

## 35<sup>th</sup> Newsletter – April 2025

### Welcome from the Chairs

Dear MATH+ Community,

On 6 February, a MATH+ delegation presented the **extension application** for a second funding period in Bonn. A group of 15 people, including the presidents of FU and HU, and TU's Vice-President Völker, traveled to Bonn for an intense **2.5-hour review session**. Our sincere gratitude goes to the delegation for their dedication and to all of you for your contributions since 2019. We are now eagerly awaiting the announcement of the results on **22 May**. WIAS has already secured its funding extension for another seven years—congratulations!

It is a pleasure to welcome **Laura Ciobanu Radomirovic** as a new MATH+ Professor for Applied Algebra at TU Berlin, along with **Lucía Martín Merchán (HU Berlin)** and **Martin Winter (TU Berlin)** as MATH+ Dirichlet Postdocs!

Warm congratulations to Carlos Améndola (TU Berlin) and his co-authors for receiving the **SIAM Review SIGEST Award** for an outstanding publication; to BMS alumna Helena Kremp, who was honored with the **Ernst Reuter Prize** from FU Berlin for her excellent dissertation; and to Andrea Walther, who was recognized as a **2025 SIAM Fellow**.

This newsletter also includes: a report on a **Nature** publication by MATH+ and RKI Scientists, detailing a model to calculate susceptibility to SARS-CoV-2 variants; an interview with **Jens Eisert** on **quantum computing** and his collaboration with *Google*; an MoU **between MATH+ and CIMPA**, updates on our **outreach activities**, including MATHINSIDE lectures and the Math Advent Calendar award ceremony as well as the **BMS Days and the BMS Student Conference**.

We received **61 proposals for the Call for Projects**. The **Cluster Days, presenting the selected projects**, will take place on 26-27 May. For social media users, MATH+ has left the **platform X and moved to BlueSky**. We encourage you to follow us there and, of course, on our other channels ([LinkedIn](#), [Instagram](#), [Facebook](#)).

Sadly, we must report the loss of our highly esteemed colleague, **Jochen Brüning**, who passed away in January. He will be greatly missed.

As always, we encourage you to **share your research results, publications, awards, or news about interesting guests** with Beate Rogler at [rogler@mathplus.de](mailto:rogler@mathplus.de).

We wish you all a successful semester and exciting research outcomes!



Sebastian Pokutta



Claudia Schillings



Andrea Walther

## MATH+ News

### + Presentation of the Extension Proposal by a MATH+ Delegation in Bonn



In February 2023, the MATH+ Board established a **writing team** for the extension proposal. Two years later, on 6 February 2025, we underwent the **review for our extension application for a second funding period** in Bonn!

A delegation of 15 people from MATH+, including the presidents of FU and HU and TU's Vice-President Völker, traveled to Bonn and faced an intense 2.5-hour review session: After a 30-minute presentation by the Chairs Team, the delegation answered questions by the 14 reviewers for an hour.

The questions covered a wide range of topics, including **our publication record in machine learning, start-ups, our success stories, plans for the second funding period, the achievements of the Thematic Einstein Semesters, and the careers paths of our alumni**. This was followed by a **poster session** where the reviewers engaged with delegation members individually.

Although we were exhausted, everyone felt we did our best, and we left with the impression that it went very well overall. Now we must wait **until 22 May, when the DFG will announce the results**.

We would like to thank the members of our delegation for their commitment and all of you for your contributions since 2019! It was and is your work and dedication to research upon which MATH+ is built!

### + Call for Projects

We are delighted to announce that we **received 61 proposals in response to our Call for Projects**. All of these innovative research project proposals will be reviewed over the coming weeks.

The **Cluster Days**, where the selected projects will be presented, will take place on **26 and 27 May at Urania Berlin**. We will publish a preliminary schedule as soon as possible.

### + Weierstrass Institute (WIAS), a MATH+ Partner, Successfully Evaluated

WIAS has already **secured its funding extension**—congratulations!

The [Weierstrass Institute for Applied Analysis and Stochastics \(WIAS\)](#) is a research institute within the [Leibniz Association](#) dedicated to application-oriented mathematical research that addresses complex challenges in science and industry. As a key partner in the Excellence Cluster MATH+, WIAS contributes significantly to advancing mathematical knowledge and innovation.

Following a comprehensive evaluation process, the Senate of the Leibniz Association announced on March 18, 2025, its recommendation to **continue funding WIAS for another seven years**. This decision underscores the institute's exceptional research contributions.

[Read more](#)

+ **MATH+ Member Carlos Améndola and Co-Authors Win Prestigious SIAM Review SIGEST Award for Outstanding Publication**



Anna Seigal, Carlos Améndola, Kathlén Kohn, and Philipp Reichenbach (ftr)

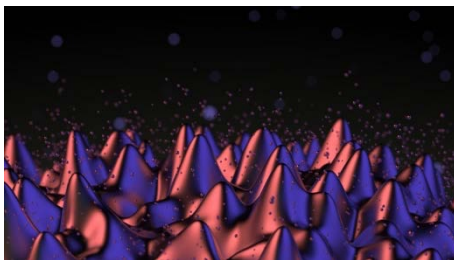
[Carlos Améndola](#), a MATH+ member and Assistant Professor at Technische Universität Berlin, along with collaborators Anna Seigal (Harvard University), Kathlén Kohn (KTH Stockholm), and Philipp Reichenbach (TU Berlin), has been awarded the prestigious **SIAM Review SIGEST Award by the Society for Industrial and Applied Mathematics (SIAM)**. Congratulations!

The award recognizes outstanding research that **bridges theoretical mathematics and real-world applications**, providing innovative tools for addressing complex problems. The team’s paper, “[A Bridge between Invariant Theory and Maximum Likelihood Estimation](#),” was honored for uncovering profound connections between geometry and statistics—specifically between *geometric invariant* theory and the statistical method *maximum likelihood estimation* (MLE). Notably, three of the four team members completed their PhDs as students of the [Berlin Mathematical School \(BMS\)](#).

The authors bring together distinct areas of mathematics, offering practical methods that benefit both geometry and statistics. **Their work shows how a geometric concept related to stability enhances the understanding of MLE**—revealing when data-fitting problems for certain mathematical models, such as Gaussian or log-linear models, yield unique and stable solutions. By bridging these fields, the team has introduced innovative methods for addressing challenges in both domains.

[Read more](#)

+ **Publication in “Nature” by MATH+ and RKI Scientists: Model Calculates Susceptibility to SARS-CoV-2 Variants in Different Countries**



Scientists from the Robert Koch Institute (RKI) and MATH+ at Freie Universität Berlin, including MATH+ Professor Max von Kleist and MATH+ Chair Claudia Schillings, have **developed a novel mathematical model**. The model calculates how many people in a given region are susceptible to different SARS-CoV-2 variants over a specific period. Their work has been published in the journal *Nature* under the title “**SARS-CoV-2**

**Evolution on a Dynamic Immune Landscape.**“

A SARS-CoV-2 infection triggers various immune responses, including the production of neutralizing antibodies, which help protect individuals from reinfection. However, since the beginning of the COVID-19 pandemic, the virus has continuously evolved, giving rise to novel variants. These genetic changes may allow variants to evade pre-existing immunity and neutralization by antibodies, increasing the possibility of reinfection.

**The study demonstrates that the ability of an emerging new variant to spread effectively within a population depends on the region’s prior infection history** and the specific variants involved, as these factors shape the population’s collective immunity.

[Read more](#)

### + Interview with Jens Eisert on Quantum Computing, Google Collaboration, and Science Outreach



In an interview with MATH+, [Jens Eisert](#), Professor for Theoretical Physics (quantum theory) at Freie Universität Berlin, discusses how his passion for **quantum technology** began, shares insights into **groundbreaking research in quantum machine learning**, and reflects on the future of **quantum computing**.

From **collaborating with Google** to inspiring young minds, he emphasizes the **importance of rigorous science, and long-term research commitment**. Additionally, he highlights the **value of science outreach**—both to engage young students in mathematics and the sciences and to communicate research outcomes to the broader public.

[Read the entire interview](#)

### + CIMPA and MATH+ Launch Partnership to Support Young Researchers



The **Centre International de Mathématiques Pures et Appliquées (CIMPA) Steering Council met on January 30–31** at TU Berlin to discuss future projects and review 2024 activities. Key outcomes included the selection of CIMPA Schools for 2026 and the exploration of the MATH+ project.

On January 31, **CIMPA and MATH+ signed a Memorandum of Understanding (MoU)** to support young researchers from developing countries.

Through the Thematic Einstein Semesters (TES), two laureates per semester will spend a month in Berlin, receiving mentorship and advancing their research. The call for applications will open in 2025, promoting inclusion and scientific excellence.

### + “No Data Without... Excellence”: A Coffee Lecture Series Organized by Four Berlin Excellence Clusters



Held from **14 January to 18 March**, this lecture series explored the **fundamentals of research data management** under the theme “No Data Without... Excellence.” The sessions addressed critical topics such as research integrity, FAIR principles, persistent identifiers, and electronic lab notebooks.

Each session provided **insights from experts, practical tips for researchers** at all career stages, and interactive discussions to deepen understanding of research data management. More than 250 participants attended the ten sessions.

This series was organized by **MATH+, NeuroCure, Matters of Activity, and UniSysCat**, combining expertise from four of Berlin’s leading Clusters of Excellence.

[Read more](#)

## MATH+ People

### + [Laura Ciobanu Radomirovic: New MATH+ Professor for Applied Algebra at TU Berlin](#)



We are delighted to announce that [Laura Ciobanu Radomirovic](#) has joined the Institute of Mathematics at TU Berlin as a **MATH+ Professor in the field of Applied Algebra**, starting in January 2025. Welcome to the MATH+ community!

Laura Ciobanu studied mathematics and computer science in the United States and earned her **PhD in group theory from Rutgers University, New Jersey**, in 2005.

She held postdoctoral positions at the **Centre de Recerca Matemàtica in Barcelona and the University of Auckland in New Zealand**. Between 2007 and 2016, she worked at the Universities of Fribourg and Neuchâtel, and in 2016, she joined **Heriot-Watt University** in Scotland as a professor and co-director of the **Maxwell Institute**, a collaborative hub for mathematical research between Edinburgh and Heriot-Watt Universities.

Through the MATH+ professorship, Laura Ciobanu will **advance her research in algorithmic and geometric group theory while fostering collaborations with the computer science community** in Berlin and beyond.

[Read more](#)

### + [MATH+ Chair Andrea Walther \(HU Berlin\) Recognized as 2025 SIAM Fellow](#)



The [Society for Industrial and Applied Mathematics \(SIAM\)](#) has named **MATH+ Chair Andrea Walther (HU Berlin)** a **2025 SIAM Fellow** in recognition of her contributions to algorithmic optimization and automatic differentiation. Congratulations! She has been an active **member of SIAM since 2011** and was elected to the **SIAM Council** in November 2023.

She studied Mathematics and Economy at Universität Bayreuth, earning her **PhD in 1999 and her habilitation in 2008—both from Technische Universität Dresden**. During this time, she held several research positions at TU Dresden, including a Junior Professorship.

In 2009, she was appointed **Professor of Mathematics and its Applications at Universität Paderborn**, a role she held until 2019 when she moved to Berlin.

Her research focuses on **nonlinear optimization**, particularly in developing and analyzing adjoint-based optimization methods, new approaches for nonsmooth optimization, and **optimization methods for machine learning**.

Since October 2019, Walther has served as a **MATH+ Professor of Mathematical Optimization at Humboldt-Universität zu Berlin**. She joined **the MATH+ Board** in November 2022 and was **elected MATH+ Chair** in October 2024, alongside Claudia Schillings (FU Berlin) and Sebastian Pokutta (TU Berlin/ZIB).

[Read more](#)



#### + Two New MATH+/BMS Dirichlet Postdocs



We are pleased to welcome **two new BMS Dirichlet Postdoctoral Fellows** to the MATH+ community: Lucía Martín Merchán ([Thomas Walpuski's group](#)/HU Berlin) and Martin Winter ([Martin Henk's group](#)/TU Berlin)!

[Lucía Martín Merchán](#) earned her Bachelor's Degree from the **University of Málaga** and a Master's Degree from the **Complutense University of Madrid**. In December 2021, she completed her PhD at the University of Málaga with a thesis entitled "Spin(7) Structures, Spinors, and Nilmanifolds". This research focused on **geometric structures on Riemannian manifolds** and incorporated techniques from related fields, including orbifolds, Lie groups, spin geometry, and rational homotopy theory. Afterwards, she held **postdoctoral positions at the University of Turin (Italy) and the University of Waterloo (Canada)**.

[Martin Winter](#) obtained a Bachelor's Degree in Computational Science and a Master's Degree in Mathematics with Computer Science from **TU Chemnitz**, where he also completed his PhD in Mathematics in 2021 with a thesis on „Spectral Realizations of Symmetric Graphs, Spectral Polytopes, and Edge-Transitivity.“ Following his PhD, Martin Winter held a postdoctoral position at the **University of Warwick (UK)**, and is currently also a guest researcher at the Max-Planck-Institute for Mathematics in the Sciences (**MPI-MiS**) in **Leipzig**.

[Read more](#)

#### + BMS Alumna Helena Kremp Honored with "Ernst Reuter Prize" for Outstanding Dissertation

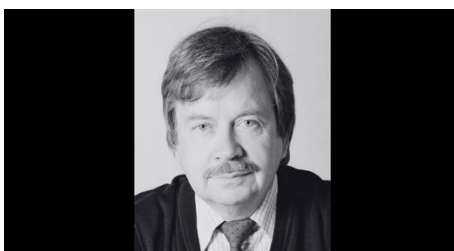


Helena Kremp, an alumna of the Berlin Mathematical School (BMS) and a **2023 doctoral graduate of Freie Universität Berlin**, has been awarded the prestigious "**Ernst Reuter Prize**" for her exceptional dissertation on "[Topics in Particle Systems and Singular SDEs](#)." Congratulations!

Helena Kremp earned her bachelor's and master's degrees at Humboldt-Universität zu Berlin before joining Freie Universität as a BMS PhD student under the supervision of Nicolas Perkowski. She contributed to the [MATH+ project group "Stochastic Analysis of Particle Systems: Langevin Dynamics and the Dean-Kawasaki Model"](#). Following her doctorate, she held a postdoctoral position at TU Vienna. As of December 2024, she has **returned to Berlin to work as a Postdoc** within the [CRC/TRR388 project "Rough Analysis, Stochastic Dynamics, and Related Fields"](#) at TU Berlin and the Weierstrass Institute for Applied Analysis and Stochastics (WIAS).

[Read more](#)

#### + MATH+ Mourns the Loss of Jochen Brüning



Professor Jochen Brüning passed away at the **age of 77 on 16 January 2025**, marking the loss of a highly respected colleague and a distinguished mathematician, who worked across disciplinary boundaries.

Born in 1947, Jochen Brüning earned his PhD in 1972 in Marburg and held professorships at Universität Duisburg,

Universität Augsburg, and Humboldt-Universität zu Berlin (HU). From 2006 to 2014, he **led the CRC Space-Time-Matter collaborative research center**, fostering collaboration across major Berlin institutions.

As the **founding director** of the [Hermann von Helmholtz-Zentrum für Kulturtechnik](#) (1999-2013), he **promoted interdisciplinary research and public engagement**. Known for his **visionary leadership, infectious enthusiasm and strategic vision**, he built bridges between disciplines and fostered dialogue between science and society.

[Read more](#)

#### + **The Following BMS Students Have Successfully Completed Their Doctorates**

**Ji Hoon Chun (TU Berlin)**

"On Finite Sphere Packings and Coverings"

**Robert Sven Denkert (HU Berlin)**

"Singular Mean-Field Control and Games and Control Randomisation with Applications to Reinforcement Learning"

**Ariane Ernst (FU Berlin)**

"Mathematical modeling and analysis of neurotransmission"

**Julian Adam Kern (TU Berlin)**

"Scaling limits in interacting particle systems"

**Christian Kipp (TU Berlin)**

"On local maximizers of the isotropic constant"

**Evgeniya Lagoda (FU Berlin)**

"k-regular maps and cohomology theory of configuration spaces"

**Dante Luber (TU Berlin)**

"Matroids, Flag Varieties and Generalized Permutahedra"

**Sarah Maria Morell (TU Berlin)**

"Flow-based problem solving in combinatorial optimization"

**Luca Pelizzari (TU Berlin)**

"Topics in rough and stochastic analysis with applications in finance"

**Anastasija Pešić (HU Berlin)**

"Mathematical analysis of a variational model related to pattern formation in biomembranes"

**Vasilii Rogov (HU Berlin)**

"Bialgebraic geometry and fundamental groups of quasi-projective varieties"

**Yang-Wen Sun (HU Berlin)**

"High-dimensional Change Point Detection using Graph-Spanning Ratio"

**Congratulations!**

## MATH+ Events

### Review

#### + **BMS Days & BMS Student Conference | 17-21 February 2025**



The [BMS Days 2025](#) took place on 17–18 February at Urania Berlin, welcoming **28 outstanding Phase I applicants from 15 countries** for a week-long experience.

The Orientation Week began with a „Pizza Night“ organized by the BMS Student Representatives to welcome the participants.

The following BMS Days included **introductions to the BMS graduate program, meetings with potential supervisors, and in-person interviews**. An online info session on 13 February provided insights for those unable to attend in person. Mathematical lectures were delivered by [Falk Hante](#) (HU Berlin), [Anna Maria Hartkopf](#) (FU Berlin), [Marc Kegel](#) (HU Berlin), [Alexandra Wesolek](#) (TU Berlin), [Hanno Gottschalk](#) (TU Berlin), and [Max von Kleist](#) (FU Berlin).

The **BMS Student Conference** was held on 19–21 February at TU Berlin, featuring talks by [Claudia Totzeck](#) (U Wuppertal), [Marita Thomas](#) (FU Berlin), and BMS students.

The “Wine & Cheese” event on 20 February provided a relaxed atmosphere for networking. The event concluded with BMS Alumni discussing career opportunities.

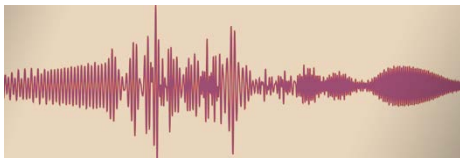


Both events were a great success, and we look forward to welcoming the new students this fall!

[Read more](#)

### Preview

#### + **International Workshop on Nonlinear Dynamics in Semiconductor Lasers (NDSL 2025)**



We are pleased to announce the International Research Workshop on Nonlinear Dynamics in Semiconductor Lasers (NDSL 2025), taking place from **16–18 June 2025, at the Weierstrass Institute (WIAS)** in Berlin.

The workshop will focus on the **mathematical, physical, and technological aspects of nonlinear phenomena in optoelectronic devices**. We welcome contributed talks and poster presentations—please submit your title and a short abstract (max. 300 words) via the registration form on our website.

- Abstract submission deadline: 30 April 30
- Notification of acceptance: 7 May
- Registration deadline: 1 June

👉 For details and confirmed speakers, visit: [www.wias-berlin.de/workshops/NDSL25](http://www.wias-berlin.de/workshops/NDSL25).

**26/27 May 2025: “MATH+ Cluster Days“ with presentations of the project proposals @Urania Berlin!**



## MATH+ Fridays in the Summer Semester 2025

- 25 April:** [Adriana Garroni](#) (Sapienza U, Rome): [Emergence of defects at grain boundaries: Variational analysis \(Kovalevskaya Lecture\)](#) @TU (C 130)
- 16 May:** [Nalini Anantharaman](#) (U Strasbourg): [Euler Lecture](#) @U Potsdam Lecture
- 23 May:** [Artur Avila](#) (U Zürich): tba @TU (C 130)
- 13 June:** Richard von Mises Lecture @HU
- 20 June:** tba @Urania
- 11 July:** Certificate Ceremony and Summer Party @FU (T9)

**Spotlight Talks: every two weeks** during the lecture period from April to July.

- 23 April: Ye-Chao Liu (AA2-19):** Entanglement Detection via Frank-Wolfe Algorithms
- 07 May: Zachary Adams (EF45-5):** A New Approach to Metastability in Multi-Agent Systems
- 21 May: Franziska Eberle (MATH+ Junior Research Group Leader):** Demand Strip Packing
- 04 June: Moritz Grillo (AA3-12):** On the Expressivity of Neural Networks
- 18 June: Ségolène Martin (AA5-8):** Convolutional Brenier Generative Networks
- 02 July: Sebastian Zimmer (EF45-1):** Informing Opinion Dynamics Models with Online Social NetworkData
- 16 July: Mikhail Kirilin (AA5-11):** Data-Adaptive Discretization of Inverse Problems

## Other Events

- 02 June: Pub Quiz, hosted by MATH+ @Fahimi-Bar (Kreuzberg), Skalitzer Straße 133**
- 28 June: Excellent Pub Quiz, Long Night of the Sciences @TU Berlin (Main building, Foyer)**

## MATH+ Outreach

### + MATHINSIDE for School Students on *Pi Day* – The International Day of Mathematics (14 March)



On *Pi Day*, the *International Day of Mathematics* on 14 March, 314 school students and math enthusiasts joined us at TU Berlin for a morning filled with three engaging math lectures. The speakers provided insights into the research work of mathematicians and the diverse applications of mathematics. The lecture program was primarily aimed at school students from the 10th grade upwards and was also a popular excursion destination for many school classes and courses. The lecture topics included:

- “Manic-Depressive Phases: The Mathematics of Quantum Computers in an Exciting Era” (**Jens Eisert, FU Berlin**),
- “A Brief Introduction to Game Theory” (**Max Klimm, TU Berlin**), and
- “The Fascinating World of Pseudoline Arrangements” (**Sandro Roch, TU Berlin**).

A big thank you to all of the speakers for their dedication in supporting MATH+ outreach activities!

[Read more](#)

+ **Festive Award Ceremony for the Math Advent Calendar 2024 on 26 January 2025**



Nearly 200,000 participants from over 70 countries took part in the 2024 digital **Math Advent Calendars**, organized by **Mathe im Leben** and **MATH**. From **December 1 to 24**, daily math challenges were available on [mathekalender.de](https://mathekalender.de) for students, teachers, and math enthusiasts. The **MATH+ Advent Calendar** (for 10th grade and above) featured problems from research fields such as **artificial intelligence, game theory,**

**and agent-based modeling.**

The **grand award ceremony took place on 24 January 2025 at FU Berlin**, welcoming more than **700 excited winners**. A special film commemorated **20 years of the Math Advent Calendars**, while a video message from **Federal Minister Cem Özdemir** highlighted the calendar's educational impact. The event featuring a math magic show, live music, and numerous prizes—thanks to generous donations.

**We would like to sincerely thank all the contributors of math challenges:** *Lukas Abel, Yamaan Attwa, Anouk Beursgens, Filip Blasković, Hajo Broersma, Christian Haase, Marieke Heidema, Margarita Kostré, Dante Luber, Marvin Lücke, Mathew Maat, Sören Nagel, Tobias Paul, Stefano Piceghello, Lukas Protz, Silas Rathke, Amir Shakouri, Martin Skutella, Arthur Straube, Rudolf Straube, Pim van' t Hof, and Anne Zander.*

👉 **Watch the recording of the award ceremony and the congratulatory video celebrating 20 Years of Math Advent Calendar on the [MATH+ YouTube channel!](#)**

+ **“Excellent Pub Quiz” Hosted by MATH+ at the Fahimi Bar in Kreuzberg**



Calling all team players, puzzle lovers, and science fans: In 2025, Berlin's seven Clusters of Excellence are launching a seven-part “Excellent Pub Quiz” series! **On June 2, MATH+ will host the event, with most quiz questions focusing on mathematics**—complemented by a live talk from BMS PhD student Joshua Wiebe about the Decision Theatre and additional questions from the research areas of the other six Berlin Clusters of Excellence.

- **When:** June 2, 2025, from 7:00 PM to 9:00 PM (doors open at 6:00 PM)
- **Where:** Fahimi Bar (Kreuzberg, at Kottbusser Tor), Skalitzer Str. 133, 10999 Berlin

Put your knowledge to the test with exciting, funny, and surprising questions drawn from all research areas covered by the Berlin's Clusters of Excellence—ranging from intelligence research, new materials, and green chemistry to world literature, neuroscience, and politics.

Grab your teammates, come up with a team name, and join in the fun! We're looking forward to a relaxed quiz night where you'll discover more about the research of Berlin's Clusters of Excellence.

**The event will be held in German.** No registration required, but space is limited.