Newsletter

BELGIAN MATHEMATICAL SOCIETY

155, November 15, 2025

Comité National de Mathématique CNM

C W N M

NCW Nationaal Comité voor Wiskunde

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

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

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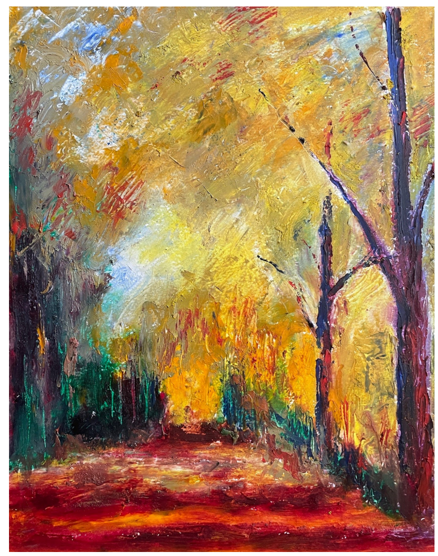

By Andreas Weiermann

Contents

Foreword by the president of the BMS

Dear BMS'ers,

Let me start with a little question: "What is the difference between a little bird?" Answer: "Its one leg is just as long." Absurdity is simply an extreme form of abstraction – probably this is why so many mathematicians enjoy absurd humour! I hope you'll also enjoy some news from our community.

This year, the Young Scholar Award has been exceptionally conferred upon two laureates: Stijn Cambie and Kevin Iván Piterman. Exceptional not only because it is the first time we have two winners in the same year, but also because both are of truly exceptional calibre.

Stijn Cambie distinguished himself early on by winning several prizes during his high school years in the Flemish and International Mathematical Olympiads. He obtained his PhD from Radboud University Nijmegen in 2021 under the supervision of Ross Kang. Currently, he holds an FWO junior postdoctoral fellowship at KU Leuven (supervised by Jan Goedgebeur) and an interim lectureship at the University of Antwerp. His main field of research is graph theory, in which he has solved several open problems, including multiple Erdős problems. He has collaborated with some of the leading researchers in his field and is currently involved in a joint project with Terence Tao. His work has already resulted in over 40 publications.

Kevin Iván Piterman is an Argentinian mathematician who currently holds an FWO postdoctoral fellowship at the VUB under the supervision of Leandro Vendramin. Before this, he held, among other positions, an Alexander von Humboldt Research Fellowship in Marburg, Germany. He obtained his PhD in 2019 from the University of Buenos Aires under the supervision of Gabriel Minian. His research spans a broad range of topics in algebra and topology, including finite groups and combinatorial methods in geometric group theory. Some of his most recent results on group actions on contractible 2-complexes have been published in Inventiones Mathematicae, one of the most prestigious journals in mathematics.

Please join me in warmly congratulating both of them! If you would like to learn more about their work, I encourage you to attend our "Recent Breakthroughs in Mathematics" meeting, which will take place on December 17 at the Solbosch campus of ULB in Brussels, where Stijn and Kevin will each give a short talk. The same day will also feature lectures by Timothée Bénard (on the work of Margulis, Abel Prize 2020), Olivier Schiffmann (on the work of Kashiwara, Abel Prize 2025), and Dennis Gaitsgory (on his own work that led to the Breakthrough Prize 2025). Those who joined us last year will remember the friendly atmosphere and excellent catering! Please note that registration is mandatory, but free of charge for BMS members. PhD students can even join the BMS for free!

We are also preparing several exciting events for 2026. First, François Loeser will deliver a series of lectures as part of the Jacques Tits Chair – more details can be found later in this newsletter. Later, in April 2026, we will organize, together with the KWG and SML, the next edition of the BeNeLux Mathematical Congress. Previous editions took place in Antwerp (1996), Ghent (2005), and Amsterdam (2016), and we are delighted that the 2026 edition will again be held in Antwerp. The programme will feature four plenary talks by Jessica Fintzen, Kathlén Kohn, Christophe Thiele and Nathalie Wahl. With 24 parallel sessions, everyone will find a topic of interest. PhD students and young postdocs are warmly encouraged to present a poster and compete with their Dutch and Luxembourg colleagues for the Best Poster Awards.

Please look further in our newsletter for more practical information about our events, and don't forget to register via our website! Best wishes,
Joost.

1 News from the BMS & NCM

1.1 Recent breakthroughs in Mathematics and General Assembly 2025

The Belgian Mathematical Society is happy to invite you to its "Recent breakthroughs in Mathematics" symposium which will take on Wednesday December 17 2025 at ULB, Campus Solbosch (room Somville, building S). On this occasion we will also organise the society's general assembly.

Participation is free for BMS members and PhD students, but registration is mandatory, see below. Non PhD students who are not BMS members will be invited to become members to enjoy the free drinks :-).

Programme

- 10h30-11h00: Welcome coffee
- 11h00-12h00: Timothée Bénard (on Margulis - Abel '20 and Lindenstrauss - Fields '10)
- 12h00-14h00: lunch
- 13h00-13h30: BMS Board meeting
- 13h30-14h00: BMS General assembly
- 14h00-15h00: Dennis Gaitsgory (on his own work - Breakthrough prize '25)
- 15h00-16h00: Stijn Cambie and Kevin Iván Piterman (YSA '25)
- 16h00-16h30: coffee break
- 16h30-17h30: Olivier Schiffmann (on Kashiwara - Abel '25)
- 17h30-18h30: drink

Make sure to register before 8 December 2025 on
https://bms.ulb.ac.be/conferences/recent-breakthroughs-in-mathematics-and-general-assembly-2024-1/.

1.2 BeNeLux Mathematical Congress

The BMS, KWG and SML join forces to organise the next BeNeLux Mathematical Congress in Antwerp on 7 and 8 April 2026. Deadline for registration with poster presentation is 10 February 2026, and 10 March 2026 without poster presentation. For keynote speakers, topics of the parallel sessions and registration, see https://bms.ulb.ac.be/conferences/bms-kwg-sml-joint-meeting/.

1.3 Save the dates

The holder of the Jacques Tits chair 2025 is François Loeser. He will give a series of lectures in Belgium. The inaugural lecture will take place in the afternoon 5th of March 2026 at the University Foundation in Brussels.

Other lectures are scheduled at the Universty of Leuven (March 4, 11, 18 and 25) and at the University of Mons (March 12, 19, 20, 31 and April 1).

More information will be available on the websites https://bms.ulb.ac.be/conferences/,
https://wis.kuleuven.be/agenda/sem-ntag and https://web.umons.ac.be/mapa/slaag/.

1.4 Membership dues for 2026

The basic BMS membership fee is 20€ per year or 100€ for 5 years. See Section 1.4.1 for reciprocity membership.

You can pay via bank transfer (**BIC: GEBABEBB / IBAN: BE70 0011 7447 8525**) or through the following QR codes (please mention your name as communication)

Left: 20 euros - basic membership fee. Middle: 60 euros - BMS + EMS fee. Right: 100 euros - 5 year basic membership fee

Our address is:

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Belgian Mathematical Society
Campus de la Plaine, C.P. 218/01
Boulevard du Triomphe
B-1050 Brussels, BELGIUM
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The new Project Euclid system for electronic access to our journal, the Bulletin of the Belgian Mathematical Society, is stricter than before and asks the Society to update our subscriber's list yearly in January. So please pay your dues as soon as possible in order to keep uninterrupted access to the Bulletin.

1.4.1 Reciprocity and combined membership

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

We summarize the most common combined memberships:

BMS	20,00€
BMS for 5 years	100,00€
BMS with reciprocity	18,00€
BMS + EMS	60,00€

Note that the EMS (European Mathematical Society) membership fee of 40,00€ is allowed only to persons belonging to an EMS corporate member society, such as the BMS. The individual EMS membership fee is 80,00€ otherwise. Note that it is now preferred that you pay your EMS membership fee directly to the EMS. See https://euromathsoc.org. for details.

1.5 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.

Content Volume 32 (4) November 2025

- On the number of powers of 2 in a system of Goldbach-Linnik type equations **Doudou Zhu, Tianze Wang, Linlin Wang** DOI: 10.36045/j.bbms.240926
- Variational principle of tree pressure for set-valued maps **Zhongxuan Yang** DOI: 10.36045/j.bbms.241007
- On (k, r)-integers related to the Piatetski-Shapiro sequences **Wei Zhang** DOI: 10.36045/j.bbms.250126
- Ultraspherical polynomials and Hahn's Theorem with respect to a raising operator **Jihad Souissi, Mohamed Alaya, Baghdadi Aloui** DOI: 10.36045/j.bbms.250225
- Non Kazhdan's groups and a new approximation property for tracial von Neumann algebras **Paul Jolissaint** DOI: 10.36045/j.bbms.250227
- Algebraic properties of generalized convolutions, and their quasi-metric properties in the complexity spaces **Netzahualcóyotl C. Castañeda-Roldán, José M. Hernández-Morales, Luz C. Álvarez-Marín** DOI: 10.36045/j.bbms.250313
- On the duality of DW-compact operators and DW-DP operators **Geraldo Botelho, Ariel Monção** DOI: 10.36045/j.bbms.250618
- Spectral and ergodic properties of the operator $B(r, s)$ over power series spaces $\Lambda_\infty(\alpha)$ of infinite type and their duals **Angela A. Albanese, Claudio Mele** DOI: 10.36045/j.bbms.250827

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

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

2.1 November 2025

Workshop on Integrable Combinatorics

18-20 November 2025, UCLouvain, Louvain-La-Neuve, Belgium

A workshop on Integrable Combinatorics will take place at UCLouvain, Louvain-La-Neuve, Belgium, from November 18 to November 20, 2025. A highlight of the programme is a lecture series by Philippe Di Francesco, recipient of the Chaire de la Vallée Poussin 2025. The inaugural lecture is aimed at a broad audience of mathematicians and physicists. The subsequent lectures and contributed talks focus on more specialised topics in mathematical physics, while remaining accessible. To view the full programme, please visit: https://agenda.irmp.ucl.ac.be/event/5611/. Registration is free but mandatory, see https://agenda.irmp.ucl.ac.be/event/5611/registrations/177/. Limited funding will be available to cover the accommodation for young researchers who wish to attend the workshop. For further information, please contact tom.claeys@uclouvain.be and christian.hagendorf@uclouvain.be.

2.2 December 2025

Getaltheorie in het Vlakkeland / Arithmétique en Plat Pays (GVL_APP)

15 December 2025, Vrije Universiteit Brussel

We are pleased to announce that the next edition of the seminar Getaltheorie in het Vlakkeland / Arithmétique en Plat Pays (GVL_APP) will take place at the Department of Mathematics & Data Science of the Vrije Universiteit Brussel (VUB) on Monday, 15 December 2025.

Speakers:

- Jacques Benatar (Brussel)
- Bin Chen (Universiteit Gent)
- Charlotte Dombrowsky (Universiteit Leiden)
- Athanasios Kouroupis (KU Leuven)

Participation is free of charge, but registration is mandatory. To register and for more information, please visit: https://www.mathconf.org/app-gvl-autumn2025.

Hope to see you there!
Andreas Debrouwere & Sam Mattheus (local organizers)

Recent breakthroughs in Mathematics and General Assembly 2025

17 December 2025, Brussels

For more information, see earlier in this newsletter 1.1 and on https://bms.ulb.ac.be/conferences/recent-breakthroughs-in-mathematics-and-general-assembly-2024-1/.

8th International Conference on Frontiers in Industrial and Applied Mathematics (FIAM-2025)

21-22 December 2025, Nirma University, Ahmedabad, India

See https://fiamconference.com/fiam-2025.

2.3 April 2026

BeNeLux Mathematical Congress

7-8 April 2026, Antwerp

For all information, see earlier in this newsletter 1.2 and https://bms.ulb.ac.be/conferences/bms-kwg-sml-joint-meeting/.

2.4 August 2026

Poisson 2026 - Summer school and Conference

3-7 August 2026, University of Antwerp
10-14 August 2026, KU Leuven

This is the 14th in a series of international meetings on Poisson geometry aiming at bringing together researchers interested in Poisson geometry in a broad sense from all over the world. The format consists of a summer school followed by a conference.

The next edition of the meeting will take place in Belgium. See all information on https://wis.kuleuven.be/events/2026_poisson/poisson2026.

2.5 TBA

Heckenberger's Francqui VUB-Leerstoel

VUB

István Heckenberger is a distinguished German mathematician who specializes in Hopf algebras, Nichols algebras, quantum groups, and related algebraic structures. He is currently a Full Professor at Philipps University of Marburg in Germany. Heckenberger has made seminal contributions to several areas of modern algebra, including differential calculi on quantum groups and quantum spaces, the theory of Nichols algebras, Weyl groupoids, and arithmetic root systems. He is also the coauthor, with Hans-Jürgen Schneider, of the comprehensive book Hopf Algebras and Root Systems.

Information about Heckenberger's Inaugural Lecture and mini-course here:

https://leandrovendramin.org/heckenberger/

2.6 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

SLAAG !

The next session of the seminar SLAAG! (https://web.umons.ac.be/mapa/slaag/) will take place on January 13, 2026 :

- 13h30-14h30: Lorenzo Furio (Sorbonne Université), Recent progress on adelic Galois images for elliptic curves over $\mathbb{Q}$ - part I
- 15h00-16h00: Davide Lombardo (Université de Pise), Recent progress on adelic Galois images for elliptic curves over $\mathbb{Q}$ - part II

Everybody is welcome.

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/

VUB Algebra Seminar

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

Organizers: Kevin Piterman, Silvia Properzi, Leandro Vendramin

3 PhD theses

Skew braces and their connection to the Yang-Baxter equation, Hopf-Galois structures and post-Lie rings

Senne Trappeniers
Vrije Universiteit Brussel
29 September 2025

Thesis advisors: Prof. Dr. Leandro Vendramin (Vrije Universiteit Brussel) and Prof. Dr. Arne Van Antwerpen (Vrije Universiteit Brussel)

Summary:

The Yang-Baxter equation initially appeared in both quantum and statistical mechanics. Drinfeld proposed studying a special class of its solutions, the so-called set-theoretic solutions. Although more restrictive, these solutions remain too general to classify completely. Nevertheless, studying them leads to a better understanding of Yang-Baxter equation. Braces, algebraic structures introduced by Rump, turn out to provide the right algebraic framework to study involutive non-degenerate solutions. Later, skew braces were introduced by Guarnieri and Vendramin as a generalisation to study also the non-involutive ones. These algebraic structures form the main focus of this thesis.

We start by studying two classes of skew braces. The first is the class of two-sided skew braces. We show that they can be described as extensions of weakly trivial skew braces by two-sided braces, which leads to novel structural results. The second class comprises bi-skew braces, which are more generally related to brace blocks. We provide a technical characterisation of brace blocks as well as more feasible constructions.

Next, we treat the connection between skew braces and non-degenerate set-theoretical solutions of the Yang-Baxter equation. After exploring how certain properties of solutions relate to those of their associated skew braces, we classify finite indecomposable involutive non-degenerate solutions with an abelian permutation group and indecomposable involutive non-degenerate solutions of size p^2 with p a prime.

Subsequently, we discuss the existing connection between skew braces and Hopf-Galois structures on finite Galois field extensions and propose a refined version. This enables an explicit classification of all such extensions where the Hopf-Galois correspondence is surjective, a behaviour closely resembling that of the classical Galois correspondence.

In the final part of the thesis we develop a Lazard correspondence between L-nilpotent post-Lie rings and L-nilpotent skew braces. By means of illustration we then use this correspondence to obtain in a more explicit form Zenouz's classification of skew braces of order p^3, $p > 3$ a prime, through a classification of L-nilpotent Lie rings of the same order.

Collectively, these results deepen the structural understanding of skew braces and emphasize their pivotal role, both in algebra and in relation with the Yang-Baxter equation. The PhD thesis is based on six articles, of which four are published so far. Two are in collaboration with Lorenzo Stefanello, one with Carsten Dietzel and Silvia Properzi, one with Marco Castelli and two written by Senne Trappeniers as the sole author.

Aspects quantitatifs en géométrie localement conformément symplectique

Pacôme Van Overschelde
ULB
31 October 2025

Thesis advisors: Prof. Dr. Mélanie Bertelson (ULB)

Summary:

This work lies within the study of locally conformally symplectic (LCS) manifolds, with the aim of clarifying the nature of the relationships between LCS geometry and contact geometry.

We first develop a structural approach to LCS manifolds by describing them as quotients of symplectic manifolds by actions of groups of conformal symplectic transformations.

We then propose a construction of LCS structures on mapping tori of contactomorphisms, generalizing a construction previously defined only for strict contactomorphisms. We also generalize a result of Bazzoni and Marrero to the case of LCS structures that are not necessarily first kind, in order to give a characterization of LCS mapping tori associated with a closed contact manifold.

We introduce a quantitative notion, called elasticity, to study exact LCS manifolds, and we give a characterization of first kind LCS manifolds in terms of this notion. We then highlight a link between elasticity and an invariant from dynamical systems, by determining the limit values of the elasticity of LCS mapping torus in terms of the Birkhoff average of the conformal factor associated with its contactomorphism. This analysis yields a bound on the extrema of the conformal factors associated with a contactomorphism, thereby providing a necessary condition for a contactomorphism to be strict.

We propose a construction of exact LCS manifolds via a gluing of Liouville cobordisms and use this construction to study the isomorphism classes of LCS mapping tori. We establish a necessary criterion and a sufficient criterion for two LCS mapping tori to be exactly isomorphic. This allows us to generalize, in LCS geometry, a result of Courte, and to exhibit examples of non-isomorphic contact manifolds admitting conformally isomorphic symplectizations, provided the Lee form is sufficiently large. This condition suggests that the transition from contact geometry to LCS geometry may preserve more structure than the passage to symplectic geometry.

Finally, this work highlights new directions for exploring various aspects of contact geometry through LCS geometry, ranging from contact dynamics to contact topology, making locally conformally symplectic geometry a natural framework to study contact geometry.

4 Job announcements

4.1 From ULB

The Université Libre de Bruxelles is announcing a vacancy for a permanent position in "Algebra and combinatorics". Please feel free to forward this announcement to anyone who might be interested. The vacancy is open for eligible candidates working in any subfield of algebra or any subfield of combinatorics (so there is no need to work in both fields !). Deadline for applications is January 31, 2026. More information can be found via the following link and at the end of this newsletter https://www.ulb.be/fr/vacances-d-emplois-academiques-et-scientifiques/faculte-des-sciences.

5 News from the universities and other societies

5.1 Winner of the 2025 Ferran Sunyer i Balaguer Prize

The book "Groups, Radical Rings, and the Yang-Baxter Equation" by Ferran Cedo (Barcelona) and Leandro Vendramin (VUB) will be published in the series Progress in Mathematics (PM, volume 361) in January 2026. The book was the winner of the 2025 Ferran Sunyer i Balaguer Prize.

5.2 Global Minds in PDE and Control Theory

It is our pleasure to announce that the Ghent Analysis and PDE Center has been awarded one of the Global Minds Fund (GMF) International Grants for 2025, funded by the Research Department at Ghent University. This initiative aims to address global challenges through innovative research and dynamic collaboration.

Since 2017, the Federal Government allocates funds, through the office of VLIR-UOS, to the Global Minds Fund (GMF) of Ghent University. GMF operates as driver of change for sustainable development, by producing and valorising relevant knowledge and expertise through mutually beneficial partnerships.

The idea is to cooperate with several key figures of Brazilian mathematicians on a project leading to educational advancement in Brazil. This project will be valuable to pass to younger generations a significant perspective in the field of partial differential equations and control theory through the leading Brazilian partners of the project.

The project is promoted by Prof. Dr. Michael Ruzhansky (PI) and co-promoted by our FWO Postdoctoral Researchers (Co-PIs) Dr. Duvan Cardona and Dr. Marianna Chatzakou. As part of our strategic alliances we will cooperate with ICMAM Latin America (International Community of Mathematicians from Latin America) in the organisation of several virtual conferences related to this project.

Organisers

- Michael Ruzhansky (PI), Ghent University
- Duvan Cardona (Co-PI), Ghent University
- Marianna Chatzakou (Co-PI), Ghent University

Global South partners:

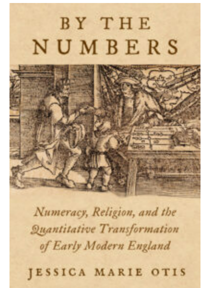
- Jaqueline Godoy Mesquita (Universidade Estadual de Campinas, Brazil)
- Paulo L. Dattori da Silva (Universidade de São Paulo, Brazil)
- Alexandre Kirilov (Universidade Federal do Paraná, Brazil)
- Marcelo R. Ebert (Universidade de São Paulo, Brazil)
- ICMAM Latin America (International Community of Mathematicians from Latin America).

Website: https://analysis-pde.org/2025/07/11/global-minds-in-pde-and-control-theory/

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

6.1 Adhemar's corner

By the Numbers. Numeracy, Religion, and the Quantitative Transformation of Early Modern England, *Jessica Marie Otis*. Oxford University Press, 2024 (xi+280 p.), isbn: 978–0197608784



Jessica M. Otis

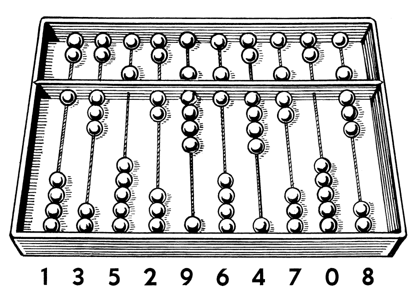
This book is a reworked version of Otis' PhD thesis submitted to the University of Virginia in 2013. It describes the spreading of numeracy and the quantitative transformation taking place in early modern England (approximately 15th to 17th century).

It is well known that most animals have some intuitive notion of (small) numbers, while being literate is something that has to be learned. Hence literature was considered to be academic, while arithmetic was something practical, a technical skill used every day or that was needed in certain professions like accounting, or construction, or in the military. There was also a religious aspect to counting and measuring since the Bible said that "all things were made by God in number, weight and measure". Hence measuring and counting the surrounding nature and people was something like doubting God's plans. Nevertheless, by the 17th and 18th century numbers had become an accepted way to understand God's creation. In six chapters Otis explains how early modern England became a period of transition to a numerate society, mainly through the introduction of the Hindu-Arabic number system.

In a first chapter Otis explains the different primitive counting systems that existed since long. There existed complicated ways of finger counting, which was somewhat forgotten in England but it was reintroduced by the books of Robert Recorde. There were also tally-sticks: marks were cut on a stick which was split in half so that debtor and creditor could get half and they can agree as long as the marks on both halves fit. Sticks could also be transferred to another person so that it became a way of payment, a kind of money so to speak. Of course there needed to be a written note who the original creditor and debtor were. When a debt was paid, the sticks were broken or burned. This was easy to understand for everybody from the illiterate to the higher educated members of Parliament. There was however no guarantee that the debt would be paid unless the inscription on the stick identified it as an Exchequer stick. The latter sticks were issued as a form of government bonds. In the 18th century the sticks were gradually replaced by cheques. As an alternative there were also minted metal disks that were called counters, compters or jettons. These were often used as markers on a counting board. These counters were inspired by the Greek pebble abacus that was used for counting (hence the word calculus, which is Latin for pebble or counter and abacus which is derived from the Latin word abax meaning flat surface, referring to the surface on which the pebbles were lined out). Such chequered surfaces for calculation were used already in the 12th century and gave also the name to the English Royal Exchequer, and of course later to the cheque.

Tally sticks

counting board



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This brings us to the use of counting boards. That was a flat surface with horizontal lines corresponding to the Roman numbers I, X, C, M. The space in between correspond to V, L, D.

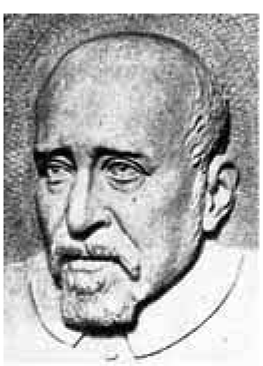
On each line some tokens were placed that symbolized the number of units. For example 9 had 4 tokens on the line I and one between I and X which represented 5. When adding 1, there would be 5 tokens on the line I which, like in present tallying, is crossed out and replaced by an extra token at the level V. Since between two lines there can be at most one token, the 2 tokens at level V are replaced by one token at level X, giving the result 10. In general when two numbers were laid out on the board separated by a vertical line, adding them consisted in moving the tokens from one side to the other, applying the rules about no more than 4 tokens on a line and no more than 1 in between them. The result can be easily transcribed in Roman notation. Subtracting numbers was obtained by applying these operations in reverse. Variants existed like for example the abacus was "mechanizing" the same idea, with a slightly different layout. It represents numbers in a positional bi-quinary system where the digits 0-9 are represented by tokens on the positional lines with the 5 represented by a token on the same line but separated from the units.

In the second chapter it is explained how the Hindu-Arabic number system was conquering the numerical manipulations and recordings. This happened reluctantly, because this notation was considered prone to modification. This was much less the case with the symbols used in the notation of Roman numbers and there were less possibilities to insert symbols before or after a written Roman number. That is why it became usual to replace the last I in a number by J to prevent extension to the right. For example 8 was written as VIIJ. On the other hand doing the computations was so much easier with the Arabic number system than with the Roman notation. So initially, even if computations were done with the Arabic numbers, the result was still denoted in Roman numbers for the record.

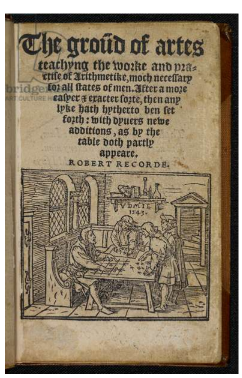
Summa de Arithmetica
L. Pacioli, 2nd ed. (1515)

Allegory of Arithmetic
Gregor Reisch (1504)

As already mentioned before, all this arithmetic was not considered to be an academic skill, practical manuals were produced that were distributed at large scale for self study, not in Latin, but in the local language. It started in Italy with the *Summa Arithmetica* (1494) by Luca Pacioli who collected the knowledge instructed in the abacci schools where merchants were instructed in the new Hindu-Arabic system. It was quickly spreading over Europe. In England, the booklet *The Ground of Artes* (1543), by Robert Recorde (c.1510 - 1558) became widely spread and widely used. Recorde also promotes the use of the plus and minus sign and inverted the symbol '=' for equality. There were other, similar books, but Recorde's was definitely the most popular. Otis proves this by the number or notes taken in the margins of the copies that are left.



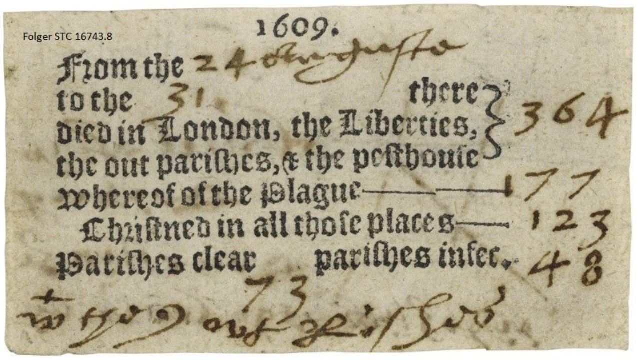
Robert Recorde



Title page (1543)

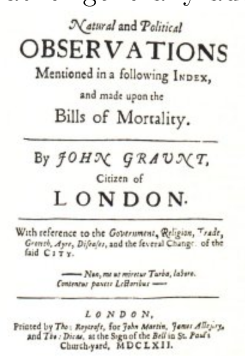
People also became more and more depending on numbers. There was the computation of the date of the religious holidays, especially the introduction of the Gregorian calendar in October 1582 became a challenge. But counting years according to the reign of the monarch was, for merchants traveling in Europe, a complicated task. Because James I of England and Ireland crowned in 1603 was also James VI of Scotland since 1567 was an extra complication that merchants had to deal with besides the conversion between the different locally valid monetary systems. It was already complicated with the non-metric English system.

There were also the different hours which were calibrated by the church bells ringing at fixed times, but they were not always synchronized between different parishes. The Plague entered England in 1348, but the epidemic returned in different waves in 16th and 17th century. Mortality bills were meticulously collected distinguishing between epidemic and other deaths. Hebdomadal lists were widely distributed and eagerly consulted to follow the evolution of the epidemic and take corresponding measures.



London Mortality bill (24-31 August 1609)

In the 16th century also the first notions of chance and statistics became a common issue. Not only gambling was an incentive. In fact the mortality bills were also tools to evaluate the risk of the Plague. Even in this early stage over- or under-reporting became a tool to force certain outcomes. There was also a religious aspect because things happened by God's Providence, and predicting things based on numbers was like putting yourself in God's place. Nevertheless in the 17th century life and fire insurance became more usual and quantified chance was rather generally adopted.



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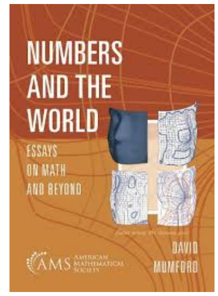
William Petty

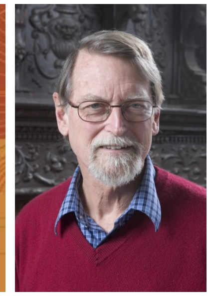
In the last chapter Otis considers the emergence of counting people for fiscal or military reasons which became in the 18th century known as "political arithmetic". Again there was a religious resistance against counting people. There is the biblical account of king David who ordered a census and was later punished for three reasons: murder, adultery, and organizing the census. The Compton Census (1676), named after the bishop of London, collected parish data to find out the ratio of Catholics and Protestants and those who did conform the Church of England. The reason was not purely demographic but had political and certainly a fiscal undertone. So underreporting became a problem. Mid 17th century, counting the number of hearths rather than people for taxation was considered more just but being too invasive, it was turned in 1696 into a window tax. More and more data were collected. Already in 1662, John Graunt (1620-1674), the founder of demography, took the analysis to the next level with his book *Natural and Political Observations*, inspired by William Petty's (1623-1687) publications who promoted to use the collected data into an instrument for social engineering.

The book is written in a pleasing format for a general readership. As an history book, there are many citations, often in the original (written) English used in that period, but this is easily understood, even for present day readers who are not especially trained. Of course these citations and other justifications require a lot of notes and references. Although the book has 280 pages, the actual text is only some 180 pages since it is completed with 51 pages of notes and 37 pages of primary and secondary references and 9 pages with a useful detailed index. In order not to interrupt the reading too much all these notes are collected at the end of the book instead of adding extensive footnotes. The topics in the different chapters are thematic so that the story over the different chapters is not in its historical sequence. I can recommend this interesting history which highlights how the transition was initiated to a numerate population and a more data driven society, which we know all too well these days.

Adhemar Bultheel

Numbers and the world. Essays on math and beyond *David Mumford*. AMS, 2023 (xvi+241 p.), isbn: 978-1-4704-7051-7 (pbk)





David Mumford

David Mumford is an American polymath, born in the UK, winner of the Fields Medal (1974), and of many other prizes, among which the Shaw Prize (2006), Steel Prize (2007), the Wolf Prize (2008), and the National Medal of Science (2010). He worked in algebraic geometry and later in computer vision and pattern theory. With this book (at the time of writing it in 2023 he is 85) he gives, as a round-up of his very productive life and his quite diverse interests, his vision on a number of scientific, social, and political issues. There are 19 chapters grouped into four parts. It would be impossible to give in this review a reasonable insight on the contents of each of the chapters. So here is a quick survey.

Part 1 (3 chapters) is about education and popularization of mathematics. There is of course the widespread disdain for mathematics. His answer is to teach students the applications first, let them solve meaningful real life problems, the abstraction comes later. As an admirer of Grothendieck, he wrote an obituary trying to explain his work to the non-mathematician. The remaining chapter is remarkable. When asked to select "the most beautiful mathematical formula" he starts by dividing the mathematicians into 4 different "tribes" since each will differ about the beauty of a formula. There are the *explorers* (subdivided into *mappers* and *gem-collectors*) looking for objects with certain properties; the *alchimists* who want to connect remotely different subjects; the *wrestlers* who are interested in inequalities, measuring the relative strength of both sides; the *detectives* (subdivided into *miners* and *baptizers*) who try to solve the most difficult and challenging problems. He gives examples of historical mathematicians and what kind of formulas they would select from a top 100 formulas. His analysis is quite accurate.

Part 2 (4 chapters) is about the history of mathematics. The first is about the Pythagoras theorem, raising the question why it was discovered independently in several cultures long before Pythagoras. The next two are about the history of algebra and how the different branches of mathematics were added in the course of history and how they are related. In the fourth he draws a parallel between the developments in mathematics and in art in the last two centuries.

Part 2 (3 chapters) deals with AI, neuroscience and consciousness. The original research was based on grammar and parse trees, but that changed with the introduction of neural nets in an attempt to mimic the working of our brain. He was not an early adaptor of these deep learning techniques and claims that there is some map of the parse tree present in the brain. New to the field, and currently a hot scientific topic is the question whether robots (or animals) can ever be conscious like we humans are? Some animals seem to have some form of it, but whether robots will ever be conscious is yet to be found out. Even clear definitions of our moods and feelings need to be agreed upon.

Part 4 (3 chapters) describes 3 of his pet topics: some result about the smallest zero of the Riemann-zeta function; an analysis of rogue waves; and an alternative for the ZFC foundation of mathematics based on reverse mathematics (i.e., find the minimal foundations needed). In his opinion, applied math did not play the role it should.

Part 5 (2 chapters) is about quantum theory. He explains his thoughts about the quantum collapse, and his ideas about quantum computing.

Part 6 (4 chapters) deals with miscellaneous personal topics: the publishing crisis that evolved from small publishers to the dominant Elseviers and Springers of this world just wanting to make profit; how politics and religion can interfere with mathematics; his predictions of the world for the next decennia.

Each chapter has some fresh and original ideas from a great mathematician. I certainly enjoyed reading each of them.

Adhemar Bultheel

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HR EXCELLENCE IN RESEARCH

SUBJECT TO THE APPROVAL BY THE ACADEMIC BOARD OF 24TH NOV. 2025

FULL-TIME ACADEMIC POSITION IN ALGEBRA AND COMBINATORICS

FACULTY OF SCIENCES

Reference : 2026/A008
Application deadline: 31 January 2026
Start date: 01 October 2026

Job description

The Department of Mathematics at Université libre de Bruxelles (ULB).

Within the Faculty of Science of the *Université libre de Bruxelles*, the Department of Mathematics is home to 6 research groups: Analysis and PDEs, Algebra and combinatorics, Differential geometry, Mechanics and applied mathematics, Actuarial sciences, Mathematical statistics and probability. The successful candidate will join the research group “Algebra and Combinatorics”, which currently has 4 permanent members (Samuel Fiorini, Dimitri Leemans, Špela Špenko and Joost Vercruysse), as well as a number of postdocs and PhD students.

Description of the position in Algebra and combinatorics

Area of Research : The successful candidate should have a strong background in algebra and/or combinatorics, broadly defined. There are no restrictions on subdisciplines. The successful candidate will collaborate closely with the members of the research group in the disciplines relevant to their research agenda, and they will also be invited to collaborate with other research groups of the department. Members of the Algebra and combinatorics research group are, for instance, active in the fields of incidence geometry, abstract polytopes, discrete optimization, graph theory, convex polytopes, non-commutative algebra, (non-commutative) algebraic geometry, homological algebra, Hopf algebras, quantum groups, representation theory, monoidal categories.

Educational and scientific goals : The selected candidate will contribute to research and teaching in algebra and combinatorics. They essentially aim at

- developing and/or expanding on their research agenda while fostering research collaborations within and outside the Department of Mathematics of ULB, seeking funding for research projects in the field and publishing in internationally recognized peer-reviewed journals;
- contributing to education (bachelor, master and PhD education) by coordinating courses (preparing/updating lecture notes, teaching theory classes, preparing, supervising and marking exams, organizing exercise sessions is coordination with the teaching assistants) for the Department of Mathematics and by supervising students for study and research projects at bachelor, master and PhD level.

Courses covered at the time of recruitment :
The candidate will be expected to teach courses at various levels in the Mathematics program, and at the bachelor level in other programs at ULB (service courses). In the long run, candidates will be requested to take up a teaching load that matches the average among the permanent members in the department (currently around 110 hours theory classes per year). Although subject to possible changes, the proposed initial course load will be:

- MATH-F-122 Linear algebra (1st Bachelor in Mathematics and Physics) – partim, 30h of theory classes;
- MATH-F-307 Discrete Mathematics (2nd Bachelor in Mathematics and Informatics) – 36h of theory classes;
- MATH-F-427 Combinatorial algebra (Master program in Mathematics) – 24h of theory classes.

The successful candidate will also be expected to gradually take up administrative tasks within the Department of Mathematics and Faculty of Sciences.

Qualifications required :

PhD Degree (with doctoral thesis) in Mathematics.

Skills required

- Applicants should have at least 4 years of research experience at the time of their recruitment. Doctoral research years count towards this qualification.
- Post-doctoral experience and exchange periods outside of the applicants' home institution (during or after their PhD) will be taken into consideration when evaluating applications.
- Candidates should have a proven record and/or pipeline of high-quality publications in internationally recognized peer-reviewed journals and be able to write grant proposals in the field.
- A good command of English at an academic level.
- Applicants who do not speak French (level B2) may be granted a period of adaptation, but they must be able to teach in French at the end of the third year following their appointment.

Interested ?

For more information, please contact Joost Vercruysse (E-mail: joost.vercruysse@ulb.be).

Your application will consist of a Curriculum Vitae *(if you wish, a standard CV can be downloaded from the website: https: //www.ulb.be/fr/documents-officiels/emplois-academiques-et-scientifiques-cv-type)* and a single pdf document including the following elements and that is structured as in the template available at this URL address https://www.ulb.be/fr/documents-officiels/1e-applic-form-acad-tps-plein-docx.

This template organizes your application file to include the following elements:

- an application letter;

- a maximum 7,000-character report (4 pages) presenting the applicant's research activities and a research project, including how these will integrate into ULB's research teams;
- a maximum 7,000-character report (4 pages) on the applicant's previous teaching activities and a teaching project for the first five years in this position; these must be relevant to the faculty and to the teaching profiles for the programs to which the applicant is to contribute;
- a maximum 7,000-character report (4 pages) note on the applicant's international achievements and projects;
- the names and e-mail addresses of five referees (taking into account gender balance) who may be contacted by those in charge of evaluating applications; these referees should not have conflicts of interest because of family or emotional ties.

Incomplete applications or applications that do not use the proposed format will not be examined by the selection committee.

The appointment to the academic staff of ULB is made at "Chargé de Cours intermédiaire" level and will become definitive after a probation period of 3 years. As of their appointment, members of academic staff are authorized to use the honorary title of "Professeur".

Where to go to apply?

Click here: https://jobs.ulb.be/job-invite/1689/?isInternalUser=true

For any connection problems or questions about our application, consult our FAQ : e-recrut-mode-d-emploi-candidat-en- 1734942996246-pdf

Equal opportunities policy

ULB's personnel management policy is geared towards diversity and equal opportunities.

We recruit candidates on the basis of their skills, irrespective of age, gender, sexual orientation, origin, nationality, beliefs, disability, etc.

Would you like to be provided with reasonable adjustments in the selection procedure because of a disability, disorder, or illness? Please contact Marie Botty, the person in charge of diversity aspects for the academic and scientific staff (marie.botty@ulb.be). Be assured of the confidentiality of this information.

More details on the ULB gender and diversity policy are available at Diversity at ULB - ULB.

You will find all the regulations relating to academic careers on our site at http://www.ulb.ac.be/emploi/academique.html.