Newsletter

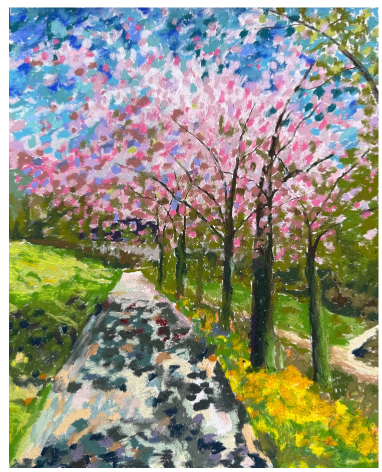
BELGIAN MATHEMATICAL SOCIETY

158, May 15, 2026

Comité National de Mathématique CNM

C W N M

NCW Nationaal Comité voor Wiskunde



By Andreas Weiermann

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

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The next edition of this newsletter appears on 15 September. It was my honour to edit this newsletter, from now on you can send your content to andreas.debrouwere@vub.be. Best regards, Wendy

1 News from the BMS & NCM

1.1 Bulletin of the Belgian Mathematical Society - Simon Stevin

Starting from Volume 28 the Bulletin of the Belgian Mathematical Society - Simon Stevin only appears online. 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.

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

2.1 June 2026

52nd International Workshop on Graph-Theoretic Concepts in Computer Science (WG 2026)

2-4 June 2026, KU Leuven campus Kulak

For all information about this theoretical computer science conference, see https://wg2026.be/.

2.2 July 2026

Summer School ALGAR 2026
Semiglobal fields and their valuations

1-10 July 2026, University of Antwerp

In 2026, the Algebra & Arithmetic Summer School at the University of Antwerp will be dedicated to semiglobal fields and their spaces of valuations. The main week (6 - 10 July) will consist of lectures taught by specialists as well as exercise sessions and a few research talks. Here, some familiarity with quadratic forms and valuations will be assumed. Those who would like a brief overview covering background material that will be assumed in the main week, are invited to participate in the workshops of the preliminary days (1 - 3 July).

The speakers are

- Nicolas Daans (University of Mons, Belgium),
- David Grimm (University of Santiago de Chile),
- Katharina Hübner (Goethe University Frankfurt, Germany),
- Qing Liu (University of Bordeaux, France).

Application deadline: 25 May
For more information, visit our webpage below.
https://www.uantwerpen.be/en/summer-winter-schools/algar/.

The organisers,
Karim Johannes Becher, Remi Rasson, Safiétou Cissé

2.3 September 2026

Mathematics for Industry

7-11 September 2026, De Krook (Gent)

We are happy to invite you to the fourth Belgian "Mathematics for Industry" study week, taking place from 7 - 11 September 2026 at De Krook (Gent) and supported by the BE-MATHS-IN network and Platform Wiskunde Vlaanderen.

During this intensive workshop, small interdisciplinary teams (engineers, mathematicians, physicists, statisticians, ...) work on real-world industrial challenges proposed by companies. It is a unique opportunity to collaborate, learn and make impact in just one week.

Registrations are now open: https://be-maths-in.be/mfi26/registration.

Participation (including catering and accommodation) is free of charge. (A small fee only applies for confirmed stays at the event hotel.)

All info can be found on the event website: https://be-maths-in.be/mfi26/.

If you have any questions or comments, do not hesitate to contact us at studyweek@be-maths-in.be.

Brussels Summer School in Mathematics (BSSM)

9-11 September 2026, ULB

The Brussels Summer School in Mathematics (or BSSM) is an event organized yearly around the beginning of the academic year where diverse mathematical talks happen (algebra, analysis, differential geometry, topology, mathematical physics, ...). This year the BSSM will be from September 9 to September 11. The talks are sometimes in French, sometimes in English and are given by both young researchers (PhD students and Postdocs) and by professors. The goal is not to propose any formation about one theory or the other, but to discover a multitude of interesting mathematics. The presentations are accessible to bachelor students. More informations are available on our Website and on our Facebook Page.

113th Peripatetic Seminar on Sheaves and Logic

26-27 September, Université catholique de Louvain, Louvain-la-Neuve

The **113th Peripatetic Seminar on Sheaves and Logic** (PSSL 113) will take place at the *Université catholique de Louvain* in *Louvain-la-Neuve* (Belgium) on the weekend of 26–27 September 2026.

The Peripatetic Seminar on Sheaves and Logic is an informal meeting of mathematicians working in category theory, logic, topology and algebra.

Information concerning the seminar is available at the address

https://sites.uclouvain.be/pssl113/

Participation is free, but registration is required. A call for contributed talks is open; further details are available on the webpage.

Marco Abbadini, Marino Gran, Tim Van der Linden, Enrico Vitale.

2.4 July 2027

11th International Congress on Industrial and Applied Mathematics (ICIAM 2027)

12-16 July 2027, The Hague

We invite you to contribute to the scientific program of the 11th International Congress on Industrial and Applied Mathematics (ICIAM 2027). Your contribution plays an important role in shaping a diverse and high-quality program, and we strongly encourage submissions from across the community.

Interested in submitting your work? We warmly invite you to be part of the program and share your research with an international audience.

For ICIAM 2027, submissions are open in two formats:

- Mini Symposium Proposals
- Poster Presentation Abstracts

Please refer to the website for more details and access to the submission portals:
https://iciam2027.org/call-for-abstracts/.

2.5 Seminars and colloquia

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

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

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

Ghent Geometric Analysis Seminar

https://analysis-pde.org/seminars/ghent-on-geometric-analysis/

Ghent Methusalem Junior Seminar

https://analysis-pde.org/ghent-methusalem-junior-seminar/

Seminar of Analysis and PDE

https://analysis-pde.org/seminars/

Ghent Methusalem Colloquium

https://analysis-pde.org/ghent-methusalem-colloquium/

Seminars on applied mathematics at the Namur Institute for Complex Systems (naXys)

https://www.naxys.be/events/

VUB Algebra Seminar

https://leandrovendramin.org/team/seminar.html

Organizers: Kevin Piterman, Silvia Properzi, Leandro Vendramin

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VUB Magma Workshop

The idea is to hold an informal, friendly seminar/workshop to explore the computer algebra system Magma. Everyone is welcome to contribute, whether with talks, questions, exercises, solutions, or anything else you think might be useful.

https://leandrovendramin.org/team/workshop.html

3 PhD theses

Wild potential good reduction of low dimensional Abelian varieties

Giovanni Bosco
University of Mons
7 May 2026

Thesis advisors: Prof. Dr. Maja Volkov (University of Mons)

Summary:

This thesis is devoted to the study and construction of Abelian varieties defined over p-adic fields that acquire good reduction over a wildly ramified extension of the base field. This situation remains poorly studied, in contrast to the tamely ramified case. As Serre and Tate observed in their seminal paper, this 'wild' phenomenon can only occur for primes $p \leq 2\dim(A) + 1$, where A is the Abelian variety in question. This thesis focuses on elliptic curves over $\mathbb{Q}_3$ and Abelian surfaces over $\mathbb{Q}_3$ and $\mathbb{Q}_5$. It provides a full classification of the 3-adic representations attached to elliptic curves over $\mathbb{Q}_3$ having potentially good reduction, as well as an affirmative answer to a question posed by Zarhin concerning the possibility of realising, over p-adic fields, the inertia subgroups appearing in the context of potential good reduction of Abelian surfaces over local fields.

Residual Finiteness Growth in Virtually Minimax Groups

Joren Matthys
KU Leuven Kulak
29 June 2026

Thesis advisors: Prof. Dr. Jonas Deré (KU Leuven Kulak)

Summary:

Given a finitely generated group and a non-trivial element in it, then we can hope to find a homomorphism to a finite group such that our chosen element is not mapped to the neutral element. In other words, for the given element, we can hope that this element survives in some finite quotient of the group. If this is possible for every non-trivial element in our group, then we say that the group is residually finite. In fact, many finitely generated groups satisfy this property: linear groups, free groups, nilpotent groups, lamplighter groups, etc.

This property has been intensely studied since it was introduced by Philip Hall in the first half of the twentieth century. It has many connections to other group theoretic notions, including the profinite completion, the word problem, etc. Nonetheless, there are still many questions remaining. For example, it is still unknown whether all hyperbolic groups are residually finite or not.

In 2010, Bou-Rabee introduced a new perspective on this fundamental property. Inspired by notions such as word growth and subgroup growth, he defined the residual finiteness growth to quantify this property. This notion allows us to compare the property in different groups by studying how small the aforementioned finite quotient can become in terms of the chosen group element.

In this thesis, we calculate the residual finiteness growth for all virtually nilpotent groups, completing a research line to which multiple people have contributed. We show that 'how small this finite quotient can become' depends on the structure of the complex Lie algebra corresponding to the nilpotent group (using the Lie group and Lie algebra correspondence). This result also shows that the residual finiteness growth is a profinite invariant for virtually nilpotent groups.

Lastly, we also apply our techniques to a wide class of linear, virtually solvable groups. Here, we present an upper bound for the residual finiteness growth which does not depend on the linearity dimension of the group, in contrast to earlier results.

4 Job announcements

4.1 From ULB

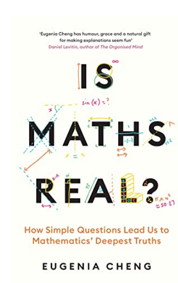
Two positions as teaching assistant are now open at ULB. It concerns 2 full-time positions for 2 years, two times renewable (6 years in total per position). These positions allow the candidate to pursue a PhD in Mathematics (any field represented at the department of Mathematics at ULB), while assuring exercise classes for diverse courses in Mathematics. For more information, feel free to contact VERCRUYSSE Joost joost.vercruysse@ulb.be, SWAN Yvik Yvik.Swan@ulb.be or any other member of the department of Mathematics at ULB. To be eligible, candidates must have the agreement of a permanent member at ULB to serve as PhD supervisor.
See all information at https://cwfront.ulb.ac.be/vacacad/vacancies/download/18043 and https://cwfront.ulb.ac.be/vacacad/vacancies/download/18044.

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

5.1 Adhemar's corner

Finally, two reviews by Adhemar, enjoy reading!

Is maths real?: How simple questions lead us to mathematics' deepest truths *Eugenia Cheng*. Profile Books, 2023 (328 p.), isbn: 978-1788169523 (hbk)



Eugenia Cheng

Cheng's research subject is category theory, but she is most widely known for her popularizing books on mathematics. In this, her latest one, she answers the title's question already at the beginning: Yes it is real, not in a palpable sense, but as a concept, it is as real as Santa Claus is a real abstract concept, just like my ideas are real, and certainly the insights that mathematics gives us to understand the real world are very real. Thus the answer to a question depends on what you mean by real, or in which universe you want the question to be answered. This idea is repeatedly applied in the subsequent chapters in which she starts with a simple question, but, by thinking more about what the question means and in what context the answer is given, she arrives at explaining what mathematics really is about, what is the job of a mathematician, why the abstraction, and why do some love it while others hate mathematics, and how mathematics should be taught.

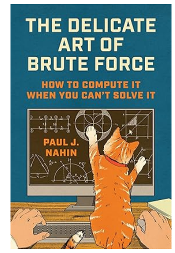
The first 4 chapters are about how, what and why math is what it is and where it comes from. The next 4 about the tools used in mathematics. Every chapter starts with a simple question. For example chapter 1: Why is $1+1=2$? If one carefully thinks about it, then the conclusion should be that it is not always 2, for example in a binary system, but also in daily life it is not always true, like for example adding 2 colors gives a new color. That's where math comes in: make abstraction of things and agree on how they operate. The abstract study objects influence the methods used which can be applied to more general objects, which requires new logical rules, etcetera. That is how mathematics constantly develops and expands. That's why we introduced negative numbers, zero, and prime numbers as an example of looking for basic building blocks. The discussion of why 0.999... equals 1 is a pretext to intuitively introduce limits like a regular n-gon approximating a circle, etc. That's how math grows and becomes more complex, literally with the introduction of complex numbers. She even throws in some of her own research and cooking hobby, and she gives her opinions about white supremacy and colonialism.

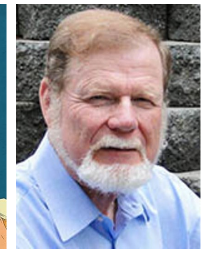
The last 4 chapters she starts with the question: Why is $y = mx + c$? This is a start to explain why it is so much easier to write letters for variables or parameters that can take all values within a set, and that this need not represent a straight line. It depends on the reference system being Euclidean, orthogonal or polar, or yet something else. Moreover, a straight line is not always the shortest distance, and all points at a constant distance from a center does not always look like a circle. This leads to a definition of π. She also discusses the irritating questions you can find on social media like $7 + 7 \div 7 + 7 \times 7$ going along with the note that most will get the answer wrong. It is just a way of giving the impression that the poster is intelligent and (most of) the others are dumb. That is exactly what math is not about. Not about being smart, and not about doing arithmetic with numbers. When she discusses topology, she analyses a similar question: How many holes has a straw? When she discusses pictures as a tool to do mathematics, she warns against possible misleading presentation of data with pie charts or bar charts, just messing with perspective or moving the origin. She even uses graphs to explain heartbreaks when a relation comes to an end. The chapter on pictures is also a pretext to devote a longer part to braids and diagrams which are of course close to her own domain of category theory, which is all about relations and arrows drawn between objects.

Her conclusion is that math is needed with rigour to refine our intuition and intuition the guide our rigour. The answers in mathematics are not fixed, but math is a place to explore and to pose questions. Educators should be given the space to explore dreams and not be confined to teach rigorous rules that leave no freedom.

Adhemar Bultheel

Paul J. Nahin, **The delicate art of brute force**. How to compute if when you can't solve it, Princeton University Press, 2026, isbn: 978-0-691-26746-3 (hbk)



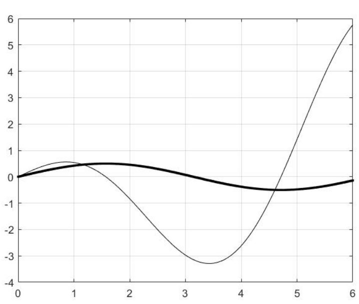


Paul J. Nahin

Paul J. Nahin is an electrical engineer, but one that loves mathematics and he has shown that in many of his books in which he illustrates that his love is in particular because it allows him to solve, with rather elementary tools, some problems that are at first sight rather complex. Hence in many of these books we find explicit computations that should trigger the interest of young students that could become possible scientists, engineers, or mathematicians in later life.

The same acclaim holds for this book. Why would he change at the age of 84? Although the title seems to suggest that the computer can help when mathematics alone cannot always provide the solution. But that is just a gambit, a perspective, needed to present yet another collection of his witty problems. Indeed there are still examples where solutions are computed using formulas, but then a simple matlab program is used to check that solution. Often the code is written in such a way that a very simple modification will solve (or approximate) a much more general problem where the math would be much more involved, or the formulas may be so complicated from the start that a simple computer simulation is preferred. But still in those cases there is some mathematics to verify that the computer produced sensible results.

As long as the computer has to check a finite number N of possibilities, it can check each and every one, but some problems become so complex that even that is impossible, and it certainly holds for problems where N has to approach infinity. Then only approximations are possble, which sometimes rely on statistical tests. But the overall lesson to take home after reading the book is that it is often optimal to use the computational power and speed of the computer in combination with your own mathematical skills for the analysis or the manipulation of the formulas to solve the problem or verify the solution.



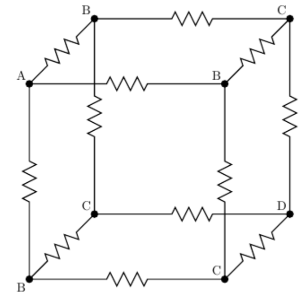
Los Alamos equation

The book is a collection with 10 examples in as many chapters of the ideas I explained above. An introduction starts with some history: the birth of electronic and digital computers around the middle of the 20th century with ENIAC, IAS, MANIAC being the first vacuum tube computers. It is illustrated that just a computer plot of the two functions of the equation $x\cos(x) = (1-a)\sin(x)$ immediately shows that there are infinite solutions and an estimate of their location is simple to see. The problem at Los Alamos was to find how the solution evolved with a. The plot on the left is generated using the matlab code from the book. The thin line is the plot of the left-hand side the thick line repesents the right-hand side. By varying the value of a, one can see how the intersections of the curves will change.

The point being made, there are first 3 chapters that are stochastic (e.g. gamble related) problems that are (approximately) solved by simulation. What is the probability that a chess match between two players of the same strength will end in a tie? The theoretical computation requires Stirling's formula for factorials to find asymptotics, but a computer can simply evaluate these formulas and see what happens when there have been n draws already, or when the players do not have equal strength.

The carpenter's problem is the following: cut 2 beams of the same length each at arbitrary places into 2 parts. Take 3 of the resulting 4 parts, then what is the probability that they can be used to form a triangle (e.g. for a window)? What if you cut one beam into 3 random pieces?

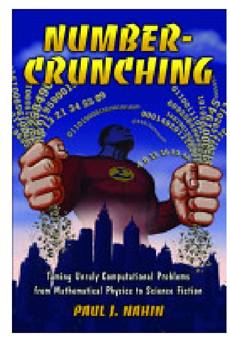
A geometric problem: Assume that you place some Wi-fi antennas in a large room, what percentage of the area in the room will be covered? In 3D this can be placed in the context of firing a torpedo at a randomly moving submarine. What is the probability the submarine will survive when the bomb explodes at the submarine's original position?



resistor cube

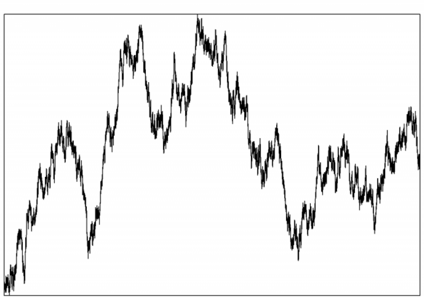
The electrical engineer still lingers in the author, so there are a number of possible configurations of circuits represented as regular graphs (hypercube, ladder, lattice, pinwheel, etc. networks) with various resistors at the branches. Problem is to find the voltages at the nodes. Of course this is 1-1 applicable to water supply plumbing or traffic control.

Next is a simple matlab implementation of a (binary) Turing machine and a discussion of the halting problem. Chapter 7 is announced as the toughest problem in the book. It is a classic leapfrog problem and can be formulated as follows: Two friends F and G start at the same time in city C to reach a destination D at a distance d, but they have only one bike. First F starts walking and G takes the bike. After a distance d_1, G leaves the bike and starts walking. When F reaches the bike he cycles for a distance d_2 (overtaking G) then he leaves the bike and starts walking. When G reaches the bike he takes it etc. Problem: Since between C and D one of both is always walking, does this define the time needed for the last one to reach D? This problem was also considered in a previous book by Nahin (*Number crunching* Princeton University Press, 2011) and I do not think that it is a spoiler to say that the answer is no. However, the simulation seemed to give an unexpected bias that was swept under the carpet. So the problem is reconsidered here to remove that bias and the reason is explained and that reason I will not spoil.



Number crunching

The 3 remaining chapters are a bit less 'recreational'. Chapter 8 is dealing with random walks (in n dimensions), and the problem is whether the random walk will escape to infinity or will there always be the possibility that at some point in the future there is a positive chance that the path will return to its starting point. The plot on the left shows the distance from the origin one has moved as a function of the number of steps. The problem is: will this curve ever cross 0 again? Suppose in 1D, the chance to go forward is p and the chance to go back is $q = 1 - p$. The remarkable answer is that escape to infinity is certain whenever at every binary choice during the walk the chance is fifty-fifty ($p = q = 0.5$), but as soon as one deviates a fraction ε from this, one is certain that sooner or later one shall return to the start. This involves some more statistical analysis than what was previously needed.



random walk

Chapter 9 is about Monte Carlo integration which is often used to compute very high dimenional integrals (into the thousands). Nahin uses matlab's random number generator although currently quasi Monte Carlo, (not depending on random number generators) are more common for practical problems.

Finally Chapter 10 is about computing the distance that gamma rays travels through a body. This is simplified to 2D where the body is the upper half of a circle and the rays reach it at random places on the diameter at random angles. Find the distribution of the lengths that a ray travels in the semicircle.

There is a rather extensive appendix with explanations about some of mathematics used in the rest of the book but everything should be accessible for anyone with a background of high school mathematics. All the problems are illustrated and tested with a matlab code. It is not a problem if the reader is not familiar with matlab because the code is very readable and Nahin goes through the steps to explain what is happening. So it is also some introduction to matlab and it is fun to run the codes and experiment on your own when you have matlab available.

In conclusion anyone who has read some of Nahin's previous books and liked it, will certainly be eager to read this one too. The style and the quality is not at all deteriorating with the age of the author.

Adhemar Bultheel