



# Newsletter

BELGIAN MATHEMATICAL  
SOCIETY

# 141, January 15, 2023

Comité National de Mathématique CNM

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NCW Nationaal Comité voor Wiskunde

**Newsletter of the Belgian Mathematical Society  
and the National Committee for Mathematics**

Belgian Mathematical Society ASBL/VZW  
ULB Campus Plaine, C.P. 218/01,  
Bld du Triomphe, B-1050 Brussels, Belgium

Website: [bms.ulb.ac.be](http://bms.ulb.ac.be)

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By Andreas Weiermann

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The next edition of this newsletter will appear on January 15th, hence, till January 9th all content can be sent to [wendy.goemans@kuleuven.be](mailto:wendy.goemans@kuleuven.be). Any information that you qualify as interesting to be spread among the Belgian Maths community is very much welcomed! Examples of such information are: PhD defenses, seminars, conferences, workshops, meetings, interaction with other sciences or business companies, popular lectures, school initiatives, math exhibitions, job opportunities, ...

## Foreword

Dear BMS members,  
Dear fellow mathematicians,

Together with the renewed BMS board, we wish you all a happy, creative, cheerful, and joyous 2023.

Despite the grim news from around the world, last year was quite positive on the BMS front. We organised a very successful PhD day in Liège with over 100 participants; we also held our conference in memory of Jacques Tits at the Academy where 114 people took part. Both events went very smoothly, and were a positive and overall thoroughly enjoyable experience for all those who took part.

The next year starts out also quite well because we are holding our next “Breakthroughs event” at the end of March (Wednesday March 29 2023) in Brussels. This will also be the occasion for our General Assembly to which you will all be invited officially in due course. Finally, during that event, we will also have a chance to meet our second “BMS Young Scholar Award” laureate, Daniel Drimbe from KU Leuven. Please already mark the date in your agendas!

Once again, thank to all of you for your support, participation in our activities, and fidelity to our Society. Don't forget to pay your membership dues; more information on this will be provided in the following pages.

Stay tuned to our webpage, our Newsletter, and our FaceBook page for more announcements of mathematical events.

Stay safe, and see you soon, be it in real life or through a computer screen.

Céline, Joost, Wendy, and Yvik

## 1 News from the BMS & NCM

### 1.1 Membership dues for 2023

**The basic BMS membership fee is 20€ per year or 100€ for 5 years.** See Section 1.1.1 for reciprocity membership.

You can either pay via bank transfer (**BIC: GEBABEBB / IBAN: BE70 0011 7447 8525**) or via PayPal (see <http://bms.ulb.ac.be/membership/paypal.php>).

Our address is:

Belgian Mathematical Society  
Campus de la Plaine, C.P. 218/01  
Boulevard du Triomphe  
B-1050 Brussels, BELGIUM

The new Project Euclid system for electronic access to our journal, the Bulletin of the Belgian Mathematical Society, is stricter than before and asks the Society to update our subscriber's list yearly in January. So please pay your dues as soon as possible in order to keep uninterrupted access to the Bulletin.



Figure 1: Left: 20 euros - basic membership fee. Middle: 45 euros - BMS + EMS fee. Right: 100 euros - 5 year basic membership fee

### 1.1.1 Reciprocity and combined membership

The BMS has reciprocity agreements with the AMS, EMS, DMV, LMS, RSME, SMF, SBPMef, VVWL and KWG. In case you are already member of one of these societies, your membership fee for the BMS is reduced to 18€. Details can be found on [this webpage](#).

We summarize the most common combined memberships:

BMS	20,00€
BMS for 5 years	100,00€
BMS with reciprocity	18,00€
BMS + EMS	45,00€

Note that the EMS (European Mathematical Society) membership fee of 25,00€ is allowed only to persons belonging to an EMS corporate member society, such as the BMS. The individual EMS membership fee is 50,00€ otherwise.

Note that it is now preferred that you pay your EMS membership fee directly to the EMS. See [http://www.euro-math-soc.eu/ems\\_payment\\_new/ems\\_payment\\_new.html](http://www.euro-math-soc.eu/ems_payment_new/ems_payment_new.html) for details.

The following QR codes can be used to pay the membership fee, mention your name as communication.

## 1.2 Recent breakthroughs in Mathematics and General Assembly

The Belgian Mathematical Society is happy to invite you to its “Recent breakthroughs and GA” symposium which will take place on the afternoon of Wednesday March 29 2023.

Aside from the yearly general assembly of the BMS, the event will as usual consist in an afternoon’s discussion by international experts on some of the more breathtaking breakthroughs in contemporary mathematics.

This year the talks will focus on topics which were recently awarded the prestigious Fields medal. All talks will be accessible to large audiences of mathematicians. We will also have the chance to hear a talk by our 2022 “Young Scholar Award” recipient, Daniel Drimbe (KU Leuven).

Participation is free but registration is mandatory, see below.

Confirmed speakers

- Daniel DRIMBE (KU Leuven) - “BMS Young Scholar Award”.
- Cédric PILATTE (Oxford) - about the work of James Maynard
- Botong WANG (University of Wisconsin-Madison) - about the work of June Huh

More information will follow soon.

Registration, see the website <http://dwispc8.vub.ac.be/nieuwBMS/index.php?id=rbm-and-ga>.

### 1.3 Bulletin of the Belgian Mathematical Society - Simon Stevin

Starting from Volume 28 the Bulletin of the Belgian Mathematical Society - Simon Stevin only appears online and is not printed any more. As a member of the BMS you have electronic access to all electronically available issues of the bulletin, free of charge. If you have any trouble logging in or accessing the journal, please contact [customer\\_support@projecteuclid.org](mailto:customer_support@projecteuclid.org).

For the table of contents of previous issues, see <https://projecteuclid.org/all/euclid.bbms>.

## 2 (Online) Meetings, Conferences, Lectures, ...

### 2.1 January 2023

#### Trends in Proof Theory 2023

January 16-17 2023,

See the poster at the end of this newsletter and the website <https://juan.ag/tips-2022>.

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#### Dutch-Belgian seminar in discrete mathematics

January 20 2023, Ghent University

We are happy to announce the third edition of the Dutch-Belgian seminar in discrete mathematics at Ghent University, Belgium, on Friday 20 January 2023. Aiming to give young researchers a platform, which was sorely lacking due to COVID, we are glad to present the following program. It consists of 7 talks of 25 minutes.

- 10:45-11:00 opening
- 11:00-11:30 Jozefien D’haeseleer, Ghent University  
New examples of Cameron-Liebler sets in classical polar spaces

- 11:30-12:00 Ralihe Villagran, TU/e  
Determinantal ideas of graphs
- 12:00-12:30 Elena Bernardini, TU/e TBA
- 12:30-13:30 lunch
- 13:30-14:00 Lins Denaux, Ghent University  
On higgledy-piggledy sets and the Andre/Bruck-Bose representation
- 14:00-14:30 Gianira Alfarano, TU/e TBA
- 14:30-15:00 Steven Van Overberghe, Ghent University TBA
- 15:00-15:30 coffee break
- 15:30-16:00 Carlo Emerencia, VUB TBA
- 16:00-16:30 Alessandro Neri, Ghent University TBA

Registration is free but mandatory and possible through the following link:

<https://docs.google.com/forms/d/e/1FAIpQLSf3mjBrwp27cwK-SGT9sNk4-DbxgDwdOvxw2jIrZzdLGa444w/viewform?fbzx=6629004869231004457>

For more details, see the website: <https://dutchbelgiandiscretemathseminar.weebly.com>

We are grateful to the local organizers (Leo Storme, Jozefien D'haeseeler, Alessandro Neri) for their support and funding for this event.

Hope to see you then! The organizers Aida Abiad (TU/e, UGent, VUB), Jan De Beule (VUB), and Sam Mattheus (USCD)

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### EoS Minicourse Event

January 23 2023, UAntwerpen

This is the second Minicourse Event of the Excellence of Science Project *Beyond Symplectic Geometry*. The speakers at this event are Joel Fine (ULB), Partha Ghosh (ULB), Alberto Rodríguez-Vázquez (KU Leuven), and Joeri Van der Veken (KU Leuven).

The event will take place on Monday, Jan 23, 2023 at the University of Antwerp on Campus Middelheim in Building G in room M.G.005 (on the ground floor of building G). Participation is free, but registration is mandatory (to estimate the amount of coffee...).

More information is available on the minicourse event webpage

<https://www.uantwerpen.be/nl/personeel/sonja-hohloch/private-webpage/excellence2-of-scienc/minicourses/>

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### Nonparametric classification and machine learning - introduction, comparison and applications

January 25-27 2023, University of Namur

The institute of Complex Systems (naXys) and the department of mathematics of the university of Namur are organizing a PhD School, funded by FNRS. This year's theme is Statistics and we will have

two lecturers, Professor Christophe Ley (University of Luxembourg) and Professor Germain Van Bever (University of Namur).

The course is titled “Nonparametric classification and machine learning - introduction, comparison and applications” and it is targeted to Master’s and PhD Students of complex systems and engineering, but it is of course open to researchers and professors of any level. The only prerequisite is some undergraduate mathematics.

The school will take place at University of Namur (Room S09, Faculty of Sciences) in the mornings (9h30-12h45) of the days 25-26-27 of January 2023. The lectures will be only in person.

Registration is free but mandatory for organizational reasons and the deadline to register is the 15 of January. You can register at this link

<https://www.unamur.be/sciences/mathematique/EDStat/inscription>

All information about the school, the program, the lecturer and the location can be found here

<https://www.unamur.be/sciences/mathematique/EDStat/edstat>

Do not hesitate to contact us for any additional information.

We look forward to see you there, The organizers German Van Bever, Jérôme Daquin, Riccardo Muolo

## 2.2 February 2023

### Functional approach to dynamical systems

February 7, 14, 21 28 2023, University of Namur

The course entitled “Functional approach to dynamical systems” will be given in English at the Department of Applied Mathematics at the University of Namur and it is open to anyone interested. The main objective of this course is to acquire the concepts and main results as well as the methods of the theory of infinite-dimensional dynamical systems (distributed parameter systems). The various aspects of studying such systems (modeling, analysis, design of stabilizing control laws, simulation) are discussed in lectures, tutorials and personal work. More particularly, the course is focused on the following topics:

- Homogeneous linear differential equations in a Banach or Hilbert space of infinite dimension:
  - Generalization of the concept of matrix exponential to the notion of semigroups of bounded linear operators.
  - Introduction of different types of semigroups.
  - Study of the stability of distributed parameter systems.
- In-homogeneous Cauchy problems in infinite dimensional spaces:
  - Study of the controllability and the observability of such systems.
  - Design of stabilizing control laws (PI regulator, Linear-Quadratic (LQ) control laws, ...).
  - Applications to partial differential equations (PDE), such as the heat equation, the vibrating string or reaction-convection-diffusion equations.

The practical information for the course is listed below.

Lecturer: Anthony Hastir (University of Namur).

Dates and schedule: February 7, 14, 28, 2023: 9:00-12:30, February 21, 2023: 14:00-17:30 (including a 10 minutes coffee break).

The course will take place at the Faculty of Sciences at the University of Namur, Building 09, Room S08, Rue Joseph Grafé 2, B-5000 Namur.

Confirmation of participation is required via email at the following address: [anthony.hastir@unamur.be](mailto:anthony.hastir@unamur.be). The deadline for registration is January 23, 2023.

Certificates of participation may be delivered for doctoral training ECTS.

### 2.3 March 2023

#### Mathematics Research Day

March 15 2023, UAntwerpen

We invite you to the third edition of the Mathematics Research Day of the Department of Mathematics of the University of Antwerp. The audience aimed at this event are bachelor & master students, PhD students, postdocs, and teachers in mathematics and/or physics.

On the one hand, some junior researchers of the Department of Mathematics will explain their fields of research. On the other hand, important aspects for a career in academia and industry will be discussed. Participation is free, but registration is mandatory (to estimate the amount of coffee...).

More information will be posted on the webpage of the UAntwerpen Pure Mathematics Group:

<https://www.uantwerpen.be/en/research-groups/fundamental-mathematics/research/>

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#### 17th International Young Researchers Workshop on Geometry, Mechanics and Control

March 29-31, 2023, KULeuven

<https://wis.kuleuven.be/events/young-researchers-workshop2023/young-researchers-workshop2023>

This workshop is a yearly international event to promote young researchers in the field of differential geometry and its relations to mechanics and control theory. The workshop features three mini-courses in key topics in the field, given this year by Chiara Esposito (Università degli Studi di Salerno), Azahara de la Torre Pedraza (Sapienza Università di Roma) and Maryam Kamgarpour (École Polytechnique Fédérale de Lausanne). Besides, there are selected talks proposed by the participants and a gong session. This event is targeted to all researchers in the field, with an emphasis on young participants (doctoral students and postdocs). The [registration](#) deadline is January 30th, 2023 for contributions and February 27th, 2023 for participation-only.

## 2.4 April 2023

### Mini-course on the combinatorics of $p$ -Kazhdan–Lusztig bases

April 17-21 2023, Ghent University doctoral school

Ghent University organises a mini-course on the combinatorics of  $p$ -Kazhdan–Lusztig bases that will be given by Chris Bowman (University of York) and Maud De Visscher (City University of London).

The course covers the basics of Hecke categories and their associated  $p$ -Kazhdan–Lusztig polynomials. Over the past decade, Hecke categories have arisen as some of the most important structures in representation theory and have been used to resolve some of the field's most famous conjectures. The purpose of this course is to give a hands-on introduction to working with Hecke categories and a thorough grounding in their basic structures.

The mini-course will consist of 10 hours of lectures and 5 hours of guided exercises. In summary:

- 17 to 21 April 2023;
- 5 day mini-course by Chris Bowman and Maud De Visscher;
- part of Doctoral Schools in Ghent University;
- free for students and postdocs;
- lunch included.

For more information, and the registration form: <https://sites.google.com/view/kleine-seminar-mini-course>.

Questions and comments can be sent to [sigiswald.barbier@ugent.be](mailto:sigiswald.barbier@ugent.be).

## 2.5 May 2023

### Summer School on High-dimensional Expanders

May 22-26 2023, Ghent University

See the poster at end of this newsletter. More information and registration: <https://algebra.ugent.be/hdx>, or email us at [hdx@ugent.be](mailto:hdx@ugent.be).

The organizers: Pierre-Emmanuel Caprace (UCLouvain), Tom De Medts (UGent), Timothée Marquis (UCLouvain)

## 2.6 July 2023

### International Category Theory Conference

July 2-8 2023, Université catholique de Louvain

The next International Category Theory Conference - CT2023 - will take place at the Université catholique de Louvain in Louvain-la-Neuve (Belgium). The conference will start on Sunday, July 2 (with a welcome reception) and will end on Saturday, July 8, 2023.



We are pleased to let you know that the following Invited Speakers have accepted to give a 50-minute plenary lecture:

- George Janelidze (University of Cape Town)
- Steve Lack (Macquarie University)
- Vanessa Miemietz (University of East Anglia)
- Paolo Perrone (University of Oxford)
- Luca Reggion (University College London)
- Christina Vasilakopoulou (National Technical University of Athens)

The members of the CT2023 Scientific Committee are:

- Richard Garner
- Sandra Mantovani (Chair)
- Jorge Picado
- Emily Riehl
- Giuseppe Rosolini
- Walter Tholen
- Tim Van der Linden

The information concerning the conference is available at the address <https://sites.uclouvain.be/ct2023/> and it will be regularly updated.

The abstract submission for the contributed talks will be possible (starting from February) until March 31st. The information concerning the registration will be available on the website of the conference in due time.

If you wish to contact the organizers please write to the address [ct2023-org@uclouvain.be](mailto:ct2023-org@uclouvain.be).

Federico Campanini, Marino Gran, Julia Ramos Gonzalez, Tim Van der Linden, Joost Verduyck, Enrico Vitale

## 2.7 August 2023

### Finite Dimensional Integrable Systems (FDIS 2023)

August 7-11 2023, UAntwerpen

The 7th International Conference on *Finite Dimensional Integrable Systems in Geometry and Mathematical Physics (FDIS 2023)* will take place during August 7-11, 2023 at the University of Antwerp/Belgium.

The previous editions took place in Jena/Germany (2011), at CIRM (Luminy)/France (2013), in Bedlewo/Poland (2015), in Barcelona/Spain (2017), in Shanghai/China (2019), and in Tel Aviv/Israel (2022).

More information is available on the conference webpage

<https://www.uantwerpen.be/nl/personeel/sonja-hohloch/private-webpage/conference-workshop/fdis2023/>

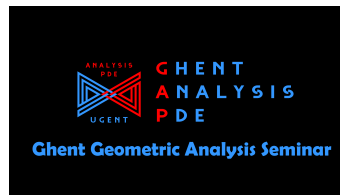
## 2.8 Seminars and colloquia

### Analysis & Geometry Seminar UAntwerpen (usually Wednesdays 16-17h during term)

This is the weekly research seminar of the analysis & geometry-interested people in Antwerp. During the semester, we have once per week a research talk in analysis and/or geometry and/or related topics. The list of speakers comprises researchers from Antwerp as well as other universities. Details (schedule, speakers, titles, abstracts, seminar room/ online/ hybrid etc.) can be found on the seminar webpage <https://www.uantwerpen.be/nl/personeel/sonja-hohloch/private-webpage/seminars/analysis-geometry/>

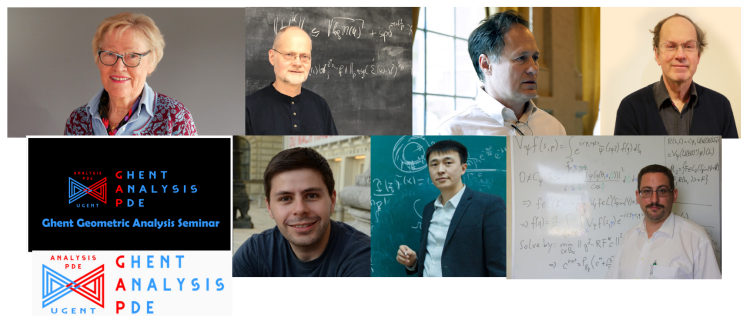
To be added/deleted from the mailing list, please send an email to:  
sonja dot hohloch AT uantwerpen dot be

### Ghent Geometric Analysis Seminar



The Ghent Geometric Analysis seminar is dedicated to studying the modern techniques of elliptic and subelliptic partial differential equations (PDEs) that are used to establish new results in differential geometry and differential topology. We are planning to invite several of the leaders in the fields of microlocal analysis, geometric analysis, and harmonic analysis abroad.

In view of the recent activities and investigations undertaken by the members of the Ghent Analysis and PDE center and the works in the interplay of geometric analysis and harmonic analysis of our group, our seminar also will be a scenario for presenting the recent developments in the field and their applications to other branches in mathematics. Visit the website of our new Ghent Geometric Analysis Seminar at <https://analysis-pde.org/seminars/ghent-on-geometric-analysis/>



Organisers:

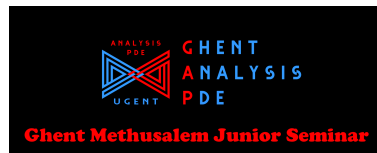
- Duvan Cardona Sanchez ([Duvan.CardonaSanchez@UGent.be](mailto:Duvan.CardonaSanchez@UGent.be))

- David Santiago Gómez Cóbos ([davidsantiago.gomezcobos@ugent.be](mailto:davidsantiago.gomezcobos@ugent.be)).

Visit also the website of the seminar to be informed of the scheduled intensive mini-courses about geometric analysis.

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### Ghent Methusalem Junior Seminar



The Ghent Methusalem Junior Seminar is run by PhD students and postdocs at the **Ghent Analysis & PDE Center** (<https://analysis-pde.org>).

It provides an ideal opportunity for young researchers in mathematics to share their ideas and to learn about new trends in a wide range of fields. Targeting a mainly (though not exclusively) young audience has meant for the organizers to ensure a relaxed atmosphere and to encourage the audience to engage in stimulating discussions with the speakers, ideally leading to new collaborations.

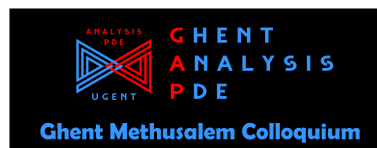
The seminar currently takes place every Tuesday at 4.30 PM (CET) on ZOOM. For more information about our activity and about past and future talks, please visit the dedicated webpage: <https://analysis-pde.org/ghent-methusalem-junior-seminar/>

If you would like to give a talk or to invite someone to give a talk, please contact:

- Duvan Cardona Sanchez, Ghent University, ([Duvan.CardonaSanchez@UGent.be](mailto:Duvan.CardonaSanchez@UGent.be))
- Serena Federico, Università di Bologna, ([serena.federico2@unibo.it](mailto:serena.federico2@unibo.it)).
- Vishvesh Kumar, Ghent University, ([Vishvesh.Kumar@UGent.be](mailto:Vishvesh.Kumar@UGent.be)).
- David Rottensteiner, Ghent University, ([David.Rottensteiner@UGent.be](mailto:David.Rottensteiner@UGent.be)).
- Bolys Sabitbek, Queen Mary University of London, ([b.sabitbek@qmul.ac.uk](mailto:b.sabitbek@qmul.ac.uk)).

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### Ghent Methusalem Colloquium



The Ghent Methusalem Colloquium is intended for a broad audience of PhD students, postdocs and professors at the Ghent Analysis & PDE Center and beyond. The series includes colloquia from visiting and invited guests. Visit the website of our new Ghent Methusalem Colloquium at <https://analysis-pde.org/ghent-methusalem-colloquium/>

Visit the webpage of the colloquium to have a look of the scheduled talks by:

- Prof. Andreas Seeger, University of Wisconsin-Madison, US.
- Prof. Roland Duduchava, University of Georgia Tbilisi, Georgia.
- Prof. Eugene Shargorodsky, King, Äôs College London, UK.
- Prof. Durvudkhan Suragan, Navarbayev University, Kazakhstan.
- Prof. Julio Delgado, Universidad Del Valle, Cali-Colombia.
- Prof. Johannes Sjostrand, The Institut de Mathématiques de Bourgogne, France
- Prof. Victor Nistor, The Institut Élie Cartan de Lorraine, France.
- Prof. Gerd Grubb, University of Copenhagen, Denmark.
- Dr. Sven Nõmm Tallinn, University of Technology, Estonia.
- Prof. Vitaly Volpert, Institut Camille Jordan, University of Lyon, France.
- Prof. Philippe Souplet, Université Sorbonne Paris Nord, France.
- Prof. Todor D. Todorov, California Polytechnic State University California, USA.
- Prof. Joachim Toft, Linnaeus University Sweden.
- Prof. Alexander Cardona, Universidad de los Andes Colombia.
- Prof. Jean VAN SCHAFTINGEN, Catholic University of Louvain Belgium.
- Prof. Medea Tsaava, The University of Georgia, Georgia.
- Prof. Margarita Tutberidze, The University of Georgia, Georgia.
- Prof. George Tephnadze, The University of Georgia, Georgia.
- Prof. Dmitri Vassiliev, University College London, UK.



The Ghent Methusalem Junior Seminar and the Ghent Methusalem Colloquium are supported by FWO Odysseus 1 Project: Analysis and Partial Differential Equations, and by the Ghent University Methusalem Programme “Analysis & PDE”.



## Methusalem Colloquium talks

### KU Leuven

Scheduled talks for the spring semester 2023 are

- **Thursday, 23 February, 2-3pm in 200L.00.06**

Speaker: **Mike Whittaker (University of Glasgow)**

Title: **Aperiodic tilings, from the Domino problem to an aperiodic monotile**

Abstract:

Almost 60 years ago, Hao Wang posed the Domino Problem: is there an algorithm that determines whether a given set of square prototiles, with specified matching rules, can tile the plane? Robert Berger proved the undecidability of the Domino Problem by producing a set of 20,426 prototiles that tile the plane, but any such tiling is nonperiodic (lacks any translational symmetry). This remarkable discovery began the search for other (not necessarily square) aperiodic prototile sets, a finite collection of prototiles that tile the plane but only nonperiodically. In the 1970s, Roger Penrose reduced this number to two. Penrose's discovery led to the planar einstein (one-stone) problem: is there a single aperiodic prototile? In a crowning achievement of tiling theory, the existence of an aperiodic monotile was resolved in 2010 by Joshua Socolar and Joan Taylor. My talk will be expository, and culminate in new aperiodic monotiles that we recently discovered. In this talk we will introduce the complex zeta function that one can attach to the singularities of a complex polynomial. The poles that arise when constructing its analytic continuation are related to many invariants of the singularities. We will review the basic properties and results about the complex zeta function and discuss some open problems.

- **Thursday, 2 March, 4-5pm in 200K.00.07**

Speaker: **Fatemeh Mohammadi (KU Leuven)**

Title: TBA

- **Friday, 17 March, 3-4 pm in (room TBA)**

Speaker: **Alberto Rodriguez Vazquez (KU Leuven)**

Title: **Isometric actions on symmetric spaces**

The colloquium talk will be followed by a minicourse on Lie groups and Lie algebras with lectures on 20, 23, 27 and 30 March.

## 3 News from the universities

### Ghent Analysis and PDE Center, summary for 2022

2022 was another fruitful year for our Analysis and PDE Center at Ghent University. Here, we summarise the main highlights from this year.

Some statistics:

- Our website [analysis-pde.org](https://analysis-pde.org) had more than 96,000 views since its launch in 2019.
- We had 24 speakers in Ghent Methusalem Junior Seminar for 2022.
- We had 20 speakers in Ghent Methusalem Colloquium for 2022.

- More than 290 presentations were given by our members and guests in our Analysis and PDE group seminar in 2021-2022.
- Members of our Analysis and PDE Centre in 2022 attracted two FWO Fellowships, as well as received a number of prestigious awards and prizes for their research.

Publications for 2022: published papers and preprints:

- <https://analysis-pde.org/articles-2021/>
- <https://analysis-pde.org/published-accepted-papers/>

See also our previous summaries for 2021, 2020 and 2019:

- <https://analysis-pde.org/summary-for-2021/>
- <https://analysis-pde.org/summary-for-2020/>
- <https://analysis-pde.org/summary-for-2019/>

Prizes/Awards, Grants, and Highlights of 2022:

- FWO Junior Postdoctoral Fellowship, to Marianna Chatzakou.
- FWO PhD Fellowship, to Arne Hendrickx.
- Scopus Award Kazakhstan 2022 to Berikbol Torebek in recognition of his scholarly contribution to mathematics.
- Presidency of the Scientific Board (2022-2024) for the ICMAM Latin America, to Duván Cardona by the Colombian Mathematical Society.
- Research Internship Grant to Duván Cardona, by the ERC-Advanced Grant DyCon Project 2015 H2020-694126 at The Deusto Institute of Science and Technology, Area: Control Theory and Microlocal Analysis, Report of this project is on this website: <https://cmc.deusto.eu/duvan-cardona/>.
- Heidelberg Laureate Forum Grants for young researchers to Berikbol Torebek, Meiirkhan Borikhanov, Vishvesh Kumar, Karlygash Dosmagulova, and Anjali Srivastava.
- IMU-Simons African Fellowship Awards to Abimbola Abolarinwa (Nigeria) and Narciso Gomes (Capo Verde).
- The Best Scientist Prize by the Kazakhstan Government to Niyaz Tokmagambetov and Durvudkhan Suragan, with awards of approx. 12,000 euros each.



New PhD students. 5 new PhD students are starting at UGent in 2022, supervised by Michael Ruzhansky:

- Xuechao Wang, Ghent University

- Arne Hendrickx, Ghent University, supported by FWO PhD Fellowship
- Yergen Aikyn, Ghent University, supported by Bolashaq Foundation, Kazakhstan
- Irfan Ali, Ghent University, supported by HEC Pakistan
- Zhipeng Song, (Ghent University and Université de Franche-Comté, France).

There were two successful PhD defences in 2022:

- Aishabibi Dukenbayeva, Nonlocal elliptic problems: well-posedness and spectral properties.
- Bakhodirjon Toshtemirov, Direct and inverse problems for singular partial differential equations with fractional order integral-differential operators.

This makes it 17 PhD students for our group, currently supervised by Michael Ruzhansky: see here for complete list:

- <https://ruzhansky.org/curriculum-vitae/>.

International and national conferences organised by our group in 2022:

- Ghent Methusalem Junior Seminar via ZOOM (every Wednesday).
- Ghent Methusalem Colloquium via ZOOM.
- Ghent Geometric Analysis Seminar via ZOOM (every Monday).
- Noncommutative Analysis and PDEs: 29-30 November 2022.
- Trends in Calculus of Variations and PDEs: 18-20 May 2022.
- Summer School “Singularities in Science and Engineering”, 22-31 August 2022.
- London-Ghent Microlocal Analysis Workshop, 23-24 March 2022.

Around 60 visitors during 2023, see the complete list here:

- <https://analysis-pde.org/summary-for-2022/>

## 4 History, maths and art, fiction, jokes, quotations ...

### 4.1 A Trip to Infinity

You can find a review by Daniel Kaplan on Netflix’s film “A Trip to Infinity” for Nature Physics’ Books & Arts column at <https://rdcu.be/c3CRU>.

### 4.2 May 12th: a comic story about Maryam Mirzakhani

For May 12, the new issue of the Comics & Science series was published, The Mirzakhani Issue, produced by Cnr Edizioni in collaboration with the Italian Mathematical Union, which contains the story UNDER THE SIGN OF TORUS, written by Davide La Rosa and drawn by Silvia Ziche.

See <https://umi.dm.unibo.it/2022/04/21/may12-mirzakhani/>.

### 4.3 1945-1960, Quinze années d'enseignement des mathématiques

Guy Noël (professor emeritus) published a book on the teaching of mathematics in French speaking part of Belgium from 1945 to 1960 : Dossier 12 : 1945-1960, Quinze années d'enseignement des mathématiques, G. NOËL <https://www.sbpmb.be/wp-content/uploads/2022/09/Resume-dossier-12.pdf> It is distributed by "la Société Belge des Professeurs de Mathématiques d'expression française" - SBPMef asbl <https://www.sbpmb.be/publications/brochures/>

### 4.4 Imaginary



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Kulak,  
12 september t.e.m.  
7 oktober 2022

**GENT**  
Campus Sterre,  
17 oktober t.e.m.  
10 november 2022

**DIEPENBEEK**  
Agora, gebouw D,  
17 november t.e.m.  
22 december 2022

**ANTWERPEN**  
Universiteitsbibliotheek,  
23 januari t.e.m.  
17 februari 2023

**LEUVEN**  
Universiteitsbibliotheek,  
27 februari t.e.m.  
26 maart 2023

**BRUSSEL**  
Pleinlaan 2,  
15 april t.e.m.  
13 mei 2023

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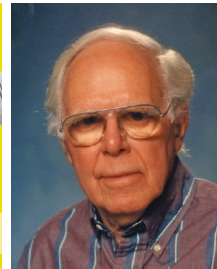
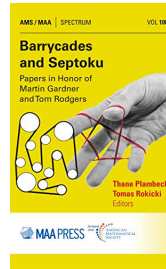
### 4.5 Adhemar's corner

The first review of Adhemar in this new year is on a collection of G4G papers in honour of Martin Gardner and Tom Rodgers, 'Barrycades and Septoku', editors Thane Plambeck and Tomas Tockiki.



**Barrycades and Septoku** by *Thane Plambeck, Tomas Rokicki, (eds.)*, MAA/AMS, 2020 (xvi+217 p.), isbn: 9781470448707. Spectrum series vol. 100

Martin Gardner (1914-2010) raised a whole generation of people interested in recreational mathematics, and puzzles, games and magic with a mathematical twist. It was an idea of Tom Rodgers (1945-2012) to bring the enthusiasts for these topics together in what became known as *Gatherings for Gardner* (G4G). The first G4G (G4G1) was held in 1993 and is organized since 1996 every 2 years. Tom Rodgers also came up with the idea of setting up every year local meetings worldwide, called *Celebration of Mind*, around Gardner’s birthday.

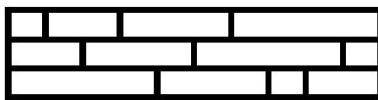


Martin Gardner



Tom Rodgers

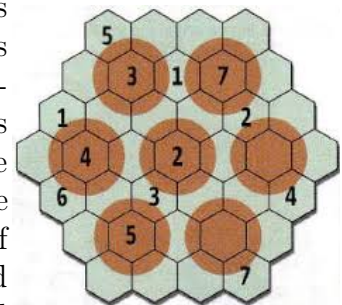
In this book the editors have collected a number of papers that were contributed to G4G $_n$  with  $n \leq 11$  (that’s up to 2014) and that are collected here in honor of Martin Gardner and Tom Rodgers, in particular of the latter. So it starts with a few ‘remembrances’ by people who have known Tom Rogers. The bulk of the book consists of papers in the style of other books that published some kind of proceedings of the G4G meetings that appeared on an irregular basis. Some of them were reviewed earlier in this Newsletter (issue 52, March 2005, issue 99, September 2014). The papers range over all the subjects of interest to the G4G lovers, whether they attended or not. There are 6 parts each with two or more papers by well known people in the field like N. Sloane, R. Guy, S. Golomb, T. Rokicki, B. Cipra, G. Bell, G. Hart, and E. and M. Demaine.



Barrycade for  $n = 4$

Part 1 treats sequences, tilings and packings. The latter involve polyomino-based puzzles. N. Sloane presents some weird sequences from his *Online Encyclopedia of Integer Sequences* (OEIS) and R. Guy discusses the *Barrycades* of the title. It corresponds to arrange the integers from 1 to  $n$  in different permutations such that their partial sums generate all the numbers from 1 to  $n(n + 1)/2 - 1$  just once. For example (1, 2, 3, 4) gives sums 1, 3, 6, [10], while (2, 3, 4, 1) gives 2, 5, 9, [10] and (4, 3, 1, 2) gives 4, 7, 8, [10]. So these 3 permutations give all natural numbers less than the total sum 10 exactly once. Visually this is represented using bricks of length 1,2,3,4. When put in natural order give layer 1, using the second and third order gives layers 2 and 3, resulting is a rectangular brick wall, a barrycade, referring to Barry Cipra who started the problem. Of course many mathematical questions can be asked when this is generalized to numbers 1, 2, . . . ,  $n$  with  $n > 4$ , or if the bricks are placed in a circle, forming a corral.

Part 2 has the general title ‘Fun and games’. It starts with two papers about combinatorial games, which includes chess problems. The first is a tribute to John Horton Conway (1937-2020) who succumbed to covid-19 in April 2020. Another one introduces the other term of the book’s title: Septoku. A septoku is sudoku-like problem, but instead of a square  $3 \times 3$  grid of cells, with each cell consisting of  $3 \times 3$  locations in which the numbers 1-9 have to be arranged and such that each column and row of the larger grid is a permutation of these 9 numbers. A septoku is played on an hexagonal grid. A cell consists of an hexagonal location surrounded by six other hexagonal locations. The whole grid consists of 7 such cells: one in the center and surrounded by six others which share with each of its neighbouring cells one hexagonal boundary location. The goal is to fill each hexagon with numbers 1-7 such that each cell, column, row and diagonal contain the 7 numbers exactly once.



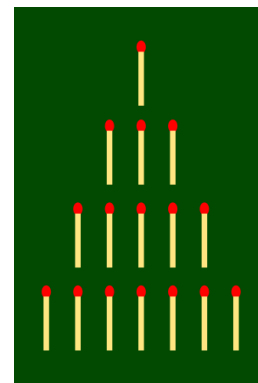
Credit: Wikipedia

Septoku

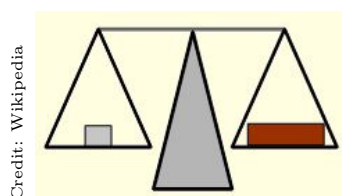
In part 3, we find two history papers. One about the search of God’s number during the last three decades. The paper is written by T. Rokicki who proved in 2010, together with his coworkers that God’s number is 20. It is the minimal number of turns required to bring a Rubik’s cube in its

starting position in the worst possible case. The other paper goes back to antiquity to look for the origins of Nim-like games. In those games, one has a number of piles (e.g. rows of matches). Each player can take away any number of matches (at least 1) from only one arbitrary pile. The looser (or winner) is the player who has to take (or can take) the last match.

Part 4 has again a general title: ‘Puzzles’ and has 5 papers. I just mention 3 of them. Conway’s *Game of Life* is played on a rectangular grid. Each cell can be alive or dead. There are few simple rules that define whether in the next step the status of a cell will change or not. That defines a cellular automaton, and the goal is to start from an initial situation that will generate certain patterns, like a group of alive cells flying off to infinity (in a spaceship). Here the problem is to play the game of *RetroLife*, that is, given a certain situation, find what could have been the previous status (with some restrictions). There is a coin weighting problem with  $n$  coins looking identical but with 3 different weights, and a balance which has one scale that can contain one coin, and another that can contain



Credit: Wikipedia



Credit: Wikipedia

an arbitrary number of coins. The problem is to find out the weight category of each (or just one) coin in a minimal number of weighting instances. Here we find also a first rubber band puzzle. Take a rubber band and use your five fingers and wind the band around them such that it forms a pentagram. Do that with the other hand in your pocket!

In the part on ‘Art, sculpture, and design’ we get two papers. George Hart is an artist who has produced a lot of geometric sculptures. Many are polyhedra-based sphere-like structures, formed by intertwining bands, which he calls orbs. You can admire them on his website. Here he describes the realization of *Comet!*, a work for the atrium of the Albion College in Albion Michigan. It consist of nine such orbs of different sizes hanging from the ceiling.

The last part has a paper about magic tricks. E.g. how the magician is predicting the permutation of coin flips that the public did outside the magician’s view. Some coding theory can help to guess the most probably flips after a number of questions. There are several generalizations and different strategies to find the result.

We conclude that this is once more a collection of fun mathematics backed up with some true mathematics. Some of the games or puzzles are new, others are classic but generalizations are proposed or new mathematical questions are formulated and/or solved. Some of the mathematics is not so simple, but the book is still addressing a general public mainly interested in the result or the effect and perhaps less in the theory. Therefore the technical details are caught in other publications to which the authors refer. This is a true tribute to Martin Gardner and to Tom Rodgers.



Credit: George Hart

Some other collections of G4G papers are

1. Elwyn R Berlekamp and Tom Rodgers (eds.). *The Mathematician and the Pied Puzzler*, A K Peters (1999)
2. David Wolfe, Tom Rodgers. *Puzzlers’ tribute. A feast for the mind*, A K Peters (2002)
3. Barry Cipra, Erik Demaine, Martin Demaine, Tom Rodgers (eds.). *Tribute to a mathemagician*, A K Peters (2004)
4. Erik D. Demaine, Martin L. Demain, Tom Rodgers (eds.). *A lifetime of puzzles. Honoring Martin Gardner*, A K Peters/CRC (2009)
5. Ed Pegg Jr., Alan H. Schoen, Tom Rodgers (eds.). *Mathematical wizardry for a Gardner*, A K Peters/CRC (2009)

One orb of Comet!

# Trends in Proof Theory 2023

University of Ghent  
January 16-17, 2023



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- Bruhat-Tits buildings
- Kazhdan's property (T)
- Hecke algebras
- Lattices in p-adic groups
- Ramanujan complexes and high-dimensional expanders
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Anne-Marie Aubert	Institut de Mathématiques de Jussieu-PRG	<a href="#">Local representation theory and Hecke algebras</a>
Indira Chatterji	Université Côte d'Azur (Nice)	<a href="#">Kazhdan's property (T)</a>
Shai Evra	Hebrew University of Jerusalem	<a href="#">Ramanujan complexes: Applications</a>
Ori Parzanchevski	Hebrew University of Jerusalem	<a href="#">Ramanujan complexes</a>
Petra Schwer	Otto-von-Guericke Universität Magdeburg	<a href="#">Bruhat-Tits buildings</a>
François Thilmany	Université Catholique de Louvain	<a href="#">Lattices in p-adic groups</a>
Alain Valette	Université de Neuchâtel	<a href="#">Ramanujan graphs</a>

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