



Newsletter

BELGIAN MATHEMATICAL
SOCIETY

137, March 14, 2022

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
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Andreas Weiermann

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The next edition of this newsletter will appear on May 15th, hence, till May 9th all content can be sent to wendy.goemans@kuleuven.be.

Foreword

Dear BMS members,
Dear fellow mathematicians,

We thank all the usual members for staying faithful to us through these turbulent times, and welcome all the new members. We hope that everyone will find interesting, useful, and enlightening information about the bustling mathematical activities that are happening in Belgium in the coming months.

The future of international collaboration seems to have darkened even more in the last few weeks, as the COVID menace has, in a horrible twist of faith, now been superseded by the anguish of war. Despite this, we believe that it is only through friendship and intelligence that humanity can hope to crawl its way out of the furnace it seems to invariably want to dash itself. We, as mathematicians, need and must stay united in these difficult times, and shed as much light around us as we can.

Stay safe, stay cheerful, and keep writing nice theorems with our friends from all over the world.

Céline, Joost, Wendy, and Yvik

1 News from the BMS & NCM

1.1 About ICM

See the BMS' official announcement at the end of this newsletter.

1.2 PhD day May 13th

The Belgian Mathematical Society invites all PhD students linked to mathematics to present a poster or a short talk at the PhD-Day. Grab the opportunity to show your research to your fellow PhD students, to meet each other, and exchange ideas.

Every PhD student presenting a poster gets one panel to present a poster in A0 format. At the end of the PhD-Day, there will be the best poster award. The best poster will be selected on the criteria of layout, contents, and clarity of the poster.

We also offer the possibility to present a contributed talk. The scientific committee will make a selection among the proposed abstracts.

A job fair will be organised during the afternoon.

When? Friday, May 13, 2022

Where? Université de Liège, bâtiment B37, Amphithéâtre 01

Programme

- 9h30: Welcome coffee and registration
- 9h50: Welcome to the participants
- 10h00: Godeaux lecture (online), Prof. Tim Gowers (Fields Medal, Collège de France and University of Cambridge)
- 11h00: Contributed talks
- 12h15: Poster storm session

- 12h30: Lunch (free for registered participants) and poster session
- 14h00: Contributed talks
- 15h00: Job Fair (and poster session)
- 16h30: Mitia Duerinckx (Université Libre de Bruxelles), BMS Young Scholar Award 2021
- 17h15: Drink, best poster award

Registration for the PhD day is free but mandatory, and is open until April 10 for oral and poster presentations. All information can be found on the website

<http://dwispc8.vub.ac.be/nieuwBMS/index.php?id=phd-day-2022>.

See also the poster at the end of this newsletter.

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.

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

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

2.1 March 2022

Miniworkshop From toric to hyperbolic

UAntwerpen

March 15-16, 2022

This 2-day miniworkshop on March 15-16, 2022 aims at bringing together junior and senior researchers on singularities, integrable systems, and related topics.

In the afternoon of March 16 (more precisely at 14:00h in M.G.010), there will be the public PhD defense of Yannick Gullentops to which all speakers and participants are wholeheartedly invited.

The program, schedule, and further details can be found on the workshop webpage

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

De wiskundige L.E.J. Brouwer, een veelzijdig genie

March 17, 2022, 16.30pm-18.00pm

Zie de poster achteraan deze nieuwsbrief voor details over en registratie voor dit minisymposium.

London-Ghent Microlocal Analysis Workshop



The next “London-Ghent Microlocal Analysis Workshop” will take place on 23-24 March 2021, online on ZOOM. Visit the website of our new workshop at <https://analysis-pde.org/conferences/london-ghent-microlocal-analysis-workshop-23-24-march-2022/>. This Microlocal Analysis Workshop will be organised by some Ph.D. students of the Analysis and PDE group of Prof. Dr. Michael Ruzhansky (Ghent University and Queen Mary University of London) and some Ph.D. students of the research group of Prof. Dr. Boguslaw Zegarlinski at Imperial College London.

Speakers:

- Serena Federico, Universita di Bologna, Italy.
- Esther Bou Dagher, Imperial College London, UK.
- Karina Navarro Gonzalez, Universidad de Sao Paulo, Brazil.
- Bolys Sabitbek, Ghent University, Belgium.
- Shreya Mehta, Imperial College London, UK.
- Niyaz Tokmagambetov, Ghent University, Belgium.
- Xianfeng Ren, Imperial College London, UK.
- Brian Grajales, Universidad de Pamplona, Colombia.
- Yaozhong Qiu, Imperial College London, UK.
- Mengchun Zhang, Imperial College London, UK.

Organisers:

- Duvan Cardona Sanchez (Ghent University, Belgium)
- Marianna Chatzakou (Ghent University, Belgium)
- David Santiago Gómez Cóbos (Ghent University, Belgium)
- Larry Read (Imperial College London, UK).

2.2 April-May 2022

Mini-course by international chair Trusses: between braces and rings

ULB

April 24 - May 22, 2022

Professor Tomasz Brzeziński (University of Swansea, United Kingdom, and University of Białystok, Poland) was awarded an ‘international chair’ at the *Université Libre de Bruxelles* (ULB). He will visit the department of Mathematics of the ULB between April 24 and May 22, and during this stay he will teach an 8h mini-course addressed to Master and PhD students and any one else with an interest in (new) algebraic structures.

A (provisional) schedule and abstract of the course is given below. More and updated information will be posted on the website of the “algebra and combinatorics” research unit of ULB:

<https://algcomb.ulb.be/#activities>.

- Thursday 26 April, 14h-16h30, 'Salle de profs', ULB, Campus Plaine, building NO, 9th floor.
- Thursday 5 May, 14h-16h30, 'Salle Solvay' at ULB, Campus Plaine, building NO, 5th floor.
- Thursday 12 May, 14h-16h30, 'Salle Solvay' at ULB, Campus Plaine, building NO, 5th floor.
- Thursday 19 May, 14h-16h30, 'Salle Solvay' at ULB, Campus Plaine, building NO, 5th floor.

"Trusses: between braces and rings"

An algebraic structure is a collection of sets with operations. Typical and most widespread across mathematics are systems such as a semigroup, monoid, group, ring, field, associative algebra, vector space or module. In this lecture course we will study some simple algebraic systems which have recently gained prominent position in algebra and topology such as braces, racks or quandles (sets with two operations interacting with each other in prescribed ways). In particular we will explore a little known fact (first described nearly 100 years ago by Pruefer and Baer) that one can give a definition of a group without requesting existence of the neutral element and inverses by using a ternary rather than a binary operation (i.e. an operation with three rather than the usual two inputs). A set with such a suitable ternary operation is known as a heap. By picking an element in a heap, the ternary operation is reduced to the binary group operation, for which the chosen element is the neutral element (the resulting group is known as a retract). We will study properties and examples of heaps and relate them to the properties of corresponding groups (retracts). Next we will look at heaps with an additional binary operation that distributes over the ternary heap operation, known as trusses, relate them to both rings and braces, and study their properties and applications.

2.3 May 2022

Trends in Calculus of Variations and PDEs (An Online Conference On Zoom)

Jointly organised by University of Sussex, UK and Ghent Analysis & PDE Centre, UGent, Belgium

May 18-20, 2022

The past decade has witnessed enormous advances and progress in the fields of Calculus of Variations and Partial Differential Equations. The new research, along with the developments of novel tools, techniques and ideas, at the same time has led to the formation of many challenging and fundamental open problems, that as ever, point at interesting and deep connections inside and outside mathematics. These range from real and harmonic analysis, algebraic and differential topology on the one hand to geometric analysis, regularity theory for elliptic systems, geometric measure theory, nonlinear elasticity and fluid mechanics on the other. The aim of this conference is to address some of these developments through a series of lectures and talks by some of the leading researchers in the fields.

Official Website <https://sites.google.com/view/tcvpde-2022/home>

Registration Link <https://sites.google.com/view/tcvpde-2022/registration>

Poster Presentation

There will be allocated time for presentation of posters during one of the breaks in the conference. If you would like to submit and have your poster presented at the conference, please do so by emailing the organisers. We will collate and arrange them for display in the poster presentation slot and will also post them on the conference website. (Email: kvmaths7@gmail.com)

Confirmed Speakers

- Jonathan Bennett (University of Birmingham, UK)

- Matteo Bonforte (Universidad Autónoma de Madrid, Spain)
- Nicolas Burq (Universite Paris-Sud, France)
- Gui-Qiang G. Chen (University of Oxford, UK)
- Serena Dipierro (The University of Western Australia, Australia)
- Piotr Hajłasz (University of Pittsburgh, USA)
- Emmanuel Hebey (Université de Cergy-Pontoise, France)
- Jan Kristensen (University of Oxford, UK)
- Jens Marklof (University of Bristol, UK)
- Govind Menon (Brown University, USA)
- Giuseppe Mingione (University of Parma, Italy)
- Clément Mouhot (University of Cambridge, UK)
- Tadahiro Oh (University of Edinburgh, UK)
- Fraydoun Rezakhanlou (University of California, Berkeley, USA)
- Gigliola Staffilani (Massachusetts Institute of Technology, USA)
- Mitsuru Sugimoto (Nagoya University, Japan)
- Enrico Valdinoci (The University of Western Australia, Australia)
- Neshan Wickramasekera (University of Cambridge, UK)

Scientific Organisers

- Vishvesh Kumar (Ghent Analysis & PDE Centre, UGent, Belgium)
- Michael Ruzhansky (Ghent analysis & PDE Centre, UGent, Belgium and School of Mathematical Science, QMUL, UK)
- Ali Taheri (Department of Mathematics, University of Sussex, UK)



Support This conference is supported by EPSRC grants, FWO Odysseus grant, and by the Ghent University Methusalem Programme “Analysis & PDE”.



Miniworkshop on Geometry and Mechanics

UAntwerpen

May 30-31, 2022

This 2-day miniworkshop aims at bringing together junior and senior researchers working in differential geometry, geometric mechanics, and related topics.

In the afternoon of Monday May 30, there will be a public PhD defense, to which all speakers and participants are wholeheartedly invited. All the other talks will take place on May 31.

Invited speakers include David Martin de Diego (ICMAT, Spain), Geoff Prince (LaTrobe University, Australia), Zoltan Muzsnay (University of Debrecen, Hungary), David Saunders (University of Ostrava, Czech Republic) and Sándor Hajdú (University of Antwerp, Belgium).

Participation is free. But we ask you to register before May 23. See all information on <https://www.uantwerpen.be/en/staff/tom-mestdag/my-website/workshop/>.

2.4 June 2022

Nonlinear Elliptic PDE in Hauts-de-France Third Edition

June 27-30, Valenciennes (France)

In June 2017 and June 2019 we organized in Valenciennes and in Calais the first two editions of “Nonlinear Elliptic PDE in Hauts-de-France”. It is now time for the third edition of this event. The goal is to bring together again, for 4 days, more than twenty specialists in nonlinear elliptic PDEs. This will allow us to strengthen the links we already have between ourselves and neighboring universities (Brussels, LLN, Mons), to renew our contacts with colleagues who participated in the first two editions and to create new contacts.

Further informations are available on the poster at the end of this newsletter and on the website <https://3rd-nlepde-hf.sciencesconf.org/>.

2.5 Seminars and colloquia

Methusalem Colloquium talks

KU Leuven

Scheduled talks for the spring semester are

Monday, 14 March, 4-5pm in 200M.00.06

Speaker: Guillem Blanco (KU Leuven)

Title: The complex zeta function of a singularity

Abstract: 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.

Monday, 28 March, 2-3pm in 200L.00.06

Speaker: Ian Charlesworth (KU Leuven)

Title: Regularity and entropy of non-commutative random variables

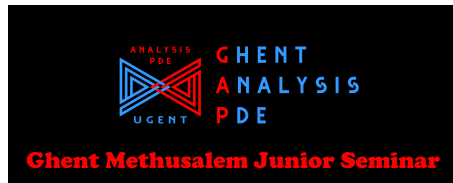
Abstract: A major topic in free probability is the regularity of non-commutative distributions: given some non-commutative random variables, can one determine if they are “almost” freely independent? What are the consequences if they are? I will give an overview of the theory of free entropy and free Fisher information, with a focus on results precluding the existence of atoms in spectral measures and the satisfaction of algebraic relations. This survey will include some of my own work, as well as that of many others from the field.

The colloquium talk will be followed by a lecture series in the month of May.

Speaker: Ian Charlesworth (KU Leuven)

- 5 May: Microstates and non-microstates free entropies: examples and properties
- 9 May: Polynomial convolutions of free variables
- 12 May: Free entropy dimension and the absence of atoms
- 16 May: Consequences for von Neumann algebras
- 19 May: One of: Connections between χ and χ^* , or Free Stein dimension and polynomials

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/>

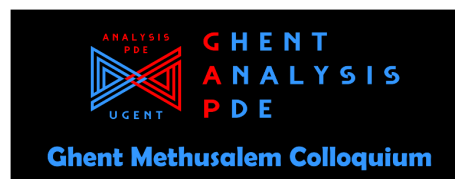
If you would like to give a talk or to invite someone to give a talk, please contact:

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

Scheduled talks are (to be updated):

- 15 March 2022, Gian Maria Dall’Ara, (Scuola Normale Superiore, Italy).
- 22 March 2022, Rajula Srivastava, (University of Wisconsin- Madison, US).
- 5 April 2022, Cody Stockdale, (Clemson University, US).
- 12 April 2022, Federico Castillo, (Catholic University of Chile, Chile).
- 19 April 2022, Bae Jun Park, (Sungkyunkwan University, Korea).
- 26 April 2022, Lucas Mason-Brown, (University of Oxford, UK).
- 3 May 2022, Joshua Flynn, (University of Connecticut, US).
- 14 June 2022, Daniel Campos, (Universidad de Costa Rica, Costa Rica).

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/>

Scheduled talks are (to be updated):

- 16 December 2021, Philippe Souplet, Université Sorbonne (Paris Nord, France), (postponed).

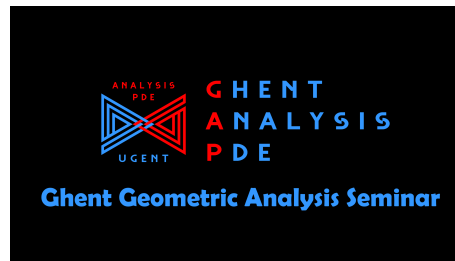
The Ghent Methusalem Junior Seminar and the Ghent Methusalem Colloquium are supported by FWO Odysseus 1 Project: Analysis and Partial Differential Equations, and by the Ghent University Methusalem Programme “Analysis & PDE”.



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. The use of linear elliptic PDE dates at least as far back as Hodge theory. These techniques can be applied to the problem of computing the index of operators that have shown to have relevant geometric information for different applications in mathematical physics and other problems of classification.

On the other hand, geometric and topological properties of spaces, such as submanifolds of the Euclidean space, Riemannian manifolds, symplectic manifolds, and vector bundles can be computed using these techniques. This approach dates back to the work by Tibor Radó and Jesse Douglas on minimal surfaces, John Nash Jr. on isometric embeddings of Riemannian manifolds into the Euclidean space, Louis Nirenberg on the Minkowski problem and the Weyl problem, Aleksandr Danilovich Aleksandrov and Aleksei Pogorelov on convex hypersurfaces. In particular, the fundamental contributions by Uhlenbeck, Shing-Tung Yau, Richard Schoen, and Richard Hamilton launched a particularly exciting and productive era of geometric analysis that continues to this day. A celebrated achievement was the solution to the Poincaré conjecture by Grigori Perelman, completing a program initiated and largely carried out by Richard Hamilton.

Going to the recent developments on the field, the Seminar of Geometric Analysis at the Ghent Analysis and PDE center will present the aforementioned works as well as the fundamental works on Index theory, K-theory and their applications to non-commutative geometry, and K-theory, in view of the Atiyah and Singer solution of the Gelfand conjecture (their celebrated Atiyah-Singer Index theorem).

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/>

Scheduled talks are (to be updated):

- 18 April 2022, Andreas Seeger, (University of Wisconsin-Madison, US).
- 30 May 2022, Jonathan Rohleder, (Stockholms Universitet, Sweden).

Organisers:

- Duvan Cardona Sanchez (Duvan.CardonaSanchez@UGent.be)
- David Santiago Gómez Cóbos (davidsantiago.gomezcobos@ugent.be)
- Andrea Vanessa Hurtado Quiceno (andreavanessa.hurtadoquiceno@ugent.be)

Geometry Seminar Cal State Fullerton

The Geometry Seminar at Cal State Fullerton, Fridays at 9:00 am, California time, that is 18:00 Western Europe time, takes place online. See all information at the end of this newsletter.

3 PhD theses

Hyperbolic singularities in the presence of S^1 -actions and Hamiltonian PDEs

Yannick Gullentops

UAntwerpen

March 16, 2022 at 14:00h in M.G.010, Campus Middelheim, UAntwerpen

Thesis advisors: Prof. Dr. Sonja Hohloch (UAntwerpen)

Summary:

Hamiltonian systems are dynamical systems which have at least one conservation law. These systems are of particular interest because they allow us to use geometric tools to obtain dynamical results. This thesis focuses on two distinct types of Hamiltonian systems: proper S^1 -systems and Hamiltonian PDEs. Proper S^1 -systems are Hamiltonian systems on four dimensional manifolds, where we have two conservation laws, one of which is a proper map inducing an S^1 -action. The presence of the S^1 -action allows us to link the minimal period (dynamical feature) of that S^1 -action to the local shape of hyperbolic fibers (topological feature). This allows us to establish a one-to-one correspondence between the topology of hyperbolic fibers and a graph theoretical construction, called a generalized bouquet. After the theoretical classification of hyperbolic fibers we focus on explicit examples. We study the bifurcation behaviour of a family of proper S^1 -systems and discuss what happens locally around hyperbolic fibers. For the investigation of Hamiltonian PDEs, we start with a 'triholomorphic' Dirac-type equation, called the Cauchy-Riemann-Fueter equation, on a so-called hyperkähler manifold that can be transformed into a Hamiltonian PDE. Then, we discuss scale manifolds as preferred underlying function spaces for the study this equation. Finally, we describe the problems concerning convergence behaviour.

Analysis and control of nonlinear infinite-dimensional systems: Application to chemical and wave processes

Anthony Hastir

University of Namur

March 30, 2022, 15:00pm, Auditorium S01, rue Grafé 2, 5000 Namur

Thesis advisors: Prof. Dr. Joseph J. Winkin (University of Namur) and Prof. Dr. Denis Dochain (UCLouvain)

Summary:

Nonlinear infinite-dimensional systems are nonlinear dynamical systems whose state components lie in an infinite-dimensional space, typically a function space. Such systems, which are also called dis-

tributed parameter systems, are ubiquitous in real-life since they are able to model many physical processes, going from conservative mechanical systems to dissipative phenomena. A lot of questions may arise when dealing with such classes of systems. For instance, the well-posedness in terms of existence and uniqueness of solutions as well as the study of the equilibria, their stability and their control are paramount steps when studying these dynamical systems. On the basis of the existing literature, we pay a particular attention to the existence, the uniqueness and the stability of equilibria and the control of nonlinear distributed parameter systems. In particular, as main contributions, we extend the classical approach that allows to deduce the stability of equilibria for a nonlinear system based on the stability of a corresponding linearized version of it. Using a new concept of differentiability for nonlinear operators which takes another space as the state space into account, we show how to guarantee local exponential stability or instability of the equilibria for the original nonlinear system. This is applied to the determination of the stability of the equilibria of a nonlinear plug-flow tubular reactor model with axial dispersion for which the temperature and the reactant concentration are considered as state variables. From a control point of view the previous results are extended to the stabilization of equilibria of nonlinear infinite-dimensional systems. Thanks to this extension we are able to identify a class of optimally controlled systems for which the required assumptions hold. As another contribution we study the field of tracking control, and especially funnel control, which constitutes an appropriate tool for the output of a system to track a class of reference signals. As a main contribution on this topic, we extend the available results that allow to consider linear infinite-dimensional systems as internal dynamics to the nonlinear setting. We prove that a general class of nonlinear infinite-dimensional systems that satisfy some standard assumptions admits a differential relation between the input and the output that is conducive for funnel control. A large number of theoretical results in this thesis are illustrated by means of examples and numerical simulations, especially in the field of process control. The considered applications are related to chemical reactor models, damped wave equations and damped sine-Gordon equations.

Jacobi-Angelesco multiple orthogonal polynomials and applications

Marjolein Leurs

KU Leuven

March 30, 2022, 18:00pm

Thesis advisors: Prof. Dr. Walter Van Assche (KU Leuven)

Summary:

This thesis investigates a particular kind of multiple orthogonal polynomials, the Jacobi-Angelesco polynomials. The interest for these polynomials came from two different perspectives: a link with multiwavelets and a link with simultaneous rational approximations.

First we give a brief overview on orthogonal polynomials with respect to one measure on part of the real line. In particular the classical orthogonal polynomials are interesting since they have a nice properties. There are three families of classical orthogonal polynomials named after Jacobi, Laguerre and Hermite and there are limiting relations between the three families. Then, multiple orthogonal polynomials are orthogonal with respect to several measures (μ_1, \dots, μ_r) and there are two types. For an easier transition from one to r measures, we first look into multiple orthogonal polynomials with respect to two measures that have a weight function of Jacobi-type. After that, we make the generalization from two to r measures in and obtain the Jacobi-Angelesco polynomials where the supports of the r measures are in the shape of a star. Next, in a similar way as for the classical orthogonal poly-

nomials by taking a proper limit, a Laguerre-type weight is obtained from the Jacobi-type weight and the corresponding polynomials are the Laguerre-Angelesco polynomials. For both families of multiple orthogonal polynomials we state explicit expressions, the nearest neighbor recurrence relation, a differential equation and the asymptotic behavior of the zeros. At last we review ongoing and future research questions. We first state open problems for the Jacobi-Angelesco polynomials before looking into promising applications of these polynomials. Very interesting are the irrationality proofs that are constructed from Hermite-Padé approximation problems. These approximation problems are closely related to multiple orthogonal polynomials and are used to prove the irrationality of many special numbers, like π and $\zeta(3)$.

Set-theoretic solutions of the Yang-Baxter equation and associated algebraic structures

Charlotte Verwimp

Vrije Universiteit Brussel

May 20, 2022 (*This timing is tentative.*)

Thesis advisors: Prof. Dr. E. Jespers (Vrije Universiteit Brussel) and Prof. Dr. L. Vendramin (Vrije Universiteit Brussel)

Summary: The Yang-Baxter equation is one of the essential equations in mathematical physics, initially appearing in both quantum and statistical mechanics. The problem of constructing and classifying its solutions has been fruitfully approached by Drinfeld who proposed the idea to focus on the subclass of set-theoretic solutions. So far, not all such solutions of the Yang-Baxter equation are known.

This PhD thesis is highly motivated by this open problem. An effective way to approach it, is to identify and study the underlying algebraic structures. More precisely, we focus on the (semi)group and ring theoretical aspects that occur, and study them for specific classes of set-theoretic solutions of the Yang-Baxter equation.

Initially, we deal with arbitrary set-theoretic solutions of the Yang-Baxter equation and discover a connection, via a 1-cocycle, between the structure monoid and the (left and right) derived structure monoids, three (in general different) monoids associated to a set-theoretic solution. In case the set-theoretic solution is left non-degenerate, the 1-cocycle between the structure monoid and the left derived structure monoid is bijective. This allows us to put two monoid structures on the same set, leading to the definition of a YB-semitruss. The latter turns out to be the suitable associative algebraic structure to study left non-degenerate set-theoretic solutions of the Yang-Baxter equation. In particular, they can be used to prove that any such finite solution is right non-degenerate if and only if it is bijective, which is one of the main results in this thesis. If a solution is (left and right) non-degenerate and bijective, we determine when its structure monoid and derived structure monoids are Malcev nilpotent, and deal with multipermutation solutions.

Set-theoretic solutions that are not left nor right non-degenerate are explored to a much smaller extent. In the final part of this thesis, such solutions are generated using the theory of skew lattices. Moreover, the obtained set-theoretic solutions turn out to be idempotent or cubic.

Parallelization of Least Squares System of Equations under the Matrix Splitting Theory

Gilles Ingelbrecht

Vrije Universiteit Brussel

May 2022 (*This timing is tentative.*)

Thesis advisors: Prof. Dr. K. Barbé (Vrije Universiteit Brussel)

Summary:

In our society today, we are faced with an immeasurable amount of digital information. The analysis of this data provides insights, both on an economic and on a scientific level. The large influx of data helps to identify trends or to deliver new scientific results. The resulting datasets, however, are potentially too large, such that the required statistical analysis becomes impossible to be solved numerically in a timely fashion. In this thesis we focus on regression analysis, which constitutes a standard method within statistics and machine learning. In a big data context, both the number of observations and the number of variables in these models may increase without limit.

We revisit Renaut's Least Squares Multisplitting (LSMS) technique aimed at solving the linear least squares problem in parallel. The LSMS technique decomposes the design matrix column-wise into several blocks. The global least squares solution is subsequently replaced by an equivalent set of local least squares problems which are to be solved in parallel. At every iteration step the local solutions are recombined using an appropriate weighting scheme. This allows for a scalable and highly parallel implementation aimed at distributed systems.

We begin our journey in the field of matrix (multi)splittings and introduce a novel parallel matrix splitting method: hierarchical binary Jacobi, which we prove to always be convergent for h.p.d. coefficient matrices. These results are subsequently translated to the least squares formulation using the equivalence between the LSMS methods and matrix splittings. To illustrate the LSMS methods, we perform a case-study on a high-scaling regression problem within engineering: the extended local polynomial method (ELPM). It is used to estimate the frequency response function (FRF) in the presence of missing output samples. The direct solution of the ELPM scales cubically with the number of samples in the record, which eventually becomes numerically unfeasible for larger problems. While a straightforward application of the LSMS provides some improvement, we show that by considering the ELPM as a mixed-valued least squares problem, the complexity drastically reduces to that of the LPM with no missing samples.

While LSMS methods show it is possible to split the least squares problem into a set of equivalent set of smaller sized problems, there remains a large degree in freedom in the selection of the partition. In this thesis, we study the impact of the partitioning strategy and develop our own method based on graph theory and clustering. Finally, we compare our methods with existing partitioning strategies which were developed from the equivalent h.p.d. perspective.

Finite geometry and friends: tilings in abelian groups and EKR-results for flags in spherical buildings

Sam Mattheus

Vrije Universiteit Brussel

May 2022 (*This timing is tentative.*)

Thesis advisors: Prof. Dr. Ph. Cara (Vrije Universiteit Brussel) and Prof. Dr. J. De Beule (Vrije Universiteit Brussel)

Summary:

The thesis is divided into two main parts: one about conjectures related to tilings in finite abelian groups and one about extremal combinatorics in spherical buildings. The overarching theme is the interplay of finite geometry with different domains, such as harmonic analysis and algebraic graph theory.

In the first part we survey results regarding Rédei's conjecture and Fuglede's conjecture. While particular instances of both are situated in factorizations of the elementary abelian groups $(\mathbb{Z}/p\mathbb{Z})^d$, the original motivations are quite distinct. Nevertheless, interesting connections between both are only recently being realized and our aim is to collect and explain such relations.

We show how finite geometry and harmonic analysis can both be used to make progress on these conjectures. Techniques from the latter can for example be used to give different proofs of known results in finite geometry. It would be interesting to see whether this new perspective will lead to proofs of new results as well. On the other hand, we can construct a counterexample to a particular instance of Fuglede's conjecture based on notions from finite geometry. The relation between Rédei's conjecture and the cylinder conjecture, a known conjecture in finite geometry, was known to some experts but appears for the first time in the literature. Finally, we generalize the cylinder conjecture in the context of divisible codes. We show that this natural generalization fails once subfields come into the picture, but that it is true for small cases.

The second part of the thesis deals with combinatorics in spherical buildings. Ever since the original result on intersecting families of sets by Erdős, Ko and Rado in 1961, an abundance of similar 'EKR-theorems' in different settings has appeared, with a fitting concept of 'intersecting' in each. Along with these results came a plethora of techniques to prove them. Some of the most powerful ones, both in success rate and scope of applicability, lie in the field of algebraic combinatorics and algebraic graph theory in particular. Typically, the problem at hand is restated to the search of the largest cocliques in the graphs of the 'non-intersection' relation, and the goal is then to bound their size.

Known general bounds for cocliques in regular graph rely on the eigenvalues (of the adjacency matrix) of the graph. In many natural situations, the adjacency algebra (i.e. the complex matrix algebra generated by this matrix) is commutative. This implies that its representation theory simplifies considerably and allows one to compute the eigenvalues of the original graph in an elegant way. In the thesis, we prove an EKR result for non-opposite flags in spherical buildings using this approach. This is, to the best of our knowledge, the first instance where the corresponding adjacency algebra is not commutative and more advanced representation theory is necessary. Nevertheless we can overcome this hurdle by building on results due to Brouwer. Surprisingly, after setting up the necessary algebraic background, the computation of the eigenvalues requires only elementary combinatorics.

4 Job announcements

4.1 Professor in Algebraic Geometry

The successful candidate will join the Research Group Pure Mathematics. The current topics of the research group include category theory, homological algebra, quadratic form theory, field arithmetic, representation theory, complex analysis, differential geometry and symplectic geometry.

See all information at

<https://www.uantwerpen.be/en/jobs/vacancies/academic-staff/?q=2016&descr=Professor-in-Algebraic-Geometry>.

4.2 3 PhD and 2 post-doc positions in UCLouvain and UGent

We offer three PhD positions and two post-doc positions for the EOS project “High-dimensional expanders and Kac–Moody–Steinberg groups” (more details about the project on [this page](#)):

1. One PhD position in UGent (4 years), one PhD position in UCLouvain (4 years) and one joint PhD (2 years in UCLouvain + 2 years in UGent): see [this link](#) for further info and how to apply.
2. One post-doc position in UGent (2 years) and one post-doc position in UCLouvain (2 years): see [this link](#) for further info and how to apply.

The application deadline is 17 April 2022. For questions, you may contact one of us:

- Pierre-Emmanuel Caprace: pierre-emmanuel.caprace@uclouvain.be
- Tom De Medts: tom.demedts@ugent.be
- Timothée Marquis: timothee.marquis@uclouvain.be

5 News from the universities

5.1 Platform Wiskunde Vlaanderen

Zie de website <https://www.platformwiskunde.be/> en in het bijzonder “Brede publiek” en “In de kijker” voor het laatste wiskundenieuws.

6 History, maths and art, fiction, jokes, quotations ...

6.1 Nieuwe editie IMAGINARY

Volgend academiejaar komt er een nieuwe editie van IMAGINARY, alle informatie is te vinden op <https://www.imaginarymaths.be/>.

6.2 π -day

Many thanks to Paul Levrie for sending the π -trivia on the next pages to help us celebrate π -day.

6.3 π -day in “Iedereen beroemd”

See item “3. En dat met uw belastinggeld” (after 6min35sec) on <https://www.vrt.be/vrtnu/a-z/iedereen-beroemd/2021-2022/iedereen-beroemd-d20220314/>.

6.4 Manneken Psthagoras

Manneken Pis heeft stijl, hij is waarschijnlijk het beeldje met de grootste garderobe ter wereld. Om een ode te brengen aan de wiskunde en Brussel, creëerde de Vakgroep Wiskunde & Data Science samen met Julie De Kezel het allereerste wiskunde pakje voor Manneken Pis.

Al eeuwen hangt de mens aan de lippen van diegene van wie hij kan leren. In de wiskunde is de oudste en bekendste lesgever Pythagoras. Hij was een echte cultfiguur en hulde zich graag in mysterie, wat zijn aantrekkingskracht nog verhoogde. Manneken Pis kreeg daarom een klassieke oude toga in Ionische Griekse stijl met een chiton, een riem en een himation. Het ondergewaad/de chiton is een rechthoekig gewaad in Byzantijns paars en wordt vaak gelinkt aan het oud Griekse Tyrisch purper, een kleur die status toonde in oud Griekse klederdracht. Het Byzantijns paars is een oudere kleur die tot op de dag van vandaag nog steeds een geschiedenis aan betekenissen draagt en ook de kleur is van VUBs wetenschappelijke kring. De riem is een touw gemaakt uit een lila changeon-stof met een goud-gele schijn. De himation is een gedrapeerde ‘toga’ over de chiton in een dunner wit katoen waarvan de rand is afgewerkt met een in het goud geborduurde Koch curve. Op zijn hoofd draagt hij een combinatie van een tulband (vaak geassocieerd met Pythagoras’ reizen naar Babylon) en een “klak”, refererend naar de studentikoze tradities van de universiteiten. Typerend aan de klak zijn de ruwe versieringen in de vorm van “buttons” bezet met slogans. Deze werden voor de gelegenheid in een wiskundig jasje gestoken door er de naam van bekende Brusselse wiskundigen in te verwerken. Ook Pythagoras’ beroemde stelling over de kwadraten van de zijden van een rechthoekige driehoek kreeg een plaats. Aan de voeten van het beeldje bevindt zich een bewegende rechthoekige driehoek waar op elke zijde vierkanten gemonteerd die zich met water vullen om zo de stelling demonstreren bij het zelfstandig 180 graden draaien (door een kleine motor en zonnepanelen).

Het kostuum werd geschonken aan de stad Brussel op 24 september. Ter ere van Pi-dag wordt Manneken Pis opnieuw “Manneken Psthagoras”.

6.5 Adhemar’s corner

This edition of the newsletter contains a review of Adhemar on *Weapons of math destruction* of Cathy O’Neil, a warning against powerful algorithms using big data that increase social inequality and threaten democracy. To end on a more cheerful and distracting note, also the review of *100 Years of Math Milestones* of S.R. Garcia, S.J. Miller (eds.), a collection of challenging problems for bright undergraduate students, is added. Each problem in this book is associated to a mathematical event from the years 1913-2012.

π -trivia

Did you know that ...



π i

- ... today is **π -day**? Why? Because in American spelling, the date March 14 is written as 3/14 and 3.14 is an approximation for the number π . Actually, in Europe we should celebrate π -day on April 31....
- ... you should definitely eat cake ('pie') today, or even better: treat your colleagues at work with pie?



- ... Since 26 November 2019, thanks to UNESCO:



- ... the number π is a constant that gives the ratio of the circumference of a circle to its diameter? Or the ratio of the area of the circle to the square of its radius? To 500 decimal places, π looks like this:

3.141592653589793238462643383279502
88419716939937510582097494459230781
64062862089986280348253421170679821
48086513282306647093844609550582231
72535940812848111745028410270193852
1105596446229489549303819644288109
75665933446128475648233786783165271
20190914564856692346034861045432664

82133936072602491412737245870066063
15588174881520920962829254091715364
36789259036001133053054882046652138
41469519415116094330572703657595919
53092186117381932611793105118548074
46237996274956735188575272489122793
818301194913

Note that there is no regularity at all in the decimals of the number π , so calculating many decimals of π is not straightforward. Fortunately, there are algorithms that allow you to calculate a large number of decimal places of π relatively quickly.

- ... on August 14, 2021, a team from a Swiss university set a new record for calculating decimals of π ? With a supercomputer 6.28×10^{13} decimals were determined. It took the computer 108 days. The previous record, set by Timothy Mullican, of 5×10^{13} decimals, dates from 2020.

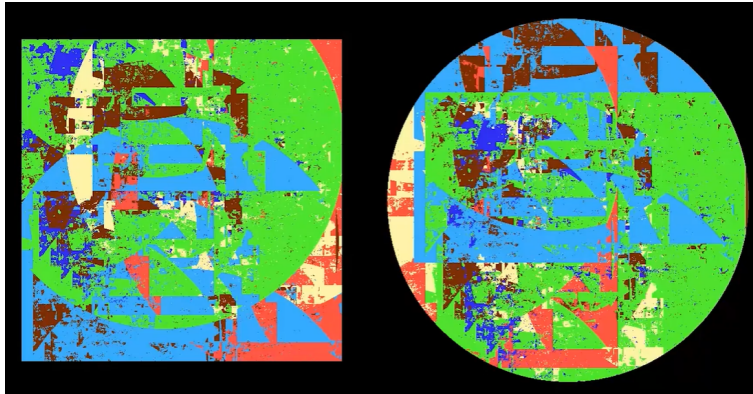


- ... the world record of memorising digits of π is held since 2015 by India's Rajveer Meena with 70 000 digits? It took him almost 10 hours to recite them all and get into the Guinness Book of World Records. But unofficially, the world record is held by Akira Haraguchi from Japan, who recited 100,000 decimal places back in 2006 (in 16 hours) and claims to know many more!

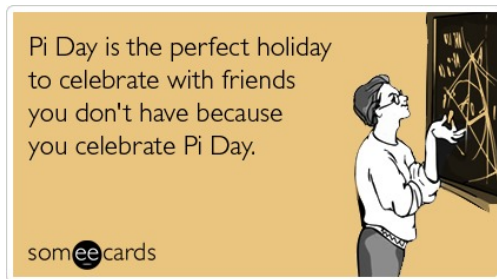


The skyline of π

- ... in a paper published on arXiv one month ago three mathematicians show how to split up a square into a finite number of pieces that can be rearranged to form a circle with the same area? This was done before but this is the first time the pieces that are used (some 10^{200} pieces!) can be visualised.



- ...



- ... there's a painting by the renowned Spanish painter Joan Miró that features pi?

- ... if you add the inverses of all the positive natural numbers, this yields a sum equal to $+\infty$, but that you get a sum of precisely π if you change the sign of some of the terms (in well-chosen places)?

$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} - \frac{1}{5} + \frac{1}{6} + \frac{1}{7} + \frac{1}{8} + \frac{1}{9} - \frac{1}{10} + \frac{1}{11} + \frac{1}{12} - \frac{1}{13} + \frac{1}{14} - \frac{1}{15} + \frac{1}{16} + \dots = \pi$$

For which terms do you need to change the sign? For those terms whose denominator has an odd number of prime factors of the form a multiple of four plus one. You can find this result in a book by Leonhard Euler dating from 1748.

- ... the Bruges-born mathematician Eugène Catalan also had a certain fondness for the number π ? Here are two beautiful infinite sums that can be found in his papers:

$$(1870) \quad 1 + \frac{1}{2} \tan\left(\frac{1}{2} \cdot \frac{\pi}{4}\right) + \frac{1}{2^2} \tan\left(\frac{1}{2^2} \cdot \frac{\pi}{4}\right) + \frac{1}{2^3} \tan\left(\frac{1}{2^3} \cdot \frac{\pi}{4}\right) + \frac{1}{2^4} \tan\left(\frac{1}{2^4} \cdot \frac{\pi}{4}\right) + \dots = \frac{4}{\pi}$$

$$(1844) \quad 1 + \frac{1}{2 \cdot 3} + \frac{1 \cdot 2}{3 \cdot 4 \cdot 5} + \frac{1 \cdot 2 \cdot 3}{4 \cdot 5 \cdot 6 \cdot 7} + \frac{1 \cdot 2 \cdot 3 \cdot 4}{5 \cdot 6 \cdot 7 \cdot 8 \cdot 9} + \dots = \frac{2\pi}{3\sqrt{3}}$$

- ... this old Dutch text:

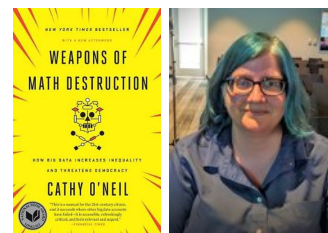
*Wie u eens, π , heeft verzonnen,
in aloude tyden, was nooit begonnen,
inderdaad spoedig geëindigd,
als hy had ingezien
welk gezeur de cyfers biên.*

can help you memorise digits of π ?

(2022 - see also <http://www.eoswetenschap.eu/wiskunde-sexy/>)

Weapons of Math Destruction, Crown, New York, 2016 (272 p.) by *Cathy O’Neil*

Cathy O’Neil has a PhD in mathematics from Harvard and has been active in the Occupy Wallstreet movement defending social and economic justice. The latter is very present in this book where she is fiercely denouncing the impact of algorithms that make use of massively harvested big data and that make automatic decisions having a disastrous effect on people. They are often started with good intentions, but in many cases they had nasty feedback loops that amplified social injustice that they wanted to diminish.



Cathy O’Neil

So in successive chapters she goes through several of such automated procedures to illustrate this unjustness. Of course these algorithms causing the problems are based on models that use mathematics, but there is little mathematics in this book. At most there is some statistics mentioned. Models are based on averages over a large set, but they cannot be applied to individuals or to smaller subsets. Or the models may confuse correlation with causality. It is applied to American society where racism and general negative preoccupation against Hispanics or African Americans is amplified by these systems.

Examples are admission to higher education or advertisements for predatory for-profit colleges that make a lot of money. Advertisement is often targeting the most vulnerable and poor community making people believe they are making a step up the social ladder. The richer class is spammed with advertisements for things they do not need. Justice makes use of data obtained about neighbourhoods so that people are harassed by police, not because they behave badly, but because they happen to live in a poor neighbourhood, and criminals are punished harder because of their environment. Also job applications may depend on data obtained from Facebook or Amazon or YouTube clicks. Workers or teachers are evaluated or have to follow an automatically generated schedule based on data collected from external sources, not taking into account what is humanly possible. If they are fired but become very successful in a competitive company, the algorithms are not adapted. Obtaining a loan or credit from a bank is race and environment depending. Even insurance that is fundamentally based on a solidarity principle does not work well in practice, but it can force people to pay fees beyond their abilities and these insurance companies make profits beyond imagination. One chapter is also dealing with the influence of social media on politics and voting behaviour. We know all too well what happened with elections in the US and elsewhere after the book was published.



The book was a big success. The author gave a TED talk that you can still find online and her book won the Euler Book Prize issued by the MAA in 2019. She is also the founder of ORCAA (O’Neil Risk Consulting & Algorithmic Auditing), a consulting company to remedy what she is denouncing in this book. It came out at a time when there was a growing awareness of the undemocratic and almost unlimited power of the the big companies with global impact that became giants based on their massive collection of data about our behaviour and sometimes private data, and when this is prohibited by law, they use data that people provide willingly in exchange for easy access to some Internet facilities. Privacy has become a growing issue and we have the GDPR rules, we have seen the European Commission call CEO Mark Zuckerberg to account for the unlawful use of information about Facebook users. The superior behaviour of Zuckerberg reflected his untouchable status. We have seen Cambridge Analytica that was bankrupted after a major data breach in 2018, but they immediately had a restart under a new name.

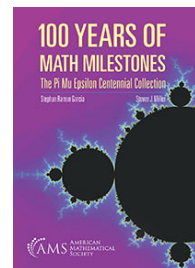
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In this book O’Neil is repeating herself over and over, so I do not think it is a well written book, but it is well documented. It is strongly oriented towards the US society, and several particular companies using these bad algorithms that she mentioned are generally unknown to European readers. However the warning finger she points at the problems is important and generally applicable, and it is as important as it was in 2016 when she published her book. If you do not want to read all the details and the repetitions in the book, it may be less waste of time to watch her TED talk.

Adhemar Bultheel

100 Years of Math Milestones. The Pi Mu Epsilon Centennial Collection, AMS/MAA, 2019 (581 p.) edited by *Stephan Ramon Garcia* and *Steven J. Miller*

Pi Mu Epsilon is an American society founded in 1914 to promote mathematics and encourage bright mathematics students to explore mathematics further and achieve a better understanding. Membership is restricted to the math honors students that have obtained sufficiently high scores for their math courses. The society publishes a journal with research papers focussing on papers by students, and this journal has also a problem section. In 2013, to celebrate their centennial anniversary, it was decided to collect for each of the past 100 years an important mathematical achievement and link a centennial problem to it. With some extra framing and context, each item is also introducing students to some recent history of mathematics. This collection was published in 4 parts of 25 years in their journal issues of 2015. The complete collection is now put together and reprinted in this book.



The entries for each year from 1913 to 2012 (on average of 5 to 6 pages) are organized in a similar format. With an introduction, the topic that is associated with the year is explained. Sometimes already here there are suggestions to think about some problem or to prove something. Then there is the centennial problem, sometimes the size of a research project. Its formulation can be short or long with several subproblems. In some way they are related to what has been explained in the introductory section, but the connection can be rather loose. Problems can be submitted by different people, but often the editors are the originators. The next section gives additional comments. In only few cases these comments contain the solution to the problem, but in most cases there are at best some hints, while the solution is left to the reader. In most cases, you find additional definitions and information, or a discussion of related problems, sometimes a bit of history or applications, etc. The end is a list of references.

**Über die Koeffizienten derjenigen Potenzreihen,
welche eine schlichte Abbildung des Einheits-
kreises vermitteln.**

VON Prof. Dr. LUDWIG BIEBERBACH
in Frankfurt a. M.

The topics covered include the topics that are often found in popular science books and that are accessible for good undergraduate math students. Clearly the latter is the target readership. This is not the kind of book that would easily sell to a public that has no advanced mathematical interest. The required mathematics are however only slightly over the edge of the undergrad's curriculum. There is a lot on number theory, some cryptography, some graph theory, analysis, statistics, and games. A year can be associated with a particular theorem, paradox, conjecture, equation, or constant (Gödel's theorems, Banach-Tarsky paradox, twin-prime conjecture, Schrödinger equation, Kinchin's constant,...), or it can be connected with a person (M. Gardner, P. Erdős, G. Cantor, and others), but also tools important for mathematicians (TeX, Mathematica, ArXiv, SageMath, GIMPS,...). Too many subject to discuss here, and it must have been difficult for the editors to select only one fact per year anyway.

I give just one example of a randomly selected year 1984 to illustrate the freewheeling stream of ideas. Obviously 1984 refers to the novel of George Orwell and the scene in which Winston Smith solves the "equation" $2 + 2 = 5$ (which is only correct if one works modulo 1). Also in a *Star Trek* episode there is a scene with captain Picard referring to this $2 + 2 = 5$. Then the problem is raised to finding integers that can be obtained using only 4's and the standard algebraic operations. The centennial problem is to solve this puzzle but minimizing the cost ($+, -, \times$ cost 1 unit; exponentiation, factorial, and division is 2 units, etc. if you allow other operations). Classify the numbers representable with a cost at most C . Given n , what is the minimal cost to represent it. The comments refer to *The Hitchhiker's Guide to the Galaxy* trilogy where in book one there is the ultimate answer 42 to the ultimate question while in book two a possible question is found to be "What do you get if you multiply 9×6 ?". The answer is indeed 42 but only in base 13. This is also alluded to in an episode of *Doctor Who*. Then the 1984 comments move on to the Bieberbach conjecture and the proof by de Branges in 1984.

This is a rather unfair reflection of the contents because other items are much more mathematical and require much more advanced analysis. But any other selection of one or more years would have been unfair as well. It is just a marvelous but challenging collection of problems and it contains a lot of fun stuff that is often found in more popular science books.

Adhemar Bultheel



About ICM 2022

The [International Congress of Mathematicians](#) (ICM) is one of the most important conferences for mathematicians throughout the world. Held every four years since the end of the 19th century, it is during this meeting that some of the most prestigious math prizes are awarded, including the famous Fields medal (which many call the “Nobel prize of mathematics”). Simply being invited to speak at an ICM is a great honor, and as usual Belgium is proud to boast [several colleagues who are scheduled to speak at the next ICM in July 2022](#).

The next ICM was supposed to take place in Saint Petersburg in July 2022. Preparations had been carried out with admirable dedication and professionalism by our Russian colleagues, battling on the one hand a global pandemic and on the other hand the legitimate doubts and questions by many mathematicians around the world in the wake of the actions of the Russian government and its leader. There were, for instance, calls for boycott following [the tensions between Russia and Ukraine](#) or the case of [Azat Miftakov](#).

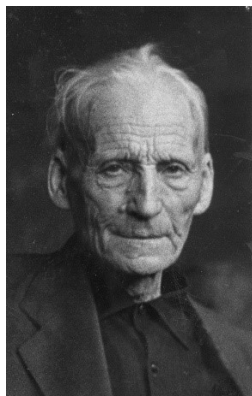
Sadly, the situation changed when the Russian army buried all possibility of denial of the true nature of its government by invading Ukraine on February 22d, 2022. Such an unspeakable act forces all mathematical societies to take action, albeit only in words. The [International Mathematical Union](#) (i.e. the organisation that oversees the ICM) therefore decided not to hold the ICM in Russia, but migrate the whole event online as detailed in the [statement published on February 26th 2022](#).

The [Belgian Mathematical Society](#) salutes this inevitable decision which marks a dark day for international scientific collaboration.

UITNODIGING MINISYMPIOSIUM

De wiskundige L.E.J. Brouwer, een veelzijdig genie

Donderdag 17 maart 2022



In 2015 is het persoonlijk archief van L. E. J. Brouwer (1881-1966) overgedragen aan het Noord-Hollands Archief in Haarlem. Onlangs zijn de circa acht strekkende meter manuscripten, correspondentie en andere documenten geschoond en geïnventariseerd. Daarmee is het archief van een van Nederlands grootste wiskundigen toegankelijk geworden voor geïnteresseerden.

Om dit te vieren, organiseren wij op donderdag 17 maart 2022 een minisymposium bij het Noord-Hollands Archief in Haarlem, Jansstraat 40, waarvoor wij u van harte uitnodigen. Het symposium vindt plaats van 16.30 - 18.00 uur (inloop vanaf 16.15 uur).

Het symposium wordt georganiseerd door de Commissie Persoonlijke Archieven van Wiskundigen (CPAW) van het Koninklijk Wiskundig Genootschap in samenwerking met het Noord-Hollands Archief (NHA).

Programma

Welkomstwoord door Lieuwe Zoodsma (directeur Noord-Hollands Archief)

Wim Veldman (Radboud Universiteit) *Intuitionistische wiskunde: Brouwers antwoord aan Cantor*

Jan van Mill (UvA) *Brouwer en topologie*

Teun Koetsier (VU) *Brouwer en de Bhagavad Gita*

Voor deelname aan het symposium verzoeken wij u vriendelijk om zich aan te melden via communicatie@noord-hollandsarchief.nl onder vermelding van 'Brouwer'.

Het symposium is ook online te volgen van 16.30-17.40 uur via de link op deze website:
www.noord-hollandsarchief.nl/brouwer

Met vriendelijke groet,

Teun Koetsier (CPAW) en Lieuwe Zoodsma (NHA)

De ontsluiting van het archief van Brouwer is mogelijk gemaakt door financiële steun van: Het Prof dr. F.E.J. Kruseman Aretz Fonds/ Prins Bernhard Cultuurfonds, het Noord-Hollands Archief, de Koninklijke Hollandsche Maatschappij der Wetenschappen, de Stichting Compositio Mathematica, het Platform Wiskunde Nederland, het Korteweg-De Vries Instituut, het Institute for Logic, Language and Computation.



27·06 > 30·06·22

NONLINEAR ELLIPTIC PDE IN HAUTS-DE-FRANCE (3rd edition)

INVITED SPEAKERS :

- David Arcoya (Universidad de Granada)
- Denis Bonheure (Université Libre de Bruxelles)
- Stefano Buccheri (Universität Wien)
- Giulio Ciraolo (Università degli Studi di Milano La Statale)
- Matteo Cozzi (Università degli Studi di Milano La Statale)
- Manuel Del Pino (University of Bath)
- Louis Dupaigne (Université Claude Bernard, Lyon)
- Antonio J. Fernández (Consejo Superior de Investigaciones Científicas, Madrid)
- Filippo Gazzola (Politecnico di Milano)
- François Hamel (Aix-Marseille Université)
- Louis Jeanjean (Université de Franche-Comté, Besançon)
- Tommaso Leonori (Sapienza Università di Roma)
- François Murat (Sorbonne Université, Paris)
- Benedetta Noris (Politecnico di Milano)
- Rosa Pardo (Universidad Complutense de Madrid)
- Angela Pistoia (Sapienza Università di Roma)
- Berardino Sciunzi (Università della Calabria, Cosenza)
- Enrico Serra (Politecnico di Torino)
- Philippe Souplet (Université Sorbonne Paris Nord)
- Elisa Sovrano (EHESS, Paris)
- Guido Sweers (Universität zu Köln)
- Peter Takác (Universität Rostock)
- Christophe Troestler (Université de Mons)

27 > 30 JUIN



CAMPUS MONT HOUY
VALENCIENNES - FRANCE

ORGANIZING COMMITTEE

- Mabel Cuesta (LMPA)
- Colette De Coster (Ceramaths)
- Alberto Farina (LAMFA)
- Gaëlle Mailly (LMPA)

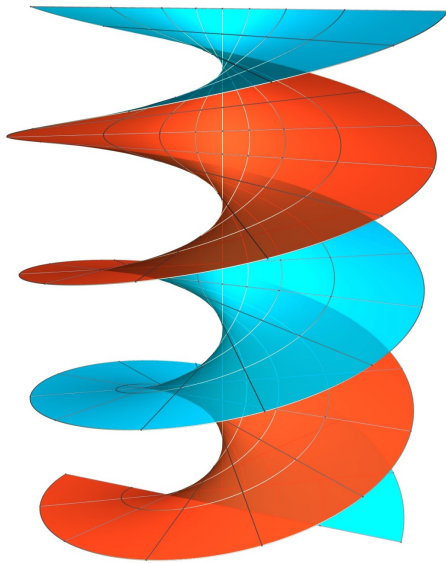


PROGRAM, INFORMATION AND REGISTRATION
<https://3rd-nlepde-hf.sciencesconf.org>

GEOMETRY SEMINAR

Department of Mathematics
California State University Fullerton

Zoom meeting room: 893 4325 5295 Password: 112358



ABOUT THE SEMINAR

The Geometry Seminar at Cal State Fullerton was established in the Spring semester 2007, and the first speakers were Professors Zhiqin Lu and Ovidiu Munteanu (at that time both from UC Irvine). Since then, the seminar became the meeting place of faculty interested in Topology- and Geometry-related themes, and their students. We value very much the students' participation to our events, which we feel should guide our more motivated students interested to pursue a graduate career, where a good mastery of various topics in Topology and Geometry is welcome.

Many collaborative efforts were born out of the conversations among our participating faculty members. E.g. at the American Mathematical Society's Meeting 1167, which took place on May 1-2, 2021, the Special Session on Differential Geometry and Geometric PDE was organized by Professors Alfonso Agnew, Nicholas Brubaker, Thomas Murphy, Shoo Seto, and Bogdan Suceavă. Such efforts are the expression of our academic environment and our collaborating atmosphere.



SCHEDULED TALKS

Friday, February 18, 9:00 am

Simona Nistor, from University Al. I. Cuza Iași

Friday, February 25, 9:00 am

Martha Dussan Angulo, Universidade de Sao Paulo, Brazil

Friday, March 4, 9:00 am

Oliver Dragičević, University of Ljubljana, Slovenia

Friday, March 11, 9:00 am

no event

Friday, March 18, 9:00 am

Vera Tonić, University of Rijeka, Croatia

Friday, March 25, 9:00 am

Baisheng Yan, Michigan State University

Friday, April 1, 9:00 am

Tommy Murphy, California State Univ. Fullerton

Friday, April 8, 9:00 am

2022 AMS–MAA Joint Mathematical Meetings,
(taking place virtually this year)

Friday, April 15, 9:00 am

no event

Friday, April 22, 9:00 am

Nicoleta Voicu, Transylvania University, Braşov, Romania

Friday, April 29, 9:00 am

no event

Friday, May 6, 9:00 am

no event

Friday, May 13, 9:00 am

Thomas Mark, University of Virginia

VENUE

The symposium will take place virtually via Zoom.

WEBSITE More information about CSUF's virtual geometry seminar, including an up-to-date calendar with speaker times, information about past and upcoming speakers, and recordings of past talks. Visit our website at

<https://wcasper.github.io/geometry-seminar/>.

2021-2022 ORGANIZERS

W. Riley Casper, CSUF

Shoo Seto, CSUF

CONTACT

W. Riley Casper, CSUF

Email: wcasper@fullerton.edu

FRIDAY MAY 13 2022

THE BELGIAN MATHEMATICAL SOCIETY'S PHD DAY

UNIVERSITÉ DE LIÈGE

Building B37

Auditoire 01

The Belgian Mathematical Society is happy to invite all PhD students linked to mathematics to showcase their research, meet each other and exchange ideas!

Welcome from 09:30.

- **Godeaux lecture** (online) at 10:00 by **Timothy Gowers** (Collège de France and University of Cambridge), Fields Medal.
- Talk at 16:30 by **Mitia Duerinckx** (Université Libre de Bruxelles), BMS Young Scholar Award 2021.

Contributed talks, Poster presentations and Best poster award.

Job fair from 15:00.

Register now on <http://bms.ulb.ac.be>



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Mathématique