1966-1969) of pupils of Mathematical Gymnasium, Belgrade, Serbia Graduated (1973) in mathematics at the Faculty of Natural Sciences and Mathematics, University of Belgrade Defended his Masters (1976) and PhD Thesis (1980) at the same Faculty. Was honorary assistant (1973-1979) at various faculties, Universities of Belgrade, Novi Sad and Kragujevac. In 1981/82 and 1982/83 he was honorary docent at University of Kragujevac. From 1973 to his retirement in 2017, he held various positions at Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade.. His research interest is in Algebra (Functional equations on quasigroups, Semigroups) and Mathematical Logic (Tableaux systems, Artificial Inteligence, Fuzzy Systems). Most of his published papers can be accessed at ResearchGate: https://www.researchgate.net/profile/Aleksandar-Krapez/research.

A Novel Approach toward Bipolar Soft Sets and Their Applications

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Abstract: The notion of bipolar soft sets have already been defined but in this article the notion of bipolar soft sets has been redefined, called T-bipolar soft sets. It is shown that the new approach is more close to the concept of bipolarity as compared to the previous ones and further it is discussed that so far in the study of soft sets and their generalizations the concept introduced in this manuscript has never been discussed earlier. We have also discussed the operational laws of T-bipolar soft sets and their basic properties. In the end we have deliberated the applications of T-bipolar soft sets in decision making problems.

Keywords: Soft sets, Bipolar Soft set, T-bipolar soft sets, Decision making.

Dr Tahir Mahmood is currently working as an assistant professor at the department of Mathematics, International Islamic University, Islamabad, Pakistan. He did his PhD from Quaid-i-Azam University Islamabad, Pakistan. His research work mainly focused on Spectral Theory of Hilbert spaces, Homological Algebra-I, Theory of Semirings, Fuzzy Algebra, General Relativity, and Numerical Solution of partial differential equations. He has published 160+ papers in internationally reputed Journals with 200+ Impact Factor. He produced several M. Phil and PhD students.

Iterated function system of generalized Suzuki type contraction mappings in dislocated metric spaces

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Abstract: We present the iterated function systems of generalized Suzuki type contractive mappings in the setup of dislocated metric spaces. We also constructed the fractals of iterated function system with a finite collection of generalized contractive compact valued mappings defined on a Hausdorf dislocated metric spaces. Furthermore, we also study the well-posedness of attractors based problems of generalized contractive operator in the framework of dislocated metric spaces. Some examples are presented to support the results proved therein. These results extend, improve and generalize many results in the existing literature

Keywords: Iterated function system, Fixed point, Set-valued map, Generalized contractive mapping, Suzuki contraction.

Dr. Talat Nazir is an Assistant Professor in Department of Mathematics, COMSATS University Islamabad, Abbottabad Campus, Pakistan. He is an active researcher working on Nonlinear Analysis. He has published more than seventy research articles, ten books and book chapter, and several conference publications..

Neutrosophic view theory of mathematics

Surapati Pramanik

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Abstract: This paper presents a new philosophy of mathematics, which we call neutrosophic view theory of mathematics. It is based on the neutrosophy, a new branch of philosophy broiunded by Prof. Florentin Smarandache. The Paper utilizes the main principle of neutrosophy that states that between two opposite ideas, there exists a continuum-power spectrum of neutralities. The paper also utilizes the fundamental thesis of neutrosophy, which states that any idea <X> is p% true, q% indeterminate and r% false, where p, q, and r are subset of standard or non-standard unit interval. According to neutrosophy, mathematics is the study of uncertain, incomplete and inconsistent information. This paper first time presents the neutrosophic view theory in the ontology of mathematics, in the epistemology of mathematics, and the theory of types of mathematical truth. Neutrosophic view theory of mathematics is a systematic theory of philosophy of mathematics. The basis of this philosophy is the qualitative analysis of mathematical abstraction. The direct objects of mathematics are quantitative patterns with neutrosophic components that are products of abstract neutrosophic thinking.

Keywords:

Surapati Pramanik has been working as a teacher educator since 2006 in Nandalal Ghosh B.T. College, India. He received a Ph. D. in Mathematics from Indian Institute of Engineering Science and Technology (IIEST), Shibpur formerly known as Bengal Engineering and Science Uiversity, Shibpur in 2010 and Ph. D. in Education, an M. Sc. and an M. Ed. from University of Kalyani. He acts as a Ph. D. supervisor in Mathematics for Jadavpur University and IIEST, Shibpur. His research focuses on fuzzy multi criteria decision making (MCDM), mathematics education, Soft computing and neutrosophic fuzzy sets. His research earned outstanding paper awards several times in West Bengal State Science and Technology Congress in mathematics (2011) and Social Sciences (2010, 2013, 2019). He is an editorial board member of "Neutrosophic Sets and Systems", and "Current Chinese Science: Artificial Intelligence & Robotics". His publication includes 24 book chapters, 130 research papers, two editorial books. He acts as a reviewer for more than 40 international journals with more than 100 reviews. He is a life member of thirteen scientific organizations including Calcutta Mathematical Society, ISI, Kolkata. Currently he is working on neutrosophic and fuzzy hybrid sets. Research area: Soft computing, operations research, MCDM, Fuzzy and neutrosophic hybrid set, Mathematics education

Data Privacy Protection: An Optimisation Approach and a Case Study in Cluster Analysis

Abdellah Salhi

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Abstract: Data Privacy (DP) has always been an issue and more so today than ever before because of the advanced tools available to take advantage of data for all sorts of reasons including unethical. It has, therefore, become one of the big challenges that Big Data has thrown about in recent years. There are a number of attempts at dealing with DP using mainly data encoding, homomorphic encryption in particular, and other mathematical devices that allow datasets (encrypted) to be worked in place of others (protected) for the benefit of getting the same or equivalent solutions. They do, however, have limitations often due to the high dimensionality of the data and its extremely large volume. The curse of dimensionality and volume are of course inherent to the concept of Big Data. In this talk, we suggest a new approach that relies on Complexity Theory and NP-Completeness in particular. We describe our approach and illustrate it on a very common problem in data science, namely clustering. Results on a practical problem and their discussion will be included.

Keywords:

Abdellah Salhi is a Professor of OR at the Department of Mathematical Sciences of the University of Essex, UK. After a PhD from Aston University, he worked as a Research Fellow at the Universities of Leeds, Edinburgh, and Southampton, before settling in Essex. He works on topics in OR and Data Science. He designed the Plant Propagation Algorithm and applied it to challenging problems in design and optimisation. His most recent work includes the design of a new approach to protect the security of data. He has lead many research projects concerned with operations at container ports, green distribution in online shopping, smart town centres, optimum pollination with honeybees and others. His work appears in prominent journals such as the ACM TEvC, Annals of OR, JORS, COR, to name a few. He co-organises the yearly EGL Workshop at one of the universities of Essex, Greenwich and UCL. He was HoD from 2010 to 2016.

From non-associative to approximate associative structures in the framework of Omega algebras

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Abstract: In the talk we will present our results on a particular type of lattice valued algebraic-relational structures. We start from classical algebras equipped with a generalized (lattice valued) equality replacing the classical equality. These notions and related techniques originate in universal algebra (weak congruences), in logic (Boolean and Heyting valued models) and in fuzzy mathematics (cut-sets and graded models). The lattice with is a co-domain of all fuzzy mappings is complete. The starting algebra does not satisfy related identities in general, but they are satisfied on cut-factors (substructures over the related congruences which are cuts of the lattice valued equality). Special attention we will pay on non-associative structures which will yield by our construction to omega associative structures (semigroups, groups or rings...). The results presented are joint work with Branimir Šešelja.

Keywords: Omega algebra, Complete lattice, Non-associative algebra, Lattice valued equality.

Dr Andreja Tepavcevic is a principal research fellow at Mathematical Institute of Serbian Academy of Sciences and Arts in Belgrade, Serbia and a full professor at Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad. She is the head of Applied Algebra Chair at Faculty of Sciences. She graduated two tracks in Informatics and Mathematics and defended a PhD thesis in Algebra at University of Novi Sad. She was a visiting professor, gave courses and seminar lectures at more than 25 universities throughout the world in many EU countries, Japan, USA, Russia and others. She gave tutorials at FUZZ-IEEE conferences and she was a plenary, keynote and invited speaker at several conferences in Russia, Spain, India, Slovakia, Slovenia, etc. She supervised six PhD, several master and graduate thesis. Her main research is in universal algebra and lattice theory and theory of ordered sets; fuzzy sets theory and applications, with about 150 refereed publications in journals, chapters in monographs, international conferences; one research monograph and 10 university textbooks. She is an associate editor and a member of editorial board of several journals including Fuzzy Sets and Systems, coordinator of several research projects (national and international) and the head or a member of organizing and program committees of several conferences. Besides south slavic languages, she speaks English, Spanish and basic German.

The single elements in Hv-groups

Thomas Vougiousklis

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Abstract: The largest class of hyperstructures is the one which satisfy the weak properties. These are called H_v-structures introduced by Vougiouklis in 1990 and they proved to have a lot of applications. In a set H with a hyperoperation (=*hope*) $\cdot: H\times H\rightarrow P(H)-\{\emptyset\}$, define the *weak associativity*: $(xy)z\cap x(yz)\neq\emptyset$, $\forall x,y,z\in H$ and *weak commutativity*: $xy\cap yx\neq\emptyset$, $\forall x,y\in H$. A hyperstructure $(H,\cdot)$ is H_v*-group* if it is weak associative and reproductive: $xH=Hx=H$, $\forall x\in H$. In a similar way more complicated hyperstructures are defined. Main tools in hyperstructures are the fundamental relations β^*, γ^* and ε^*, which are defined, in Hv-groups, Hv-rings and Hv-vector spaces, respectively, as the smallest equivalences so that the quotient would be group, ring and vector spaces, respectively. An element is called single if its fundamental class is singleton. Special classes appeared, which introduce new properties applicable in several sciences. We present some results on hyperstructures containing 'single elements', and some new constructions.

Keywords: Hyperstructures, H_v-structures, Hv-groups, Hv-rings and Hv-vector spaces.

Thomas Vougiousklis is currently working a Emeritus professor of Mathematics at the Democritus University of Thrace, Greece. He did his MS from Aristotle University of Thessaloniki in 1971 and did PhD from Democritus University of Thrace, Greece in 1980 on Cyclicity of Hypergroups. He Introduced and studied: P-hypergroups, cyclicity, Fundamental relations γ^*, ε^*, Representations by generalized permutations and hypermatrices, Very Thin hyperstructures, H_v-structures, H_v-Lie algebras, h/v-structures, ∂–operations, V&V Bar in questionaires. He published 160 + Research Papers in internationally reputed Journals with over 4000 citations. Research interests are Hyperstructures, H_v-Structures, Lie Algebras, Mathematical Models, Education, Philosophy, Social Sciences and V&V Bar in Questionaires.

Homomorphic Images of a Picard Group

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Abstract: In this paper, we investigated the Picard group actions on projective line over finite fields F5 n by using coset diagrams and found homomorphic images of these actions.

Keywords: Group action, Picard Group, Homomorphic images.

Saima Anis is currently working as an assistant professor at the department of Mathematics, COMSATS University Islamabad, Pakistan. She did one year post doctorate from University of Chicago, USA on HEC Post Doc scholarship. She did her Master and Ph.D. from Quaid-i-Azam University Islamabad, Pakistan. She visited China, UK, Jeju National University, Korea for collaborative research work and presented talks in international conferences. She is reviewer of few international journals including MathScinet.

State of Information and Communication Technology and Information Technology Education in the Philippines

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Abstract: Technological developments and the cooperation of a number of discipline and the government organizations including the Department of Information and Communication Technology, Department of Science and Technology, Trifocal agencies of the government, Data Privacy, Cyber Technology, IT-BPM, Telemedicine, Financial Technology and the Philippines readiness to the 4th Industrial revolution. These numerous technologies are already adopted by Philippine industries, although it differs in size in terms of spreading and adaptation of the public. The area covered to where all potential welfare will be understood from these technologies depends on the country's potential to control its dimensions to adjust to the global needs that are expected to come with the latest trends of technologies. The Philippines needs to develop and focus on establishing and developing technology infrastructures as firm contexts for sustained learning and accumulating various types of capital, while increasingly and systematically closing the existing technological and knowledge gaps of many of the Filipinos. Both the government and private boroughs of the society need to concentrate to the extreme investment it has been putting in Research and Development; relatively, the Philippine government must have an informed view specially in FIR on how to improve the efficiency of its implementation. Other interrelated degrees are needed to be able to succeed technologically and benefit from different developments in technology: 1. Readiness' to international trade and human capital investment, which can be a very convenient way for faster shifting of innovative ideas and technology, 2. More competition in key industries like Telco, financial institutions and ICT, 3. Better educated citizens and workers that can efficiently and just produce workable human capital, 5. Progressive establishment to keep the people secure, especially the poor citizens and vulnerable, in the face security, unexpected business and employment disruptions, 6. More investment in data collection and monitoring and 7. Promote science and technology in education and society and innovation which are the drivers of socio economic development and inclusive growth. The government as a whole has systematic policies in other existing technologies and in education but still should structurally review and adapt policies, institution and development efforts in light of upcoming revolutionary changes.

Keywords: Data Privacy, Cyber Technology, IT-BPM, Telemedicine, Financial Technology.

Pastor Arguelles Jr. is currently working as a Dean, College of Computer Studies University of Perpetual, Philippines. He did his Doctor of Philosophy in Technology Education from Rizal Technological University, Philippines, Master of Science in Information Technology Rizal Technological University, Philippines and Bachelor of Science in Computer Science from University of Batangas, Philippines. He has several years academic and administrative experience.

Dilemma of mathematics

Mohammad Azram

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Abstract: The pursuit of knowledge and the use of reason based on sense and observation is a key ingredient for research. Mathematics is a creation of human mind concerned chiefly with ideas, processes and reasoning. In this paper, we will try to give a new comprehensive definition of mathematics to understand "what is mathematics". We will discuss the controversial nature and position of mathematics and its scientific status. We will highlight the position of mathematics in different civilizations. We will highlight the mythical issues about Mathematics. We will also discuss the current state of mathematics i.e. mathematics in crises, especially pure mathematics and will put forward the remedial suggestions. We have gathered together some of these impressions; these are all tentative, nothing final about them, but these are here nonetheless.

Keywords: Mathematics, Mythical issues, Scientific status, LOGS, Crises of mathematics

Mohammad Azram received his B.Sc. and M.Sc. (with distinction) in Mathematics from the University of Peshawar, Pakistan in 1974 and 1976 respectively. He received his MS and Ph.D in Mathematics from the University of Idaho (USA) in 1985 and 1989 respectively with CGPA 3.9/4.0. As a teacher, he served the University of Peshawar for 22 years, IIUM Malaysia for 18 years, SQU about 3 years and University of Idaho USA about 5 years. As a leader/administrator; he served the University of Peshawar as Director (Ph.D./M.PhDl programs), Head (Dept of Computer Science) and member of Academic Council, the Senate, and the affiliation committee. He has served IIUM as a Professor of Mathematics, Deputy Dean (Academics, Centre for Postgraduate Studies), Head (Dept of Sc, Faculty of Engg), Head (Committee for Research and Innovation) and Head (Committee for Postgrad Students). During his stay at IIUM, he was awarded two Gold and two Bronze Medals in research exhibitions. He won Best Presentation/Excellent Paper Award in the 10thTheIIER International Conference (ICSTEM'15). He has authored about 98 academic journal papers, 41 conference proceeding, 12 books/chapters in books and completed 12 research projects. articles/referred proceedings and about 12 book's chapters. He was invited as Keynote/invited speaker for ICMAE'10, ICTIP'11 , 16thTheIIER International Conference and 5thIMCL.

The Model of Weak Structures of Non-associative Rings

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Abstract: In this paper, we introduce the notion of LA-hypergroups and discuss some basic properties. We also discuss constructions of LA-hypergroups and introduce Mathematica packages for the existence of LA-hypergroups. The beauty of this structure is that all non-associative structure ever existed before is not true for two elements, but LA-hypergroup is true. Then we provide a new class rings known as of Hv-LA-rings, which is the generalization of LA -hyperrings. Additionally, we provide application of chemical reaction in redox reaction using the Hv-LA-rings.

Keywords: Hyperoperation, Hypergroups., LA-hypergroups, Hv-LA-rings, chemical reaction.

Muhammad Gulistan got his MPhil degree from Quaid-e- Azam University Islamabad in 2011 and PhD degree from Hazara University in 2016. Now he is working as an assistant professor in the department of mathematics and statistics of Hazara university. His area of research is "Cubic sets and their generalizations, Non-associative hyper structures, neutrosophic cubic sets, neutrosophic cubic graphs, decision making". He has published more than 90 research papers in different well reputed journals. He supervised over 25 M.Phil. and 5 PhD research students.

Intersectional soft gamma ideals of ordered gamma semigroups

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Abstract: In contemporary mathematics, parameterization tool like soft set theory precisely tackles complex problems of economics and engineering. In this paper, we demonstrate a novel approach of soft set theory i.e., intersectional soft (int-soft) sets of an ordered Γ-semigroup *S* and develop int-soft left (resp. right) Γ-ideals of *S*. Various classes like Γ-regular, left Γ-simple, right Γ-simple of an ordered Γ-semigroup S are characterize through int-soft left (resp. right) Γ-ideals of *S*. Particularly, a Γ-regular ordered Γ-semigroup *S* is a left Γ-simple if and only if every int-soft left Γ-ideal f_A of *S* is a constant function.

Keywords: Soft sets; int-soft left (right) Γ-ideals; Γ-regular ordered Γ-semigroups; Left (right) Γ-simple ordered Γ-semigroups.

Dr Faiz Muhammad Khan is an Associate Professor of Mathematics in the Department of Mathematics and Statistics, University of Swat. He received his M Phil Mathematics from Quaid-I-Azam University Islamabad in 2009, His Ph D from Universiti Teknologi Malaysia (UTM) in 2013 with International Doctoral Fellowship throughout the study. He also avails Partial support from HEC Pakistan. Dr Faiz completed his Post-doctoral in mathematics from Northwestern Polytechnical University Xi'an in 2018. He was Incharge of the Department of Mathematics and Statistics, University of Swat from March 2014 to May 2017. In his co-supervision, two PhD students from Malaysia and China and two M Phil students from Malakand University successfully completed their degrees. Currently, Dr Faiz is working on the fuzzification of algebraic structures, soft sets and their applications. Dr. Faiz published about 50 research articles in reputed international Journals. He also presented his work in various national/international conferences. Presently, he is HEC approved Ph D supervisor and 10 M Phil Students are working under his supervision.

Neutrosophic Mathematics: Foundation and Applications

Ahmed A. Salama

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Abstract: In real-life problems, the data associated are often imprecise, or non-deterministic. Since the world is full of indeterminacy, the Neutrosophics found their place into contemporary research. I will talk in my presentation about Neutrosophic Mathematics and some applications

Keywords: Neutrosophic crisp set, Neutrosophic fuzzy set, Neutrosophic Information Systems

Ahmed Abdelkahlek Salama is currently working as a Professor of Mathematics and Computer Science Department, Faculty of Science, Port Said University, Egypt.

Previous Position:

1) Dean of the Higher Institute of Business and Computer Sciences, Arish, Egypt.

2) Head of Mathematics and Computer Science Department, Faculty of Science, Port Said University, Egypt.

PhD and DSc. in Mathematics and Computer Sciences. Published many articles and Books in mathematics, computer science, Statistics.

The first Arab to use the Neutrosophic concepts in these areas (computer Sci., Statistics and Topology).

Research Interests:

Neutrosophic Mathematics, Computer Science, Statistics, IT

The following is involved in the fields of Neutrosophic

- Founder the Neutrosophic Crisp Set Theory.
- Founder the Neutrosophic Topological spaces and many Applications in Computer Sci. and Information Systems.

Honors and Awards:

• Holder of the gold medal from the International Institute for Neutrosophic Sciences 2020, • Awarded the greatest research prize in Africa 2017

Existence and stability of stochastic differential equationsdriven by G-Brownian motion

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Abstract: Stochastic differential equations have a wide range of applications in many areas such as finance, physics, economics, biology and engineering. The goal of the current article is to investigate the concepts of existences-uniqueness and stability for stochastic differential equations driven by G-Brownian motion.

Keywords: Stochastic Differential Equations, Existence, Stability

Faizullah is currently working as an associate professor of Mathematics at the department of BS&H, College of E&ME, NUST Islamabad, Pakistan. He did his Master from Quaid-i-Azam University Islamabad and MPhil from NUST Pakistan. He got his PhD from Ocean University of China and post doctorates from Swansea University of United Kingdom. He published 40+ paper in internationally reputed Journals. He supervised 5 M. Phil students. He is member of selection boards and Board of studies of several Pakistani universities

Quantum sets, L-algebras and the existence of states

Xiao Long Xin

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Abstract: The development of the idea of the set theory of ambiguous objects can be traced back to Birkhoff's and von Neumann's century-marking papers on quantum logic. In contrast to the classical set, the subset of the quantum set is replaced by a closed subset of Hilbert space. In this report, we first give a brief introduction about L-algebras, which is the solution of the quantum Yang-Baxter equations. Next, we will introduce the concepts and theories related to quantum sets. Then, we present our recently works in two ways. One is pseudo L-algebras, the other is about the existence of states on some kind of quantum L-algebras.

Keywords: Quantum set, L-algebra, State

Xiao Long Xin is a mathematical profession of the school of mathematics, Northwest University, China. He received the Ph.D. degree in mathematics from Gyeongsang National University, Korea in 1999. His major research interests lie in the areas of logical algebras and their applications, algebraic hyperstructure theory, fuzzy sets, fuzzy logic. He has published more than 140 papers, where 50 papers was indexed by SCI. Now, he has implemented 2 projects from National Natural Science Foundation. In 2013, He has presided over the completion of the research results "some logical algebra and fuzzy research" and got the second prize of Shaanxi province science and technology award.

Contributed talks

Fixed Point Results of Multivalued F-Contractions in Graphical Metric Spaces with a Directed Graph

Bibi Afifa Arooj[a], Talat Nazir[a]

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Abstract: In this paper, we study the fixed point results of multivalued mappings in the setup of graphical metric spaces endowed with a directed graph. Several fixed point results are obtained by employing the generalized contraction conditions in complete graphical metric spaces. In addition, some non-trivial examples are established to show the validity of established results. Our results unify, extend and generalized various results of fixed point theory in the existing literature.

Keywords: Fixed point, Multivalued mapping, Generalized contraction, Directed graph, Graphical metric

Miss Bibi Afifa Arooj is a Research Scholar and Graduate Student in Department of Mathematics, COMSATS University Islamabad, Abbottabad Campus, Pakistan. She is a Master Student of Mathematics. She is working on Fixed Point Theory directed with Graph Theory.

The hom-associative Weyl algebras in arbitrary characteristic

Per Bäck[a], Johan Richter[b]

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[b]Blekinge Institute of Technology, Karlskrona, Sweden, johan.richter@bth.se

Abstract: In characteristic zero, the associative Weyl algebras are formally rigid, meaning that they cannot be deformed without giving up associativity. In this talk, I will show that there is however a framework in which they can be deformed, when considered as so-called hom-associative algebras. I will then show that for such algebras, a deformed version of the famous and still unsolved Dixmier conjecture from the late 60's can be proven to hold true. Moreover, I will delve into the prime characteristic case where we will see that the same conjecture does not hold, not even in a deformed version.

Keywords: Dixmier conjecture, Formal multi-parameter hom-associative deformations, formal multi-parameter hom-Lie deformations, Hom-associative Ore extensions, hom-associative Weyl algebras.

Per Bäck holds an MSc degree in Applied Mathematics and in Applied Physics and Electrical Engineering - International, with Chinese concentration from Linköping University in Sweden, with an exchange year at Nanjing University in China. Currently, he is a PhD student in algebra at Mälardalen University under the supervision of Prof. Sergei Silvestrov, Dr. Lars Hellström, and Dr. Johan Richter (BTH). Research-wise, he is mainly interested in non-associative algebra and in non-commutative algebra, but he has also published popular science work on languages and group theory. At Mälardalen University, he is the representative for the Swedish Mathematical Society and the organizer of the Research Student Seminar in Mathematics and the Little Mathematics and Applied Mathematics Seminar. Here, he has also been a member of the Doctoral Student Council, the Research Council, and the Faculty Board. He has been lecturing on all levels, in courses ranging from Introductory Chinese, via Thermodynamics & Statistical Mechanics to Topology and Algebraic Topology

Minimal properties on twisted derivations

Germán García Butenegro

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Abstract: Twisted differential operators are commonly defined based on pairs of endomorphisms of the underlying coefficient algebra. In the classical theory, unique factorization is required due to its good association and commutation properties which ease many calculations. The aim is to set minimal algebraic conditions to generalize results on twisted derivations established by Hartiwg, Larsson and Silvestrov (2003) to certain non-associative algebras, using one-sided factorization and base properties of the twisting linear maps.

Keywords: Twisted derivations, Non-associative algebras

Additivity property of polynomial covariant commutation relations

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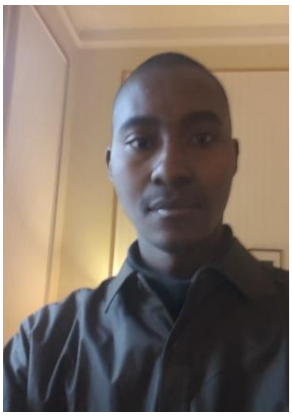
Abstract: In this work conditions for additivity property of polynomial covariant commutation relations are derived for associative algebras. A reduction degree of the polynomial property of representations of this kind of commutation relations is presented for associative algebras.

Keywords: Covariant commutation relations, Additivity, Properties of representations, Heisenberg-Lie commutation relations



Domingos Djinja is a teaching assistant at Eduardo Mondlane University, in Mozambique. He is also a PhD at Malardalen University (Sweden). He holds mater degree in Mathematics by Uppsala University (Sweden) and he received honours degree in Mathematics by Eduardo Mondlane University. He did research in Nonlinear Functional Analysis, Probabilistic Measure Theory. He is currently doing research in Operator Algebras. He is interested in Nonlinear Functional Analysis and Operator Algebras. This involves Nemytsiki operators, local operators, disjointness preserving operators, options pricing, numerical Analysis, commutation relations and associative algebras. He published several papers on international journals and international conferences.

(Co)associative 3-ary (co)algebras and infinitesimal bialgebras: construction and main properties

Gbevewou Damien Houndedji, Mahouton Norbert Hounkonnou

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Abstract: The (co)associative, partially (co)associative and totally (co)associative 3-ary (co) algebras and infinitesimal bialgebras are constructed and discussed. Their trimodules and matched pairs are defined and completely characterized. The main structural properties and relations are also deduced and analyzed.

Keywords: Associative 3-ary algebra, Coassociative 3-ary coalgebra, Associative 3-ary bialgebra.

Damien Gbevewou HOUNDEDJI held a PhD in Mathematics from the University of Abomey-Calavi at the International Chair in Mathematical Physics and Aplications (ICMPA-UNESCO Chair). He is currently in postdoc position at the ICPMA-UNESCO Chair. His research areas include (non)associative rings, (n-ary)(co)algebras, bialgebras, (bi-)hom-algebras, representation theory and their various generalizations.

His works are communicated at different international conferences, and published in renown conference Proceedings and outstanding ISI-ranked journals. (https://www.researchgate.net/profile/Gbevewou-Houndedji).

Homfly polynomial computation for a triangle Seifert graph

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Abstract: In this talk, we present a construction of the signed interior polynomial of a signed bipartite graph associated to a triangle graph. Then, we compute the top of Homfly polynomial and the Homfly polynomial of the Seifert graph associated to a triangle graph.

Keywords: Signed interior polynomial, Signed bipartite graph, Homfly polynomial, Seifert graph, triangle graph

Sitouvih Stéphane Robert Houndessahoue is currently a PhD student at the International Chair in Mathematical Physics and Applications (ICMPA-UNESCO Chair) of the University of Abomey-Calavi. His research activities deal with graph theory and algebraic geometry.

Notion of symmetric contraction in abstract spaces

Aftab Hussani

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Abstract: The purpose of this presentation is to introduce a new class of symmetric contraction and establish some new results for such contraction under the improved approach of symmetric contractive condition in the context of abstract space. The motivation of this conference is to observe the solution of fractional order differential equation with one of the boundary conditions using fixed point technique in metric space.

Keywords: Fixed point; $\mathscr{F}$-metric space; Fractional symmetric contraction.

Aftab Hussain is currently as an Assistant Professor at the Department of Mathematics, Faculty of Sciences, King Abdulaziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia. He is an active member of Analysis Group. His research work in Functional Analysis theoretically, numerically and grapically. He has received Ph.D degree in Mathematics from International Islamic University Islamabad, Pakistan. He has published more than 45 research papers in scientific journals and presentations at scientific conferences. He is a reviewer and guest editor of journals. He is the member of national and international mathematical societies. He has attended various national and international conferences. His field of interest and specialization are fixed point theory and applications.

Complex Fuzzy Sets with Applications in Image Processing

Hameed Khan

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Abstract: A complex fuzzy set is characterized by a membership function, whose range is not limited to $[0,1]$, but extended to the unit circle in the complex plane. In this paper, we discussed some operations and results of CFSs concerning complex fuzzy union, complex fuzzy intersection, complex fuzzy complement, complex fuzzy cartesian product, complex fuzzy bounded sum, complex fuzzy bounded difference, complex fuzzy algebraic sum, and complex fuzzy algebraic product. We gave specific examples of these operations and each result. Since the phase term of CFS is periodic and behaves like a 2D Fourier transform, therefore we have used CFSs in image processing using 2D IDFT. We have introduced a new method to develop a new kind of matrix using a complex fuzzy set, through which we identified a reference image among several images detected by the digital camera.

Keywords: Complex fuzzy set, 2D Inverse Discrete Fourier transform, Image processing, 2D Fourier transform.

Hameed Khan is currently a graduate student of Mathematics at COMSATS University Islamabad, Pakistan. He did his B.Sc from Hazara University Mansehra, Pakistan. He did his M.Sc and B.ed from Abbottabad University of Science and Technology, Pakistan. He worked on the topic ***"Algebraic Properties of Complex Fuzzy Sets"*** under the supervision of **Dr. Madad Khan**.

On Classification of (n+1)-dimensional n-Hom-Lie Algebras

Abdennour Kitouni, Sergei Silvestrov

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Abstract: The aim of this work is to study properties of n-Hom-Lie algebras in dimension n+1 allowing to explicitly find them and differentiate them, to eventually classify them. Some specific properties of (n+1)-dimensional n-Hom-Lie algebra such as nilpotence, solvability, center, ideals, derived series, and central descending series are studied, the Hom-Nambu-Filippov identity for various classes of twisting maps in dimension n+1 is considered, and systems of equations corresponding to each case are described. All 4-dimensional 3-Hom-Lie algebras with some of the classes of twisting maps are computed in terms of structure constants as parameters and listed in the way emphasising the number of free parameters in each class, and some detailed properties of the Hom-algebras are obtained.

Keywords: Hom-algebras, n-Hom-Lie algebra

Abdennour Kitouni is currently employed as a researcher in mathematics at Mälardalens University, Sweden. He is mainly specialized in algebra and has been working during the last ten years on n-ary algebras and generalizations such as n-ary Hom-algebras. Among those, he has mostly worked with n-Lie algebras and their generalizations, studying both the structural properties of said algebras as well as computationally studying the defining identities of said algebras. He has obtained his doctoral degree from the Université de Haute-Alsace, France and worked at Mälardalens University, Sweden and Constantine 1 University, Algeria.

Conformal fractional Poisson algebra on a Minkowski phase space: induced infinitesimal Noether symmetry and recursion operator

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Abstract: We show that a Minkowski phase space endowed with a bracket relatively to a conformal frac_tional derivative realizes a deformed Poisson algebra, confering a bi-Hamiltonian structure to the resulting manifold. We then infer that the related Hamiltonian vector field is an infinitesimal Noether symmetry, and compute the corresponding recursion operator.

Keywords: Minkowski phase space, conformal fractional derivative, recursion operator, infinitesimal Noether symmetry, bi-Hamiltonian structure.

Mahougnon Justin Landalidji is currently a researcher at the International Chair in Mathematical Physics and Applications (ICMPA-UNESCO Chair) of the University of Abomey-Calavi. His research activities deal with symplectic geometry, (quasi-) (bi-) Hamiltonian structures of Kepler problem, recursion operator and their generalizations. His works are communicated at different international conferences on geometric methods in Physics, and published in renown conference Proceedings and outstanding ISI-ranked journals. (https://www.researchgate.net/profile/Mahougnon-Landalidji).

Iterated Function Systems and Fractals in Generalized Metric Spaces

Hira Haleem Lodhi, Talat Nazir

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Abstract: The aim of this paper is to present the iterated function system based on cyclic *F*-contraction mappings. By employing the generalized cyclic *F*-contractive mappings, we defined the generalized Hutchinson operators and obtained the attractors of generalized Hutchinson operators. We also constructed several fractals by employing iterated function system of cyclic *F*-contractive mappings. Some examples are presented to support our main results. The presented results are new, extend and unify several comparable results in the existing literature.

Keywords: Iterated function system, Cyclic *F*-contraction, Attractor, Hutchinson operator, Fractal.

Miss Hira Haleem Lodhi is a Graduate Student and Research Scholar in Department of Mathematics, COMSATS University Islamabad, Abbottabad Campus, Pakistan. She is working on area of Iterated Function Systems and Fixed Point Theory.

Hom-Lie structures on 3-dimensional skew symmetric algebras

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Abstract: We describe the dimension of the space of possible linear endomorphisms that turn skew-symmetric three-dimensional algebras into Hom-Lie algebras. We find a correspondence between the rank of a matrix containing the structure constants of the bilinear product and the dimension of the space of Hom-Lie structures. Examples from classical complex three-dimensional Lie algebras are given to demonstrate this correspondence.

Keywords: Hom-Lie structures, Skew-symmetric algebras

Elvice Ongong'a is a young enthusiastic researcher in mathematics from Nairobi, Kenya. He is currently doing his Ph.D. studies at Mälardalen University, Sweden under the supervision of Prof. Sergei Silvestrov. His research interests are in Hom-algebras and he has been working on classification problems of such algebras in lower dimensions. He is also involved in research in Africa and he is a member of the Eastern African Universities Mathematics Program (EAUMP) network. His current studies in Sweden are fully supported by the International Science Program (ISP).

On computing fuzzy set-valued maps on sets equipped with directed a graph

Muhammad Rafique, Talat Nazir

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Abstract: In this paper we introduce a new concept of generalized fuzzy set-valued graphic *F*-contractive mappings with set-valued domain and analyses the existence of fuzzy fixed points for such contractive maps equipped with directed graph. In addition, some non-trivial examples upon the generality of our results provided therein. The established ideas in this work will motivate new directions in fixed point theory and related hybrid models in the literature of fuzzy mathematics.

Keywords: Fuzzy fixed point, Fzzy set-valued map, Generalized contractive mapping, Graph

Mr. Talat Nazir is a PhD Scholar in Department of Mathematics, COMSATS University Islamabad, Pakistan. He is working in the area of Fuzzy Mathematics, Fixed Point Theory and Nonlinear Analysis. He is an active researcher of Mathematics.

A lattice representation of interval–valued fuzzy sets by family of lower (level) cut sets

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Abstract: We present the necessary and sufficient conditions for a family of subsets of a nonempty set *A* to be a collection of lower level sets of an interval-valued fuzzy set. We consider interval –valued fuzzy sets as lattice valued fuzzy sets and as the co-domain of the membership function we consider the lattice of all closed sub-intervals of the real interval [0,1] with empty set added, ordered by set inclusion. The concept of lower level sets is known in the theory of fuzzy sets, but it is not widely investigated in fuzzy set theory as it is the concept of cut sets. The reason for this might be that lower level sets have similar properties as cut sets, and cut sets are easier to handle. An open problem that will be presented, is to give the necessary and sufficient conditions for a family subsets of a nonempty set *A* to be a collection of cut sets of an interval-valued fuzzy set.

Keywords: Interval-valued fuzzy sets, Cut sets, Lower level (cut) sets

Marijana Gorjanac Ranitović is currently an Assistant Professor at Faculty of Education of the University of Novi Sad. She teaches at all three levels of higher education in Serbia. She obtained a PhD in mathematics at the Faculty of Sciences, University of Novi Sad. Her current research interests relate to Order structures, Lattice theory and Algebraic aspects of Fuzzy Set Theory. She has published research articles in the leading international journals and participated in a number of projects.

On the universality and isotopy-isomorphy of (r, s, t)-inverse quasigroups and loops with applications to cryptography

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[c] Obafemi Awolowo University, Ile-Ife, Osun, Nigeria, tjayeola@oauife.edu.ng

Abstract: This work introduced a condition called R-condition, under which (r, s, t)-inverse quasigroups are universal. Middle isotopic (r, s, t)-inverse loops, satisfying the R-condition and possessing a trivial set of r-weak inverse permutations were shown to be isomorphic; isotopy-isomorphy for (r, s, t)-inverse loops. Isotopy-isomorphy for (r, s, t)-inverse loops was generally characterized. With the R-condition, it was shown that for positive integers r, s and t, if there is an (r, s, t)-inverse quasigroup of order 3k with an inverse-cycle of length gcd(k, r + s + t) > 1, then there exist an (r, s, t)-inverse quasigroup of order 3k with an inverse-cycle of length gcd(k(r + s + t),(r + s + t) 2). The procedure of application of such (r, s, t)-inverse quasigroups to cryptography was described and explained, while the feasibility of such (r, s, t)-inverse quasigroups was illustrated with sample values of k, r, s and t

Keywords: Weak inverse, Cross inverse, M-inverse, (r, s, t)-inverse quasigroups and loops, Rcondition, isotopy-isomorphy, Long inverse cycle, Cryptography.

Ilemobade Richard is currently a graduate student in Pure Mathematics (Algebra) at Obafemi Awolowo University, Ile-Ife, Nigeria, West Africa. He obtained his bachelor's degree in Mathematics from the University of Lagos, Akoka, Lagos, Nigeria. His area of interest is Non-associative Algebraic Systems. He has attended and participated in national and international conferences home and abroad, seminars and workshops.

On Applications of Complex Fuzzy Sets in Decision Making Sciences

Raja Fida ur Rehman

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Abstract: In 1965, Z.A. Zadeh launched idea of a fuzzy set. It is extension of a crisp set. It can be used in different branches of science (decision sciences, engineering etc). The range of a fuzzy set is closed interval [0,1] and its image set is called membership function and the domain is a universal set. Presently, the generalized shape of a fuzzy set is a CFS whose range is extended to a unit disk with span one in a complex plane. The idea of a CFS was first given by Ramot et al., (2002). Appropriately, a CFS is an expansion of a fuzzy set, it is expanded from a closed interval [0,1] to a circle of span one in a complex plane. The membership function of a CFS S is denoted as σS(t) and defined on the universal set U as: for any t∈U a complex plane within the circle of span one in a complex plane. In this way, all values of σS(t) lie on and in a circle of span one in a complex plane, and mathematically σS(t)=τS(t)ejρS(t), Where j=√-1. The term τS(t) is said to be amplitude term; ρS(t) is said to be a phase term. The CFS S is represented as {(t, σS(t))|t∈U}. In my research I have proved some results of CFS by using the operation of set theory.

Keywords:.Fuzzy sets, Complex Fuzzy sets, Decision sciences

Raja Fida ur Rehman is currently working as a student of Mathematics at the department of Mathematics, COMSATS University Islamabad, Abbottabad Campus, Pakistan. He did his BS from University of Azad Jammu & Kashmir Muzaffarabad, Pakistan. and MS from COMSATS University Islamabad, Abbottabad Campus, Pakistan. He is working on "Applications of Complex Fuzzy Sets in Decision Making Sciences" under the supervision of Dr. Madad Khan.

Generalized iterated function system and common attractors of generalized Hutchinson operators in semi metric spaces

Farah Noor Saeed, Talat Nazir

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Abstract: The aim of this paper is to present the generalized iterated function system and the common attractors of generalized Hutchinson operators in the setup of semi metric spaces. We constructed several fractals by employing generalized iterated function system with a finite collection of generalized contractive compact valued mappings defined on Hausdorff semi metric space. We also present some new examples to support our main results. The presented results are new, unify and extend several results in the existing literature.

Keywords: Generalized iterated function system, Common fixed point, Hutchinson operator, Set-valued map, Semi metric space.

Miss Farah Noor Saeed is a ResearchScholar and Graduate Student in Department of Mathematics, COMSATS University Islamabad, Abbottabad Campus, Pakistan. She is an active researcher and working on area of Fractals Theory and Nonlinear Analysis.

Two versions of Tarski fixed point theorem applied to fuzzy set equations and inequations

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Abstract: The set of all fuzzy subsets of a given set and the set of all fuzzy relations on a given set are complete lattices, provided that the codomain lattice is complete. That gives us an opportunity to apply Tarski fixed point theorem to some typical fuzzy set and fuzzy relational equations, the solutions to which are the fixed points of a monotonous operator. Moreover, the solutions to some systems of fuzzy set equations may also be seen as the fixed points of a monotonous operator on a complete lattice. Using the original version of Tarski fixed point theorem we solve some existential and extremal problems. Using its constructive version we get even more, a "construction" of the existing solution. Such a construction may take uncountably many steps, thus it is proved that in a special case of a meet-continuous lattice, the process may end in at most countably many steps.

Keywords: Complete lattice, Fixed point theorem, Fuzzy set equation, Fuzzy set inequation

Vanja Stepanović is a lecturer at the Department of Mathematics and Physics at University of Belgrade, Faculty of Agriculture. She has received her BSc and MSc at the University of Belgrade, Faculty of Mathematics and defended her PhD thesis at the University of Novi Sad, Faculty of Sciences, in 2012. She is author and co-author of scientific papers published in scientific journals and presented at national and international conferences. Her works are in the fields of lattice theory (week congruences), fuzzy set theory and algebraic geometry, as well as in the field of social sciences and humanities. He is also the author of a monograph study. She reviewed for mathematical scientific journals, including Fuzzy Sets and Systems. In 2018, Fuzzy Sets and Systems awarded her a Certificate for Outstanding Contribution to Reviewing..

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