

33rd Newsletter – October 2024

Welcome from the Chair

Dear MATH+ Community,

We are pleased to announce that we submitted the **extension proposal** at the end of August. A heartfelt thank you goes out to everyone who contributed! Our focus will now shift to the upcoming evaluation by the DFG and the Science Council in early February in Bonn. Please keep your fingers crossed!

Before this important milestone, we would like to remind you of our upcoming **MATH+ Day on 18 October**. We hope to see many of you there, as the General Assembly will also include the election of new Chairs and Board members.

This newsletter brings more exciting news: The **recent publication** from Jens Eisert's group in "[Nature Physics](#)" has attracted considerable attention. We also recommend listening to the insightful **Meridian Podcast**, where Dominic Bunnnett and Marwa Zainelabdeen discuss [collaboration with African partners](#). Additionally, we kindly ask for your support in spreading the word about **two calls for application** to the [BMS PhD Program](#) and [Dirichlet Postdoc Fellowships](#), and we would like to draw your attention to the [BUA communication campaign](#) featuring MATH+.

In the "People" section, we would like to congratulate several outstanding MATH+ members: **MATH+ Distinguished Fellow** [Peter K. Friz](#) shares insights into his career and research in an interview. [Sven Wang](#) has been elected to the prestigious "**Junge Akademie**," [Fabian Telschow](#) has received the **ERS IASC Young Researchers Award**, and [16 BMS graduates](#) have successfully completed their PhDs.

In the coming weeks, several outreach events are also on the horizon: The [MATH INSIDE](#) lecture series and the "[Science Slam](#)" by the Berlin Clusters of Excellence will take place on 07 November, in the morning and evening, respectively. Following that, the third "**Mathenacht aus Berlin, Bonn, and Münster**" will be held on 29 November, featuring contributions from all three mathematical Clusters of Excellence.

Lastly, we urgently ask for your help by **submitting puzzles** for the [MATH+ Advent Calendar](#).

And as always, we encourage you to **share your research results, publications, awards, or news** about interesting guests with Beate Rogler at rogler@mathplus.de.

We look forward to seeing you on 18 October, and best wishes for the upcoming semester!



MATH+ Chair Michael Hintermüller

MATH+ News

+ MATH+ Day with General Assembly and Election of the New MATH+ Chairs

On 18 October, the next MATH+ Day will take place at Urania Berlin, beginning with the **General Assembly (GA)** at 10:00 am. In addition to the Chair's report, the MATH+ by-laws (Ordnung) will be updated. Specifically, the leadership structure will be changed **from a "Chair with two Co-Chairs" to a team of three Chairs**. The final item on the GA agenda will be the **election of the new Chairs and Board**.

Following the lunch break, **the poster session** will be held in the Urania Loft, showcasing both current and recently completed MATH+ projects. As always, this will be a fantastic opportunity for the MATH+ community to come together for exchange, discussions, and inspiration – sparking interdisciplinary collaboration and innovative projects. We look forward to seeing you all there!

+ Quantum Error Mitigation: "Nature Physics" Publication by Jens Eisert's Group (FU Berlin)



A [recent publication in "Nature Physics"](#) by the research group of Jens Eisert demonstrates that error mitigation does not function as a scalable scheme. What challenges arise when addressing how quantum errors can be mitigated?

To explore the potential and limitations of quantum error mitigation, this work investigates the extent to which it can be applied to all quantum circuits as a scalable solution for

large system sizes. To this end, a mathematical framework is developed that is general enough to encompass a wide range of protocols currently used in practice.

The research is closely related to the MATH+ projects in the Emerging Fields [EF 1-11](#) and [EF 1-7](#).

[Read more](#)

+ "Calculate with Africa" – MERIDIAN Podcast Featuring Dominic Bunnnett and Marwa Zainelabdeen



MERIDIAN podcast host Kevin Caners speaks with MATH+ members Dominic Bunnnett, a postdoc at TU Berlin, and Marwa Zainelabdeen, a doctoral researcher at FU Berlin and WIAS, about how cooperation with the Global South in mathematics can help address global challenges. What does international cooperation, particularly with Africa, look like?

Tune in to hear Marwa and Dominic discuss their perspectives on collaboration with Africa in the latest episode, titled "Calculate with Africa: Transforming the World Through Mathematics." You can find the episode on [Spotify](#) and [Apple Podcasts](#).

[Meridian](#) is the science podcast of the Berlin Center for Global Engagement (BCGE), a center of the Berlin University Alliance (BUA).

[Read more](#)

+ Berlin Mathematical School: Call for Applications for the PhD Program 2024



The BMS is currently accepting applications for admission to its PhD program in 2025. Please encourage interested students to apply and distribute this announcement.

Application Deadlines:

- **Phase I with scholarship:** 01 December 2024,
- **Phase I without scholarship:** 01 April 2025,
- **Phase II - start before August 2025:** 01 December 2024,
- **Phase II - start in August, September, or October 2025:** 01 April 2025.

For detailed information, please visit our [Application page](#).

+ Call for Application: BMS Dirichlet Postdoc Fellowships – starting in Fall 2025

We invite applications for the [Dirichlet Postdoc Fellowships](#) starting in Fall 2025. This two-year position is open to promising young mathematicians who will have completed their PhD degree by 30 September 2025 and wish to pursue their own research in one of the eight broad research areas of mathematics covered by the Berlin Mathematical School.

Application deadline is **1 December 2024**.

[Read more](#)

+ Zuse Institute Berlin (ZIB) Celebrated 40th Anniversary



On 13 September, the ZIB celebrated its 40th anniversary. Numerous personalities from science and politics attended the ceremony, including Science Senator Dr. Ina Czyborra.

The theme was "Future in Berlin," focusing on the role of the [Zuse Institute](#) in Berlin's research landscape, particularly in AI research. In addition to keynote speeches by Ina Czyborra and

Günter Ziegler, the spokesperson for the Berlin University Alliance and President of FU Berlin, there were lectures given by Martin Grötschel, the former president of the ZIB and BBAW, and Gitta Kutyniok, an AI professor from Munich who previously worked at TU Berlin and was a member of MATH+.

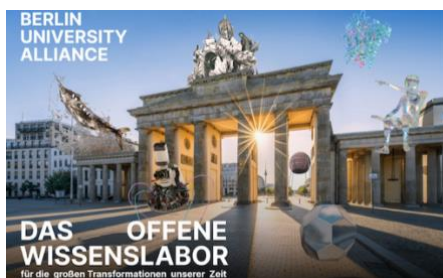
+ Research Presentation in Madagascar by Postdoc Alexia N. Raharinirina from FU Berlin



On 28 August, Alexia N. Raharinirina, a postdoc in [Max von Kleist's group](#) at Freie Universität Berlin, delivered a talk on Biomathematics at her alma mater, the University of Antananarivo in Madagascar.

The purpose of the talk was to introduce the field of biomathematics and spark interest among the audience. While biomathematics research is well-established in Berlin, it remains less developed in universities across Madagascar. The presentation highlighted the interdisciplinary nature of the field. Approximately twelve fourth-year mathematics students attended, including three women, and the talk was well received.

+ BUA Communication Campaign Featuring MATH+



MATH+ is participating in the current [communication campaign](#) of the Berlin University Alliance, which aims to showcase the research activities of the [seven Berlin Clusters of Excellence](#) to the public. Representing MATH+, [Sarah Wolf \(FU Berlin\)](#) and [Kai Nagel \(TU Berlin\)](#) [explain their research areas in an interview](#), using a math agent as a focal point which can be seen on posters and in an animation set in a Berlin location.

Additionally, [three exemplary MATH+ research projects](#) are highlighted. During a social media week from 7-11 October, these topics – the interview, introduction, and the animation of the math agent – will be further promoted across the social media channels of the Berlin University Alliance and MATH+.

MATH+ People

+ Interview with MATH+ Distinguished Fellow Peter K. Friz (TU Berlin/WIAS)



MATH+ Distinguished Fellow [Peter K. Friz](#) is an Einstein Professor at TU Berlin and affiliated with WIAS since 2009. In an interview with MATH+, he discusses his academic journey, his research on Rough Path Theory, and his future plans.

Friz studied in Vienna, Paris, and Cambridge, and completed his PhD at NYU's Courant Institute of Mathematical Sciences in 2004.

His research focuses on stochastic analysis and rough path theory. Friz has received prestigious grants, including an ERC Starting Grant (2010-2016) and an ERC Consolidator Grant (2016-2021). As of October 2024, he is the spokesperson of the Collaborative Research Centre (CRC) [SFB/Transregio 388 "Rough Analysis, Stochastic Dynamics, and Related Fields."](#)

[Read more](#)

+ Sven Wang (HU Berlin) Elected to "Junge Akademie"



[Sven Wang](#), Junior Professor at Humboldt Universität zu Berlin (HU), has been elected to the "Junge Akademie," a recognition that underscores his contributions to mathematics and his interdisciplinary approach. Congratulations! In an interview with MATH+, he discussed his career, research interests, and his love for mathematics and music.

He completed his Master's and PhD at University of Cambridge (UK) and later pursued a postdoctoral position at MIT (US).

Wang's research focuses primarily on mathematical statistics. Additionally, he works in social choice theory, examining the quantitative aspects of democratic processes. This includes developing fair voting systems and transparent algorithms for selecting representative citizens' assemblies, known as "Bürgerräte" in Germany.

[Read more](#)

+ Fabian Telschow (HU Berlin) Received the ERS IASC Young Researchers Award at CompSTAT 2024



On 30 August, Fabian Telschow, a postdoc at HU Berlin, received the [ERS IASC Young Researchers Award](#) at the 26th International Conference on Computational Statistics ([CompSTAT 2024](#)) for his presentation on the paper „[Precise FWER Control for Gaussian Related Fields: Riding the SuRF to continuous land -- Part 1.](#)“

The award includes a prize of 500 euros. The achievement will also be published in the [International Statistical Institute newsletter](#).

+ MATH+ Dissertation Award Winners 2023



In cooperation with the Einstein Foundation Berlin, MATH+ awards up to three annual prizes to BMS graduates for outstanding dissertations. We are delighted that the MATH+ Dissertation Awards 2023 were presented to **Dr. Viorel Andrei Bud**, **Dr. Toyomu Matsuda**, and **Dr. Arturo Merino**. Congratulations!

The award ceremony took place on 12 July as part of the MATH+ Friday, followed by the Summer Party.

[Read more about the three awardees](#)

+ The Following BMS Students Have Successfully Completed Their Doctorates

Fabian Altekrüger (TU Berlin)

"Solving Bayesian Inverse Problems using Neural Networks"

Ángel Crespo Blanco (TU Berlin)

"Double phase elliptic problems: existence and multiplicity results"

Sebastian Ertel (TU Berlin)

"Stochastic Analysis of Mean Field Monte Carlo methods with applications in Filtering and Computational Fluid Dynamics"

Egor Gladin (HU Berlin)

"Cutting Plane Methods and Dual Problems"

Benedikt Konstantin Gräßle (HU Berlin)

"A posteriori nonconforming finite element error analysis for fourth-order problems with quadratic semilinearity "

Svenja Marie Griesbach

"Revealing and Exploiting Information in Network Environments"

Dominik Gutwein (HU Berlin)

"Coassociative submanifolds and G2-instantons in Joyce's generalised Kummer constructions"

Dave Jacobi (TU Berlin)

"On / off super-Brownian Motion: A super-Brownian motion with Dormancy"

Melania Koser (HU Berlin)

"On singularly-perturbed variational problems for pattern formation in helimagnets and martensites"

Mahmut Levent Dogan (TU Berlin)

"Complexity of Orbit Problems for Torus Actions"

Sophie Luisa Plato (TU Berlin)

"Cross-Diffusion in Population Dynamics and Electrokinetics – Analysis and Numerics"

Michael B. Rothgang (HU Berlin)

"Equivariant transversality for closed holomorphic curves"

Maximilian Julius Stahlberg (TU Berlin)

"Social Dynamics on Networks Ancient Roads, Public Goods and Impartial Selection"

Sylvain Ronald François Spitz (TU Berlin)

"Polyhedral Methods for Mechanism Design"

Anh Duc Vu (TU Berlin)

"Percolation in Random Environments and Stochastic Homogenisation"

Kangning Wei (TU Berlin)

"Integrable Birational Maps: Geometric Construction and Degree Growth"

Congratulations!

MATH+ Events

Preview

+ MATH INSIDE – 07 November 2024 at ZIB



The next *MATH INSIDE* event will take place on 07 November at the Zuse Institute Berlin (ZIB). This session's topic is "Geometry and Its Applications." From 10 a.m. to 1 p.m., there will be three engaging one-hour talks showcasing the exciting ways geometry shapes the world around us.

MATH INSIDE is a lecture series where MATH+ researchers discuss various applications of mathematics and provide accessible insights into their current research. The talks are designed for high school classes to broaden their understanding of mathematical applications and inspire a deeper interest in mathematical research. More information will be available online shortly.

+ Join the Berlin Clusters of Excellence at their SCIENCE SLAM (Berlin Science Week) – 07 November



Come and support the MATH+ representative at the [Science Slam on 07 November](#), starting at **19:30** (doors open at 19:00) at the Roadrunner's Paradise Club (Prenzlauer Berg). The event is hosted by the seven Berlin Clusters of Excellence and is part of the [Berlin Science Week](#).

BMS Phase II student HSUEH Chun-Sheng and Postdoc Gregor Pasemann (both from HU Berlin) will present their research in entertaining 10-minute talks in English for the general public. They will compete against PhD students and postdocs from the six other Berlin Clusters of Excellence, each covering different topics. Fun is guaranteed, and we would be delighted if you would [join us in cheering on our MATH+ members](#).

[Read more](#)

+ “Mathenacht from Berlin, Bonn, and Münster” Offered by Three Mathematical Excellence Clusters



The third joint “Mathenacht” of the Excellence Clusters from Berlin (MATH+), Bonn (Hausdorff Center for Mathematics), and Münster (Mathematics Münster) will take place **online** on **29 November**. The event will include workshops for children, a panel discussion on “AI & Math”, and lectures by scientists from each cluster. Representing MATH+ will be Ekin Ergen (TU Berlin), leading a workshop for 9th-grade students, Hanno Gottschalk (TU Berlin), offering insights on AI, and Gabriele Steidl (TU Berlin), presenting a lecture on generative neural networks. The program will be available online shortly.

MATH+ Fridays in the winter semester 2024/25

01 November: [Heather Harrington](#) (MPI Dresden)
[Topology Data Analysis for Multiscale Biology](#) @TU (C.130)

15 November: “[A Day of Arithmetic Geometry](#)”
on the occasion of the **retirement of Jürg Kramer** @HU (ESZ, O'115)

+ **Spotlight Talks:** every two weeks during the lecture period from October to February.

23 October: [Arsen Hnatiuk](#) (AA4-14): [An Inexact Generalized Conditional Gradient Method](#)

06 November: [Ioannis Papadopoulos](#) (Dirichlet Postdoc): Computing Multiple Solutions of Topology Optimization Problems

20 November: [Martin Winter](#) (Dirichlet Postdoc): Of Rigid and Flexible Polytopes

04 December: [Fabian Lehmann](#) (Dirichlet Postdoc): Calabi-Yau 3-Folds with Boundary

18 December: Jan Marten Sevenster: Computational Aspects of Quadratic Forms in Determining the Representation Type of Quiver Algebras

15 January: [Benedikt Jahnel](#) (EF45-3): [Data Transmission in Dynamical Random Networks](#)

29 January: [Lasse Ermoneit](#) (AA2-17): [Coherent Transport of Semiconductor Spin-Qubits: Modeling, Simulation and Optimal Control](#)

12 February: [Kristina Maier](#) (EF45-4): [Hybrid Models for Large Scale Infection Spread Simulations](#)

MATH+ Outreach

+ **WANTED: Your Challenge for the MATH+ Advent Calendar 2024**



Christmas is just around the corner. However, we're still missing your challenges! We warmly invite you to participate by submitting your tricky puzzle. And as you may have also noticed, we have a new Advent Calendar logo! Please submit a challenge and showcase your research to a bright, young audience. Feel free to involve your group members and (PhD) students as well! Please consider creating mathematical puzzles suitable for students from the 10th grade and above. For inspiration, you can refer to previous challenges and solutions on the [Calendar's homepage](#).

Submit your proposal, including a solution in German and/or English, by 31 October to schools@mathplus.de. If you have any questions or need assistance regarding the MATH+ Advent Calendar, please also contact schools@mathplus.de