Berlin Mathematics Research Center

MATH+

28th Newsletter – June/July 2023

Welcome from the Chair

Dear MATH+ Community,

As you might know, the Math Institute at TU Berlin accommodating the MATH+ Office has been closed due to serious water damage. We are looking for other facilities and hope for your understanding of our current limitations.

Despite this, we hope everyone enjoyed the many activities provided by MATH+ members this semester, like the Thematic Einstein Semester "Mathematical Optimization for Machine Learning," as well as our events at "Tag der Berliner Mathematik" and "Lange Nacht der Wissenschaften."

Moreover, we want to congratulate Gavril Farkas (HU) for being elected as a "Fellow of the Academia Europaea," Sebastian Pokutta (ZIB/TU) and his co-authors for being awarded the "Gödel Prize," and Barbara Zwicknagl for receiving the "Excellent Teaching Award" from the HU. We'd also like to welcome Alex M. Blumenthal of the Georgia Institute of Technology as MATH+ Visiting Scholar hosted by Maximilian Engel (FU).

On Women in Math Day on 12 May, we celebrated the 30th Kovalevskaya Colloquium with Friday speaker Anja Schlömerkemper (U Würzburg) and the corresponding Kovalevskaya Lunch. Read an interview with MATH+ Gender & Diversity Manager Tanja Fagel about the history. To highlight our own women in math, we interviewed Sarah Wolf (FU) and released her short film portrait on our MATH+ YouTube channel, where you can also find an interview and film portrait of Max Klimm (TU).

This newsletter also presents a short summary by Heike Solga (WZB, Berlin Social Science Center) of the recent paper on "Gender bias in W1 and W3 professor recruitment: Does discipline matter?" that is related to "MATH+ as a Sociological Research Project." Heike Solga presented her findings to the MATH+ public during a Spotlight Talk on 10 May.

To conclude this semester, the last **MATH+ Friday on 07 July will end with a great Summer Party at FU,** including the presentation of the MATH+ Dissertation Awards 2022, with a barbecue and lots of fun to be had. More details will follow by email. We look forward to seeing you there!

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.
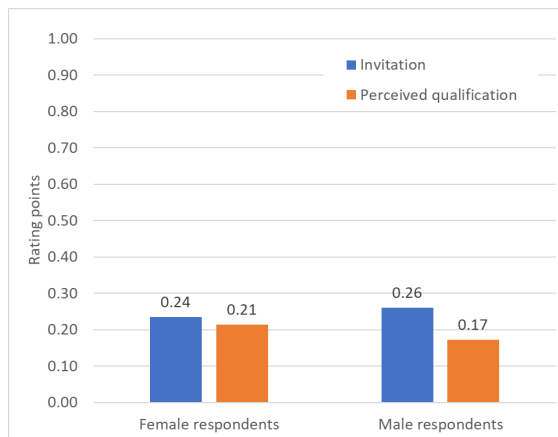
Best wishes for the summer semester, and I hope to see you soon,

MATH+ Chair

✚ MATH+ as a Sociological Research Project

MATH+ initiated and funds a sociological research project that studies MATH+ as an arena both for career decisions and academic selection. On 10 May, in a special Spotlight Talk, Heike Solga (WZB, Berlin Social Science Center) reported on their recent paper "Gender bias in W1 and W3 professor recruitment: Does discipline matter?" Here is her short summary:

Rating point advantage of female applicants by respondent (professor) gender

The underrepresentation of women among professors is a widely recognized problem in terms of productivity, diversity, and equity in academia. The prevailing narrative for this underrepresentation is that (un)conscious gender biases disadvantage female applicants in professorship appointments. Contrary to this narrative, recent evidence suggests that women are not less likely to be selected for professorships when they apply. We examined whether a gender bias in full professor recruitment exists and whether this differs between disciplines and by gender of the evaluating professors. In 2020, we conducted a factorial survey experiment with 1,857 professors from very different disciplines in Germany—mathematics/physics, political science/sociology/economics, and German studies.

We find no evidence of discrimination against female applicants; in fact, we find a modest advantage for female applicants in perceived qualifications and the likelihood of being invited for an interview (see Figure) - across disciplines and by both male and female professors. Our results support previous evidence showing that affirmative action policies have been effective in promoting women to professorships. They also suggest the importance of fixing the still-leaky pipeline to professorships (in particular by increasing the share of female applicants). **Read the entire paper** here.

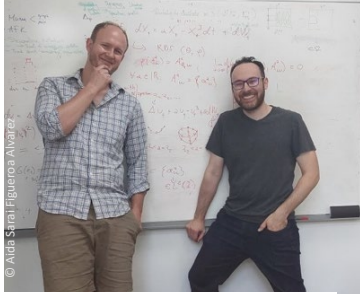### ✚ 30th Kovalevskaya Colloquium and Lunch on 12 May, Women in Mathematics Day

MATH+ and the BMS celebrated the 30th Kovalevskaya Lunch and Colloquium, held by Anja Schlömerkemper (Universität Würzburg), and the Women in Mathematics Day on 12 May. The lunch took place at FU Berlin, jointly organized with the CRC 1114, and preceded the Kovalevskaya Colloquium. It is an event that brings together young female mathematicians with a female professor who shares experiences from her career as a woman mathematician.

On the occasion of the 30th Kovalevskaya Lunch, Tanja Fagel, MATH+ Gender & Diversity Manager, gave us an interview with interesting insights into the popular tradition of the lunch. She describes the importance of the event for young female mathematicians, who experience female professors very closely as role models and can ask burning questions in a direct exchange.

✚ MATH+ Visiting Scholar Alex Blumenthal at FU Berlin

M. Engel (left) with A. Blumenthal

Read more

MATH+ is delighted to welcome Alex M. Blumenthal from the Georgia Institute of Technology, based in Atlanta, Georgia (USA), to join the MATH+ community as a MATH+ Visiting Scholar hosted by Maximilian Engel (FU).

He is a world-leading expert on ergodic theory and random dynamical systems, with outstanding contributions to these areas and their links with fluid dynamics, turbulence, and SPDEs. His research interests lie primarily in random dynamical systems focusing on chaotic behavior.

✚ Gavril Farkas (HU Berlin) Elected as "Member of Academia Europaea""

MATH+ Distinguished Fellow Gavril Farkas (HU Berlin) was elected as a fellow of the Academia Europaea (the Academy of Europe) in the mathematics section. Congratulations!

Academia Europaea is the Pan-European Academy of Sciences, Humanities, and Letters. Its objective is the "advancement and propagation of excellence in scholarship" through joint activities and events in education and research around the world. Its members are scientists and scholars from a wide range of disciplines nominated yearly by a committee of experts.

Gavril Farkas is the Director of the Institute for Mathematics and Professor of Algebraic Geometry at HU, where he also leads the Algebraic Geometry research group. He has been an active member of the Berlin Mathematical School (BMS) since his arrival and, in 2019, joined MATH+.

Read more

✚ "Gödel Prize" for MATH+ Member Sebastian Pokutta

Sebastian Pokutta has been awarded the Gödel Prize along with his co-authors and colleagues for their work on extended formulations in combinatorial optimization. Their paper, "Exponential Lower Bounds for Polytopes in Combinatorial Optimization," published in the *Journal of the ACM* in 2015, has been recognized for its groundbreaking contribution.

Sebastian Pokutta is a professor of mathematics at TU Berlin and Vice President of the Zuse Institute Berlin (ZIB). His research interests lie at the intersection of artificial intelligence and optimization, combining machine learning with discrete optimization techniques and the theory of extended formulations. This groundbreaking work explores the limits of computation in alternative models of complexity.

Read more

✚ Barbara Zwicknagl Received the "Excellent Teaching Prize" from HU Berlin

MATH+ member Barbara Zwicknagl has been awarded the "Excellent Teaching Prize" by Humboldt-Universität zu Berlin as Laureate of the year 2022. Congratulations!

The prize honors outstanding achievements in teaching at the Faculty of Mathematics and Natural Sciences and was awarded for the first time in 2009. All teachers can be nominated for this award by students and members of the faculty.

✚ "Tagesspiegel" Article, Short Film, and MATH+ Interview on Max Klimm's Research Projects (TU)

The Berlin newspaper "Tagesspiegel" has published an article on the interdisciplinary MATH+ research project, "Evolution Models for Historical Networks," by Max Klimm and his colleagues. Along with the article, MATH+ interviewed him on a few more MATH+ projects and released his short film on "Game Theory," produced by the Berlin University Alliance (BUA).

Max Klimm has been a junior professor for "Discrete Optimization" at Technische Universität Berlin since July 2020. His current research interests are in algorithmic game theory, discrete optimization, efficient algorithms, operations research, and mechanism design.

Read the interview and watch the short film

✚ Sarah Wolf: An Interdisciplinary Mathematician and her Film Portrait on "Decision Theatre"

Sarah Wolf has been MATH+ Junior Research Group Leader of the research group "Mathematics for Sustainability Transitions" at Freie Universität Berlin since 2019 and leads the "Schule@DecisionTheatreLab," a project funded by the Berlin University Alliance (BUA) and MATH+.

MATH+ has released her film portrait on a mobility model and the "Decision Theatre," produced by the BUA, to celebrate "International Women in Math Day" on 12 May.

A Decision Theatre is a workshop in which scientists, expert stakeholders, and citizens discuss a societal challenge and can use data and simulation results displayed on several big screens at the same time.

Read the entire interview

✚ The Following BMS Students Have Successfully Completed Their Doctorate

Philipp Schulze (TU Berlin)
"Energy-Based Model Reduction of Transport-Dominated Phenomena"

Philipp Reichenbach (TU Berlin)
"Invariant Theory in Computational Complexity and Algebraic Statistics"

Congratulations!

+ Celebrating and Honoring Günter M. Ziegler on His 60th Birthday

On 18-19 May 2023, more than 100 companions, long-term collaborators, former postdocs, and students came together or traveled from all over the world to pay their respects and celebrate Günter M. Ziegler's 60th birthday with a workshop at Zuse Institute Berlin (ZIB) on "GMZ 60: Geometry, Topology, Community".

Günter M. Ziegler is one of the most prominent representatives of mathematics in Germany and a highly valued member of the math community in Berlin. He was one of the founding fathers behind MATH+, and the Berlin Mathematical School, before he became president of FU Berlin in July 2018. He was re-elected for a second term in August 2022. For his contributions to mathematics research, he received the Leibniz Prize in 2001 and an ERC Advanced Grant in 2010. In 2008, the DFG awarded him the Communicator Prize.

For more information and a review on G. M. Ziegler's career, see the MATH+ website.

Read more

MATH+ Events

Preview

+ MATH+ Fridays:

07 July: Christian Kuehn (TUM): Multiscale Dynamics: From Finite to Infinite @FU (T9).

To celebrate the end of the semester and the presentation of the MATH+ Dissertation Awards 2022, all BMS/MATH+ community members are invited to the **MATH+ Summer Party!** There will be a barbecue in the courtyard in front of the computer science building at FU (Takustr. 9).

We look forward to seeing you there!

+ Spotlight Talks:

28 June: Olaf Parczyk (EF1-12): Learning Extremal Structures in Combinatorics

12 July: Ilja Klebanov (EF1-10): Kernel Ensemble Kalman Filter and Inference

+ 26th Berlin Mathematics Day (Tag der Mathematik) at HU Berlin with MATH+

The Humboldt-Universität zu Berlin hosted the 26th Berlin Mathematics Day on 06 May 2023, at the Adlershof Campus. Around 850 participants and 186 teams were able to dive into the world of math and participate in the team competition. Traditionally, the mathematical institutes of HU, FU, and TU Berlin take turns hosting this event annually. Other partners are the Berliner Hochschule für Technik, the Zuse Institute, and the Weierstrass Institute (WIAS).

In cooperation with the Norwegian Academy of Sciences, MATH+ funded the grand prize for the major mathematics team competition: a trip to Oslo. The winners got to attend this year's Abel Prize award ceremony to mathematician Luis A. Caffarelli.

MATH+ also participated with an information and mathematical games booth. The school project "Schule@DecisionTheatreLab" was of great interest to teachers. After the Berlin Mathematics Day, we were delighted to receive many applications from school classes to participate in this project.

+ "Excellent Pub Quiz" at "Long Night of the Sciences" (Lange Nacht der Wissenschaften Berlin)

As part of the Long Night of the Sciences (Lange Nacht der Wissenschaften Berlin) on 17 June, together with all seven Berlin Excellence Clusters, MATH+ hosted the "Excellent Pub Quiz" at the Technische Universität Berlin. TU Berlin was very helpful and provided a huge tent and all equipment. More than 28 teams and around 120 participants competed in a very relaxed atmosphere.

There were many great questions, lots of laughs, and prizes to be won. The questions ranged from a variety of research areas representing each cluster which included: applied-oriented mathematics, Catalysis/green chemistry, AI, neuroscience, active materials, world literature and liberal democracy. We hope to host similar events in the future, so stay tuned!

+ WANTED: Your Challenge for the MATH+ Advent Calendar 2023

While most of you are enjoying the summer, the MATH+ team is already busy organizing the next MATH+ Advent Calendar. We cordially invite you to actively participate by submitting your tricky puzzle. We strongly encourage you to submit your challenge and to present your research to a young and bright audience. Furthermore, engage your group members and (PhD) students! Please consider mathematical puzzles suitable for students in 10th grade or higher. If you need some inspiration, have a look at previous challenges and solutions on the Calendar webpage.

You can send your proposal including a solution in German and/or English by 31 August to schools@mathplus.de. If you have any questions or require assistance regarding the MATH+ Advent Calendar, please contact schools@mathplus.de.