

# **MATHEMATICIANS at UP IAM and UP FAMNIT**

## **REPORT 2014**



UNIVERSITY OF PRIMORSKA

FACULTY OF MATHEMATICS, NATURAL SCIENCES AND INFORMATION TECHNOLOGIES  
(UP FAMNIT)

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**Mathematicians at UP IAM/UP FAMNIT Report 2014**

Edited by

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Boštjan Frelih, Paweł Petecki and Edward Dobson.

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## UNIVERSITY OF PRIMORSKA (UP)

The University of Primorska (Univerza na Primorskem; Università del Litorale; UP) was established by the Slovenian parliament on January 29, 2003 and was registered at the District Court of the city Koper on March 3, 2003 thus becoming a legal entity.

The UP is a public institution, financed by the Slovenian Government. The activities of the UP are focused on offering high-quality study programmes, active inclusion of students in research work and researchers in teaching, and on internationally comparable achievements in the fields of research and education.



### **Members of the University of Primorska:**

- Faculty of Built Environment;
- Faculty of Humanities;
- Faculty of Management;
- Faculty of Mathematics, Natural Sciences and Information Technologies;
- Faculty of Education;
- Faculty of Tourism Studies;
- Faculty of Health Sciences;

### **2 research institutes:**

- Science and Research Centre;
- Andrej Marušič Institute;

- University Library;
- Student Residences;

### **Two associate members:**

- College of Design Ljubljana;
- Orthopaedic Hospital Valdoltra.

## **International Cooperation**

The UP strives to strengthen the international and cross-border cooperation and projects.

- Fields of project cooperation: Research, Education, Applied Sciences, Student and Faculty Mobility.
- Themes of project cooperation: Intercultural dialogue, Languages, Cultural heritage, History, Anthropology, Geography, Education, Sociology, Management, Tourism, Environment, Agriculture, Health, Mathematics, Informatics, Kinesiology and Ergonomics, etc.
- Partner institutions from: Austria, Croatia, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Lithuania, Netherlands, Norway, Poland, Russia, Spain, UK, etc.

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## **FACULTY OF MATHEMATICS, NATURAL SCIENCES AND INFORMATION TECHNOLOGIES (UP FAMNIT)**

Glagoljaška 8, SI-6000 Koper, Slovenia

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The Faculty of Mathematics, Natural Sciences and Information Technologies (UP FAMNIT) was established by the UP in 2006 for the purpose of balancing the social sciences with the natural sciences.



The Faculty is committed to integrating mathematics (the universal language of science) with computer science (the modern language of computation and information technology) into study programmes. This provides graduate students of the UP FAMNIT as well as UP with exceptional knowledge of these essential disciplines.

The Faculty works closely with the Andrej Marušič Institute (UP IAM) to provide opportunities for research experience to students. The Faculty is also benefiting and constantly improving from close collaboration with the UP IAM through involvement in interdisciplinary research and exposure to current research. Nowadays it is not enough to excel in one field or sector - an interdisciplinary approach is needed. The fundamental questions that face humanity today are too complex to be answered through just one sector of expertise.

The Faculty operates five departments:

- Department of Applied Natural Sciences,
- Department of Biodiversity,
- Department of Information Sciences and Technologies,
- Department of Mathematics,
- Department of Psychology.

The total number of employees in the current academic year (2014/15) is: 116 (61.08 FTE) full-time and 40 part-time teaching and research staff, of which 15 are full-time and 2 part-time foreign professors and researchers, and 15 administrative staff (14.15 FTE). In the Academic year 2014/15 additional 36 foreign professors will be participating at the UP FAMNIT study process within the project UP and the World.

### **Educational Activities**

The first generation of students were enrolled in UP FAMNIT in the academic year 2007/08. In the current academic year (2014/15), the Faculty offers eight undergraduate university programmes (BA), six Master (MS) and three PhD programmes:

Undergraduate university programmes (BA) (3 years):

- Mathematics
- Mathematics in Economics and Finance
- Computer Science
- Bioinformatics
- Biodiversity
- Biopsychology
- Mediterranean Agriculture

- 
- Applied Kinesiology

Master's (MS) programmes (2 years):

- Mathematical Sciences
- Computer Science
- Nature Conservation
- Mathematics with Financial Engineering
- Biopsychology
- Applied Kinesiology

Doctoral (PhD) programmes (3 years):

- Mathematical Sciences
- Computer Science
- Applied Kinesiology

In the 2014/15 academic year, 799 students have been enrolled in study programmes at UP FAMNIT, of which 596 are in undergraduate programmes, 178 in master's programmes, and 25 in doctoral programmes. The undergraduate programmes are all offered on a full-time basis, while the master's programmes are offered both on a full-time and part-time basis. The doctoral programmes are offered only on a part-time basis. All courses/programmes are designed in accordance with Bologna Declaration. In the 2014/15 academic year, the undergraduate programme Mathematics, master's (MS) programme Mathematical Sciences and doctoral (PhD) programme Mathematical Sciences are offered also in English.

## **Research**

Research data / indicators as of December 31, 2014:

- The number of registered researchers: 104 (of which 1 has a Young Researcher fellowship).
- Average number of points according to the methodology SICRIS per registered researcher at ARRS in 2014 = 73.29 points.
- The effectiveness based on ARWU methodology - total number of published work of our researchers in journals that are indexed in databases SCI, SSCI and AHCI in 2014 = 166 publications.
- The average number of normalized citations per registered researcher (within the last 10 years) = 133.04 citations.

## **International and inter-university cooperation**

Since its establishment, international mobility of professors and researchers has been one of the basic policies of the Faculty.

The teaching and research staff at the Faculty is highly international. The Faculty is involved in a number of bilateral projects, both independently and in collaboration with the University of Primorska, Andrej Marušič Institute (UP IAM).

As at any faculty included in the sphere of international educational, the students, graduates, teachers and researchers can integrate into the European Higher Education Area and

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beyond through UP FAMNIT, as well as incorporate their courses with the programmes in universities abroad.

Professors and colleagues actively participate in international scientific conferences, meetings and summer schools in their scientific field. They also feature as keynote speakers in several international conferences, and lecture at universities abroad as visiting lecturers.

The international integration of the Faculty is also reflected in the attractiveness for its doctoral and postdoctoral training for foreigners. In recent years, UP FAMNIT has hosted several foreign students (Hungary, China, USA, etc.) for postdoctoral training. We are also recording more students attending doctoral studies in mathematics. Of the ten young Researchers at the UP FAMNIT and UP IAM in 2014/2015, seven are foreigners (from five different countries: Argentina, Bosnia and Herzegovina, Mexico, Poland and Slovakia).

The Faculty is an organiser and co-organiser of resounding international conferences.

Successful international cooperation is also reflected in the numerous contacts our professors and researchers have with scientists from prestigious foreign universities and their visits to UP FAMNIT and UP IAM: Eötvös Loránd University, Budapest, Hungary; University of Pécs, Hungary; University of Leoben, Austria; Matej Bel University, Banská Bystrica, Slovakia; Comenius University in Bratislava, Slovakia; Luleå University of Technology, Sweden; Rutgers, The State University of New Jersey, USA; Mississippi State University, Starkville, USA; Northern Arizona University, Flagstaff, USA; University of Wisconsin, Madison, USA; Colgate University, New York, USA; University of Washington, Seattle, USA; University of Lethbridge, Canada; Beijing University, China; Capital Normal University, Beijing, China; Beijing Jiaotong University, China; Pohang University of Science and Technology, South Korea; University of the Basque Country, Bilbao, Spain; Moscow State University, Russia; Louisiana State University, USA; University of Western Australia, Perth, Australia; Netanya Academic College, Israel; Utrecht University, Netherlands; University of Amsterdam, Netherlands; National University of La Plata, Argentina; University of Salerno, Italy and many others.

The UP FAMNIT has adopted the Erasmus programme aimed at the cooperation and exchange of students and teaching staff in higher education, the CEEPUS programme, a Central European programme for the exchange of students and professors, and has signed bilateral agreements with many foreign institutions.



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## ANDREJ MARUŠIČ INSTITUTE (UP IAM)

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The UP PINT (University of Primorska, Primorska Institute for Natural and Technical Sciences) was founded in 1999 as an independent public research institution and as such registered in the register of the District Court of Koper on September 27, 1999. On October 14, 2011 the UP PINT was renamed to the University of Primorska, Andrej Marušič Institute (UP IAM). As from this date the Institute legally operates under the new name (hereinafter referred to as UP IAM).

The UP IAM carries out fundamental and applied research, is involved in international scientific cooperation, and establishes connections with similar organizations around the world, in line with its development programme. With its researchers, habilitated teachers and assistants, the UP IAM is involved in educational activities of the University of Primorska (UP) and cooperates with members and Associated members of the UP in designing proposals for new courses and new programmes of UP, as well as in establishing new faculties.

Natural sciences and technology are foundations on which industry is based, therefore their high quality development is of strategic importance. In the UP, UP FAMNIT and UP IAM are responsible for development of natural sciences and technology. Both institutions are committed to making continuous efforts towards excellent work quality and to persisting in their efforts to move closer to the top of the scientific world. Being on top entails not only being successful within one field, but requires an excellent interdisciplinary performance, which involves working beyond traditional and sharp divisions among the basic areas of human science (natural sciences, technology, social sciences, and humanities). Basic questions of humankind are simply too complex to allow for answers only using tools or through the perspective of a single scientific discipline. Therefore, both institutions seek primarily to develop a single, uniform or linked science.

The research activities are organized into four research and development units: Department of Technology, Department of Mathematics, Department of Information Science and Technologies, and Department of Health Study. All units are strongly tied in interdisciplinary studies.

At the Department of Mathematics research is carried out mainly in algebra, combinatorics and graph theory with probability theory and is strongly connected with all other departments. Department of Information Science and Technologies conducts research on data structures, data mining, large-scale distributed GRID architectures, and in collaboration with Department of Health Study in the field of e-health. The core activity of the Department of Technology is environment protection and the technology associated with it.

Within the institute there are also two centers. The Slovene Center for Research of Suicide (SCRS), founded in 2011, is the first such center in Slovenia, which field is capturing above all innovative manners in approach to research of problem of suicide. The Center for Industrial Applications (CIA) was founded in 2012, with aim to strengthen the transfer of knowledge and good practices from research to industry.

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## MATHEMATICIANS AT UP IAM/UP FAMNIT

UP IAM and UP FAMNIT currently includes 64 mathematicians:

Prof. BATAGELJ Vladimir  
Prof. DOBSON Edward  
Prof. GRAVNER Janko  
Prof. JANEŽIČ Dušanka  
Prof. KUZMA Bojan  
Prof. MALNIČ Aleksander  
Prof. MARUŠIČ Dragan, Rector UP  
Prof. PISANSKI Tomaž  
Prof. POTOČNIK Primož  
Prof. STEVANOVIĆ Dragan  
Assoc. Prof. BANIČ Iztok  
Assoc. Prof. BELARDO Francesco  
Assoc. Prof. KOVÁCS István  
Assoc. Prof. KUTNAR Klavdija, Dean UP FAMNIT  
Assoc. Prof. MIKLAVIČ Štefko, Vice-rector for Research UP  
Assoc. Prof. MILANIČ Martin, Vice-dean of UP FAMNIT  
Assoc. Prof. PASALIC Enes  
Assoc. Prof. PERMAN Mihael  
Assoc. Prof. PREZELJ Jasna  
Assoc. Prof. ŠKREKOVSKI Riste  
Assoc. Prof. ULE Aljaž  
Assist. Prof. BOBEN Marko  
Assist. Prof. BOLDIN Barbara  
Assist. Prof. HORVAT Boris  
Assist. Prof. HUJDUROVIĆ Ademir  
Assist. Prof. JAKLIČ Gašper  
Assist. Prof. LUKŠIČ Primož  
Assist. Prof. OREL Marko, Vice-dean of UP FAMNIT  
Assist. Prof. RAIČ Martin  
Assist. Prof. ŠPARL Primož  
Assist. Prof. ŠPARL Petra  
Assist. Prof. VERRET Gabriel  
Assist. Prof. VITRIH Vito, Director of UP IAM  
Assist. Prof. ZHANG Cui  
Assist. Prof. ZGRABLIČ Boris  
Dr. BAJRIČ Samed  
Dr. CERGOL Boris  
Dr. FRELIH Boštjan  
Dr. JERMAN Marjan  
Dr. KAVKLER Iztok  
Dr. KOVIČ Jurij  
Dr. MA Jicheng  
Dr. MRAMOR Blaž  
Dr. ORBANIČ Alen



Assist. Prof. Marko Orel received the University award "Svečana listina Univerze na Primorskem"

Dr. POŽAR Rok  
 Dr. TONEJC Jernej  
 Dr. VIDALI Januš  
 ANTONČIČ Iva  
 BERČIČ Katja, Young Researcher  
 CEPAK Nastja, Young Researcher  
 CERINŠEK Monika  
 CHIARELLI Nina  
 ESTÉLYI István, Young Researcher  
 FERJANČIČ Karla, Young Researcher  
 FILIPOVSKI Slobodan  
 HARTINGER Tatiana Romina, Young Researcher  
 HODŽIĆ Samir, Young Researcher  
 KOIKE QUINTANAR Sergio Hiroki, Young Researcher  
 PENJIĆ Safet, Young Researcher  
 PETECKI Paweł, Young Resercher  
 PEZDIR Rado, MSc  
 RAMOS RIVERA Alejandra, Young Researcher  
 TISNIKAR Viljem  
 VASILYEV Alexander, Young Researcher  
 ZALOKAR Ana, Young Researcher



Nastja Cepak, Tatiana Romina Hartinger and Sergio Hiroki Koike Quintanar

## RESEARCH PROGRAMS

- 2009-2014: Algebra, Discrete Mathematics, Probability and Game Theory; leader: Dragan Marušič.
- 2009-2014: Computationally Intensive Methods in Theoretical Computer Science, Discrete Mathematics, Combinatorial Optimization and Computational Analysis and Algebra with Applications in Natural and Social Sciences; leader: Tomaž Pisanski.
- 2013-2016: Alive? Alive! Research and Prevention of Suicide; leader: Diego De Leo.

## RESEARCH PROJECTS

- 2014-2017: J1-6720 Algebraic Graph Theory with Applications; leader: Dragan Marušič.
- 2014-2017: J7-6828 Bounded Rationality and Economic Performance; leader: Aljaž Ule.
- 2014-2016: What we Wood believe? Societal perceptions of the forest-based sector and its products towards a sustainable society ( $W^3B$ ); leader: Klavdija Kutnar.
- 2013-2016: J1-5433 Application of Semiregular Group Actions in Some Open Problems in Algebraic Graph Theory; leader: Dragan Marušič.
- 2012-2014: EnergyVillab. Network of Living Labs, Virtuous in Energy Saving and in the Development of Renewable Energy Resources; leader: Štefko Miklavič.
- 2012-2014: TISAR - Traveller Information System for the Adriatic Region; leader: Primož Lukšič.
- 2011-2014: J1-4021 Algebraic Graph Theory and Applications; leader: Dragan Marušič.
- 2011-2014: J1-4010 Bipartite Distance-regular Graphs; leader: Štefko Miklavič.
- 2011-2014: KC CLASS - Cloud Assisted Services; leader: Boris Horvat.

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- 2011-2014: L1-4292 The Detection of Irregularities and Fraud in the Financing of Public Health Services; leader: Primož Potočnik.
  - 2011-2014: N1-0011 GReGAS - Geometric Representations and Symmetries of Graphs, Maps and other Discrete Structures and Applications in Science; ESF EuroGiga project; leader: Tomaž Pisanski.
  - 2011-2014: SAFEPORT - Management of Industrial and Environmental Risks in the Port; leader: Jure Pražnikar.

#### **BILATERAL PROJECTS led by Math Department 2014 – to date**

- 2014-2016: New Trends in Matching Theory: bilateral scientific - research cooperation between RS and Republic of Turkey, UP IAM and Boğaziçi University.
- 2014-2015: Algebraic Aspects of Graph Theory: bilateral scientific - research cooperation between RS and Republic of Serbia, UP IAM and University of Niš.
- 2014-2015: Theoretical Properties of the Adriatic Indices and the Adriatic Matrices: bilateral scientific - research cooperation between RS and Republic of Croatia, UP IAM and University of Split.
- 2014-2015: Using Probability in Graph Theory and Networks: bilateral scientific - research cooperation between RS and USA, UP FAMNIT and University of California - Davis.
- 2014-2015: Abstract Polygonal Complexes and their Representations: bilateral scientific - research cooperation between RS and USA, UP IAM and Northeastern University.
- 2014-2015: Cliques, Stable Sets, and Graph Classes: bilateral scientific - research cooperation between RS and USA, UP IAM and Rutgers University, RUTCOR.
- 2014-2015: Quasi-coverings and Finite Group Actions on Graphs: bilateral scientific - research cooperation between RS and Russia, UP IAM in Sobolev Institute of Mathematics, Novosibirsk.
- 2014-2015: Cycles and Paths in Symmetric Graphs: bilateral scientific - research cooperation between RS and Russia, UP IAM in Sobolev Institute of Mathematics, Novosibirsk.
- 2014-2015: Schur Groups, Separable S-rings and Applications: bilateral scientific - research cooperation between RS and Russia, UP IAM in St. Petersburg Department of Steklov Institute of Mathematics of the Russian Academy of Sciences.
- 2013-2014: Symmetry properties in science based on combinatorial mathematics, bilateral scientific - research cooperation between RS and South Korea, UP IAM and Yeungnam University.
- 2013-2014: Resolving the conjecture on almost cospectrality of the components of NEPS of graphs: bilateral scientific - research cooperation between RS and USA, UP IAM and University of Wisconsin - Madison.
- 2013-2014: Hamiltonicity of Vertex-transitive graphs: bilateral scientific - research cooperation between RS and USA, UP IAM and Vanderbilt University.
- 2012-2014: Graph Width Parameters and Graph Powers: bilateral scientific - research cooperation between RS and Argentina, UP IAM and Universidad Nacional de La Plata.

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**Ars Mathematica Contemporanea** is publishing high-quality articles in contemporary mathematics that arise from the discrete and concrete mathematics paradigm. It favors themes that combine at least two different fields of mathematics. In particular, it welcomes papers intersecting discrete mathematics with other branches of mathematics, such as algebra, geometry, topology, theoretical computer science, and combinatorics. The name of the journal was chosen carefully. Symmetry is certainly a theme that is quite welcome to the journal, as it is through symmetry that mathematics comes closest to art.

Issues of *Ars Mathematica Contemporanea* from Vol 6, No 1 onward are partially supported by the Slovenian Research Agency from the Call for co-financing of scientific periodical publications.

By SCImago Journal Rank indicator, a portal that includes the journals and country scientific indicators developed from the information contained in the Scopus® database, *Ars Mathematica Contemporanea* is the leading journal in Slovenia in 2013.



Founding Editors and Editors-in-Chief: Dragan Marušič and Tomaž Pisanski



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## ESF EuroGIGA GReGAS, 2011 - 2014

European Science Foundation

Graphs in Geometry and Algorithms

Geometric representations and symmetries of graphs, maps and other discrete structures and applications in science



EuroGIGA is a research network consisting of four collaborative research projects (CRPs). Each CRP is focusing on specific scientific issues and it is a small research network itself consisting of Individual Projects (IPs) and Associate Partners (APs).

EuroGIGA CRPs are:

- GraDR - Graph drawings and representations (leader Jan Kratochvil, Charles University, Czech Republic),
- ComPoSe - Combinatorics of point sets and arrangement of objects (leader Oswin Aichholzer, Graz University of Technology, Austria),
- VORONOI - Spatial decompositions and graphs (leader Günter Rote, Freie Universität Berlin, Germany),
- GReGAS - Geometric representations and symmetries of graphs, maps, and other discrete structures and applications in science (leader Tomaž Pisanski, UP and University of Ljubljana, Slovenia).



EuroGiga final conference, February 16 - 21, 2014, Berlin, Germany

**Project leader:** Tomaž Pisanski, Slovenia

**Leading Organization:** UP

**PI countries:** Croatia, Germany, Slovakia, Slovenia, Turkey

**AP countries:** Austria, Belgium, New Zealand, Israel, USA, UK

**Principal Investigators:**

Vladimir Batagelj, SI

Turker Biyikoglu, TUR

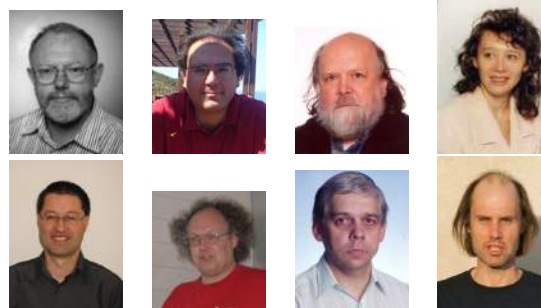
Sandi Klavžar, SI

Antoaneta Klobučar, CRO

Dragan Marušič, SI

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**Associated Partners:**

Leah Wrenn Berman, USA

Marston D. E. Conder, NZ

Patrick Fowler, UK

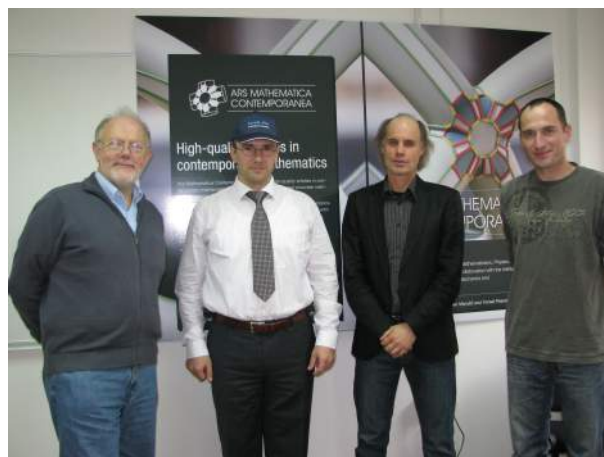
Wilfried Imrich, AUT

Mikhail Klin, IL

Dimitri Leemans, BE

Josef Leydold, AUT

Egon Schulte, USA



Tomaž Pisanski, Aigars Ekers (ESF representative), Dragan Marušič, Štefko Miklavič

**Participating Organizations**





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## Project UP and the World, 2013 - 2015



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA IZOBRAŽEVANJE,  
ZNANOST IN ŠPORT



*Naložba v vašo prihodnost*  
OPERACIJO DELNO FINANCIRA EVROPSKA UNIJA  
Evropski socialni sklad

University of Primorska successfully applied to a call of the Ministry of Education, Science and Sport of the Republic of Slovenia and obtained funds for promotion and encouragement of the internationalization of higher education process between the years 2013 and 2015.

In order to present its programmes and activities to international audience, University of Primorska published a multilingual booklet in September 2014.

The main objective of the call coincides perfectly with the overall aim of UP FAMNIT to enhance the internationalization of study and research processes and open itself to the international higher education and research sphere.

Within the project, we perform three types of activities:

- employment of foreign professors (Assoc. Prof. Francesco Belardo, University of Messina, Italy, 2014/06/01 - 2015/05/31),
- shorter visits of foreign professors who actively participate in the teaching process (Marcin Anholcer, Poznan Univeristy of Economics, Poland, April - June 2014, Andrew Paul Fabel, Mississippi State University, USA, May - June 2014, Russell Stephen Woodroffe, Mississippi State University, USA, May - June 2014),
- organisation of international workshops with invited foreign speakers (International conference on Graph Theory and Combinatorics, Rogla, 2014/05/16 - 2014/05/18, Symmetries of Graphs and Networks, Rogla, 2014/06/29 - 2014/07/05, 2014 PhD Summer School in Discrete Mathematics, Rogla, 2014/06/29 - 2014/07/05, Ljubljana - Leoben Graph Theory Seminar, Koper, 2014/09/03 - 2014/09/05, Smart Cities Conference, Koper, 2014/10/14 - 2014/10/16).



Assoc. Prof. Francesco Belardo

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## ORGANIZED EVENTS IN 2014

### International Conference on Graph Theory and Combinatorics

May 16 - 18, Rogla, Slovenia

<https://conferences.matheo.si/conferenceDisplay.py?confId=7>

#### Organized by:

UP FAMNIT

UP IAM

#### In Collaboration with:

Centre for Discrete Mathematics

UL PeF (University of Ljubljana, Faculty of Education)



#### Scientific Committee:

Štefko Miklavič, Primož Šparl

#### Sponsors:

ARRS - Slovenian Research Agency

MIZS - Ministry of Education, Science and Sport

EFS EuroGIGA GReGAS - European Science Foundation, Graphs in Geometry and Algorithms, Geometric representations and symmetries of graphs, maps and other discrete structures and applications in science

#### Talks:

T. Dobson: *On circulant graphs that are isomorphic to Cayley graphs of more than one abelian group*

A. P. Fabel: *Another strategy for proving planar sets are aspherical*

G. Gévay: *Zonographs and some of their applications*

A. Hujdurović: *Vertex-transitive CIS graphs*

G. Kiss: *On achromatic and pseudoachromatic indices of affine spaces*

B. Kuzma: *On commuting graph*

D. Marušič: *My 42 years of Mathematics with Aleksander Malnič*

E. Pasalic: *Planar functions versus bent functions*

M. Perman: *Chinese restaurant proces, random premutations and random measures*

T. Pisanski: *Some questions about Levi graphs of configurations of points and circles*

R. Požar: *Computational aspects of graph coverings*

J. Prezelj Perman: *Curvature in complex analysis*

D. Stevanović: *A Simple Estimate of the Largest Eigenvalue of Adjacency Matrix of a Graph*

V. Tisnikar: *Graphs in between of Object-centric and Arrow-centric mathematics*

A. Vasilyev: *Extremal graphs with respect to Inverse Sum Indeg index*

R. Woodroffe: *Regularity: a homological measure of graph complexity*

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## 2014 PhD Summer School in Discrete Mathematics and Symmetries of Graphs and Networks IV

June 29 - July 5, Rogla, Slovenia

<https://conferences.matheo.si/conferenceDisplay.py?confId=2>

### Organized by:

UP FAMNIT and UP IAM

### In Collaboration with:

Centre for Discrete Mathematics, UL PeF (University of Ljubljana, Faculty of Education)

### Sponsors:

ARRS - Slovenian Research Agency

MIZS - Ministry of Education, Science and Sport

EFS EuroGIGA GReGAS - European Science Foundation, Graphs in Geometry and Algorithms, Geometric representations and symmetries of graphs, maps and other discrete structures and applications in science

### Scientific Committee:

Klavdija Kutnar, Aleksander Malnič, Dragan Marušič, Štefko Miklavič, Primož Šparl

### Organizing Committee:

Iva Antončič, Boštjan Frelih, Ademir Hujdurović, Boštjan Kuzman (head)

The Summer School consisted of four minicourses (of six hours each) given by:

- Mark Elingham, Vanderbilt University, USA: Construction techniques for graph embeddings.
- Mariusz Meszka, AGH University of Science and Technology, Poland: Combinatorial designs.
- Primož Moravec, University of Ljubljana, Slovenia: Some topics in the theory of finite groups.
- Enes Pasalic, UP, Slovenia: Symmetric key cryptography and its relation to graph theory.

### Invited Talks:

Marston Conder (University of Auckland, New Zealand): *Skew morphisms of finite groups*

Shaofei Du (Capital Normal University, China): *A classification of regular embeddings of graphs of order prime-cube*

Yan Quan Feng (Beijing Jiaotong University, China): *Pentavalent symmetric graphs of order twice a prime power*

Michael Giudici (University of Western Australia, Australia): *Graph-restrictive permutation groups and the PSV Conjecture*

Isabel Hubard (IMATE-UNAM, Mexico): *Realizations of 4,4 toroidal maps*

György Kiss (Eötvös Loránd University, Hungary): *Colorings of affine and projective spaces*

Young Soo Kwon (Yeungnam University, South Korea): *Classification of reflexible edge-transitive embeddings of  $K_{m,n}$  and corresponding groups*

Luis Martínez Fernández (University of the Basque Country, Spain): *On the number of words of a given GC-content in some cyclic DNA-codes*

Joy Morris (University of Lethbridge, Canada): *Automorphisms of Cayley graphs that respect partitions*

Egon Schulte (Northeastern University, USA): *Skeletal Polyhedra, Polygonal Complexes, and*

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## *Nets*

Tamas Szonyi (Eötvös Loránd University, Hungary): *On colourings of projective planes and spaces*

Paul Terwilliger (University of Wisconsin-Madison, USA): *Billiard Arrays and finite-dimensional irreducible  $U_q(\mathfrak{sl}_2)$ -modules*

Steve Wilson (Northern Arizona University, USA): *Semisymmetric graphs from algebraic LR Structures: Large vertex stabilizers*

Dave Witte Morris (University of Lethbridge, Canada): *On hamiltonian cycles in Cayley graphs with commutator subgroup of order  $pq$*

## **Talks:**

Istvan ESTELI: *On groups all of whose undirected Cayley graphs of bounded valency are integral*

Alison GORDON LYNCH: *Finite-dimensional irreducible modules for an even subalgebra of  $U_q(\mathfrak{sl}_2)$*

Alexey MEDVEDEV: *Prefix-reversal Gray codes*

Gabriel PRETEL: *Compatible elements for a tridiagonal pair*

Loredana SIMČIĆ: *Codes constructed from orbit matrices of block designs*

Klara STOKES: *Irreducibility of configurations*

Andrea SVOB: *Transitive combinatorial structures constructed from finite groups*

Wenqin XU: *2-Arc-Transitive Metacyclic Covers of Complete Graphs*

Ma XUESONG: *The Classification of Minimal non-core-2 2-groups with Almost Maximal Class*

Jun-Yang ZHANG: *Vertex-Transitive Digraphs of Order  $p^5$  are Hamiltonian*



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## Ljubljana - Leoben Graph Theory Seminar 2014

September 3 - 5, Koper, Slovenia

<https://conferences.matheo.si/conferenceDisplay.py?confId=5>

### Organized by:

UP FAMNIT

UP IAM

### In Collaboration with:

FNM (University of Maribor)

FMF (University of Ljubljana)

IMFM.

### Sponsors:

ARRS - Slovenian Research Agency

MIZS - Ministry of Education, Science and Sport

EFS EuroGIGA GReGAS - European Science Foundation, Graphs in Geometry and Algorithms, Geometric representations and symmetries of graphs, maps and other discrete structures and applications in science

### Programme Committee:

Wlfrid Imrich, Sandi Klavžar, Klavdija Kutnar, Tomaž Pisanski, Norbert Seifter, Wolfgang Woess

### Organizing Committee:

Boštjan Brešar, Nina Chiarelli, Tatiana Romina Hartinger, Marko Jakovac, Aleksander Kelenc, Martin Milanič (head)

### Invited talks:

Tinaz EKIM: *Minimum Maximal Matching: old problem, new challenges*

Alexander IVANOV: *Revisiting Goldschmidt's Amalgams*

Elena KONSTANTINOVA: *Hamiltonicity of graphs and Gray codes*

István KOVÁCS: *Finite CI-groups and Schur rings*

Florian LEHNER: *Symmetry breaking in graphs and groups*

Romeo RIZZI: *Covering the edges of a graph by matchings of bounded size*

### Talks:

Jernej AZARIJA: *Moore graphs and cycles are extremal graphs for convex cycles*

Francesco BELARDO: *The Laplacian Spectral Theory of Signed Graphs*

Simona BONVICINI: *Palette index of 4-regular graphs*

Gabor GÉVAY: *Regular maps whose 1-skeleton is a generalized Petersen graph*

Nina HAUG: *The minimum number of subtrees of trees*

Marc HELLMUTH: *On the Cartesian Skeleton of Hypergraphs and Digraphs*

Andreas HINZ: *The Frame-Stewart Conjecture*

Wlfrid IMRICH: *The Cartesian product of graphs with loops*



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Marko JAKOVAC: *The partition dimension of some graph products*

Marko OREL: *Some examples of cores*

Iztok PETERIN: *Toll convexity* Tomaž PISANSKI: *Cubic graphs with one-factor and the associated quartic graphs*

Dragan STEVANOVIĆ: *On trees with extremal values of Zagreb indices*

Riste ŠKREKOVSKI: *On Wiener index of iterated lines graphs of trees*

Gabriel VERRET: *Semiregular automorphisms of cubic vertex-transitive graph*



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## 2nd annual Mississippi Discrete Mathematics Workshop

November 15 - 16, Mississippi, USA

<http://rwoodroofe.math.msstate.edu/workshop2014/>

### Organized by:

Mississippi State University; and UP through the ARRS research agency of Slovenia.

### Sponsors:

Mississippi State University, and ARRS - Slovenian Research Agency

### Organizing Committee:

Ted Dobson (Mississippi State University)

Klavdija Kutnar (UP FAMNIT and UP IAM)

Dragan Marušič (UP FAMNIT and UP IAM)

Laura Sheppardson (University of Mississippi)

Russ Woodroofe (Mississippi State University)

### Featured speaker:

Paul Balister (University of Memphis, USA)

### Talks:

Anna Bachstein: *Decomposition of cubic graphs on the torus and Klein-bottle*

Paul Balister: *Minimal symmetric differences of lines in projective planes (keynote)*

Paul Fabel: *Applications of trees and diamond free semilattices in geometry and topology*

Eric Gottlieb: *An Erdős-Szekeres result for set partitions*

Drew Lewis: *A combinatorial approach to some questions from affine algebraic geometry*

Rok Požar: *Solvable regular covering projections of graphs*

Bernd Schroeder: *Using Algebraic Topology to prove performance guarantees for a constraint satisfaction algorithm?*

Shaohui Wang: *Padmakar-Ivan index of  $k$ -trees*

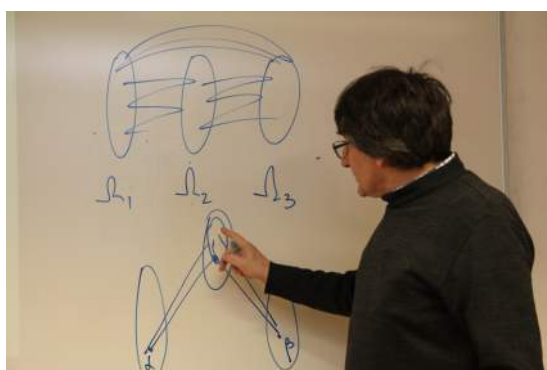
Erik Westlund: *Decomposing Cayley digraphs into isomorphic directed trees*



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## Research Mathematical Seminar in 2014

- 06/01/2014 Tomaž Pisanski (University of Ljubljana and UP): Combinatorial Configurations, Quasiline Arrangements and Systems of Curves on Surfaces (part II)
- 13/01/2014 Ted Dobson (UP & Mississippi State University, USA): On the Cayley Isomorphism Problem
- 27/01/2014 Samed Bajrić (UP): On Certain Construction Methods of Cryptographically Significant Boolean Functions
- 17/02/2014 Mikhail E. Muzychuk (Netanya Academic College, Israel): On Systems of Linked Block Designs
- 24/02/2014 Josu Vukman: On the Consequences of a Result of S. Kurepa



- 03/03/2014 István Estélyi (UP): Cayley Integral Groups
- 10/03/2014 Nina Chiarelli (UP): On a Class of Graphs between Threshold and Total Domishold Graphs
- 17/03/2014 Paweł Petecki (UP): On Cyclic Hamiltonian Decompositions of Complete  $k$ -uniform Hypergraphs
- 24/03/2014 Martin Milanič (UP): Counterexamples to Orlin's Conjecture on Equistable Graphs
- 31/03/2014 Irina Cristea (University of Nova Gorica, Slovenia): Some Combinatorial Aspects of the Connections between Hypergroups and Fuzzy Sets
- 07/04/2014 Karla Počkaj (UP):  $C^1$  Hermite Interpolation with Spatial PH Cubic Biarcs and a Fully Data-dependent Criterion for Free Angles Selection
- 14/04/2014 Norbert Seifter (Montanuniversität Leoben, Austria): Generalized Ends of Groups and Graphs
- 23/04/2014 Primož Lukšič (University of Ljubljana and UP): Distance Degree Regularity and Distance-balanced Properties of Graphs
- 28/04/2014 Ajda Fošner (UP): Ohranjevalci na tenzorskem produktu matrik
- 12/05/2014 Marcin Anholcer (Poznan University of Economics, Poland): Spectra of Graphs and Closed Distance Magic Labelings
- 29/05/2014 Paul Fabel (Mississippi State University): Fibre Bundles as Generalized Universal Covers
- 26/05/2014 Ana Zalokar (UP): On Equity-linked Life Insurance
- 02/06/2014 Russ Woodroffe (Mississippi State University, USA): Noncontractibility of the Coset Lattice and Fixed Points of Group Actions
- 09/06/2014 Slobodan Danko Bosanac (Ruđer Bošković Institute, Croatia): Verifiable Information: the Problem of Communication
- 11/06/2014 Robin Wilson (Open University, UK): Euler: 300 years on / A Century of



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## Graph Theory



- 16/06/2014 Janez Povh (Faculty of information studies): Kaj imata skupnega kombinatorična optimizacija in realna algebraična geometrija?
- 23/06/2014 Ganna Kudryavtseva (IMFM): Non-commutative Stone Dualities
- 29/09/2014 Matthew Johnson (Durham University, UK): Finding (Shortest) Paths between Graph Colourings
- 06/10/2014 Pablo De Caria (National University of La Plata, Argentina): On Chordal and Dually Chordal Graphs and their Tree Representations
- 06/10/2014 Flavia Bonomo (Buenos Aires University, Argentina): Minimum Weight Clique Cover in Claw-free Perfect Graphs
- 13/10/2014 György Pál Gehér (University of Szeged and University of Debrecen, Hungary): A Two Dimensional Matrix Problem of Molnar and Timmermann and its Connection to a Geometric Problem of Rassias and Wagner
- 20/10/2014 Ademir Hujdurović (UP): Generalized Cayley Graphs
- 27/10/2014 Istvan Kovacs (UP): Finite CI-groups and Schur Rings
- 03/11/2014 Rok Požar (UP): Solvable Regular Covering Projections of Graphs
- 10/11/2014 Tomaž Pisanski (University of Ljubljana and UP): General Haar Graphs in Sage
- 17/11/2014 Nina Chiarelli (UP): Equistarable Bipartite Graphs
- 24/11/2014 Jurij Kovič (UP): Japonska tempeljska geometrija
- 01/12/2014 Francesco Belardo (UP): Spectral Determination of Signed Graphs
- 08/12/2014 Emil Žagar (University of Ljubljana): Geometric Interpolation by Parametric Polynomial Curves
- 15/12/2014 Alexander Vasilyev (UP): On Adriatic Indices, Spectral Properties of Adriatic Matrices and Software for Topological Descriptors
- 22/12/2014 Martin Milanič (UP): Vector Connectivity in Graphs
- 29/12/2014 Vladimir Gurvich (Rutgers University, USA): On Nash-solvability of Chess-like Games

**Seminar Coordinator:** Štefko Miklavič

More: <http://www.famnit.upr.si/sl/seminars>

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## Summer Math Camp “Mathematics is Cool”, August 24 - 30, 2014.

The camp intended for pupils in the last three years of primary schools and for those in secondary schools that are interested in mathematics. This year, the camp was conducted separately for primary and secondary school for the first time. The camp included lectures and workshops on various mathematical topics and numerous social activities. The purpose was to show that mathematics can be both fun and useful.

More: <http://tabor.famnit.upr.si/>

### Organized by:

UP FAMNIT

UP IAM

### Organizing committee:

Bojan Kuzma

Martin Milanič

Vito Vitrih

### Speakers:

Barbara Boldin, UP

Nastja Cepak, UP

Nina Chiarelli, UP

Karla Ferjančič, UP

Marjan Jerman, UL and UP

Olga Kaliada, UP

Milan Mitrović, OŠ Sava Kladnika Sevnica

Mihael Perman, UP

Rado Pezdir, UP

Jasna Prezelj, UL and UP

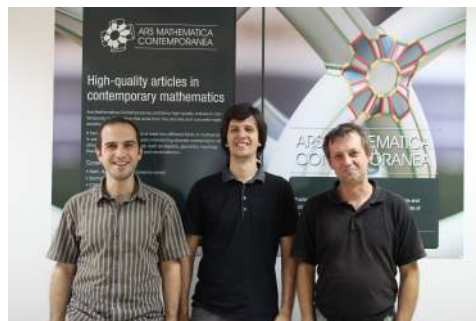
Maruša Saksida, UP

Aljaž Ule, University of Amsterdam and UP

Borut Umer, UP

Tadej Vodopivec, UP

Ana Zalokar, UP



## Famnit Excursions into the Mathematical Universe, once a month.

A series of popular lectures on mathematics and its role in the modern world running for the sixth consecutive year in the 2014/2015 academic year. The lectures are held from October to June, usually once a month. In 2014/2015 this series of lectures is offered as one of the programs of continuing education for professionals in education.

More: <http://izleti.famnit.upr.si/>

### Organized by:

UP FAMNIT and UP IAM

### Coordinator:

Martin Milanič

### Speakers:

Boštjan Brešar, UM FNM

Arjana Brezigar Masten, UP and UMAR

Boštjan Frelih, UP FAMNIT and UP IAM

Klavdija Kutnar, UP IAM and UP FAMNIT

Janez Žibert, UP FAMNIT and UP IAM



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**Preparations for the International Mathematical Olympiad,  
September 22 - 26, 2014.**

More: <http://www.famnit.upr.si/sl/novice/raziskovalni-dnevi-i-1>

UP FAMNIT and UP PeF (the Faculty of Education) hosted the Mathematical Research Days, the annual preparation for the Mathematical Olympiad organized by DMFA Slovenia (the Association of Mathematicians, Physicists and Astronomers of Slovenia). Theoretically and through problem solving the participants discussed the following topics: one day was devoted to geometry (István Estelyi gave a talk on Ptolemy's theorem) and one to algebra (Marko Palangetić gave a talk on functional equations), while three research days were devoted to combinatorics: Marko Rajković gave a talk on arithmetic on the permutations, Anastasiya Tanana presented the differential equations and Ademir Hujdurović gave a talk on graph theory.





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## VISITING PROFESSORS AND RESEARCHERS IN 2014

- Marcin Anholcer (Poznan Univeristy of Economics, Poland)
- Francesco Belardo (University of Messina, Italy)
- Flavia Bonomo (University of Buenos Aires, Argentina)
- Sylwia Cichacz-Przenioslo (AGH University of Science and Techology, Poland)
- Pablo De Caria (National University of La Plata, Argentina)
- Cemil Dibek (Bogaziçi University, Turkey)
- Tomislav Došlić (University of Zagreb, Croatia)
- Tinaz Ekim (Boğazici University, Turkey)
- Sergei Evdokimov (Saint Petersburg Department of V. A. Steklov Institute of Mathematics, Russia)
- Andrew P. Fabel (Mississippi State University, United States of America)
- Yan Quan Feng (Beijing Jiaotong University, China)
- György Gehér (University of Szeged, Bolyai institute and MTA-DE Lendület Functional Analysis Research Group, Hungary)
- Michael Giudici (University of Western Australia, Australia)
- Vladimir Gurvich (Rutgers University, USA)
- Alexander A. Ivanov (Imperial College London, UK)
- Matthew Johnson (Durham University, UK and Northern Ireland)
- Jian-Bing Liu (Beijing Jiaotong University, China)
- Alison Gordon Lynch (University of Wisconsin - Madison, USA)
- Luis Martinez Fernandez (University of the Basque Country, Spain)
- Joy Morris (University of Lethbridge, Canada)
- Mikhail E. Muzychuk (Netanya Academic College, Israel)
- Daniel Paulusma (Durham University, UK and Northern Ireland)
- Gabriel Hernan Pretel (University of Wisconsin - Madison, United States of America)
- Jelena Sedlar (University of Split, Croatia)
- Norbert Seifter (University of Leoben, Austria)
- Slobodan Simić (Mathematical Institute of the Serbian Academy of Sciences and Arts, Serbia)
- Pablo Spiga (University of Milano-Bicocca, Italy)
- Paul Terwilliger (University of Wisconsin-Madison, USA)
- Elena Valentinova Konstantinova (Sobolev Institute of Mathematics, Russia)
- Fabio Vlacchi (Universita degli Studi di Firenze, Italy)
- Damir Vukičević (University of Split, Croatia)
- Robin Wilson (The Open University, UK)
- Dave Witte Morris (University of Lethbridge, Canada)
- Russell Stephen Woodroffe (Mississippi State University, USA)
- Da-Wei Yang (Beijing Jiaotong University, China)

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## RESEARCH VISITS IN 2014

Mathematicians of UP IAM and UP FAMNIT had research visits at the following institutions in 2014:

- École Normale Supérieure de Lyon, Lyon, France, January - February
- University of Bilbao, Bilbao, Spain, February, 3 researchers
- Kuwait University, Kuwait, February
- Jagiellonian University Kraków, Kraków, Poland, March - April
- Vanderbilt University, Nashville, USA, April, 2 researchers
- Eötvös Loránd University, Budapest, Hungary, April, 2 researchers
- Beijing Jiaotong University, Beijing, China, January, April - May, 2 researchers



- Mississippi State University, Starkville, USA, April, August - September, November, 5 researchers
- LAMSADE, Université Paris-Dauphine, Pariz, France, May - June
- Max Planck Institute for Mathematics in Sciences, Leipzig, Germany, June
- Graz University of Technology, Graz, Austria, July, 2 researchers
- University of Oregon, Eugene, USA, August
- RWTH Aachen University, Aachen, Germany, August
- The State University of New Jersey, Rutgers, USA, September
- University of Salerno, Salerno, Italy, September
- Sobolev Institute of Mathematics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia, September, 5 researchers
- Novosibirsk State University, Novosibirsk, Russia, September, 5 researchers
- Boğazici University, Istanbul, Turkey, September, 2 researchers
- St. Petersburg Department of the Steklov Math. Inst., St. Petersburg, Russia, September
- Xidian University Xidian, China, September
- NTNU Trondheim, Trondheim, Norway, September
- University of Helsinki, Helsinki, Finland, October - November
- University of Buenos Aires, Buenos Aires, Argentina, November
- University of La Plata, Buenos Aires, Argentina, November, 2 researchers
- Yeungnam University, Daegu, S. Korea, December
- University of Messina, Messina, Italy, December
- University of Catania, Catania, Italy, December
- Yeungnam University, Daegu, South Korea, December, 2 researchers

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## CONFERENCE ATTENDANCES IN 2014

Mathematicians of UP IAM and UP FAMNIT attended the following conferences in 2014:

- International Symposium on Artificial Intelligence and Mathematics, Florida, USA, January
- Algebraic, Topological and Complexity Aspects of Graph Covers, Ostravice, Czech Republic, January, 1 active participant
- Dagstuhl Seminar 14071, Graph Modification Problems, Saarbrücken, Germany, February, 1 invited speaker
- EuroGIGA Final Conference, Berlin, Germany, February, 3 active participants
- Smart Cities and District Heating and Cooling in Europe, Sofia, Bulgaria, March, 1 active participant
- World Economic Conference, Philadelphia, USA, March, 2 active participants
- 48th Spring Topology and Dynamics Conference, Richmond, Virginia, USA, March, 1 active participant
- Workshop on Galois Geometries and its Applications, Pécs, Hungary, April, 1 plenary talk, 5 active participants
- 13th Serbian Math. Congress, Vrnjačka Banja, Serbia, May, 1 plenary talk, 1 active participant
- Modern trends in Algebraic Graph Theory, Villanova, USA, June, 1 invited speaker, 4 active participants
- Cloud Innovation Forum, London, UK, June, 1 active participant
- 8th International Conference, Curves and Surfaces, Paris, France, June, 2 active participants
- Design and security of cryptographic algorithms and devices for real-world applications, Šibenik, Croatia, June, 2 active participants
- 2014 CMS Summer Meeting, Winnipeg, Canada, June, 1 active participant
- 9th European Conference on Mathematical and Theoretical Biology, Goteborg, Sweden, June, 1 active participant
- Summer School and Workshop: Differential Forms on Singular Complex Spaces Bonn, Germany, June, 1 participation
- Zagreb Workshop on Operator Theory, Zagreb, Croatia, July, 1 active participant
- GO IX - International Colloquium on Graphs and Optimization 2014, Sirmione, Italy, July, 1 active participant
- International Workshop "Algorithmic problems in group theory and related areas", Novosibirsk, Russia, July - August, 3 active participants
- 9th International Conference on Communications and Networking in China, Maoming, China, August, 1 active participant
- MAA MathFest 2014 Portland, Oregon, USA, August, 1 organization of the minisection
- International Conference on Combinatorics and Graphs (ICCG), Beijing, China, August, 1 invited speaker, 3 active participants
- 19th International Linear Algebra Society Conference (ILAS2014), Seoul, S. Korea, August, 1 active participant
- G2C2 Graphs and Groups, Cycles and Coverings, Novosibirsk, Russia, September, 4 invited speakers, 1 active participant, collaborating at the organization
- "Seventh Cracow Conference on Graph Theory "Rytro '14", Cracow, Poland, September, 3 active participants

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- "SMART 2014 - Subdivision, Geometric and Algebraic Methods, Isogeometric Analysis and Refinability in Tuscany", Siena, Italy, September, 1 active participant
  - BalkanCryptSec 2014, Istanbul, Turkey, October, 2 active participants
  - 3rd annual Mississippi Discrete Mathematics Workshop, Starkville, USA, November, 1 active participant, 1 collaborating at the organization
  - Conference on Mathematics and its Applications-2014 (CMA-2014), Kuwait, November, 1 active participant
  - Workshop on Tractable special cases of hard combinatorial optimization problems, Graz, Austria, December, 1 invited speaker, 1 active participant
  - EVS - European Venture Summit, Dusseldorf, Germany, December, 1 active participant
  - Computational Algebra, Computational Number Theory and Applications (CACNA 2014), University of Kashan, Iran, December, 1 invited speaker
  - Korea-Slovenia Workshop on Combinatorics and Applied Mathematics, Yeungnam University, South Korea, December, 2 active participants.

### **INVITED LECTURES AT RESEARCH INSTITUTES/UNIVERSITIES IN 2014**

Mathematicians of UP IAM and UP FAMNIT had invited lectures at the following research institutes/universities in 2014:

- Adam Mickiewicz University, Faculty of Mathematics and Computer Science, Poznań, Poland, January
- University of the Basque Country, Bilbao, Spain, February
- École Normale Supérieure de Lyon, Lyon, France, February
- Vanderbilt University, Nashville, USA, April
- Mississippi State University, Starkville, USA, April
- Eötvös University, Dept. of Geometry, Budapest, Hungary, April
- University of Oregon, Computer and Information Science, Eugene, OR, USA, August
- del Instituto de Matemáticas de la UNAM, Ciudad de México, D.F., Mexico, August
- Xidian University, Xi'an, Shaanxi, China, September
- Rossijskaja akademija nauk, Institut matematiki i mehaniki, Ekaterinburg, Russia, September
- Boğazici University, Istanbul center for mathematical sciences, Istanbul, Turkey, September



**Original Scientific Articles**

- ALIZADEH, Yaser, ANDOVA, Vesna, KLAJŽAR, Sandi, ŠKREKOVSKI, Riste. Wiener dimension: fundamental properties and (5,0)-nanotubical fullerenes. *MATCH Communications in Mathematical and in Computer Chemistry*, ISSN 0340-6253, 2014, vol. 72, no. 1, str. 279-294. [COBISS.SI-ID 16970841]
- ANTONČIČ, Iva, HUJDUROVIĆ, Ademir, KUTNAR, Klavdija. A classification of pentavalent arc-transitive bicirculants. *Journal of algebraic combinatorics*, ISSN 0925-9899, 2014, 26 str. [COBISS.SI-ID 1536726980]
- ARROYO, Aubin, HUBARD, Isabel, KUTNAR, Klavdija, O'REILLY, Eugenia, ŠPARL, Primož. Classification of symmetric Tabačjn graphs. *Graphs and combinatorics*, ISSN 0911-0119, 2014, vol. 30, 17 str. [COBISS.SI-ID 1536477636]
- BAJRIĆ, Samed, PAŠALIĆ, Enes, MURATOVIĆ-RIBIĆ, Amela, GANGOPADHYAY, Sugata. On generalized bent functions with Dillon's exponents. *Information processing letters*, ISSN 0020-0190. [Print ed.], 2014, vol. 114, issue 4, str. 222-227. [COBISS.SI-ID 1536172740]
- BASTL, Bohumír, BIZZARRI, Michal, KRAJNC, Marjetka, LÁVIČKA, Miroslav, MICHÁLKOVÁ, Kristýna, ŠÍR, Zbyněk, VITRIH, Vito, ŽAGAR, Emil. C [sup] 1 Hermite interpolation with spatial Pythagorean-hodograph cubic biarcs. *Journal of Computational and Applied Mathematics*, ISSN 0377-0427. [Print ed.], 2014, vol. 257, str. 65-78. [COBISS.SI-ID 16726361]
- BASTL, Bohumír, BIZZARRI, Michal, FERJANČIČ, Karla, KOVAČ, Boštjan, KRAJNC, Marjetka, LÁVIČKA, Miroslav, MICHÁLKOVÁ, Kristýna, ŠÍR, Zbyněk, ŽAGAR, Emil. C [sup] 2 Hermite interpolation by Pythagorean-hodograph quintic triarcs. *Computer Aided Geometric Design*, ISSN 0167-8396. [Print ed.], 2014, vol. 31, no. 7-8, str. 412-426. [COBISS.SI-ID 1536803524]
- BANIČ, Iztok, SOVIČ, Tina. Inverse limits in the category of compact hausdorff spaces and upper semicontinuous functions. *Bulletin of the Australian Mathematical Society*, ISSN 0004-9727, 2014, vol. 89, iss. 1, str. 49-59. [COBISS.SI-ID 19784200]
- BELARDO, Francesco. On the structure of bidegreed graphs with minimal spectral radius. *Filomat*, ISSN 0354-5180, 2014, vol. 28, no. 1, str. 1-10. [COBISS.SI-ID 1536990916]
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## 2014 HIGHLIGHTS OF MATHEMATICIANS AT UP FAMNIT & UP IAM

- **Prof. Dragan Marušič was awarded the honorary title of "Advisory Professor of Beijing Jiaotong University"**

Rector of UP, Prof. Dragan Marušič received the honorary title of "Advisory Professor of Beijing Jiaotong University", the highest award by the Beijing Jiaotong University. The ceremony was held at the opening of scientific conference International Conference on Combinatorics and Graphs in Beijing, China, August 8 - 12.

- **Prof. Tomaž Pisanski become a full member of the Slovenian Academy of Engineering**

Prof. Tomaž Pisanski become a full member of the Slovenian Academy of Engineering, in the Science Research Class on February 25, 2014.

- **Prof. Dragan Stevanović published a book**

The Dutch publisher Elsevier published the book entitled "Spectral Radius of Graphs" by Prof. Dragan Stevanović. The book is dedicated to the development, demonstration and open problems in the field of spectral graph theory.

- **Assist. Prof. Marko Orel received the University award "Svečana listina Univerze na Primorskem"**

"Svečana listina Univerze na Primorskem" is designed to promote the achievements of young professors, teaching assistants and researchers of UP, under 35 year old, for their teaching or research excellence.

- **FAMNIT's students were successful in the 5th Open Mathematical Olympiad of the Belarusian-Russian University (International Student Olympiad)**

Second year student of the undergraduate study programme Mathematics, Edin Husić achieved excellent 13th place, and received Honourable Mention. Bećo Merulić, third year student of the undergraduate study programme Mathematics, achieved 38th place. This year, 25 universities from six different countries with a total of 52 contestants participated in the 5th Open Mathematical Olympiad of the Belarusian-Russian University, held in Belarus, from February 19 to February 21.

- **Excellent results of our mathematicians at the Open International Internet-Olympiad**

The Internet Mathematical Olympiad consists of four rounds. The first three were held at the headquarters of our faculty, while the fourth, final round was held in Ariel University in Israel. This year in the first round there were 7191 participants from 225 universities. At the second round there were 873 participants from 184 universities, of which 6 were our students, i.e., Roman Solodukhin, Marko Palangetić, Ratko Darda, Edin Husić, Luka Pavlović and Bećo Merulić. Roman Solodukhin achieved excellent 3th place, whereas Marko Palangetić achieved 5th place. Ratko Darda achieved 18th place, Edin Husić and Luka Pavlović achieved 35th place, and Bećo Merulić achieved 56th place. At the third round there were 72 participants from 42 universities, of which 3 were our students, i.e., Marko Palangetić, Ratko Darda and Roman Solodukhin. Marko Palangetić achieved 6th place, Ratko Darda achieved 8th place, and Roman Solodukhin achieved 10th place. All three students qualified

- **Our students were successful in the Vojtech Jarník International Mathematical Competition**

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On Friday, April 4, 2014, 24rd Annual Competition was held at the University of Ostrava, in Czech Republic. In the category I, the members of UP FAMNIT team were: Marko Palangetić, Marko Rajković, Roman Solodukhin (all 1st year BSc students), Ratko Darda and Anastasiya Tanana (both 2nd year BSc students). The most successful among them was Anastasiya Tanana, who in this very challenging competition gathered around half of all points. All together gathered 66 points and as the team achieved 2nd place.

The competition is aimed at university students interested in mathematics. It is the oldest mathematical competition for university students in the European Union.

- **FAMNIT's students were successful in the International Mathematics Competition for University Students**

This year's competition was co-organized by University College London and American University in Bulgaria, Blagoevgrad. It took place in Blagoevgrad, Bulgaria, from July 29 to August 4. The members of UP FAMNIT team were: Marko Rajković and Marko Palangetić (both 1st year BSc students), and Anastasiya Tanana (2nd year BSc student). Anastasiya Tanana received the first prize, while both Marko Rajković and Marko Palangetić received third prize.

- **Student Ratko Darda published two original papers in SCI journals as a co-author**

Ratko Darda, third year student of undergraduate study programme Mathematics, published two original papers in SCI journals as a co-author. The first one with the title "On Bounds for the Product Irregularity Strength of Graphs" was written together with Assist. Prof. Ademir Hujdurović. The second one with the title "Trees of Given Order and Independence Number with Minimal First Zagreb Index" was written together with Assist. Alexander Vasilyev and Prof. Dragan Stevanović.

- **Three new Doctors of Science**

This year we have three new PhD's among us, Boštjan Frelj, Samed Bajrić and Alexander Vasilyev.

Dr. Boštjan Frelj obtained his PhD under the supervision of Assoc. Prof. Štefko Miklavic and co-supervision of Assoc. Prof. Klavdija Kutnar. He successfully defended his PhD thesis with the title "Different Aspects of Edge-regularity in graphs" on May 30, 2014.

Dr. Samed Bajrić obtained his PhD under the supervision of Assoc. Prof. Enes Pasalic and co-supervision of Assist. Prof. Marko Orel. He successfully defended his PhD thesis with the title "On Certain Construction Methods of Cryptographically Significant Boolean Functions" on July 1, 2014.

Dr. Alexander Vasilyev obtained his PhD under the supervision of Prof. Dragan Stevanović. He successfully defended his PhD thesis with the title "On Adriatic Indices, Spectral Properties of Adriatic Matrices and Software for Topological Descriptors" on December 15, 2014.



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## 2015 Math Meetings/Workshops organized by Math Department at UP FAMNIT & UP IAM

- **Algorithmic Graph Theory on the Adriatic Coast, 16 - 19 June 2015**

Algorithmic Graph Theory on the Adriatic Coast is an international workshop giving an opportunity to participants to present latest advances in Algorithmic Graph Theory and related areas. Invited Speakers: Endre Boros (Rutgers University, New Brunswick, USA); Vadim V. Lozin (University of Warwick, Coventry, UK); Sang-il Oum (KAIST, Daejeon, South Korea); Dimitrios Thilikos (National and Kapodistrian University of Athens, Greece and CNRS, LIRMM, France)

More: <http://www.famnit.upr.si/sl/konference>

- **Bled 15: 8th Slovenian Conference on Graph Theory, 21 - 27 June 2015**

This conference is a part of the Slovene graph theory conference series that takes place every four years. The first one was organized in 1985 in Dubrovnik while all the later ones were held in Bled in the years 1991, 1995, 1999, 2003, 2007, and 2011. This year the conference will be in Kranjska Gora.

More: <http://www.famnit.upr.si/sl/konference>

- **2015 PhD Summer School in Discrete Mathematics, 27 June - 03 July 2015**

The Summer School will consist of three minicourses given by: Alexander Mednykh (Sobolev Institute, University of Novosibirsk, Russia), *Laplacians, Jacobians, and Harmonic Automorphisms of Graphs*; Robert F. Morse (University of Evansville, Indiana, USA), *Introduction to Computational Group Theory*; and Eamonn O'Brien (University of Auckland, New Zealand), *Algorithms for matrix groups*.

More: <http://www.famnit.upr.si/sl/konference>

- **BalkanCryptSec 2015, 3 - 5 September 2015**

This conference is the second annual International Conference on Cryptography and Information Security, BalkanCryptSec 2015. Invited Speakers: Prof. Kaisa Nyberg (Aalto University, Finland); Prof. Alexander Pott (Otto-von-Guericke University Magdeburg, Germany); Assoc. Prof. Billy Bob Brumley (Tampere University of Technology, Finland).

- **Famnit Summer Math Camp "Mathematics is Cool", August.**

The camp is organized for pupils in primary and secondary schools that are interested in mathematics. The camp includes lectures and workshops on various mathematical topics and numerous social activities. We wish to show that mathematics can be both fun and useful.

More: <http://tabor.famnit.upr.si/>

- **Famnit Excursions into the Mathematical Universe, once a month.**

A series of popular lectures on mathematics and its role in the modern world running for the sixth consecutive year in 2014/2015.

More: <http://matematicni-izleti.famnit.upr.si/sl/>

- **Research Mathematical Seminar, each Monday.**

More: <http://www.famnit.upr.si/sl/seminars>

- **Preparations for the International Mathematical Olympiad**

- **Project UP and the World**

University of Primorska successfully applied to a call of the Ministry of Education, Science and Sport of the Republic of Slovenia and obtained funds for promotion and encouragement of the internationalization of higher education process between the

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years 2013 and 2015. Within the project, we perform three types of activities: employment of foreign professors; shorter visits of foreign professors who will actively participate in the teaching process; and organization of international workshops with invited foreign speakers. In 2015 three foreign professors will be employed: Prof. Stephen Wilson (Northern Arizona University, USA), Prof. Robert Jajcay (Comenius University in Bratislava, Slovakia) and Assist. Prof. Ján Karabáš (Institute of Mathematics and Computer Science, Science and Research Institute of Matej Bel University, Slovakia).

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REPUBLIKA SLOVENIJA  
**MINISTRSTVO ZA IZOBRAŽEVANJE,  
ZNANOST IN ŠPORT**



*Naložba v vašo prihodnost*  
OPERACIJO DELNO FINANCIRA EVROPSKA UNIJA  
Evropski socialni sklad

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