# Newsletter

# **# 117**, March 15, 2018

## Contents

## May I have a large container of coffee?

Dear BMS members,

For the last week the whiteboard in the tea room of the department carried the mysterious message "May I have a large container of coffee?". The author promised an answer to this question on March 14th. The tuned-in readers will have noticed that the number of letters in the words of this phrase correspond to the first few digits of $\pi = 3.1415926\ldots$. At the end of this newsletter you will find more riddles about $\pi$. Today is indeed $\pi$-day. It is a great opportunity to put mathematics in the spotlights and make everyone around you aware of the importance of our favorite science.

Unfortunately this $\pi$-day 2018 brought the sad news that the famous mathematical physicist Stephen Hawking passed away at the age of 76. Through his books and his lectures around the world Hawking popularized some of the most difficult theories in cosmology, always emphasizing the importance of mathematics for the development of physics.

On the topic of popularizing mathematics I am happy to see that Emmanuël Houdart, the director and co-founder of *La Maison des Maths* in Quaregnon near Mons, became *Walloon of the year*. This will help him to make mathematics more visible and to find more support for his projects. If you have never been to the *Maison des Maths* I suggest you pay them a visit or at least have a look at their website: http://maisondesmaths.be/

I am also very happy to point out that our colleague Luc Lemaire is running a monthly Mathematics column in the Walloon magazine *Le Vif/L'Express*. The first article appeared in the January 25 issue and was about the concept of conditional probabilities illustrated by heads or tails games. The February 22 column is about the Birthday Paradox. These initiatives show the effort made by our colleagues to increase awareness of mathematics among the general public. I strongly support these efforts and want to encourage all of you to develop similar initiatives or simply to make use the existing ones whenever possible.

Once more this newsletter contains lots of important and useful information for you. I want to thank all contributors and also want to encourage each of you to share any information you have. Please send your contributions to wendy.goemans@kuleuven.be. Next newsletter will appear on May 15th. The deadline for contributions is May 8.

May I draw your attention to the announcement of the **BMS PhD-Day** which will be organized in Gent on **May 25th**? This event is very important for you, for your colleagues and for your students. Please feel free to circulate this announcement and to register today on http://bms.ulb.ac.be/phdday!

### And remember...

You can follow `BelgianMathS` on twitter and tweet announcements or other interesting information to @BelgianMathS. We also have a facebook page: https://www.facebook.com/BelgianMathS. This page is your page! Please help us to keep it up to date and interesting by sending us nice links and information to Yvik Swan yvik.swan@ulg.ac.be.

Philippe Cara,
BMS president

# 1  News from the BMS & NCM

**The Belgian Mathematical Society PhD-Day**

**Your maths are made for talking!**

**Friday, May 25, 2018**
**Ghent University, Campus De Sterre, Building S9**

**Krijgslaan 281, 9000 Ghent**

The Belgian Mathematical Society invites all PhD students in mathematics to present a poster or a 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 in mathematics, presenting a poster gets one panel to display 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.

The PhD-Day starts with the Godeaux lecture, and ends with a job fair where you can establish contacts with companies interested in mathematicians.

There is no registration fee for members of the BMS. For non-members of the BMS, the registration fee is 20EUR. There is the possibility to become a member of the BMS (also 20EUR) before the start of the PhD-Day.

Please register for the PhD-Day via the website `http://bms.ulb.ac.be/phdday` with your name and affiliation. Please select whether you will present a poster or wish to make a contributed talk, or will attend the PhD-Day without presenting a poster or a talk.

All information will be made available on this website.

## Programme:

- 9h30-10h00: Welcome coffee.
- 10h00: Welcome to the participants.
- 10h10: Godeaux lecture: Prof. Laure Saint-Raymond (École normale supérieure de Lyon): Internal waves in a domain with topography.
- 11h00: Poster presentations.
- 12h00: Lunch (free for BMS members).
- 13h00: Contributed talks.
- 14h30: Poster presentations.
- 15h30: Job fair.
- 17h00: Drink and best poster award.

# 2   Meetings, Conferences, Lectures, . . .

## 2.1   International Francqui Chair 2017-2018

### Multimodal data analytics in the age of big data

From January to June 2018, we will have the pleasure of hosting Prof. Robert Calderbank, Duke University, as International Francqui Chair holder supported by VUB (hosting institute), UGent, UCLouvain, KULeuven, and ULB.

Prof. Calderbank is going to deliver a series of lectures at VUB, UGent, UCLouvain, KULeuven, and ULB on a rich set of subjects revolving around electrical engineering, applied mathematics and computer science.

We would like to cordially invite you to attend the lectures by Prof. Calderbank, which will be followed up by a networking reception. Please find the information related to all remaining lectures in the links below, where you can also register for each individual event.

- Lecture at UCLouvain, March 22, 2018 *Golay, Heisenberg and Weyl*

    http://www.vub.ac.be/en/events/2018/golay-heisenberg-and-weyl

- Lecture at KULeuven, April 27, 2018 *5G Wireless*

    http://www.vub.ac.be/en/events/2018/5g-wireless

- Lecture at ULB/VUB, May 3, 2018 *Coding Theory and Computer Architecture*

    http://www.vub.ac.be/en/events/2018/coding-theory-and-computer-architecture

- Lecture at VUB, May 18, 2018 *Data+*

    http://www.vub.ac.be/en/events/2018/data

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## 2.2   Methusalem Lecture Series

### Lectures and Mini-Courses in Pure Mathematics

### KU Leuven, Department of Mathematics

A series of colloquium talks for a broad pure mathematics audience and specialized mini-courses in algebra, analysis and geometry. Upcoming colloquium talks (Heverlee Campus in Leuven):

| | | |
|---|---|---|
| Jorge Castillejos Lopez (KU Leuven) | March 15, 2018 | 16:15-17:15 |
| Thibault Pillon (KU Leuven) | April 12, 2018 | 16:15-17:15 |
| Erik Koelink (Radboud University Nijmegen) | May 17, 2018 | 16:15-17:15 |
| Roland Speicher (University of Saarbrücken) | May 28, 2018 | 11:30-12:30 |

For titles and abstracts, room number and the full schedule, please visit

https://wis.kuleuven.be/methusalem-pure-math/activities

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## 2.3   April 2018

**4th International researchers, statisticians and young statisticians congress**

**April 28-30, 2018**

**Ilica Hotel Spa & Welness Thermal Resort Çeşme, Izmir, Turkey**

See the announcement at the end of the newsletter and the website www.irsysc2018.com

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## 2.4   May 2018

**Chaire de la Vallée Poussin 2018**

**Bernard Dacorogna (Professeur à l'École polytechnique fédérale de Lausanne)**

**May 22 & 24, 2018**

**Louvain-la-Neuve**

See the announcement at the end of this Newsletter.

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## 2.5   July 2018

**ALGAR 2018: Sums of squares in fields**

**July 2-6, 2018**

**Stadscampus, University of Antwerp, Belgium**

Lecture series on sums of squares in fields and on diverse tools from algebra and arithmetic used in their study.
The main target group consists of Master students and PhD students in fundamental mathematics. More advanced mathematicians are also welcome to participate.

Regular registration: €250
Master and PhD students: €200
UA-students: €160
Early bird registration (deadline 17.04.18): -10% for all participants
The fee includes course material, coffee breaks, a reception and a conference dinner. Does not include accommodation and meals.

Application details: Online before 17 April (early bird) or 4 June (regular) through Mobility Online:

   https://www.uantwerpen.be/en/summer-schools/algar/registration-and-visa/procedure/

Credits: 3 ECTS credits are awarded upon successful completion of the program.

See the website www.uantwerp.be/algar for more details.

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## 2.6    August 2018

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### Young Women in C*-Algebras

### August 11-12, 2018

### Young Mathematicians in C*-Algebras

### August 13-17, 2018

### KU Leuven

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See the website https://wis.kuleuven.be/events/ymca2018 and poster at the end of this newsletter.

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### Algorithmic and Combinatorial Aspects of Partition Functions

### August 23-24, 2018

### Sciencepark 904, University of Amsterdam

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The study of various types of partition functions is a very active area of research and lies at the interface of combinatorics, probability, theoretical computer science, and statistical physics. The partition function of the Potts model and the hardcore model, also known as the Tutte polynomial and the independence polynomial respectively are prototypical examples. Some of the fundamental questions in this area include: What sort of network structure allows for efficient computation of the partition function? Which network structures maximizes/minimizes the partition function? How does the partition function of a random network behave? Recent developments have shown strong connections between phase transitions in statistical physics and answers to these type of questions. The aim of the workshop is to bring together researchers working on different aspects of partition functions in order to exchange ideas and learn about new developments. The workshop is partially supported by the NWO Gravitation Grant Networks.

Invited speakers at the workshop include:

Alexander Barvinok (University of Michigan)
Amin Coja-Oghlan (Goethe University, Frankfurt am Main)
Péter Csikvári (Eötvös Loránd, Budapest)
Leslie Goldberg (University of Oxford)
Martin Loebl (Charles University, Prague)
Alexander Schrijver (University of Amsterdam and CWI Amsterdam)

Participation and the conference dinner are free of charge, but participants should register by sending an email to guusregts@gmail.com before the 1st of August, indicating dietary requirements and affiliation.

The program consists of talks by the invited speakers and contributed talks (20 min). More details will be added later. If you wish to give a contributed talk, please send an email to guusregts@gmail.com with a short abstract before 1st July. There are limited funds available for participant support.

See the website https://sites.google.com/site/guusregts/home/workshop for more details.

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## 2.7   September 2018

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**1st International Summer School on Proof Theory**

**September 2-5, 2018**

**Workshop on Proof Theory**

**September 6-7, 2018**

**Gent**

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The 1st International Summer School for Proof Theory in Ghent is arranged under the auspices of The Proof Society, and is sponsored by the Kurt Gödel Society. The Proof Society has recently been formed to support the notion of proof in its broadest sense, through a series of suitable activities; to be therefore inclusive in reaching out to all scientific areas which consider proof as an object in their studies; to enable the community to shape its future by identifying, formulating and communicating its most important goals; to actively promote proof to increase its visibility and representation.

The aim of the summer school is to cover basic and advanced topics in proof theory. The focus of the first edition will be on structural proof theory, ordinal analysis, provability logic, automated theorem proving, and philosophical aspects of proof. Other areas like reverse mathematics, proof mining, and proof complexity will be covered at the workshop, and in follow up summer schools. The intended audience is advanced master students, PhD students, postdocs and experienced researchers in mathematics, computer science and philosophy.

The summer school is co-located with a workshop on proof theory in Ghent (6-7 September). The workshop will be the inaugural meeting of The Proof Society. Students are invited to apply with an informal abstract (1 page) to the poster session which will be held as part of the workshop.

Scientific Programme
The summer school will provide six courses:

- Cut Elimination by Matthias Baaz (TU Wien)

- Ordinals and their applications by Andreas Weiermann (Ghent University)

- Philosophy of Proof Theory by Carlo Nicolai (King's College London)

- Provability Logic by David Fernandez Duque (Ghent University)

- Proof Theory in Computer Science by Andrei Voronkov (University of Manchester)

- Programme Extraction by Monika Seisenberger (Swansea University)

In addition there will be one special evening lecture:
Selected topics from the Theory of Truth by Rafal Urbaniak (Ghent University)

Information about registration will be available from the website soon,

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http://www.proofsociety.org/summer-school-2018/ (summer school)
http://www.proofsociety.org/workshop-2018/ (workshop).

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### Summer School in Algebra and Topology

### September 12-15, 2018

### Louvain-la-Neuve

A Summer School in Algebra and Topology will take place in Louvain-la-Neuve from Wednesday 12 to Saturday 15 September 2018 (see www.uclouvain.be/irmp-summerschool for more information).

The invited speakers of the Summer School will be professors Maria Manuel Clementino (University of Coimbra), Alberto Facchini (University of Padova) and Tim Van der Linden (Université catholique de Louvain).

The Summer School will consist in three intensive courses addressed to Master and PhD students, that will be of interest also for more experienced researchers in mathematics. This event is part of a joint project of the Université catholique de Louvain with the universities of Coimbra, Padova and Poitiers, promoting research collaboration within the Coimbra Group.

The program will be the following:

- Topological algebras - Maria Manuel Clementino

- Commutative monoids, noncommutative rings and modules - Alberto Facchini

- Non-associative algebras - Tim Van der Linden

There is a limited funding to partially cover local expenses for students. To apply for this funding, the applicant should send to Marino Gran (marino.gran@uclouvain.be) an updated CV and a reference letter by May 1st, 2018.

In order to register it suffices to send an email to Mme Carine Baras (carine.baras@uclouvain.be) mentioning the academic status (Master or PhD student, post-doc, professor, etc.) by June 15, 2018.

See also the poster at the end of this Newsletter.

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### XXXV International Seminar on Stability Problems for Stochastic Models

### September 24-28, 2018

### Perm, Russia

See the announcement at the end of this Newsletter and the website http://isspsm2018.psu.ru/.

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# 3   PhD theses

**Diametral dimensions and some applications to spaces $S^\nu$**

**Loïc DEMEULENAERE, ULiège**
*May 15, 2018*
ULiège, Institute of Mathematics (B37), Auditorium 02
Quartier Polytech 1, Allée de la Découverte 12, 4000 Liège

Thesis advisor: Françoise BASTIN (ULiège)

Summary

The spaces $S^\nu$ are sequence spaces defined by Jaffard in 2004 in the context of multifractal analysis. They were introduced to provide some techniques to approximate the spectrum of singularities of a given signal. Then, they have been studied from a functional analysis point of view and several properties were pointed out: they are metrizable topological vector spaces, complete, separable, locally pseudoconvex, Schwartz, and non-nuclear. To pursue the study of spaces $S^\nu$, Aubry and Bastin considered the diametral dimension of these spaces, which appeared to be the same for all of them (when they are locally $p$-convex).

The diametral dimension is a topological invariant (for topological vector spaces) characterizing nuclear locally convex and Schwartz spaces. Moreover, there exists "another" diametral dimension which was claimed by Mityagin to be equal to the first one in Fréchet spaces. However, no argument was given to prove such an equality.

The first purpose of this thesis is to deal with the conjectured equality of the two diametral dimensions. After solving this problem for non-Schwartz Fréchet spaces, we provide several criteria which imply the equality of the two diametral dimensions in Schwartz metrizable locally convex spaces, among which the notion of prominent bounded sets and the property $(\overline{\Omega})$. We also highlight some classes of locally convex spaces for which the diametral dimensions are equal, namely the Köthe-Schwartz sequence spaces, the Hilbertizable Schwartz metrizable spaces, and so the nuclear metrizable spaces. Besides, we explain why this conjecture is in general false in non-metrizable spaces, even in nuclear ones, using particular topological properties of such spaces.

The second purpose of the thesis is to go on with the study of spaces $S^\nu$. For this, we revisit the result of Aubry and Bastin to extend the formula of the (first) diametral dimension in locally $p$-convex spaces $S^\nu$ to some locally pseudoconvex ones. We also explain why the two diametral dimensions are equal for such spaces. Finally, we point out some spaces $S^\nu$ (among which the locally $p$-convex ones) which verify (a variation of) the property $(\overline{\Omega})$.

# 4   News from the universities

## 4.1   FWO Odysseus grant for Michael Ruzhansky

Michael Ruzhansky is awarded an Odysseus I grant by FWO. He joins the research group Logic and Analysis of UGent.

## 4.2  Publications

### Publication of the fourth and last volume of the "Collected works. Œuvres scientifiques" of Charles-Jean de La Vallée Poussin

CHARLES-JEAN DE LA VALLÉE POUSSIN (1866-1962), professor at the *Université Catholique de Louvain* from 1892 till 1951, is undoubtedly the most famous Belgian mathematician of the first half of XX$^{th}$ century. He was president of the Belgian Mathematical Society from 1927 till 1929.

Between 2000 and 2004, the *Académie royale de Belgique* has published, in collaboration with the *Circolo Matematico di Palermo*, the first three volumes of the "Collected Works. Œuvres scientifiques" of de La Vallée Poussin. They contain his papers and memoirs classified by themes, completed by analyses written by worldwide experts, about his life and work, and their importance in the history of mathematics and contemporary research. The scientific editors are PAUL BUTZER (Aachen Universität), JEAN MAWHIN (Université Catholique de Louvain) et PASQUALE VETRO (Università di Palermo).

The fourth and last volume of the "Collected works. Œuvres scientifiques" of de La Vallée Poussin is now published. Devoted to his important work on potential theory, conformal mappings and complex functions, this volume of more than 500 pages is built on the model of preceding ones, and completes the publication of the scientific work of the great Belgian mathematician. It can be obtained at the price of 50 euros through the website www.academieroyale.be of the *Académie royale de Belgique* or the website http://math.unipa.it/ circmat/ of the *Circolo Matematico di Palermo*, where the preceding volumes are still available.
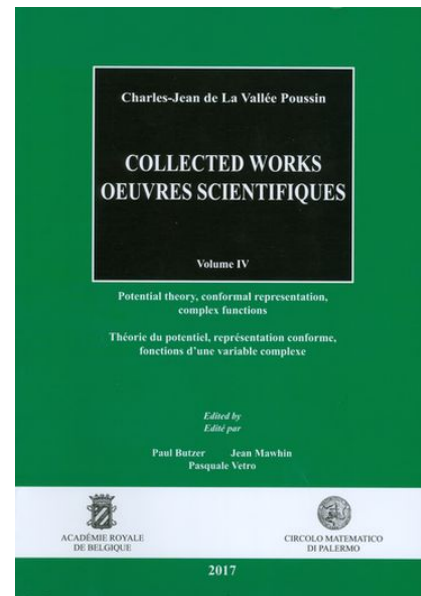
Jean Mawhin, emeritus professor of mathematics, UCL

# 5  History, maths and art, fiction, jokes, quotations …

## 5.1  Adhemar's corner

This newsletter review from Adhemar Bultheel is about three books on computer science, *Understanding the Digital World* of Brian W. Kernighan, *The Power of Networks*, of Christopher G. Brinton and Mung Chiang and *The Power of Computational Thinking* of Paul Curzon and Peter W. McOwan.

## 5.2  Pi-Day

At the occasion for $\pi$-day, Paul Levrie shares some interesting $\pi$-trivia with us! See after Adhemar's review.

**Understanding the Digital World**, *Brian W. Kernighan*, Princeton University Press, (2017) ISBN 978-0691176543 (hbk), 256 p.
**The Power of Networks**, *Christopher G. Brinton, Mung Chiang*, Princeton University Press, (2017) ISBN 978-0691170718 (hbk), 328 p.
**The Power of Computational Thinking**, *Paul Curzon, Peter W. McOwan*, World Scientific, (2017) ISBN 978-1786341839 (hbk), 232 p.

Computers play an increasingly important role in mathematics and the converse is also true, old and new branches of mathematics are increasingly important in computer science. Traditionally, languages, science, and mathematics were the corner stones and the main tools in education to develop skills needed to understand the world. The authors of the third book however argue that some computational or algorithmic thinking is essentially different from the traditional skills and therefore it should be part of our educational system. But before one can formulate an opinion about whether or not this argument is justified, we should know what this computational thinking really means.
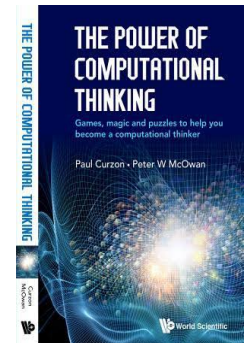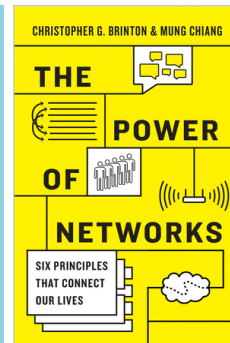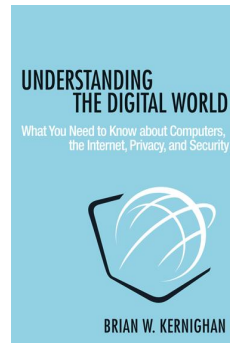
In my opinion, a good starting point is to acquire a vocabulary. ICT people talk a special language and not everybody is familiar with all of these terms. Brian Kernighan in his book discusses successively hardware, software, and communication. Basically it is the content of a course he has been teaching in Princeton. He wrote this book while turning 77, so he lived through the whole evolution since he started his career in Bell Labs late 1960s where he worked alongside K. Thompson and D. Ritchie, the creators of Unix and he was a pioneer of computer science himself. In this book he gives a modern account of all the terms that we all have heard mentioning, but which we may not be able to define precisely. We probably know what gigabyte, CPU, RAM, flash-drive, etc. means, but might have a problem to distinguish the World Wide Web from the Internet or who can explain the difference between ADSL, ethernet, Wi-Fi, and Bluetooth, or between DHPC, and TCP/IP, how exactly does cloud computing work, and how and by whom is our privacy threatened? The answers to these questions, and discussion of many many more terms, procedures, and technologies, all worth knowing, you can find in this very readable and entertaining book. It is very up-to-date including Snowden, recent privacy lawsuits, etc., a laudable attempt, as things are changing extremely fast in this area.
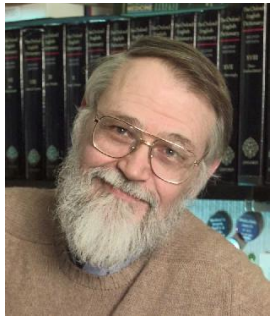
Of course, as a mathematician, perhaps you only use a computer as a tool to do simulations, to produce graphs, or just to typeset your papers, but privately, you will use a smartphone, do bank transactions, read an e-book on a tablet, watch television, and in a not too distant future we shall all be confronted with an Internet of Things. So even, if you consider yourself to be a die-hard pure mathematician, you have to deal with some or all of these devices that all have processing capacity and they are all more powerful than the IBM 1620 which I used to prepare my master thesis. If on the other hand, as a mathematician you have a more applied inclination, I know there are very challenging and even quite abstract problems to be found in computer science. In that case, you better learn the IT slang to enable communication. Both mathematics and computer science will profit from collaboration. It is my firm belief that most of the minor steps forward are obtained by digging deep into your mathematical sub-sub-sub problem, but the major progress will come from mixing different disciplines, if not within the vast body of mathematics itself, then from looking across the boundaries and explore problems from engineering, biotechnology, or whatever

is appealing to you. Aren't most if not all sciences eventually applications of mathematics? The major difficulty to initiate such a collaboration is often the vocabulary. Not that Kernighan's book will start you doing computer science but it is the abc that allows you to start.
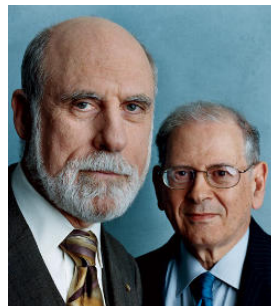


The book on *Networks* by Brinton and Chiang is somewhat similar but more restrictive in scope. The authors elaborate mostly on what falls in Kernighan's under the part on communication. Again, there is no mathematical background, although there is a lot of linear algebra, graph theory, optimization on graphs, data mining, machine learning, etc. involved. Think of Google's PageRank (an eigenvalue problem now worth billions of dollars), recommendation systems of Amazon, Netflix or YouTube, and the likes of it. Some of the material presented is 'technical' in the sense that it explains how this massive stream of data is organized or congestion is prevented, but also how these companies have organized their recommendation system, how they get paid for their services and how they compute a price for advertisement. How come that some items go 'viral' on the web, and how Facebook and Twitter can influence people, and how MOOCs (Massive Open Online Courses) are set up, and so on. Do not forget that computers are not only used for research, but they play an increasing role in our teaching (of mathematics and other courses). It requires some reflection on whether it is a good evolution or not to replace a proof of a theorem on the black- (or white-) board by some PowerPoint or another type of electronic projection.



Dennis Strigl    Eric Smidt    Vint Cerf, Robert Kahn

These authors also include some history (somewhat more than Kernighan) and they added four interviews with people who made all this happen: Dennis Strigl (former COO of Verizon, a wireless communication provider in the US), Eric Smidt (former CEO of Google), and Robert Kahn and Vint Cerf (both considered fathers of the Internet).

As mentioned in the beginning, the third book is about (the teaching of) computational thinking. They do not give (deep) arguments in any direction. In fact I believe they are already convinced that it should be included at an elementary level and they just give examples of what they believe it is to acquire this basic skill. It is somewhat surprising to read that in their opinion it is not learning to think as a computer does (if it can think at all), but it is how humans function in daily life and how this can be transferred to a machine. It is thus more than just the algorithmic idea, but also how a problem has to be modeled, based on scientific arguments, sometimes involving heuristics, and a great deal of pattern matching. The way in which the problem is modeled can allow for abstraction and generalization, or help to decompose the problem in smaller subproblems. And, not the least important, it also involves proper understanding of the problem that is communicated to you and knowing how to communicate the answer.

The authors come to this conclusion after they have illustrated these aspects with examples from daily life and by puzzles that they solve. Their arguments are not really systematic or scientifically underscored. Neither do they give recommendations on how their ideas should be implemented. In fact, what is in this book is basically a summary of what they published in the online magazine *Computer Science for Fun* located at `www.cs4fn.org` which is mainly a blog of the authors.

Adhemar Bultheel

# pi-trivia

*Did you know that (if you read this on March 14) ...*

- ... today is $\pi$-day?
  Why? Because in America they write 3/14 for the date of today, March 14, and 3.14 is an approximation to the number $\pi$.
  Today you should eat pie, as everyone does. Or you should buy some pie for someone!

- ... the number $\pi$ is a mathematical constant that is the ratio between the circumference of a circle and its diameter? The first 500 decimal digits of $\pi$ are given by:

  3.14159265358979323846264338327950
  2884197169399375105820974944592307816
  4062862089986280348253421170679821
  4808651328230664709384460955058223172
  5359408128481117450284102701938521
  1055596446229489549303819644288109
  7566593344612847564823378678316527120
  1909145648566923460348610454326640
  8213393607260249141273724587006606315
  5881748815209209628292540917153640
  3678925903600113305305488204665213844
  1469519415116094330572703657595910
  530921861173819326117931051185480744
  6237996274956735188575272489122793
  8183011194913

- ... on January 5, 2018 exactly 3.1416 centuries ago John Wallis died? The mathematician John Wallis is probably best known for his beautiful product formula for $\pi$:
  $$\frac{\pi}{4} = \frac{2 \cdot 4}{3 \cdot 3} \cdot \frac{4 \cdot 6}{5 \cdot 5} \cdot \frac{6 \cdot 8}{7 \cdot 7} \cdots$$
  which he proved in 1655.

- ... there's a very old mathematical problem which bears the name: the squaring of the circle?
  It deals with the construction (while using only a ruler and a compass) of a square with the same area as a circle with radius 1 (hence with an area of $\pi$). It is known since 1882 that this problem is unsolvable. But what if we bend the rules a little bit, and ask for the construction of something squary with area $\pi$?
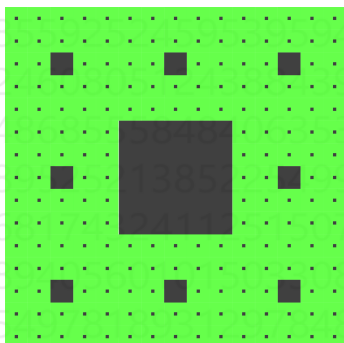
Take a square with side 1 and remove a square of area $\frac{1}{3} \cdot \frac{1}{3}$ from the center. The result has area $\frac{8}{9}$. Next remove a square of area $\frac{1}{5} \cdot \frac{1}{5}$ from the center of each of the 8 small sub-squares of area $\frac{1}{9}$. What remains has area $\frac{8}{9} \cdot \frac{24}{25}$. Continuing by removing squares of area $\frac{1}{7} \cdot \frac{1}{7}$ from each sub-square of area $\frac{1}{5} \cdot \frac{1}{5}$ surrounding the hole removed at stage 2, the remaining part of the initial square has area $\frac{8}{9} \cdot \frac{24}{25} \cdot \frac{48}{49}$. We repeat this procedure ad infinitum. In the figure the squares which have been removed are colored black.

What is the area of the remaining square-holed structure? It's the $\frac{8}{9} \cdot \frac{24}{25} \cdot \frac{48}{49} \cdots$.-th part of the initial square. Note that this product is precisely the Wallis product mentioned above. Since the initial square has area 1, the remaining (non-black) part has area $\frac{\pi}{4}$.

- ... in Ghent there's a $\pi$-related student café? It's called $\pi$-nuts (thanks for the tip, Philippe)

- ... the artists collective Troika has made an artwork Squaring the circle? Here it is:

Looking at it from one specific direction, you see a square. From the opposite direction it looks like a circle. As you can imagine, it's an optical effect.

- ... in Ostend there's is a somewhat similar optical effect: something that looks like a circle but isn't one? It's one of the works in the exposition The Crystal Ship which shows work by street artists. It looks like this, if you're in the right place (at the right time;-):



This is work by Elian, an artist from Argentina.

- ... this is a π-poem we haven't had in these π-trivia until now? The author is the American writer Robert Morgan:

> The secret relationship
> of line and circle, progress
> and return, is always known,
> transcendental and yet
> a commonplace. And though
> the connection is written
> it cannot be written out
> in full, never perfect, but
> is exact and constant, is
> eternal and everyday
> as orbits of electrons,
> chemical rings, noted here
> in one brief sign as gateway

to completed turns and
the distance inside circles,
both compact and infinite.

- ... it seems that mathematician Shaun Cooper drives a car with this registration plate?



- ... double-bass player and composer Mark Haney has produced an album where the 499 first digits of π play an importante role? It's called *Aim for the Roses*. Its composed of painstakingly layered double bass parts employing a formal strategy based on π, with each digit of π giving a duration and pitch based on its number. Hence 3 is a mi, three counts long. The first six digits form some kind of theme.
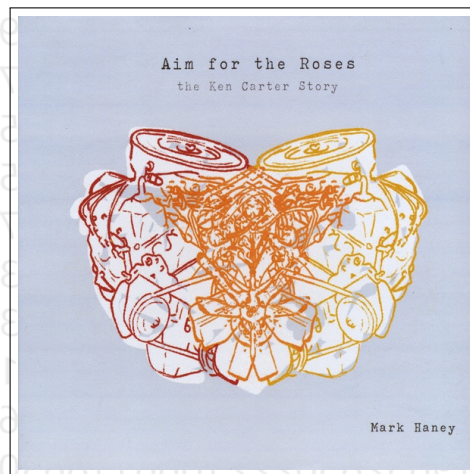


In 2016 the album became the subject (and object) of a musical docudrama (director: John Bolton). (Thanks, Daan, for the tip.)

We conclude with a sudoku-like puzzle. It's is your task to solve the following π-tectonic (also called π-suguru). You need to fill each container with the digits from 1 to 5. Adjacent (touching) cells may never contain the same number, and this includes diagonally adjacent cells.
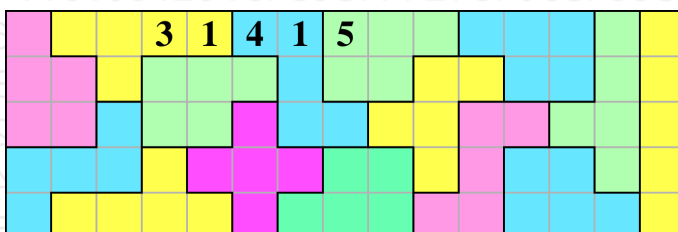
# FRIDAY MAY 25 2018

# THE BELGIAN MATHEMATICAL SOCIETY'S PHD DAY

## YOUR MATHS ARE MADE FOR TALKING!
COME PRESENT YOUR WORK, MEET YOUR COLLEAGUES, DISCUSS WITH EMPLOYERS!

# Ghent University Campus De Sterre Building S9

Welcome from 9h30 onwards.

Godeaux lecture at 10h10 by Laure Saint-Raymond (Ecole normale supérieure de Lyon).

Free registration and lunch for BMS members - you can become member of the BMS on the spot!

Contributed talks, Poster presentations, Job fair and Best poster award.

Register now on

## http://bms.ulb.ac.be/phdday

Organizers: Els Goetghebeur, Leo Storme, Michèle Vanmaele, Jasson Vindas Diaz, Andreas Weiermann.

GHENT UNIVERSITY

S B G

# Young Mathematicians in C*-Algebras
## KU Leuven, August 13 to August 17, 2018

# Young Women in C*-Algebras
## KU Leuven, August 11 to August 12, 2018

**YWC*A Mini-Courses**

**Jacqui Ramagge**
*University of Sydney*

**YMC*A Mini-courses**

**Cyril Houdayer**
*Université Paris-Sud, Orsay*

**Matthew Kennedy**
*University of Waterloo*

**Website**
https://wis.kuleuven.be/events/ymca2018

**Organising Committee**
Francesca Arici, Jorge Castillejos, Kristin Courtney, Tobe Deprez, Laurens Diels, Ellizabeth Gillaspy, Adrián González-Pérez, Thibault Pillon, Matthias Valvekens, Jonas Wahl.
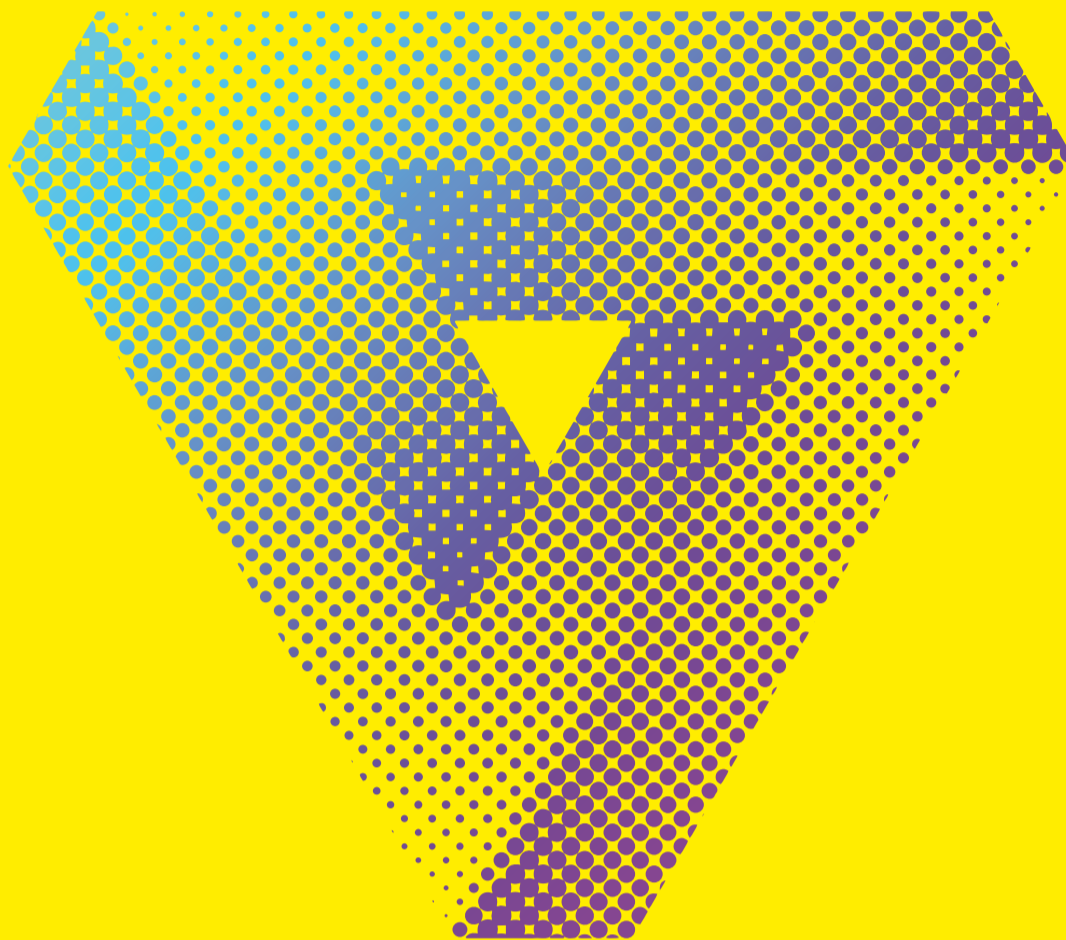
**Administrative Staff**
Marian Boni, Joelke Vandoren

# Summer School
# Algebra and Topology
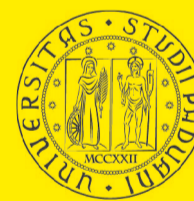
**12-15 September 2018**
**Université catholique de Louvain**
Institut de recherche en mathématique et physique

Maria Manuel Clementino
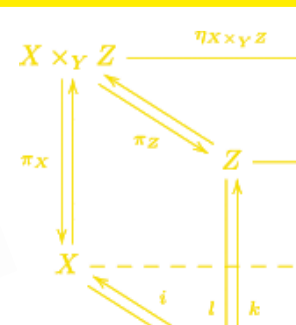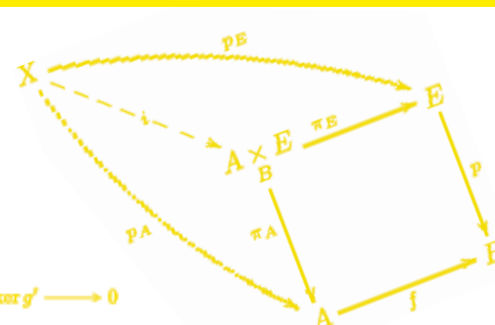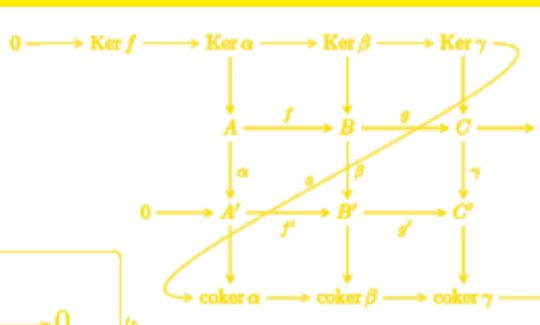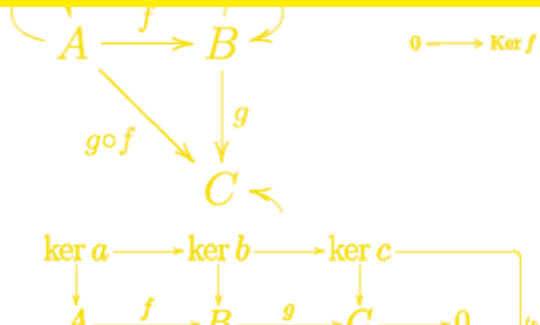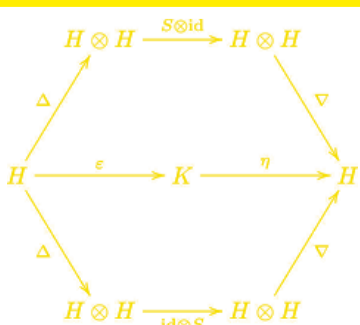(Universidade de Coimbra)
**Topological algebras**

Alberto Facchini
(Università degli Studi di Padova)
**Commutative monoids, noncommutative rings and modules**

Tim Van der Linden
(Université catholique de Louvain)
**Non-associative algebras**

**www.uclouvain.be/ irmp-summerschool**

# XXXV International Seminar on Stability Problems for Stochastic Models
## First Information Letter

XXXV International Seminar on Stability Problems for Stochastic Models (ISSPSM-2018) will be held in Perm, Russia from 24 to 28 of September 2018 under the auspices of **Perm State University** (**PSU**), **Faculty of Computational Mathematics and Cybernetics** of the Lomonosov Moscow State University and **Institute of Informatics Problems of the Federal Research Scientific Center "Computer Science and Control" of the Russian Academy of Sciences**.

Seminars on Stability Problems for Stochastic Models have a long tradition. They were founded by Vladimir Zolotarev in the 1970's. The seminars were attended by leading specialists in probability theory and mathematical statistics from all over the world. The traditional aim of Seminars is to bring together people from Europe, Asia and other continents to share their expertise and new results, to exchange the ideas and to discuss open problems. Previous three Seminars took place in **Debrecen**, **Hungary** (2017), **Svetlogorsk**, **Russia** (2016) and **Trondheim, Norway (2014).**

The city of Perm is located in the East of the European part of Russia, in the foothills of the Urals, on the banks of the Kama River that is the fourth longest river in Europe. Perm is the center of the Perm Krai. The population is about 1,050,000 people (2017). The square of the city is about 720 square kilometers. Perm is a large industrial, scientific and cultural center of Russia. The name Perm is of Finno-Ugric etymology, likely of Uralic origin. It is believed that the name of the city came from the Vepsian word perämaa that means "far-away land". Among museums of Perm, the Perm Art Gallery is widely known for its collection of wooden sculptures as well as a large collection of ancient Russian icons and paintings by famous Russian artists such as Levitan, Repin, Savrasov, Serov and others. Perm is widely known for theatricals with its opera and ballet theater.

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**The main topics of the XXXV Seminar**
Limit Theorems and Stability Problems
Stochastic Processes
Statistics of Time Series and Stochastic Processes
Finance, Insurance, Risk
Spatial Statistics
Applied Statistics and Data Analysis
Stochastic Dynamics
Random Graphs
Queuing Theory and Modeling
Information Systems
Probability Distributions
Discrete Probability Models
Nonparametric Statistics
Statistical Learning

| Conference Registration Fees | | | | | |
|---|---|---|---|---|---|
| **PhD student** | Early bird (before May1, 2018) | 100 EUR | **Regular** | Early bird (before May 1, 2018) | 150 EUR |
| | Normal registration (before July 1, 2018) | 120 EUR | | Normal registration (before July 1, 2018) | 170 EUR |
| | Late registration (before August 7, 2018) | 150 EUR | | Late registration (before August 7, 2018) | 200 EUR |

Conference fee includes the following: conference materials, coffee breaks, common excursions, a conference dinner, welcome and farewell parties, etc.

The fee must be transferred by posting to the bank account that will be indicated on the web page
                    http://isspsm2018.psu.ru/en/participants/dates-and-fees/
later.

**February 1, 2018:** the second information letter
**No later than June 1, 2018:** submission of abstracts
**No later than June 15, 2018:** notification of participation
**September 1, 2018:** the third information letter

Abstracts of communications of the XXXV International Seminar on Stability Problems for Stochastic Models will be published before the Seminar. Selected papers of ISSPSM-2018 participants will be published in the Journal of Mathematical Sciences http://www.springer.com/mathematics/journal/10958.

For more details see http://isspsm2018.psu.ru/