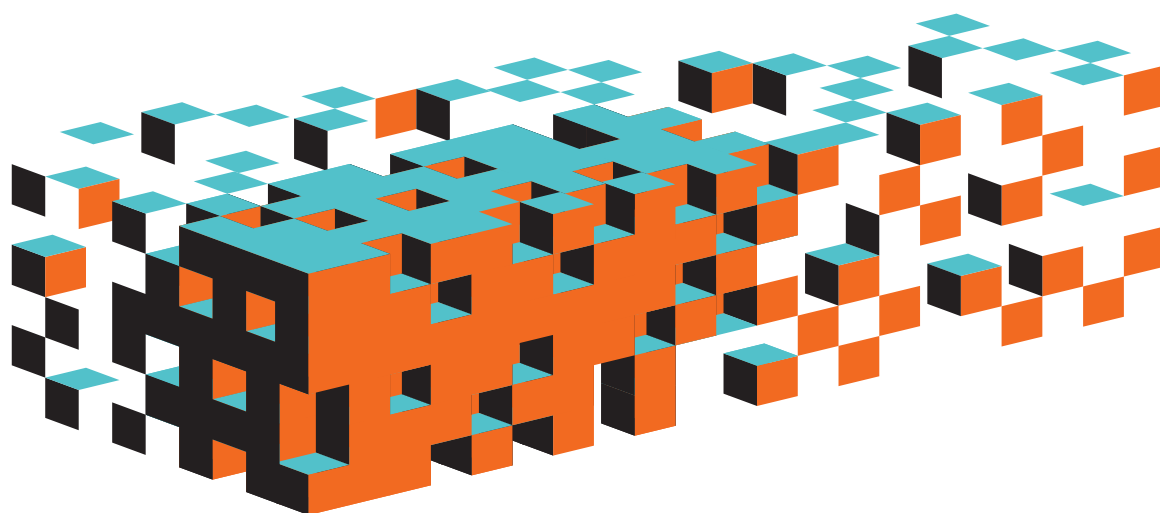


8th PhD
Summer
School in **DISCRETE
MATHEMATICS**
Rogla, Slovenia, July 1-7, 2018



WELCOME

Dear Colleague!

Some of us have gathered here for the ninth consecutive year. What was started as an informal research collaboration has now grown into a colorful series of international workshops and summer schools. We are glad to see many participants returning and several new ones joining the creative atmosphere of this event, which we will try to keep as relaxed and uplifting as in previous years. The organization of the meeting comes as a combined effort of the Faculty of Mathematics, Natural Sciences and Information Technologies (UP FAMNIT) and the Andrej Marušič Institute (UP IAM), two members of the University of Primorska, and is in line with our goal to create an international research center in algebraic combinatorics in this part of the world.

We wish you a pleasant and mathematically fruitful week at Rogla.

Scientific Committee (*Admir Hujdurović, Klavdija Kutnar, Aleksander Malnič, Dragan Marušič, Štefko Miklavič, Primož Šparl*)

GENERAL INFORMATION

8th PhD Summer School in Discrete Mathematics

Hotel Planja, Rogla, Slovenia, July 1 – July 7, 2018.

Organized by

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

UP IAM (*University of Primorska, Andrej Marušič Institute*).

In Collaboration with

IMFM - (*Institute of Mathematics, Physics, and Mechanics, Ljubljana*);

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

Slovenian Discrete and Applied Mathematics Society.

PhD Summer School in Discrete Mathematics Minicourses:

FINITE PERMUTATION GROUPS

Colva Roney-Dougal, *University of St Andrews, St Andrews, United Kingdom*

VERTEX-TRANSITIVE GRAPHS AND THEIR LOCAL ACTIONS

Gabriel Verret, *The University of Auckland, Auckland, New Zealand*

Scientific Committee:

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

Organizing Committee:

Boštjan Frelj, Ademir Hujdurović, Boštjan Kuzman, Rok Požar

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ARRS (*Slovenian Research Agency*);

MIZS (*Ministry of Education, Science and Sport*).

Website: <https://conferences.famnit.upr.si/event/7/>

MINICOURSE DESCRIPTIONS

Finite permutation groups

Colva Roney-Dougal

University of St Andrews, St Andrews, United Kingdom

`colva.roney-dougal@st-andrews.ac.uk`

This course will be an introduction to finite permutation groups. The first lecture will give many of the key definitions required for Gabriel Verret's course. After that we will go on to study the structure of various classes of permutation groups, focussing in particular on the primitive permutation groups. We will look at various especially nice actions on combinatorial objects that reveal unusual combinatorial and group-theoretic properties, and finish with some open problems.

Vertex-transitive graphs and their local actions

Gabriel Verret

The University of Auckland, Auckland, New Zealand

`g.verret@auckland.ac.nz`

The topic of this short set of lectures will be vertex-transitive graphs. (Graphs with automorphism group acting transitively on their vertex-set.) In the first half, we will discuss many basic examples and properties. In the second half, we will focus on the concept of local action in such graphs. (This is the permutation group induced by the stabiliser of a vertex on the corresponding neighbourhood.) We will first discuss some applications, and finish with some open problems.

INVITED SPEAKERS

Recent developments on the spectral determination of signed graphs

Francesco Belardo

University of Naples Federico II, Naples, Italy

The Spectral Determination Problem is one of the oldest problems in Spectral Graph Theory: given a graph, or a class of graphs, are there non-isomorphic graphs whose spectrum, with respect to a given graph matrix (adjacency, Laplacian, etc.), is the same? The literature contains many results on simple graphs. Here, we focus our attention to Signed Graphs, i.e., graphs whose edges get a sign (say, $+1$ or -1). The spectral determination problem can be considered for signed graphs as well, and it becomes an even more complicated problem. In this talk, we discuss the difference in studying signed graphs w.r.t. simple graphs and we will survey some recent results in this respect.

Lifting techniques in covering graphs and applications

Shaofei Du

Capital Normal University, Beijing, China

Constructing graphs by voltage assignment (voltage graph) is one of the basic tools in algebraic graph theory and topological graph theory. A key problem for that is to determine the liftings of automorphisms in the underlying graph. In this talk we shall present some techniques for determining liftings by using the lifting theorem and group theory and also show some applications in classifying arc-transitive graphs.

Vertex- and edge-transitivity in products of finite and infinite graphs

Wilfried Imrich

Montanuniversität Leoben, Leoben, Austria

Vertex transitivity of standard products of graphs is well investigated and understood. This topic comprises the first part of the talk. For finite graphs it is known that the Cartesian, the strong and the lexicographic product of two factors is vertex-transitive if and only if both factors are vertex transitive. For the direct product the result holds for products of connected, non-bipartite graphs. In the case of infinite graphs, on the other hand, the curious situation may occur that the so-called weak Cartesian product of infinitely many connected graphs is vertex-transitive, although all factors are asymmetric. An analogous result holds for the weak strong product of connected graphs [1]. Most of these results are collected in [4]. For more recent papers compare [3, 5, 8, 9].

Edge-transitivity of products, however, has only recently been dealt with, see for example [2, 6, 7]. Here the results differ widely between different types of products. We consider them in the second part of the talk.

We begin with edge-transitivity of products with finitely many factors, and then compare the results with those about products with infinitely many factors. Again it turns out that the differences can be significant. In particular, weak Cartesian products have a structure

that differs markedly from that of products with finitely many factors. For example, every connected edge-transitive graph G that is not prime with respect to the Cartesian product is the Cartesian or weak Cartesian power of a connected, edge-transitive graph H . If G is a finite power of H , then H has to be vertex transitive. This is not the case if G is a weak Cartesian power of H . In this case H can have two vertex orbits, and G , although vertex- and edge-transitive, is only half-transitive.

Finally, several new results and open problems about products of directed and undirected graphs with finitely and infinitely many factors will be mentioned.

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Counting in distance-regular graphs

Arnold Neumaier

University of Vienna, Vienna, Austria

A systematic technique for counting in distance-regular graphs is introduced. It is applied to give new proofs for a number of inequalities for the intersection parameters of distance-regular graphs.

Construction of self-orthogonal linear codes from orbit matrices of combinatorial structures

Sanja Rukavina

Department of Mathematics, University of Rijeka, Rijeka, Croatia

The incidence structures can be presented by their incidence matrices. An automorphism group acting on the structure induces the tactical decomposition of the corresponding incidence matrix, from which one can construct the related orbit matrix.

We will study codes spanned by the rows of an orbit matrix of a symmetric design with respect to an automorphism group that acts with all orbits of the same length. The dimension of such codes will be discussed. We define an extended orbit matrix and show that under certain conditions the rows of the extended orbit matrix span a code that is self-dual with respect to a certain scalar product.

We will also study codes spanned by the rows of the quotient matrices of symmetric (group) divisible designs (SGDD) with the dual property. In a similar way as in the case of symmetric designs, we will discuss self-dual codes constructed from the extended quotient matrices of SGDDs.

In addition, we will present a construction of self-orthogonal linear codes from orbit matrices of strongly regular graphs and show that under certain conditions submatrices of orbit matrices of strongly regular graphs span self-orthogonal codes.

Some recent results on half-arc-transitivity of graphs

Primož Šparl

University of Ljubljana, IMFM, Ljubljana, University of Primorska, Koper, Slovenia

Even though most papers on half-arc-transitive graphs (that is vertex- and edge- but not arc-transitive graphs) or graphs admitting such automorphism groups state that the investigation of such graphs originated in 1966 when Tutte proved that such graphs are necessarily of even valence, the theory really started to develop at the end of the 20th century. In the last 20 years several dozens of papers on these graphs have been published with more and more different researchers becoming interested in the topic. While the majority of papers deals with half-arc-transitive graphs of the smallest possible valence recent years brought some progress also for valences 6 and more.

In this talk I will present some of my favorite topics in the study of graphs admitting half-arc-transitive group actions and will give an overview of some recent (and perhaps not so very recent) results on such graphs, some for valence 4 and some for higher valences.

An infinite-dimensional \square_q -module obtained from the q -shuffle algebra for affine \mathfrak{sl}_2

Paul Terwilliger

University of Wisconsin-Madison, Madison, United States

Let \mathbb{F} denote a field, and pick a nonzero $q \in \mathbb{F}$ that is not a root of unity. Let $\mathbb{Z}_4 = \mathbb{Z}/4\mathbb{Z}$ denote the cyclic group of order 4. Define a unital associative \mathbb{F} -algebra \square_q by generators

$\{x_i\}_{i \in \mathbb{Z}_4}$ and relations

$$\frac{qx_i x_{i+1} - q^{-1} x_{i+1} x_i}{q - q^{-1}} = 1,$$
$$x_i^3 x_{i+2} - [3]_q x_i^2 x_{i+2} x_i + [3]_q x_i x_{i+2} x_i^2 - x_{i+2} x_i^3 = 0,$$

where $[3]_q = (q^3 - q^{-3})/(q - q^{-1})$. We will review how \square_q is related to the q -Onsager algebra. We will review the classification of the finite-dimensional irreducible \square_q -modules, and how these modules give an example of a tridiagonal pair. Our new results concern a set of infinite-dimensional \square_q -modules, said to be NIL. Let W denote a \square_q -module. A vector $\xi \in W$ is called NIL whenever $x_1 \xi = 0$ and $x_3 \xi = 0$ and $\xi \neq 0$. The \square_q -module W is called NIL whenever W is generated by a NIL vector.

We show that up to isomorphism there exists a unique NIL \square_q -module, and it is irreducible and infinite-dimensional. We describe this module from sixteen points of view. In this description an important role is played by the q -shuffle algebra for affine \mathfrak{sl}_2 .

This is joint work with Sarah Post.

STUDENT TALKS

Schultz index, Modified Schultz index, Schultz polynomial and Modified Schultz polynomial of Alkanes

Haneen Kareem Aljanabi

Budapest University of Technology and Economics, Hungary

The topological indices of molecule in chemistry can be graphically represented through demonstrating the atoms connection. Using a graph, the atoms are represented by points, while their corresponding covalent bonds are denoted by edges. A topological index of such graphical modeling is studied to give rise to the numerically graphical parameters. In the current analysis, general formulas are established depending upon some topological indices of alkanes for particular sorts of chemical trees. These indices are Schultz index, Modified Schultz index, Schultz polynomial and Modified Schultz polynomial.

Skew morphisms of simple groups

Martin Bachraty

University of Auckland, New Zealand

A skew-morphism of a finite group B is a permutation φ of its elements fixing the identity such that for each $a \in B$ there exists a non-negative integer i_a satisfying $\varphi(ab) = \varphi(a)\varphi^{i_a}(b)$ for all $b \in B$. Skew morphisms constitute a fundamental tool for the study of regular Cayley maps. Each skew morphism of a group B has an associated skew product group $G = BC$, where C is cyclic and corefree in G and $B \cap C = 1$.

We classify all skew product groups with B simple and not normal in G . As a corollary, we classify all skew morphisms of simple groups.

This is a joint work with Marston Conder and Gabriel Verret.

Extremal Type II \mathbb{Z}_4 -codes from some $2 - (31, 15, 7)$ designs

Sara Ban

Department of Mathematics, University of Rijeka, Croatia

The subject of this talk is the construction of extremal Type II \mathbb{Z}_4 -codes from some $2 - (31, 15, 7)$ designs.

A symmetric design with parameters $(4k - 1, 2k - 1, k - 1)$ is called a Hadamard 2 -design. From this design we can construct a 3 -design \mathcal{D}^* with parameters $(4k, 2k, k - 1)$. We consider a binary code spanned by the rows of the block-by-point incidence matrix of \mathcal{D}^* . For an even k , we proved that such codes are doubly-even binary codes of length $4k$, so they can be used to construct self-dual \mathbb{Z}_4 -codes of length $4k$.

We got 21 non-equivalent doubly-even binary codes of length 32 from Hadamard 2 -designs with parameters $(31, 15, 7)$. We obtained some new extremal Type II \mathbb{Z}_4 -codes of length 32 from these binary codes. We used some known methods and some improved methods to get new extremal Type II \mathbb{Z}_4 -codes of lengths 32 and 40 from obtained extremal Type II \mathbb{Z}_4 -codes of length 32.

This is a joint work with Dean Crnković, Matteo Mravić and Sanja Rukavina.

On index of nilpotent radical of locally finite p -group of finite c -dimension

Irina Deviatkova

Novosibirsk State University, Russian Federation

Let \mathfrak{M}_c denote the class of all groups satisfying the minimal condition on centralizers, that is groups in which every descending chain of centralizers stabilizes. Well-known examples of \mathfrak{M}_c -groups are abelian groups, linear groups over fields and finitely generated abelian-by-nilpotent groups. In [1] it was proved that periodic locally nilpotent \mathfrak{M}_c -groups are nilpotent-by-finite.

Following [2] we say that group G has finite c -dimension if there exists a positive integer n such that every strictly descending chain of centralizers in G has length at most n . The question now arises whether it is possible to bound the index of the nilpotent radical in G in terms of c -dimension. The easy example of why it's not possible is the group $Z_p^\infty wr Z_p$ for some prime p . Indeed, it has c -dimension 2, but nilpotent radical Z_p^∞ has index p . Nevertheless, it is possible to prove an analogue of that statement. The main result of this work is the following:

Theorem 1 *Let G be locally finite p -group of c -dimension k . Then the index of its nilpotent radical is bounded in terms of p and k .*

The proof of this theorem is mainly based on Bryant's proof of the original statement (see Theorem 1 in [1]). There is an easy corollary:

Corollary 2 *Let G be periodic locally nilpotent group of c -dimension k . Then there exist maximal prime p such that $O_p(G)$ is non-abelian and index of nilpotent radical of G is bounded in terms of p and k .*

Also, we have an interesting observation:

Theorem 3 *Let G be periodic locally nilpotent group, $F(G)$ - its nilpotent radical. Then $Z(F(G)) = C_G(F(G))$.*

This is a joint work with Alexander Buturlakin.

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Nearly multiplicity-free of transitive permutation groups

Keiji Ito

Tohoku University, Japan

We may construct association schemes from transitive permutation groups. The association scheme constructed from a transitive permutation group is commutative if and only if the transitive permutation group satisfies the condition called "multiplicity-free". Commutative association schemes are important in algebraic combinatorics and they have adjacency matrices and primitive idempotents as bases. In general, if association schemes are not commutative, then they don't have primitive idempotents. I introduce "nearly multiplicity-free" for transitive permutation groups, and I prove that non-commutative association schemes constructed from such permutation groups have a basis instead of primitive idempotents.

A Criterion for the Existence of a Solvable Hall Subgroup in a Finite Group

Antonina Khramova

Novosibirsk State University, Russian Federation

Let π be some fixed set of primes. Following the notation introduced by P. Hall in [1], E_π is the class of finite groups which have a π -Hall subgroup, and E_π^s is the class of finite groups which have a solvable π -Hall subgroup.

In [1, p.291] P. Hall has proposed a conjecture:

Let G be a finite group. If $G \in E_{\{p,q\}}$ for any $p, q \in \pi(G)$, then G is solvable.

This statement can be easily reduced to the case of a simple group. Some series of finite simple groups was considered by P. Hall himself [1], and E.L. Spitznagel in [2]. Finally, the conjecture was confirmed by Z. Arad and M. Ward in [3].

We prove the following generalization of the P. Hall conjecture.

Theorem. *Let G be a finite group, and let π be a set of primes. If $G \in E_{\{p,q\}}$ for any $p, q \in \pi$, then G has a solvable π -Hall subgroup.*

The talk is based on a joint paper with A.A. Buturlakin.

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Periodicity of Grover walks on some trees

Sho Kubota

Tohoku University, Japan

The Grover walk is kind of quantum walks and it is defined by a graph. This is studied in many fields and has many applications. Also, there are recently studies on periodicity of Grover walk on many graphs. For example, Higuchi–Konno–Segawa–Sato determine the periodic strongly regular graphs in 2017 and Kubota–Segawa–Taniguchi–Yoshie determine periodic graphs in the generalized Bethe trees in 2018. Periodic graphs are extremely rare and it is hard to find them. On the other hand, by through search by MAGMA, we found some new periodic graphs and consider families including them and determine periodic graphs of those. In this talk, we especially talk examples of periodic trees and introduce an infinite family including them. This talk is based on joint work with Yusuke Yoshie (Tohoku University).

Chiral extensions of regular toroids

José Antonio Montero Aguilar

National Autonomous University of Mexico, Mexico

An abstract polytope K is an extension of an abstract polytope P if all the facets of K are isomorphic to P . Chiral polytopes are those that have all possible rotations but lack of reflectional symmetry. In the talk we will explore the problem of building chiral extensions of polytopes. We will also show a technique involving voltages over certain graphs to construct chiral extensions of regular toroids.

Binary Codes from Skew-symmetric Hadamard Matrices

Matteo Mravić

Department of Mathematics, University of Rijeka, Croatia

A Hadamard matrix of order m is a square matrix with entries 1 and -1 such that $HH^T = mI_m$. A Hadamard matrix H of order m is skew-symmetric if $H = A + I_m$, where $A^T = -A$. Each Hadamard matrix corresponds to a $2 - (m - 1, \frac{m}{2} - 1, \frac{m}{4} - 1)$ design, called a Hadamard design, and vice versa. A Hadamard 3-design is design with parameters $3 - (m, \frac{m}{2}, \frac{m}{4} - 1)$ which can be obtained from a Hadamard design and conversely. By its incidence matrix we obtain binary codes of length m . We present a method for obtaining skew-symmetric Hadamard matrices of dimension $4m$ from skew-symmetric Hadamard matrices of order m . We will consider the case $m = 8$ and discuss obtained binary codes.

This is joint work with Dean Crnković and Sanja Rukavina.

A unified view of inequalities for distance-regular graphs

Safet Penjić

University of Primorska, Slovenia

In this talk we present some results that we got using language of t -point counts and t -point sets. Among else we prove the following. Let Γ be a distance-regular graph of diameter d and intersection array $\{b_0, \dots, b_{d-1}; c_1, \dots, c_d\}$. If $1 \leq i < j \leq d$ then

$$a_j > a_i \implies b_i > b_j \quad \text{and} \quad a_j < a_i \implies c_j > c_i.$$

If $c_q < c_{q+1}$ and $a_q \leq c_{q+1} - c_q$ (where $q \geq 2$) then $d \leq (k + 1 - c_{q+1})q + 1 \leq (k - 1)q + 1$. This diameter bound is tight.

On tetravalent half-arc-transitive graphs with cyclic normal quotients

Alejandra Ramos Rivera

University of Primorska, Slovenia

In this talk we focus on finite tetravalent graphs admitting a half-arc-transitive subgroup of automorphisms, that is a subgroup acting transitively on its vertices and its edges but not on its arcs.

Recently a new framework for a possible classification of all tetravalent graphs admitting a half-arc-transitive subgroup of automorphisms was proposed by Al-bar, Al-kenai, Muthana, Praeger and Spiga. This framework is based on the normal quotients method. They identified a subfamily of “basic” graphs such that each tetravalent graph admitting a half-arc-transitive subgroup of automorphisms is a normal cover of at least one basic graph. The basic graphs either admit an edge-transitive group of automorphisms that is quasiprimitive or biquasiprimitive on vertices, or admit a cycle as a normal quotient. In the last case, the existence of independent cyclic normal quotients (that is, they are not extendable to a common cyclic normal quotient) places severe restrictions on the studied graph.

It has been proved that there are five “special” families of tetravalent arc-transitive graphs such that if Γ is a tetravalent graph admitting independent cyclic normal quotients, then Γ is a normal cover of a graph in one of this families. In this talk we describe a family of tetravalent half-arc-transitive graphs such that each graph in this family is a normal cover of a member of each of the five “special” families.

Simple examples of collapsible complexes with exactly n free faces

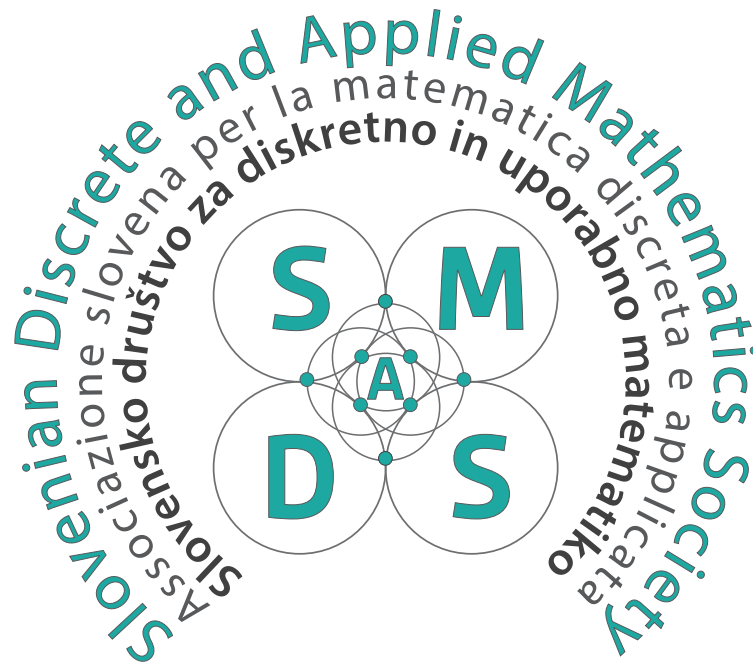
Andrés David Santamaría-Galvis

University of Primorska, Slovenia

I will describe collapsible (and shellable) simplicial complexes with any fixed number of non-adjacent free faces. Collapsible complexes with exactly one free face were first found by Hachimori in 2 dimensions, and by Adiprasito, Benedetti, and Lutz in higher dimension. Our construction glues together many copies of a modification to Hachimori’s construction.

One motivation of this work is to provide a concrete and easy-to-understand alternative to gadgets used by Goaoc et al in their recent proof that the decision version of shellability is NP-complete.

A FEW WORDS ABOUT
SLOVENIAN DISCRETE AND APPLIED MATHEMATICS SOCIETY



Slovenian Discrete and Applied Mathematics Society was founded in Koper (Slovenia), on 14 December 2016. The aim of this society is to promote the mathematical sciences, with special emphasis given to discrete and applied mathematics. The Society is research-oriented, and publishes scientific literature and organises scientific meetings such as this one. In particular, it is involved in publishing *Ars Mathematica Contemporanea* and *The Art of Discrete and Applied Mathematics*. It has members, fellows and honorary members.

A ‘Member’ may be any individual actively engaged in mathematical research, as evidenced in practice by authorship of a paper covered by *MathSciNet* or *Zentralblatt für Mathematik*, or by enrolment in a research degree (and supported by a recommendation letter from the student’s supervisor).

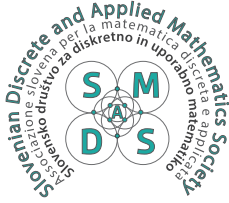
A ‘Fellow’ is a member who has strong international visibility and has made a positive impact on mathematics in Slovenia. Typically, a fellow would be expected to have at least 500 citations in the *MathSciNet* database, or be noted for some other achievements (such as an international award, or having given a keynote address in a large conference, or supervised a PhD student in or from Slovenia).

An ‘Honorary Member’ is an individual who has made outstanding contributions to the development of discrete or applied mathematics in Slovenia.

The Society has a Council to oversee its operations. It has a Nomination Committee, for nominating candidates for fellowship, and for considering candidates for honorary membership. Under the current rules, the Council of the Society will elects new Fellows and a limited number of Honorary Members at its annual meeting each year.

On 23 June 2018 the Council of the EMS approved unanimously the application of the Society for full membership of EMS. SDAMS is the first mathematics society from Eastern Europe that is member of the EMS and does not cover only pure mathematics.

SLOVENIAN DISCRETE AND APPLIED MATHEMATICS MEMBERSHIP FORM



Slovensko društvo za diskretno in uporabno matematiko

Associazione slovena per la matematica discreta e applicata

Slovenian Discrete and Applied Mathematics Society

Membership Form

Name: _____

Affiliation: _____

I am a mathematician and would like to become a member of the **Slovenian Discrete and Applied Mathematics Society**.

MyAuthor ID in MathSciNet: _____ or in zbMATH: _____.

Students who do not have these IDs yet should include a letter of reference by their advisor.

E-mail Address: _____,

Delivery Address: _____.

(Bylaws of the Society are available at the Society web page: www.sdams.si.)

I agree that my name be listed in the Society Membership list

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Slovensko društvo za diskretno in uporabno matematiko

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After the Executive Committee confirms your application you will receive your Membership ID. You should include your Membership ID in any correspondence with the Society and use it with your bank transfer. The membership fee for 2018 is 20 EUR. Instructions for submitting your payment of the Membership Fee are available at the Society web page.

A FEW WORDS ABOUT
THE UNIVERSITY OF PRIMORSKA

Established in 2003, the University of Primorska (UP) is the youngest of the three state universities in Slovenia. It consists of seven Faculties: the Faculty of Mathematics, Natural Sciences, and Information Technologies (UP FAMNIT); the Faculty of Built Environment; the Faculty of Education; the Faculty of Humanities; the Faculty of Management; the Faculty of Tourism; and the Faculty of Health Sciences; and one research institute, the Andrej Marušič Institute (UP IAM).

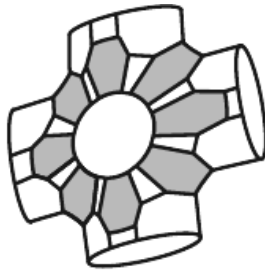
With international faculty and many research links all over the world, UP FAMNIT and its research counterpart UP IAM are at the forefront of the academic development of UP. Student enrollment at UP FAMNIT has grown from approximately 100 in its first academic year (2007/08), to 543 in the academic year 2017/18.

UP FAMNIT offers BSc, MSc, and PhD Degree programs in Mathematics, while faculty members carry out their research at UP IAM. Thus far, collaboration between UP FAMNIT and UP IAM has resulted in the following Graph Theory conferences and meetings:

- AC^2 – Algebraic Combinatorics on the Adriatic Coast, Koper, 2003, 2004, 2008, 2009.
- CoCoMat – Korea - Slovenia International Conference On Combinatorial and Computational Mathematics, Koper, 2007.
- International Workshop on Symmetries of Graphs and Networks 2010, 2012, 2014.
- PhD Summer Schools in Algebraic Graph Theory 2011 and Discrete Mathematics 2012, 2013, 2014, 2015, 2016, 2017.
- 7th Slovenian International Conference on Graph Theory, Bled, 2011.
- Graph Theory Semester, Koper, May-June 2012.
- Computers in Scientific Discovery 6, August 2012.
- Algebraic and Topological Aspects of Graph Covers, January 2013.
- $DM = 60$ Conference on Graph Theory and Combinatorics, May 2013.
- Joint Conference of Catalan, Slovak, Austrian, Slovenian and Czech Math. Society, June 2013.
- International Conference on Graph Theory and Combinatorics, May 2014.
- Ljubljana - Leoben Graph Theory Seminar 2014, September 2014.
- 2015 International Conference on Graph Theory, May 2015.
- Algorithmic Graph Theory on the Adriatic Coast, June 2015.
- 8th Slovenian International Conference on Graph Theory, Kranjska Gora, June, 2015.
- PhD Spring School in Algebraic Graph Theory, Pale, BiH, May, 2017.
- Graphs, groups, and more: celebrating Brian Alspach's 80th and Dragan Marušič's 65th birthdays, Koper, May-June, 2018.

Visit www.famnit.upr.si for more information on UP FAMNIT's graduate programs in mathematics and related fields. Visit www.iam.upr.si for more information on research.

PUBLISHING



ARS MATHEMATICA CONTEMPORANEA

Ars Mathematica Contemporanea (AMC) is an international journal, published by UP in collaboration with IMFM, the Slovenian Discrete and Applied Mathematics Society and the Slovenian Society of Mathematicians, Physicists and Astronomers.

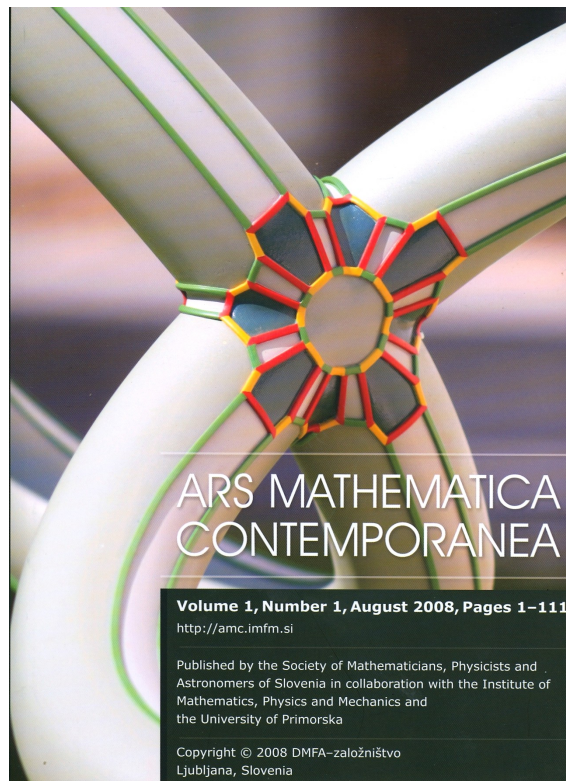
The aim of AMC is to publish peer-reviewed high-quality articles in contemporary mathematics that arise from the discrete and concrete mathematics paradigm. It favors themes that combine at least two different fields of mathematics. In particular, papers intersecting discrete mathematics with other branches of mathematics, such as algebra, geometry, topology, theoretical computer science, and combinatorics, are most welcome.

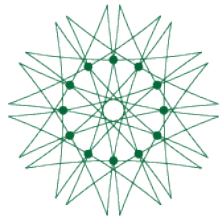
In 2015 the *Ars Mathematica Contemporanea* Journal (AMC) was once again ranked as the best Slovene scientific journal. Its impact factor for 2015 was 0.985, which landed the journal in the top quartile for scientific journals in the field of mathematics, and in 2016 the journal was in the second quartile.

This journal was launched in 2008 by Tomaž Pisanski and Dragan Marušič. Together with an international editorial team they are still managing the journal.

For more information on submissions, please refer to the AMC website

<http://amc-journal.eu>.





THE Δ RT OF DISCRETE AND
 Δ PLIED MATHEMATICS

UP and the Slovenian Discrete and Applied Mathematics Society also publish the international mathematical journal *The Art of Discrete and Applied Mathematics (ADAM)*.

This is a purely electronic, platinum open access journal that will publish high-quality articles in contemporary mathematics that arise from the discrete and concrete mathematics paradigm.

The journal is published once a year in the English language with abstracts in Slovene. It favours themes from discrete and applied mathematics and welcomes original interesting important results in the form of articles and notes, preferably not exceeding 15 pages, as well as longer survey papers.

Papers covering single topics such as graph theory, combinatorics, algorithmic graph theory, combinatorial optimization, and chemical graph theory that do not fall under the mandate of its sister journal *Ars Mathematica Contemporanea (AMC)* are most welcome here.

The papers are peer-reviewed by international experts and all published articles appear under a CC (Creative Commons) copyright license.

The editorial board is led by Editors in Chief Dragan Marušič and Tomaž Pisanski.

For more information on submissions, please refer to the ADAM website

<http://adam-journal.eu>.

A FEW WORDS ABOUT THE 8TH EUROPEAN CONGRESS OF MATHEMATICS 2020

UP mathematicians, in cooperation with representatives of all Slovene mathematical research institutions, have been granted the honour of organizing the 8th European Congress of mathematics in 2020 (8ECM). The Council of the European Mathematical Society, which gathered at the 7th European Congress of Mathematics in Berlin in July 2016, recognized the potential of the Slovenian proposal. In entrusting to us the organization of the next congress, the Council expressed its deepest confidence in Slovenian researchers. Their decision was greeted with enthusiasm and satisfaction.

In addition to the official program, special minisymposia, lectures and other events are planned. These will make the congress a lively forum of mathematical diversity for researchers, professors, teachers and students. Organizers welcome all interested participants, and will offer support for students and mathematicians from disadvantaged backgrounds.

The proposal to host this event was put forward by UP FAMNIT, in collaboration with UP IAM, University of Ljubljana, Faculty of Mathematics and Physics & Faculty of Education, University of Maribor, Faculty of Natural Sciences and Mathematics, and all other organizations active in the field of mathematics in Slovenia. It was also supported by the Slovenian Ministry of Education, Science and Sport, the Slovene Research Agency, the Slovenian Academy of Sciences and Arts and the Slovenian Rectors' Conference.

Visit www.8ecm.si for more information.

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8th PhD Summer School in Discrete Mathematics

Rogla, Slovenia, July 1 – July 7, 2018.

Edited by Boštjan Frelih.

Koper, July 2018.