

# MATHEMATICIANS at UP IAM and UP FAMNIT

## REPORT 2015



UNIVERSITY OF PRIMORSKA

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

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**Mathematicians at UP IAM/UP FAMNIT Report 2015**

Edited by

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Koper, January 2016.

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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 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 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 (2015/16) is: 124 university teachers, colleagues and researchers, and 15 professional/technical and administrative staff.

### **Educational Activities**

The first generation of students were enrolled in UP FAMNIT in the academic year 2007/08. In the current academic year (2015/16), the Faculty offers eight undergraduate university programmes (BA), six Master (MS) and three PhD programmes:

Undergraduate university programmes (BA) (3 years):

- Mathematics (available also in English)
- Mathematics in Economics and Finance
- Computer Science
- Bioinformatics
- Biodiversity
- Biopsychology
- Mediterranean Agriculture
- Applied Kinesiology

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

- Mathematical Sciences (available also in English)
- Computer Science
- Nature Conservation
- Mathematics with Financial Engineering
- Biopsychology
- Applied Kinesiology

Doctoral (PhD) programmes (3 years):

- Mathematical Sciences (available also in English)
- Computer Science
- Applied Kinesiology

In the 2015/16 academic year, 771 students have been enrolled in study programmes at UP FAMNIT, of which 560 are in undergraduate programmes, 185 in master's programmes, and 26 in doctoral programmes. All undergraduate and master's programmes are offered on a full-time basis, with the exception of the master's programme Applied Kinesiology, which is also offered on a part-time basis. The doctoral programmes are offered only on a part-time basis. All courses/programmes are designed in accordance with Bologna Declaration. Since 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, 2015:

- The number of registered researchers: 111.
- Average number of points according to the methodology SICRIS per registered researcher at ARRS in 2015 = 61,18 points.
- 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 2015 = 144 publications.
- Average number of normalized citations per registered researcher (within the last 10 years) = 167,96 citations.

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

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

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

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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 PhD's (from Hungary, China, USA, etc.) for postdoctoral training. We also have several international students pursuing doctoral studies in mathematics. Of the ten Young Researchers at UP FAMNIT and UP IAM in 2015/2016, seven are foreigners (from six different countries: Argentina, Bosnia and Herzegovina, Macedonia, 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.

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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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).

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.

Research activities at the institute 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. Within the institute there are also three 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. The Center for Applications Development and Design was founded in 2015.

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.

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## MATHEMATICIANS AT UP IAM/UP FAMNIT

UP IAM and UP FAMNIT currently includes 82 mathematicians:

Prof. BATAGELJ Vladimir  
Prof. DOBSON Edward  
Prof. GRAVNER Janko  
Prof. JAJCAY Robert  
Prof. JANEŽIČ Dušanka  
Prof. KUZMA Bojan  
Prof. MALNIČ Aleksander  
Prof. MARUŠIČ Dragan, Rector UP  
Prof. OMLADIČ Matjaž  
Prof. PISANSKI Tomaž  
Prof. POTOČNIK Primož  
Prof. STEVANOVIĆ Dragan  
Prof. STRAŠEK Rok  
Prof. WILSON Stephen Edwin  
Assoc. Prof. BANIČ Iztok  
Assoc. Prof. BELARDO Francesco  
Assoc. Prof. BRAČIČ Janko  
Assoc. Prof. KISS György  
Assoc. Prof. KOVÁCS István  
Assoc. Prof. KUTNAR Klavdija, Dean UP FAMNIT  
Assoc. Prof. KUZMANIČ Tonči Ante  
Assoc. Prof. MIKLAVIČ Štefko  
Assoc. Prof. MILANIČ Martin, Vice-Dean for Education of UP FAMNIT  
Assoc. Prof. PASALIC Enes  
Assoc. Prof. PERMAN Mihael  
Assoc. Prof. PREZELJ Jasna  
Assoc. Prof. ŠKREKOVSKI Riste  
Assoc. Prof. ULE Aljaž  
Assoc. Prof. VITRIH Vito, Director of UP IAM  
Assist. Prof. ANHOLCER Marcin  
Assist. Prof. BLAGUS Rok  
Assist. Prof. BOBEN Marko  
Assist. Prof. BOLDIN Barbara  
Assist. Prof. BREZIGAR MASTEN Arjana  
Assist. Prof. HORVAT Boris  
Assist. Prof. HUJDUROVIĆ Ademir  
Assist. Prof. JAKLIČ Gašper  
Assist. Prof. KARABAŠ Jan  
Assist. Prof. KAVKLER Iztok  
Assist. Prof. KOMPARA Mojca  
Assist. Prof. KOVIČ Jurij  
Assist. Prof. KUZMAN Boštjan  
Assist. Prof. LUKŠIČ Primož  
Assist. Prof. MRAMOR Blaž

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Assist. Prof. ORBANIĆ Alen  
Assist. Prof. OREL Marko, Vice-Dean for Science and Research of UP FAMNIT  
Assist. Prof. RAIČ Martin  
Assist. Prof. ŠPARL Primož  
Assist. Prof. ŠPARL Petra  
Assist. Prof. TARANENKO Andrej  
Assist. Prof. VERRET Gabriel  
Assist. Prof. ZHANG Cui  
Assist. Prof. ZGRABLIĆ Boris  
Dr. BAJRIĆ Samed  
Dr. BERČIČ Katja  
Dr. CERGOL Boris  
Dr. CERINŠEK Monika  
Dr. FRELIH Boštjan  
Dr. JERMAN Marjan  
Dr. KOIKE QUINTANAR Sergio Hiroki  
Dr. KOŠMRLJ Gašper  
Dr. KRNC Matjaž  
Dr. POŽAR Rok  
Dr. VIDALI Janoš  
ANTONČIČ Iva  
BAŠIĆ Nino  
CEPAK Nastja, Young Researcher  
CHIARELLI Nina  
ESTÉLYI István, Young Researcher  
FERJANČIČ Karla, Young Researcher  
FILIPOVSKI Slobodan, Young Researcher  
HARTINGER Tatiana Romina, Young Researcher  
HODŽIĆ Samir, Young Researcher  
KOVAČ Boštjan  
MARKOVIĆ Andrej  
PENJIĆ Safet, Young Researcher  
PETECKI Paweł, Young Resercher  
PEZDIR Rado  
RAMOS RIVERA Alejandra, Young Researcher  
TISNIKAR Viljem  
TURK Primož  
ZALOKAR URŠIČ Ana, Young Researcher

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## RESEARCH PROGRAMS

- 2015-2020: Algebra, Discrete Mathematics, Probability and Game Theory; leader: Dragan Marušič.
- 2015-2019: Computationally intensive methods in theoretical computer science, discrete mathematics, combinatorial optimization, and numerical 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

- 2015-2018: N1-0038 Graphs and Odd Automorphisms; leader: Dragan Marušič.
- 2015-2018: N1-0032 Graphs, Groups, Configurations and Geometries; leader: Tomaž Pisanski.
- 2014-2017: J1-6720 Algebraic Graph Theory with Applications; leader: Dragan Marušič.
- 2014-2017: J7-6828 Bounded Rationality and Economic Performance; leader: Aljaž Ule.
- 2014-2017: J1-6743 The Development of Computational Tools for Modeling Molecules of Pharmaceutical Interest; leader: Dušanka Janežič.
- 2014-2017: L1-6722 Algebra and Functional Analysis Methods in the Theory and Practice of Financial Mathematics; leader: Igor Klep.
- 2014-2016: What we Wood believe? Societal perceptions of the forest-based sector and its products towards a sustainable society (W<sup>3</sup>B); leader: Klavdija Kutnar.
- 2013-2016: J1-5433 Application of Semiregular Group Actions in Some Open Problems in Algebraic Graph Theory; leader: Dragan Marušič.

## BILATERAL PROJECTS led by Math Department 2015 – to date

- 2016-2017: Computer Algorithm Development for Binding Site Prediction in Pharmaceutical Discovery: bilateral scientific - research cooperation between RS and Austria, UP FAMNIT and University of Vienna.
- 2015-2016: Interlacing inequalities for simplicial complexes: bilateral scientific - research cooperation between RS and USA, UP IAM and Mississippi State University.
- 2015-2016: The Use of Dynamical Mechanical Analysis (DMA) to Characterize Thermo-Hydro-Mechanically Densified Wood: bilateral scientific - research cooperation between RS and USA, UP IAM and US Forest Service, Forest Products Laboratory.
- 2015-2016: Snap.py - a Pythonic interface to the large network analysis library SNAP: bilateral scientific - research cooperation between RS and USA, UP IAM and Stanford University.
- 2015-2016: Cryptographic Boolean Functions and Graph Theory: bilateral scientific - research cooperation between RS and USA, UP IAM and Naval Postgraduate School.
- 2015-2016: Bipartite distance-regular graphs: irreducible T-modules with endpoint 2: bilateral scientific - research cooperation between RS and USA, UP IAM and University of Wisconsin Madison.
- 2015-2016: Hamiltonicity of vertex-transitive graphs: bilateral scientific - research cooperation between RS and USA, UP IAM and Vanderbilt University.

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- 2015-2016: Computer Algorithm Development for Molecular Dynamics Simulation: bilateral scientific - research cooperation between RS and USA, UP IAM and NIH/NHLBI/Lab. of Computational Biology.
  - 2015-2017 Packing and Covering Problems in Graphs and Hypergraphs - research cooperation between RS and Argentina, UP IAM and Universidad Nacional de Rosario.
  - 2015-2016: Structural and Algorithmic Aspects of Graph Classes Defined by Cliques and Stable Sets - research cooperation between RS and Republic of France PROTEUS, UP IAM and LAMSADE - CNRS UMR 7243 - Université Paris Dauphine.
  - 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 and Sobolev Institute of Mathematics, Novosibirsk.
  - 2014-2015: Cycles and Paths in Symmetric Graphs: bilateral scientific - research cooperation between RS and Russia, UP IAM and Sobolev Institute of Mathematics, Novosibirsk.
  - 2014-2015: Schur Groups, Separable S-rings and Applications: bilateral scientific - research cooperation between RS and Russia, UP IAM and St. Petersburg Department of Steklov Institute of Mathematics of the Russian Academy of Sciences.

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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<sup>®</sup> database, *Ars Mathematica Contemporanea* is the leading journal in Slovenia in 2013 and 2014.

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## Project UP and the World, 2013 - 2015



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA IZOBRAŽEVANJE,  
ZNANOST IN ŠPORT



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 performed three types of activities:

- employment of foreign professors (Assoc. Prof. Francesco Belardo, University of Messina, Italy, 2014/06/01 - 2015/05/31, prof. dr. Robert Jajcay, Comenius University in Bratislava, Slovakia, 01/01/2015 - 30/06/2015),
- shorter visits of foreign professors who actively participate in the teaching process (Assist. Prof. Marcin Anholcer, Poznan Univeristy of Economics, Poland, April - June 2014 and April - June 2015, Assoc. Prof. Andrew Paul Fabel, Mississippi State University, USA, May - June 2014, Assist. Prof. Russell Stephen Woodroffe, Mississippi State University, USA, May - June 2014 and May - June 2015, Prof. Stephen Wilson, Northern Arizona University, USA, January 2015, Assoc. Prof. Marcelo Mydlarz, Universidad Nacional de General Sarmiento, Argentina, February - March 2015, Assist. Prof. János Ruff, University of Pécs, Hungary, February - April 2015, Prof. Mikhail E. Muzychuk, Netanya Academic College, Israel, February - March 2015, Assoc. Prof. Elena Valentinova Konstantinova, Sobolev Institute of Mathematics, Novosibirsk State University, Russia, March - April 2015, Assoc. Prof. Bernard Ries, Universite Paris Dauphine, France, April 2015, Prof. Tamás Szőnyi, Eötvös Loránd University, Hungary, April 2015, Dr. Oliver Schaudt, Institute of Computer Science, University of Cologne, Germany, May 2015, Assoc. Prof. Luis Martínez Fernández, University of the Basque Country, Spain, May 2015, Prof. Vladimir Gurvich, Rutgers University, USA, May 2015, Prof. Alexander Pott, Otto von Guericke University, Germany, May 2015, Prof. Jarosław Grytczuk, Jagiellonian University, Poland, May 2015, Assoc. Prof. Laura Jean Sheppardson, University of Mississippi, USA, May - June 2015),
- organisation of international workshops with invited foreign speakers (International conference on Graph Theory and Combinatorics, Rogla, 16/05/2014 - 18/05/2014,



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Symmetries of Graphs and Networks, Rogla, 29/06/2014 - 05/07/2014, 2014 PhD Summer School in Discrete Mathematics, Rogla, 29/06/2014 - 05/07/2014, Ljubljana - Leoben Graph Theory Seminar, Koper, 03/09/2014 - 05/09/2014, Smart Cities Conference, Koper, 14/10/2014 - 16/10/2014, 2015 International Conference on Graph Theory, Koper, 26/05/2015 - 28/05/2015, Algorithmic Graph Theory on the Adriatic Coast, Koper, 16/06/2015 - 19/06/2015, Algebraic Graph Theory Session at Bled'15, Kranjska gora, 21/06/2015 - 26/06/2015, 2015 PhD Summer School in Discrete Mathematics, Rogla, 27/06/2015 - 03/07/2015).

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## ORGANIZED EVENTS IN 2015

### 2015 International Conference on Graph Theory

May 26 - 28, Koper, Slovenia

<https://conferences.matheo.si/conferenceDisplay.py?confId=19>

#### Organized by:

UP FAMNIT

UP IAM

#### Organizing Committee:

Boštjan Frelj, Ademir Hujdurović, Hiroki Koike

Quintanar

#### Sponsor:

MIZS - Ministry of Education, Science and Sport



#### Invited Talks:

A. Brandstädt: *News About Efficient Domination for F-Free Graphs*

O. Schaudt: *Coloring graphs without long induced paths*

B. Servatius: *Unit distance realizations of combinatorial zeolites*

L. Sheppardson: *The Graph Bicycle Spectrum*

J. Širáň: *Vertex-quasiprimitivity in regular maps*

R. Woodroffe: *On an analogue of Kummer's Theorem for the number of equipartitions*

#### Talks:

M. Anholcer: *Group labelings of graphs*

F. Belardo: *On the eigenspaces of signed line graphs and signed subdivision graphs*

N. Chiarelli: *Equistarable bipartite graphs*

B. Frelj: *On 2-distance-balanced graphs*

T. Hartinger: *On the structure of 1-perfectly orientable graphs*

A. Hujdurović: *Generalized Cayley graphs*

R. Jajcay: *Improving Moore bounds via counting cycles*

J. Kovič: *Quadrangulations of polygonal regions*

B. Kuzma: *On Skew-Homomorphisms*

S. Penjić: *On bipartite Q-polynomial distance-regular graphs with  $c_2 \leq 2$*

P. Petecki: *Spectral Characterization of Signed Graphs*

T. Pisanski: *Some applications of generalized action graphs and monodromy graphs*

J. Vidali: *Tight distance-regular graphs with classical parameters*

S. Wilson: *Tri-circulant edge-transitive tetravalent graphs*

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## Algorithmic Graph Theory on the Adriatic Coast

June 16 - 19, Koper, Slovenia

<http://agtac15.famnit.upr.si/>

### Organized by:

UP FAMNIT and UP IAM

### Scientific Committee:

Boštjan Brešar, University of Maribor and IMFM, Slovenia

Pinar Heggernes, University of Bergen, Norway

Marcin Kamiński, University of Warsaw, Poland

Martin Milanič, University of Primorska, Slovenia

Daniel Paulusma, Durham University, UK

Primož Potočnik, University of Ljubljana, IMFM, and University of Primorska, Slovenia

Nicolas Trotignon, CNRS and ENS Lyon, France

### Organizing Committee:

Nastja Cepak, University of Primorska, Slovenia

Nina Chiarelli, University of Primorska, Slovenia

Tatiana Romina Hartinger, University of Primorska, Slovenia

Marcin Kamiński, University of Warsaw, Poland

Martin Milanič, University of Primorska, Slovenia

### Invited Talks:

Endre Boros: *Generation of monotone graph structures*

Vadim V. Lozin: *From Matchings to Independent Sets*

Sang-il Oum: *Constructive algorithm for rank-width of graphs and path-width/branch-width of matroids*

Dimitrios Thilikos: *Algorithms and Combinatorics on the Erdős-Pósa property*

### Talks:

Marcin Anholcer: *Group edge irregularity strength of graphs*

Gabriela Araujo-Pardo: *Pseudoachromatic and connected-pseudoachromatic indices of the complete graph*

Csilla Bujtás: *Line graphs, triangle graphs, and further generalizations*

Eranda Cela: *The linearizable QAP and some applications in optimization problems in graphs*

Dimitris Chatzidimitriou: *Fixed Parameter Algorithms for Completion Problems on Planar Graphs*

Konrad Kazimierz Dabrowski: *Clique-width of Restricted Graph Classes*

Tinaz Ekim: *Equimatchable Graphs are  $C_{2k+1}$ -free for  $k \geq 4$*

Archontia Giannopoulou: *Uniform Kernelization Complexity of Hitting Forbidden Minors*

Petr Golovach: *Parameterized Complexity of Secluded Connectivity Problems*

Didem Gözüpek: *Edge Coloring with Minimum Reload/Changeover Costs*

Marko Grgurovič: *Practical performance comparison of all-pairs shortest path algorithms*

Andreas M. Hinz: *The Dudeney Algorithm*

Chinh Hoáng: *On (paw, even hole)-free graphs*

Ademir Hujdurović: *Vertex-transitive CIS graphs*

Tony Huynh: *Transfinite Ford-Fulkerson on a Finite Network*

Robert Jajcay: *Computational Aspects of Finding Skew-Morphisms for Cyclic Groups*

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Eun Jung Kim: *Tree-Cut width: computation and algorithmic applications*  
Janez Konc: *Maximum clique algorithm for binding site comparison in drug discovery*  
Vadim Levit: *All Square Roots of a König-Egerváry Graph*  
Spyridon Maniatis: *The parameterized complexity of graph cyclability*  
Paul Medvedev: *On the readability of overlap digraphs*  
George Mertzios: *New Geometric Representations and Domination Problems on Tolerance and Multitolerance Graphs*  
Peter Muršič: *Recognizability of bipartite graphs and hypergraphs given degree sequence*  
Kenta Ozeki: *The 4-ordered Hamiltonicity and the spanning  $K_4^-$ -linkedness in planar graphs*  
Martin Pečar: *Choosing best shortcuts for a path*  
Irena Penev: *Stable sets in ISK4, wheel-free graphs*  
Iztok Peterin: *Another approach to the linear algorithm for the prime factor decomposition of Cartesian product*  
Ilija Ponomarenko and A.Vasil'ev: *The recognizing of the Cartan association schemes*  
Mordechai Shalom: *Graphs of Edge-Intersecting and Non-Splitting Paths*  
Oliver Schaudt: *Obstructions for three-coloring graphs without long induced paths*  
Joachim Schauer: *Asymptotic Aspects of the Quadratic Knapsack Problem*  
Ingo Schiermeyer: *4-colorability of  $P_6$ -free graphs*  
Rostislav Staněk: *A special case of the data arrangement problem on binary trees*  
Maya Stein: *Convex  $p$ -partitions of bipartite graphs*  
David Tankus: *Well-dominated graphs without cycles of lengths 4 and 5*  
Aleksandra Tepeh: *An inequality between the edge-Wiener index and the Wiener index of a graph*  
Zsolt Tuza:  *$K_3$ -WORM colorings of graphs: Feasible sets and complexity*  
Aleksander Vesel: *Linear recognition algorithm of generalized Fibonacci cubes  $Q_h(111)$*   
Sara Sabrina Zemljčič: *Distances in Sierpinski triangle graphs*  
Steve Wilson: *The Separated Box Product*  
Ismael González Yero: *On the complexity of computing the  $k$ -metric dimension of graphs*  
Janez Žerovnik: *Perfect codes in direct graph bundles*



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## **8th Slovenian Conference on Graph Theory**

June 21 - 27, Kranjska Gora, Slovenia

<http://kg15.herokuapp.com>

### **Number of participants:**

300+

### **Organized by:**

IMFM - Institute of Mathematics, Physics and Mechanics

### **In Collaboration with:**

UL FMF (University of Ljubljana, Faculty of Mathematics and Physics)

UL PeF (University of Ljubljana, Faculty of Education)

UM FNM (University of Maribor, Faculty of Natural Sciences and Mathematics)

UP FAMNIT (University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies)

UP IAM (University of Primorska, Andrej Marušič Institute)

Abelium d.o.o.

### **Scientific Committee:**

Sandi Klavžar (chair), Dragan Marušic, Bojan Mohar, Tomaž Pisanski

### **Organizing Committee:**

Boštjan Brešar, Sergio Cabello, Gašper Fijavž, Sandi Klavžar, Gašper Košmrlj, Boštjan Kuzman, Primož Potočnik

### **Local Organizing Committee:**

Katja Berčič, Tanja Gologranc, Marko Jakovac, Aleksander Kelenc, Tilen Marc, Polona Repolusk

### **Plenary speakers:**

Michael Giudici (The University of Western Australia, Perth, Australia)

Michael Henning (University of Johannesburg, South Africa)

Brendan D. McKay (Australian National University, Canberra, Australia)

Alexander Mednykh (Sobolev Institute of Mathematics, Novosibirsk, Russia)

Joy Morris (University of Lethbridge, Canada)

Gábor Tardos (Hungarian Academy of Sciences, Budapest, Hungary)

Carsten Thomassen (Technical University of Denmark, Lyngby, Denmark)

Thomas Tucker (Colgate University, Hamilton, USA)

Douglas West (Zhejiang Normal University, Jinhua, China, and University of Illinois, USA)

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## 2015 PhD Summer School in Discrete Mathematics

June 27 - July 3, Rogla, Slovenia

<https://conferences.matheo.si/conferenceDisplay.py?confId=10>

### 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

### Scientific Committee:

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

### Organizing Committee:

Boštjan Frelj, Ademir Hujdurović, Boštjan Kuzman, Rok Požar

The Summer School consisted of two minicourses (of nine hours each) given by:

- Alexander Mednykh, Sobolev Institute, University of Novosibirsk, Russia: Laplacians, Jacobians, and Harmonic Automorphisms of Graphs;
- Eamonn O'Brien, University of Auckland, Auckland, New Zealand: Algorithms for matrix groups.

### Talks:

J. Azarija: *On the (non)existence of a (75,32,10,16) SRG*

N. Bašić: *Enumeration of strong traces using dynamic programming*

M. Conder: *Classifying vertex-transitive graphs by their arc-types*

D. Dumičić Danilović: *Construction of block designs admitting a solvable automorphism group*

P. Horn: *Curvature of graphs bounds on Laplacian eigenvalues*

S. Kiefer: *Graphs Identified by Logics with Counting*

Y. S. Kwon: *Properties of some Cayley objects*

J. B. Liu: *Regular graph coverings whose covering transformation group are  $\mathbb{Z}_2$ -extensions of a cyclic  $p$ -group*

M. Maksimović: *Orbit matrices of strongly regular graphs*

N. Mostarac: *Self-dual codes from quotient matrices of symmetric divisible designs with the dual property*

T. Pisanski: *Enumeration of cations graphs*

A. Riasat: *On metric dimension of uniform subdivisions of the wheel*

M. Šimac: *LDPC codes based on  $\mu$ -geodetic graphs obtained from block designs*

S. S. Zemljčič: *Orbits in Sierpinski graphs*

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**International Conference on Cryptography and Information Security BalkanCryptSec 2015**  
September 3 - 4, Koper, Slovenia  
<https://conferences.matheo.si/conferenceDisplay.py?confId=16>

**Organized by:**

UP FAMNIT  
UP IAM

**In Collaboration with:**

IACR - International Association for Cryptologic Research

**Organizing Committee:**

Nastja Cepak, Klavdija Kutnar, Štefko Miklavič, Enes Pasalic

**Program Committee:**

Enes Pasalic, University of Primorska, Slovenia  
Marko Holbl, University of Maribor, Slovenia  
Kaisa Nyberg, Aalto University School of Science, Finland  
Billy Bob Brumley, Tampere University of Technology, Tampere, Finland  
Sugata Gangopadhyay, Department of Computer Science and Engineering, Indian Institute of Technology Roorkee, India  
Alexander Pott, Otto von Guericke University, Germany  
Panagiotis Rizomiliotis, University of the Aegean, Greece  
Miodrag Mihajevic, RCIS-AIST, Tokyo, Math. Inst. SANU, Belgrade  
Ferucio Laurentiu Tiplea, Alexandru Ioan Cuza University, Romania  
Tsonka Baicheva, Institute of Mathematics and Informatics, Bulgaria  
Tolga Yalcin, University of Information Science and Technology, Macedonia  
Zoran Djurić, University of Banja Luka, Bosnia and Herzegovina  
Svetla Nikova, KU Leuven & University Twente  
Bogdan Groza, Politehnica University of Timisoara, Romania  
Sedat Akleylek, Ondokuz Mayis University, Turkey  
Sokratis Katsikas, University of Piraeus, Greece  
Zulfukar Saygi, TOBB ETU, Turkey  
Paolo D'Arco, University di Salerno, Italy  
Vesselin Velichkov, University of Luxembourg  
Kui Ren, State University of New York at Buffalo, USA  
Michael Scott, Dublin City University, Ireland  
Claude Carlet, University of Paris 8, France  
Dieter Gollmann, Hamburg University of Technology, Germany  
Ricardo Dahab, University of Campinas - UNICAMP, Brazil  
Dimitris. E. Simos, SBA Research  
Christian Rechberger, Technical University of Denmark  
Pante Stănică, Naval Postgraduate School, USA

**Sponsors:**

CREA plus - Ministry of Education, Science and Sport  
Abelium

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**Invited Talks:**

Billy Bob Brumley: *Software-based side-channel attacks*

Kaisa Nyberg: *Key-Variance in Statistical Cryptanalysis*

Alexander Pott: *Almost perfect nonlinear and planar functions: A survey of (not so) recent results and open problems*

**Talks:**

Konstantinos Limniotis, Nicholas Kolokotronis: *Boolean Functions with Maximum Algebraic Immunity Based on Properties of Punctured Reed Muller Codes*

Sihem Mesnager, Ferruh Özbudak, Ahmet Sinak: *Results on Characterizations of Plateaued Functions in Arbitrary Characteristic*

Georgi Ivanov, Svetla Nikova, Nikolay Nikolov]: *Cryptographically Strong S-boxes Generated by Modified Immune Algorithm*

Aleksandra Mileva, Vesna Dimitrova, Vesselin Velichkov: *Analysis of the Authenticated Cipher MORUS*

Yuri Borissov, Peter Boyvalenkov, Robert Tsenkov: *Linear Cryptanalysis and Modified DES with Embedded Parity Check in the S-boxes*

Maciej Skorski: *Time-Advantage Ratios under Simple Transformations: Applications to Leakage Resilient Cryptography*

Dirk Achenbach, Jörn Müller-Quade, Jochen Rill: *Synchronous Universally Composable Computer Networks*

Catalin Dragan, Ferucio Laurentiu Tiplea: *Key-policy Attribute-based Encryption for General Boolean Circuits from Secret Sharing and Multi-linear Maps*

Dirk Achenbach, Matthias Huber, Jörn Müller-Quade, Jochen Rill: *Closing the Gap: A Universal Privacy Framework for Outsourced Data*

Enes Pasalic: *Constructing Boolean functions for stream ciphers*

Sedat Akleylek, Zaliha Yuce Tok, Ozgur Dagdelen: *On the Efficiency of Polynomial Multiplication for Lattice-Based Cryptography on GPUs using CUDA,*

Wei Dai, Berk Sunar: *cuHE: A Homomorphic Encryption Accelerator Library*

Sarah Louise Renwick, Christian Janson, James Alderman, Keith Martin: *Extended Functionality in Verifiable Searchable Encryption*





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## 4th annual Mississippi Discrete Mathematics Workshop

November 14 - 15, Mississippi, USA

<http://rwoodroofe.math.msstate.edu/workshop2015/>

### Organized by:

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)

### With partial support from:

University of Mississippi College of Liberal Arts

The University of Mississippi Department of Mathematics.

### Featured Speaker:

Tom Trotter (School of Mathematics, Georgia Institute of Technology, USA)

### Talks:

Ben Clark: *Towards an excluded-minor characterization of the Hydra-5 matroids*

Ali Dogan: *On the edge spectrum of saturation number for paths and stars*

Dustin Hedmark: *Homology of filters in the partition lattice*

Jiuhua Hu: *Total domination polynomials of graphs*

István Kovács: *Integral automorphisms of affine spaces over finite fields*

Sooyeon Lee: *Bounding the beta invariants of 3-connected matroids*

Aleksander Malnič: *On sectional complements in lifted groups*

McCabe Olsen: *The Euler-Mahonian Identity*

Simon Pfeil: *Matroids with many small circuits and many small cocircuits*

Rok Požar : *Lower bounds on the simultaneous conjugacy problem in the symmetric group*

Bernd Schroeder: *A polynomial algorithm to check the fixed point property for ordered sets of dimension 2*

Chris Seaton: *Coefficients of the Laurent expansion of the Hilbert series of Gorenstein rings*

Shaohui Wang: *Multiplicative Zagreb indices of cactus graphs*

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## Research Mathematical Seminar in 2015



### January

- 05/01/2015 Tatiana Hartinger Romina (UP IAM): “On the structure of 1-perfectly orientable graphs”;
- 12/01/2015 Matjaž Krnc (Faculty of Mathematics and Physics, University of Ljubljana): “Centralization of Wiener index”;

### February

- 19/02/2015 Franco Brezzi (Istituto Universitario di Studi Superiori, Pavia): “The Virtual Element Method for the numerical solution of PDE’s”;
- 24/02/2015 Michael Muzychuk (Netanya Academic College in Israel): “Graph Isomorphism problem, Weisfeiler-Leman algorithm and coherent configurations (Part I)”;
- 27/02/2015 Michael Muzychuk (Netanya Academic College in Israel): “Graph Isomorphism problem, Weisfeiler-Leman algorithm and coherent configurations (Part II)”;
- 27/02/2015 Sergio Hiroki Koike Quintanar (UP IAM): “On the isomorphism problem of bi-Cayley graphs (PhD Thesis Defense)”;

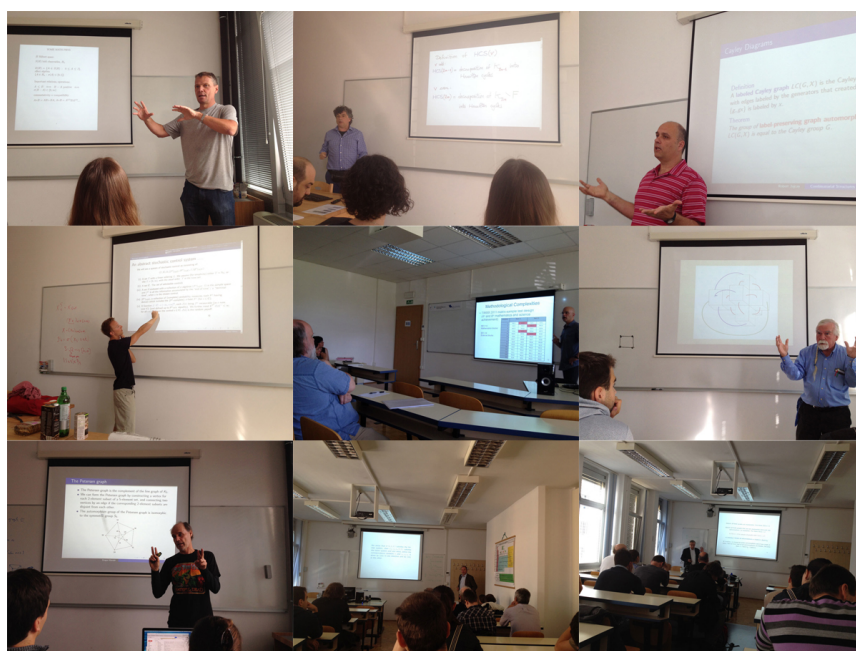
### March

- 09/03/2015 Marko Orel (UP IAM and UP FAMNIT): “Adjacency preservers on invertible hermitian matrices”;
- 16/03/2015 Samir Hodžić (UP FAMNIT): “Generalized bent functions - some general construction methods and related necessary and sufficient conditions”;
- 23/03/2015 Karla Ferjančič (UP IAM): “Construction of  $G^3$  rational motion of degree eight”;
- 24/03/2015 Alexey Medvedev (Sobolev Institute of Mathematics, Novosibirsk, Russia and Central European University, Budapest, Hungary): “Hamiltonian cycles based on independent even cycles in the Pancake graph”;
- 30/03/2015 Alexander Ivanov (Imperial Collage London, Faculty of Natural Sciences): “Locally and weakly locally projective actions”;

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## April

- 08/04/2015 Karla Ferjančič (UP IAM): “Predstavitev teme doktorske disertacije: Konstrukcija gibanj togih teles z geometrijsko zveznimi racionalnimi zlepkami”;
- 13/04/2015 Steve Wilson (Northern Arizona University, USA): “The ring of fire: solved by rocks and fishes”;
- 16/04/2015 Natalia Maslova (IMM UB RAS, Yekaterinburg, Russia): “On the finite groups which are spectrum minimal, prime spectrum minimal or prime graph minimal”;
- 20/04/2015 Tamas Szonyi (Eötvös Loránd University, Budapest, Hungary): “Blocking sets and almost blocking sets”;
- 28/04/2015 Monica Milasi (Universita degli Studi di Messina, Italy): “Variational Problems and Application to a Competitive Equilibrium Problem”;



## May

- 04/05/2015 Peter Šemrl (Faculty of Mathematics and Physics, University of Ljubljana): “Adjacency and coherency preservers”;
- 11/05/2015 Marco Buratti (Universita di Perugia, Italy): “Hamiltonian cycle systems and their automorphism groups”;
- 18/05/2015 Robert Jajcay (Comenius University, Slovakia and UP FAMNIT): “Combinatorial structures with regular automorphism groups”;
- 25/05/2015 Matija Vidmar (University of Ljubljana): “On the informational structure in optimal dynamic stochastic control”;

## June

- 12/06/2015 Plamen Vladkov Mirazchiyski (International Association for the Evaluation of Educational Achievement, Germany): “The international large-scale student assessments (ILSA)”;

## October

- 05/10/2015 Stephen E. Wilson (UP IAM, UP FAMNIT): “Operartors on Maniplexes (Part I)”;
- 12/10/2015 Stephen E. Wilson (UP IAM, UP FAMNIT): “Operartors on Maniplexes (Part II)”;
- 19/10/2015 Dragan Marušič (UP FAMNIT, UP IAM): “Odd automorphisms”;
- 26/10/2015 Mats Gyllenberg (Finnish Centre of Excellence in Analysis and Dynamics Research, Department of Mathematics and Statistics, University of Helsinki, Finland): “Finite dimensional state representation of nonlinear delay systems”;
- 26/10/2015 Wilfried Imrich (Department Mathematics and Information Technology, Montanuniversität Leoben, Austria): “Symmetry breaking in graphs”;

### November

- 02/11/2015 Štefko Miklavič (UP IAM, UP FAMNIT): “Distance-regular Cayley graphs”;
- 09/11/2015 Martin Milanič (UP IAM, UP FAMNIT): “1-Sperner hypergraphs and new characterizations of threshold graphs”;
- 16/11/2015 Edin Husić (Masters student at UP FAMNIT): “Submodular functions”;
- 23/11/2015 Robert Jajcay (UP FAMNIT and Comenius University, Slovakia): “k-regular families of automorphisms and generalized Cayley graphs”;
- 30/11/2015 István Kovács (UP IAM, UP FAMNIT): “Integral automorphisms of affine spaces over finite fields”;

### December

- 07/12/2015 Robert Jajcay (UP FAMNIT and Comenius University, Slovakia): “Half-regular Cayley maps”;
- 14/12/2015 Ademir Hujdurović (UP IAM, UP FAMNIT): “Localizable graphs”;
- 21/12/2015 Russ Woodroffe (Mississippi State University, USA): “Lattice labelings and modular elements”;



**Seminar Coordinator:** Štefko Miklavič

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

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## Summer Math Camp "Mathematics is Cool", August 16 - 22, 2015.



Since 2011, the department has been organizing a yearly summer math camp, aimed at pupils in primary and secondary schools interested in mathematics. The program of the camp consists of lectures and workshops on various mathematical topics, as well as social and sport activities. With the camp we wish to show that mathematics can be both fun and useful.

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

### Organized by:

UP FAMNIT

UP IAM

### Organizing committee:

Nastja Cepak

Boštjan Frelih

Bojan Kuzma

Martin Milanič

Vito Vitrih



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### Lectures (for Primary School):

Boštjan Frelj, UP: *Matematika in šport (Mathematics and Sport)*

Ademir Hujdurović, UP: *Skrivnostna sporočila (Secret Messages)*

Jurij Kovič, UP, IMFM: *Japonska tempeljska geometrija (Japanese Temple Geometry); Zgodovina poliedrov (History of Polyhedra)*

Milan Mitrović, OŠ Sava Kladnika Sevnica: *O starogrški geometriji v dveh delih (Ancient Greece Geometry in Two Parts)*

Rok Požar, UP: *Matematika delovanja spletnih brskalnikov (Mathematics of Web Browsers)*

Jernej Vičič, UP: *Izdelava zabavnih vsebin z otipljivim vmesnikom (Fun Programming Using Tangible User Interface)*

### Lectures (for Secondary School):

Boštjan Frelj, UP: *Matematika in šport (Mathematics and Sport)*

Ademir Hujdurović, UP: *Skrivnostna sporočila (Secret Messages)*

István Kovács, UP: *Zgodba s srečnim koncem (Story With a Happy Ending)*

Blaž Mramor, UP, Universität Freiburg: *Dimenzija: od štetja do fraktalov (Dimension: Counting and Fractals)*

Marko Orel, UP: *Od najmanjših kvadratov do delovanja CT naprave (From Linear Least Squares to the Mathematics of Computed Tomography (CT))*

Rok Požar, UP: *Matematika delovanja spletnih brskalnikov (Mathematics of Web Browsers)*

Jasna Prezelj, UP, IMFM, UL: *Iteracijske metode in numerična analiza (Iteration Methods and Numerical Analysis)*

Martin Raič, UP, UL: *O Gaussovi krivulji (Gauss Curve)*

Jernej Vičič, UP: *Izdelava zabavnih vsebin z otipljivim vmesnikom (Fun Programming Using Tangible User Interface)*



## Famnit Excursions into the Mathematical Universe.

A series of popular lectures on mathematics and its role in the modern world running for the seventh consecutive year in the 2015/2016 academic year. Lectures are held once a month, typically from October to April. In 2015/2016 this series of lectures is offered as one of the programs of continuing education for professionals in education.

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

### Organized by:

UP FAMNIT and UP IAM

### Coordinator:

Martin Milanič



### Lectures in 2015:

- 14/01/2015 Dr. Rok Požar (UP FAMNIT): “*Matematika delovanja spletnih iskalnikov*”;  
11/02/2015 Dr. Marko Boben (UP IAM, UL FRI): “*Matematika v računalniškem vidu*”;  
18/03/2015 Dr. Marko Orel (UP FAMNIT, UP IAM): “*Od najmanjših kvadratov do delovanja CT naprave*”;  
13/05/2015 Dr. Bojan Kuzma (UP FAMNIT): “*Origami!*”;  
21/10/2015 Dr. Jurij Kovič (UP FAMNIT, IMFM): “*Japonska tempeljska geometrija in zahodna geometrija*”;  
18/11/2015 Dr. Boštjan Kuzman (UL PeF, UP IAM, IMFM): “*Simetrija, matematika in glasba*”

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**Research Days of Mathematics at UP FAMNIT,  
September 28 - 30, 2015.**

More: <http://www.famnit.upr.si/sl/novice/raziskovalni-dnevi-i-2>

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: First day was devoted to inequalities (lectures was given by Marko Palangetić) and to mathematical game JOMILI Cubes (a talk was given by István Estelyi). Second day was devoted to theory of numbers (lectures was given by mag. Slobodan Filipovski) and Graph theory by dr. Rok Požar (and solving problem sets from these two areas). Third day was devoted to problems from Permutation theory (lectures given by Marko Rajković).





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## VISITING PROFESSORS AND RESEARCHERS IN 2015

- Marcin Anholcer (Poznan Univeristy of Economics, Poland)
- Francesco Belardo (University of Messina, Italy)
- Leah Berman (University of Alaska Fairbank, United States of America)
- Endre Boros (RUTCOR, Rutgers University, United States of America)
- Andreas Brandstädt (University of Rostock, Germany)
- Franco Brezzi (Istituto Universitario di Studi Superiori, Italy)
- Marco Buratti (Universita di Perugia, Italy)
- Zakir Deniz (Süleyman Demirel University, Turkey)
- Cemil Dibek (Bogaziçi University, Turkey)
- Tinaz Ekim (Bogaziçi University, Turkey)
- Sergei Evdokimov (Saint Petersburg Department of V. A. Steklov Institute of Mathematics, Russian Federation)
- Didem Gözüpek (Gebze Institute of Technology, Turkey)
- Jarosław Grytczuk (Jagiellonian University, Poland)
- Vladimir Gurvich (RUTCOR, Rutgers University, United States of America)
- Alexander A. Ivanov (Imperial College London, United Kingdom of Great Britain and Northern Ireland)
- Robert Jajcay (Indiana State University and Comenius University, Slovakia)
- EunJung Kim (Universite Paris-Dauphine, France)
- Mark Maclean (Seattle University, United States of America)
- Donatella Marini (Universita di Pavia, Italy)
- Luis Martínez Fernández (University of the Basque Country, Spain)
- Natalia Maslova (Institute of Mathematics and Mechanics of Ural Branch of Russian Academy of Sciences, Russian Federation)
- Alexey Medvedev (Sobolev Institute of Mathematics of the Siberian Branch of the Russian Academy of Sciences, Russian Federation)
- Monica Milasi (University of Messina, Italy)
- Dave Witte Morris (University of Lethbridge, Canada)
- Joy Morris (University of Lethbridge, Canada)
- Mikhail E. Muzychuk (Netanya Academic College, Israel)
- Marcelo Mydlarz (Universidad Nacional de General Sarmiento, Argentina)
- Alexander Pott (Otto von Guericke University, Germany)
- Bernard Ries (Universite Paris Dauphine, France)
- János Ruff (University of Pécs, Hungary)
- Laura Jean Sheppardson (University of Mississippi, United States of America)
- Tamas Szonyi (Eötvös Loránd University, Hungary)
- Alexandru Tomescu (University of Helsinki, Finland)
- Gordon Williams (University of Alaska Fairbank, United States of America)
- Stephen Wilson (Northern Arizona University, United States of America)
- Russell Stephen Woodroffe (Mississippi State University, United States of America)

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## RESEARCH VISITS IN 2015

Mathematicians of UP IAM and UP FAMNIT had research visits at the following institutions in 2015:

- Durham University, Durham, Great Britain, January
- University of Messina, Messina, Italy, January
- University of Messina, Messina, Italy, January-February
- University of Messina, Messina, Italy, March-April
- Rutgers University, New Brunswick, NJ, USA, March-April
- Univerza v Ljubljani, Ljubljana, Slovenia, May
- Université Paris Dauphine, Paris, France, May
- University of Western Australia, Perth, Australia, May-June
- University of Bonn, Bonn, Germany, July
- Instituto de Matemáticas, UNAM, Mexico, July-August
- National University of Rosario, Rosario, Argentina, July-August
- University of Helsinki, Helsinki, Finland, August-September
- Universidad Nacional Autonoma de Mexico, Mexico City, Mexico, September
- Uppsala University, Uppsala, Sweden, September-October
- INRIA, Roquencourt, France, October
- Kuwait University, Kuwait, October-November
- Boğaziçi University, Istanbul, Turkey, November
- Vanderbilt University, Mississippi State University, University of Mississippi, Nashville, Memphis, Oxford, Starkville, USA, November
- Kuwait University, Kuwait, November-December
- University of the Basque Country, Bilbao, Spain, December



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## CONFERENCE ATTENDANCES IN 2015

Mathematicians of UP IAM and UP FAMNIT attended the following conferences in 2015:

- Workshop in Discrete Mathematics 2015, Banska Bystrica, Slovakia, January
- 7th workshop on Algebraic, Topological and Complexity Aspects of Graph Covers, Calheta, Madeira, January
- International Workshop on Graph Decomposition, Luminy, France, January
- Workshop in discrete mathematics and related topics 2015, Banská Bystrica, Slovaška, February
- EuroCG 2015, Ljubljana, Slovenia, March
- WCC 2015, Paris, France, April
- Modelling biological evolution 2015: Linking mathematical theories with empirical results, Leicester, Great Britain, April
- The Ninth International Workshop on Coding and Cryptography 2015, Paris, France, April
- CanaDAM 2015, University of Saskatchewan, Saskatoon, Canada, May-June
- 8th Slovenian Conference on Graph Theory, Kranjska Gora, Slovenia, June
- 2015 PhD Summer School in Discrete Mathematics, Rogla, Slovenia, June
- AGTAC 2015, Koper, Slovenia, June
- 5th Mathematical Conference of the Republic of Srpska, Trebinje, Republic of Srpska, Bosnia and Herzegovina, June
- Computers in Scientific Discovery 7, Richmond, USA, July
- 40th International Symposium on Mathematical Foundations of Computer Science, Milan, Italy, August
- European Conference on Combinatorics, Graph Theory and Applications (Eurocomb 2015), Bergen, Norway, August
- Enumeration Algorithms Using Structure, Leiden, The Netherlands, August
- Giornate di Geometria 2015, Second University of Naples, Caserta, Italy, September
- School and Workshop on Complex Analysis, Geometry and Dynamics, Trst, Italy, September
- 7th workshop on Graph Classes, Optimization, and Width Parameters, Aussois, France, October
- 26th International Workshop on Combinatorial Algorithms, Verona, Italy, October
- 4th annual Mississippi Discrete Mathematics Workshop, Oxford, USA, November
- KolKom 2015, Ilmenau, Germany, November

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## **INVITED LECTURES AT RESEARCH INSTITUTES/UNIVERSITIES IN 2015**

Mathematicians of UP IAM and UP FAMNIT had invited lectures at the following research institutes/universities in 2015:

- Durham University, United Kingdom, January
- University of Vienna, Austria, February
- Univerzita della Basilicata, Italy, March
- University of Western Australia, Perth, Australia, June
- Ural Federal University, Yekaterinburg, Russia, August
- University of Helsinki, Helsinki, Finland, September
- University of Auckland, New Zealand, September
- Masaryk University, Brno, Czech Republic, October
- University of Copenhagen, Denmark, October
- Boğaziçi University, Istanbul, Turkey, November
- Vanderbilt University, USA, November

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## 2015 HIGHLIGHTS OF MATHEMATICIANS AT UP FAMNIT & UP IAM

- **Prof. Dragan Marušič was elected as rector of the University of Primorska**  
Prof. Dragan Marušič will lead the University of Primorska for the following 4 years. The elections were held at the beginning of November 2015. University of Primorska goes “neUgnano naPrej” with the new university challenges.
- **Prof. Tomaž Pisanski received the Zois Award**  
Professor Tomaž Pisanski received the Zois Award for scientific achievements in the field of discrete mathematics and its applications on November 20, 2015. Zois Award represents the most prestigious and top award for achievements in scientific research and development in Slovenia.



- **Assoc. Prof. Enes Pasalic received the UP Research Excellence Prize**  
The UP Research Excellence Prize is designed to promote the achievements of professors, teaching assistants and researchers of UP for their research excellence.
- **UP FAMNIT is a candidate for the organisation of the 8th European Mathematical Congress**  
Every 4 years a European mathematical congress (EMC) is organised in one of the European cities in collaboration between a European Mathematical Society (EMS) and local organisers. The University of Primorska, backed by Society of Mathematicians, Physicists and Astronomers of Slovenia, University of Ljubljana and University of Maribor is a candidate for the organisation of the EMC 2020.
- **Ars Mathematica Contemporanea (AMC) first among the science journals in Slovenia**  
The SCImago Journal ranked the AMC first among the science journals in Slovenia in 2014.



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- **9th Middle European Mathematical Olympiad in Koper**

Faculty of Education and Faculty of Mathematics, Natural Sciences and Information Technologies of the University of Primorska were co-organizers of this year's Middle European Mathematical Olympiad (MEMO), which was organized by DMFA and was held for the ninth consecutive year, from August 25 - 31, 2015.

More: <http://memo2015.dmf.a.si/>

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

The Internet Mathematical Olympiad consists of three rounds. This year in the first round there were 5948 participants from 196 universities. At the third round there were 85 participants from 52 universities, of which 3 were our students, i.e., Marko Palanetić, Marko Rajković, and Roman Solodukhin. Marko Palanetić ranked 7th, Roman Solodukhin ranked 11th, and Marko Rajković ranked 21st.

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

The 25th Annual Competition was held at the University of Ostrava, in Czech Republic on March 27, 2015. In the category I, the members of UP FAMNIT team were: Marko Palanetić, Marko Rajković, Roman Solodukhin (all 2nd year BSc students), and Anes Valentić (1st year Bsc student). The most successful among them were Marko Palanetić and Roman Solodukhin. 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 (IMC)**

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 27 to August 2. The members of UP FAMNIT team were: Ivan Bartulović, Vladan Jovičić, Marko Palanetić, and Roman Solodukhin (all 2nd year BSc students). Marko Palanetić received Second Prize and Ivan Bartulović received Third Prize. Vladan Jovičić and Roman Solodukhin achieved Honorable mention.

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- **Famnit's students were successful in the International Scientific Student Conference (ISSC-2015)**

The 53rd International Scientific Student Conference was held in Novosibirsk (Russia) from April 11 - 17, 2015. At the conference, eight students of UP FAMNIT presented various research projects, i.e., Marija Tepegjuzova and Anes Valentić (both 1st year Bsc students); Vladan Jovičić, Marko Palangetić, Luka Pavlović, Marko Rajković, and Roman Solodukhin (all 2nd year BSc students); Ratko Darda (3rd year Bsc student). Marko Rajković achieved First Prize for his project “Polynomial time primality testing” and Ratko Darda achieved Second Prize for his project “Bounds on the product irregularity strength of graphs”.



- **Excellent results of FAMNIT's students at the South Eastern European Mathematical Olympiad for University Students (SEEMOUS)**

From March 3 - 8, 2015 in Ohrid (Macedonia) the international mathematical competition SEEMOUS 2015 was held. The competition was attended by 91 mathematicians from 21 universities and 7 countries. Our students, Marko Palangetić and Roman Solodukhin achieved silver and bronze medal, respectively.



- **Excellent results of FAMNIT's students in the programming Central Europe Regional Contest 2015**

The competition was organized by the Croatian Computer Science Association and hosted by the Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia, from November 13 - 15, 2015. There were university students from seven countries. Our team consisting of Vladan Jovičić, Marko Palangetić, and Daniel Siladji achieved good 45th place.

- **A new Doctor of Science**

Dr. Sergio Hiroki Koike Quintanar obtained his PhD under the supervision of Assoc. Prof. Istvan Kovacs. He successfully defended his PhD thesis with the title "On the isomorphism problem of bi-Cayley graphs" on February 27, 2015.



- **Start of the project "N1-0038"**

The project will address the concept of even/odd automorphisms of graphs, i.e., even/odd permutations on the set of vertices which maintain the structure of the graph. This simple concept, also a new concept, opens a new field of research, which is interesting and leads to important new discoveries in many many years of open research problems. The project leader is Prof. Dragan Marusič. The project started on September 1, 2015 and will end on August 31, 2018.

- **Project "J1-7051" received**

The proposed project is focused on structural and algorithmic aspects of graph theory and concentrates on a selection of classical and modern promising research areas at the confluence of graph theory with theoretical computer science: the independent set problem in hereditary graph classes; the study of the price of connectivity for variants of independence and domination; the study of graph classes defined by cliques and independent sets, including CIS graphs and equitable graphs; the study of graph classes defined by variants of domination; computational complexity and algorithms for variants of domination. The leader of this project is Assoc. Prof. Martin Milanič. The project starts on January 1, 2016, and ends on December 31, 2018.

- **Mathematical Advent Calendar**

The Department of Mathematics at UP FAMNIT organized for the first time a prize quiz Mathematical Advent Calendar for high school students, which was held from December 1 - 18, 2015. 230 high school students were competing by solving various mathematical problems on an almost-daily basis.

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## 2016 Math Meetings/Workshops organized by Math Department at UP FAMNIT & UP IAM

- **2016 PhD Summer School in Discrete Mathematics, 26 June - 02 July 2016**  
The Summer School will consist of two minicourses given by: Pablo Spiga (University of Milano-Bicocca, Italy) and Dimitri Leemans (University of Auckland, New Zealand).  
**Scientific Committee:**  
Klavdija Kutnar, Aleksander Malnič, Dragan Marušič, Štefko Miklavič, Primož Šparl.  
**Organizing Committee:**  
Boštjan Frelih, Ademir Hujdurovič, Boštjan Kuzman, Rok Požar.  
More: <http://www.famnit.upr.si/sl/konference>
- **Famnit Summer Math Camp “Mathematics is Cool”, August 21 - 27, 2016.**  
Since 2011, the department has been organizing a yearly summer math camp, aimed at pupils in primary and secondary schools interested in mathematics. The program of the camp consists of lectures and workshops on various mathematical topics, as well as social and sport activities. With the camp 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 seventh consecutive year in 2015/2016.  
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, September 2016**  
In September 2016, we plan to co-organize (jointly with UP PeF and DMFA Slovenia) Mathematical Research Days, the opening part of the annual preparation for the International Mathematical Olympiad. Theoretically and through problem solving the participants will discuss selected mathematical topics, typically spanning a range from geometry, algebra, number theory, combinatorics, graph theory, etc.
- **5th and 6th Mathematics Day at FAMNIT, March 11 and April 22, 2016**  
Upon request, the department organizes a day event consisting of a series of lectures and workshops for selected pupils of final primary school grades (8th or 9th). Such events already took place in 2013, 2014, and twice in 2015. Next two are planned for March 2016 when we will host pupils from the Bežigrad primary school in Ljubljana and pupils from the Ivan Rob primary school in Šempeter pri Gorici, and for April 2016 when we will host pupils from four primary schools in Ljubljana.







