Berlin Mathematics Research Center

MATH+

26th Newsletter – March 2023

Welcome from the Chair

Dear MATH+ Community,

Even though it's already March, this is our first newsletter of the year. Next to news and upcoming deadlines, we'd like to announce that there will be a new **Call for Projects!** We sent you the announcement and timeline earlier. You can expect the details of the call later this month.

After a two-year break, we are happy that the BMS Days 2023 could take place again in person on 20 and 21 February in Berlin. They were followed by the BMS Student Conference on 22-24 February at TU Berlin. More information about the event and all speakers can be found in the review section.

The **second round for** BMS applications is open from 01 March to 01 April.

As we already announced, Gavril Farkas, Alexander Mielke, Bruno Klingler, and Peter K. Friz were selected as **MATH+ Distinguished Fellows**. We will successively introduce all of them. A portrait of Gavril Farkas appeared on our website in May 2022. This newsletter introduces Alexander Mielke (WIAS/HU Berlin). Read more about him in the People's section and on the MATH+ website.

We are looking forward to the forthcoming **Thematic Einstein Semester (TES)** on Mathematical Optimization for Machine Learning (Summer Semester 2023) that started on 10 February with an Opening Day and Reception after the MATH+ Friday talk by Stephen Wright (U Wisconsin, Madison). The current Thematic Einstein Forum will end with a Spring School (27-30 March) and the Final Conference on 31 March.

We are happy to announce that the **MATH+ "After Movie" of the** Celebrating Math events (01 July) is now online, presenting beautiful impressions of the "P versus NP" talks at the FUTURIUM and the BMS Certificate Ceremony at the BBAW. Please visit the MATH+ YouTube channel to watch all videos.

And finally, the **MATH+ Advent Calendar** again boasted more than 5800 participants, and the proud winners received their great prizes at the Award Ceremony at the FU Berlin on 20 January. More information can be found below. We warmly thank all contributors!

If you have any news you would like to share regarding your research, publications, prizes, or interesting guests, please contact Beate Rogler at rogler@mathplus.de.

I wish everyone a restful lecture break and look forward to the summer semester.

MATH+ Chair

+ MATH+ Call for Projects

MATH+ is calling for new projects to start in 2024. The complete timeline is as follows:
- 12 June: Proposal submission deadline
- 23 June: Board selects reviewers
- 30 August: Review submission deadline
- 04 September: Feedback of reviews to the applicants
- 11/12 September: Cluster Days – Presentation of all proposals
- 18 September: Publication of funding decisions
- 01 Jan 24: Start of new projects

+ Collaborative Thematic Einstein Forum (TEF) "Scales of Temporality: Modeling Time and Predictability in the Literary and the Mathematical Sciences" Ends with a Spring School and a Final Conference

In the current Winter Semester 2022/23, MATH+ is collaborating with the Cluster of Excellence "Temporal Communities" in the Thematic Einstein Forum on "Scales of Temporality: Modeling Time and Predictability in the Literary and Mathematical Sciences." The collaboration aims to explore common grounds and similar problems both in the mathematical sciences and the Humanities, particularly the philologies and literary studies.

As a concluding activity, a **Spring School** **takes place from 27-30 March**. The TEF ends with the **Final Conference on 31 March 2023** to synthesize findings from the TEF and focus on promising areas for further collaborative research between mathematics and literary sciences on scales of temporality.

+ Thematic Einstein Semester (TES) "Mathematical Optimization for Machine Learning" (2023)

The Thematic Einstein Semester "Mathematical Optimization for Machine Learning" in the summer semester of 2023 aims at unlocking the potential of mathematics within the extremely large and diverse fields of study that constitute modern Computer Science and Data Science.

The first **Workshop on "Machine Learning"** will take place from **26-28 April at Zuse Institute Berlin (ZIB).** This workshop will focus on bridging the gap between Optimization and Machine Learning.

In particular, it will cover topics relating to the use of Machine Learning in Physical Systems and Optimization, as well as aspects concerning Discrete Optimization. More details are to follow.

+ Results of the MATH+/BMS Dirichlet Postdoc Applications

The application deadline for the two MATH+/BMS Dirichlet Postdoctoral Fellowships was 01 December. This call met with a resounding response, yielding a total of 144 applications. The successful candidates will be presented here soon.

+ Second Round for BMS Applications

For admission to the BMS PhD program in October 2023, applications will be accepted in the second round via the BMS online portal from 01 March to 01 April 2023. The application is open to Phase I

applicants requiring admission only and Phase II applicants receiving their master's degree by 30 September 2023.

MATH+ People

✚ MATH+ Distinguished Fellow: Alexander Mielke (WIAS/HU Berlin)

After receiving his PhD from the Universität Stuttgart in 1984 and a two years research stay at Cornell University (Ithaca, NY), Alexander Mielke received the "Richard-von-Mises Prize" (GAMM) and the "Heinz Maier-Leibnitz Prize for Applied Mathematics" (DFG) in 1989. He was appointed professor at the Universität Hannover and the Universität Stuttgart before he accepted a full professor position at the Humboldt Universität zu Berlin in 2004.

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Mielke heads the "Partial Differential Equations" research group at the WIAS, where he has served as Deputy Director since 2005. He joined the DFG Research Center MATHEON and was a member of the MATHEON Executive Board from 2009 to 2014. From 2011-2017, he received the ERC Advanced Grant for the project "Analysis of Multiscale Systems Driven by Functionals". In MATH+, he has been involved as a Scientist in Charge of the Application Area (AA2) Materials, Light, and Devices and is currently chair of the MATH+ Council.

Alexander Mielke works in the field of nonlinear partial differential equations. He develops variational methods for problems in continuum mechanics and materials science, including the description of nonlinear elasticity, plasticity, thermal effects, and chemical reaction-diffusion systems. He is known for his work in finite-strain elastoplasticity and for developing the theory of rate-independent systems.

Read more about him and his statement on the award

✚ Tobias Schäffter (PTB) Elected as Acatech Member

Tobias Schäffter has been elected as a member of the German Academy of Engineering Sciences (acactech) based on his outstanding research and reputation. **Congratulations!**

He is head of the Berlin Institute of the Physikalisch-Technische Bundesanstalt (PTB) – the National Metrology Institute of Germany. He has been a Professor of Biomedical Imaging at TU Berlin and the Einstein Center Digital Future since 2019. Tobias Schäffter is also a member of the Berlin-Brandenburg Academy of Sciences.

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✚ Leon Bungert: New "Junior Research Group Leader" at TU Berlin

We warmly welcome Leon Bungert as the new Junior Research Group Leader (JRGL) for "Mathematics of Data Science" at TU Berlin.

He joined the MATH+ community on 01 March, coming from the Hausdorff Center of Mathematics (Bonn).

A more detailed introduction will follow in the next newsletter.

+ The Following BMS Student Has Successfully Completed Her Doctorate

Sophie Louise Puttkammer (HU Berlin)
"Direct guaranteed lower eigenvalue bounds with quasi-optimal adaptive mesh-refinement"

Congratulations!

MATH+ Events

Review

+ BMS Days and BMS Student Conference from 20 to 24 February 2023

The BMS Days 2023 took place on 20 and 21 February in person for the first time since 2020. We welcomed 27 invited applicants from 17 countries at the Magnus-Haus in the heart of Berlin. They were introduced to the graduate school's program and had the opportunity to get to know potential supervisors and the BMS community. The mathematical lectures were given by Pavle Blagojevic (FU Berlin), Tobias Breiten (TU Berlin), Angela Ortega (HU Berlin), Martin Skutella (TU Berlin), Vikram Sunkara (FU Berlin, ZIB), and Maite Wilke Berenguer (HU Berlin).

The BMS Days were followed by the BMS Student Conference from 22 to 24 February, with invited talks by Claudio Arezzo (U Parma and ICTP) and Günter M. Ziegler (FU Berlin). In addition, several BMS students presented part of their mathematical research or thoughts on various topics. We are particularly happy that the beloved "Wine&Cheese" event could take place again on Thursday night that week.

Read more on the BMS website

MATH+ Outreach

+ MATH+ Advent Calendar – Thanks to All Supporters and Participants!

More than **5,800 participants took part in the** MATH+ Advent Calendar 2022. Almost 3,000 high school students, more than 800 university students, and 660 teachers solved the daily mathematical puzzles. The MATH+ Advent Calendar has attracted almost 1200 fans in Europe and abroad, even some in the USA, Canada, Turkey, and Australia. Together with the project "Mathe im Advent" for younger students of grades 4 to 9, the calendar reached almost **190,000 math aficionados**. On 20 January 2023, all winners were rewarded with great prizes at the Award Ceremony at the FU Berlin.

Many thanks to the BMS students and MATH+ scientists for contributing tricky challenges connected to their current research projects:

Fabian Altekrüger, Ariane Beier, Susanne Brinkhaus, Hajo Broersma, Lara Glessen, Svenja M. Griesbach, Falk Hante, Christian Hercher, Sarah Hiller, Pim van 't Hof, Emil Junker, Attila Karsai, Rupert

Klein, Max Klimm, Martin Knaack, Christian Kuchler, Marvin Lücke, Alex McDonough, Olaf Parczyk, Tobias Paul, N. Alexia Raharinirina, Silas Rathke, Jesse van Rhijn, Ulrich Reitebuch, Michael Schmitz, Rosa Schritt, Jan Marten Sevenster, Martin Skrodzki, Clara Stegehuis, Lotte Weedage, Christoph Werner.

Furthermore, the organizing team is very grateful to the **mathematicians from the Dutch initiative 4TU.AMI** for their enduring support. MATH+ would also like to sincerely thank all **donors for their generous prizes**.

Read more