Vera Traub receives the Heinz Maier-Leibnitz Prize

Vera Traub, Junior Professor at the Research Institute for Discrete Mathematics, receives the Heinz Maier-Leibnitz Prize of the German Research Foundation (DFG), together with nine other scientists. The prize is endowed with 200,000 euros. After Patrik Ferrari (2009) and Georg Oberdieck (2020), this is the third time in the last 15 years that the Heinz Maier-Leibnitz Prize has been awarded to a member of the Hausdorff Center for Mathematics.

According to the DFG, the Heinz Maier-Leibnitz Prize is considered the most important award in Germany for researchers in the earlier phase of their careers. The prize money has been increased from 20,000 to 200,000 euros for the first time. It can be used to fund further research within a period of up to three years. In addition, there is a 22 percent program allowance for indirect project costs. The awards will be presented on October 16, 2023 in Berlin.

Vera Traub conducts research at the interface of discrete mathematics and theoretical computer science in the field of combinatorial optimization. This deals with problems in which a particularly good solution is to be found from a large number of possible variants. In her PhD thesis, Vera Traub worked on so-called approximation algorithms for the traveling salesperson problem, in which the shortest round trip between several cities is to be determined without trying out all variants individually. Usually, certain algorithms are used for

this purpose. Vera Traub has found a new approach to this problem based on dynamic programming: Her algorithm finds significantly better solutions in the same amount of time than previous algorithms do. In her more recent work, she has also focused on the design of networks. Here, too, Vera Traub has been able to develop new methods that are superior to all previously known.

HAUSDORFF PEOPLE

Lisa Sauermann

Lisa Sauermann started as a Hausdorff Chair at the Institute for Applied Mathematics in August. She was already a member of the University of Bonn as an under-graduate student. Later, she obtained her PhD from Stanford University, and then spent time as a postdoc at Stanford University and at the Institute for Advanced Study in Princeton. In 2021, she became an Assistant Professor at the Massachusetts Institute of Technology (MIT). She was awarded the European Prize in Combinatorics in 2021, and a Sloan Research Fellowship in 2022. Starting this Fall, her research will be supported by the Heisenberg Program of the DFG.

Lisa Sauermann's main research area is probabilistic combinatorics, studying combinatorial problems using techniques from probability theory. In addition to proba-bilistic techniques, she also uses algebraic techniques in her work.

She is excited to return to the University of Bonn after nine years in the USA. In addition to the very active research environment, she is also looking forward to teaching in the bachelor's and master's programs in math at Bonn University (both of which attract outstanding students). Outside of math, she enjoys spending time with her family (she has two young daughters, 2 and 4 years old).

Welcome

Markus Hausmann

Markus Hausmann joined the Institute for Mathematics as a W2-Professor. Previously, Markus worked as an Associate Professor at Stockholm University for two years, and before that he was a postdoc in Copenhagen and in Bonn. Markus' research is in algebraic topology, in particular stable homotopy theory and its connections with algebraic and tensor-triangular geometry.

In the winter semester he will give a lecture on the Serre spectral sequence and bordism theory as well as a seminar on group cohomology. Markus is excited to now permanently join the active math community in Bonn and represent the field of topology in research and teaching.

In his spare time Markus tries to keep up with his small children and enjoys football and other outdoor activities.

Margherita Disertori, Regula Krapf, Joscha Gedicke and Dominik Liebl receive teaching awards

Margherita Disertori and **Regula Krapf** were awarded a teaching prize by the University of Bonn at this year's University Festival. Margherita Disertori is one of the four awardees of the Faculty of Mathematics and Natural Sciences, Regula Krapf received the award for extraordinary merits in teaching at the "Bonner Zentrum für Lehrerbildung" (Bonn Center for Teacher Education).

Joscha Gedicke received the teaching award of the Faculty of Mathematics and Natural Sciences, which was awarded to a total of eight lecturers at the Faculty Summer Festival. Furthermore, the Department of Economics honored **Dominik Liebl** with a teaching award in the category "Master Basic Module".

Current job openings of the HCM

There are currently three calls for applications at various career levels.

Hausdorff Postdocs
Application deadline: 2023/10/15
Call for applications: https://www.hcm.uni-bonn.de/opportu-nities/hausdorff-postdocs/official-announcement-postdocto-ral-positions/
Application portal: https://www.hcm.uni-bonn.de/en/oppor-tunities/hausdorff-postdocs/application2023/

Bonn Junior Fellows
Application deadline: 2023/09/16
Call for applications: https://www.hcm.uni-bonn.de/opportu-nities/bonn-junior-fellows/bjf-announcement/
Application portal: https://www.hcm.uni-bonn.de/opportuni-ties/bonn-junior-fellows/application/

Hausdorff Chair
Application deadline: 2023/10/31
Call for applications: University job portal

Applications in German or English with the usual documents (curriculum vitae, research plan, list of publications, description of teaching activities, copies of university certificates and diplomas) are requested in electronic form in one PDF document to the joint appointment committee of the participating faculties:

Hausdorff Center for Mathematics
Senior Search Committee
Endenicher Allee 62
53115 Bonn
Deutschland
email: frauke.beeken@hcm.uni-bonn.de

HAUSDORFF MIXED

Fourth place in worldwide mathematics competition in Bulgaria – outstanding individual rankings for the Bonn students

At this year's International Mathematics Competition for University Students (IMC) in Blagoevgrad (Bulgaria), the team of the University of Bonn achieved 4th place. Lennart Christian Grabbel even achieved an outstanding second place in the individual ranking among almost 400 participants with a score of 80 out of 100 possible points and received a so-called "Grand Grand First Prize" the highest possible award. The other Bonn students, Samuel Meyer (ranked 29th, 1st prize), Markus Janssen (ranked 66th, 1st prize), Maximilian Hauck (ranked 67th, 1st prize), Timo Lörke (ranked 92nd, 2nd prize), Julian Völlmecke (ranked 103rd, 2nd prize), Yang Zhang (ranked 165th, 3rd prize) and Iris Hebbeker (ranked 181st, 3rd prize) also achieved outstanding placements in the individual rankings.

Out of almost 70 participating teams, only the University of St. Petersburg (1st place), the Jagiellonian University in Kraków (2nd place) and the University of Tel Aviv (3rd place) finished ahead of the University of Bonn. The International Mathematics Competition for University Students has been held annually since 1994. The Bonn team regularly finishes among the top 10 universities. Many of the former students who have competed for Germany and other countries in the International Mathematical Olympiad (IMO) in recent years are now studying mathematics at the University of Bonn.

As every year, the Bonn team was supported by the Hausdorff Center for Mathematics. It was led by two other math students from Bonn, Paul Müller and Maximilian Göbel, who were also involved in the corrections.

Excursion to the DLR

What career opportunities are there for computer scientists and mathematicians at the German Aerospace Center in Cologne? That's what female math students from Bonn found out when they took a tour of DLR's facilities in Cologne as part of our joint equal opportunities work with the Bonn computer science department. In addition to discussions with employees on site, the students visited the European Astronaut Center.

BIGS poster session
on July 6th and 7th

Once a year, the PhD students of the BIGS present the state of their research. The Lipschitz Hall and the Plücker Room are full of posters, and filled with people engaged in discussions. The young scientists present their current research not only to each other, but also to interested postdocs and professors. The posters look as different as the topics themselves: some display just text and formulas, while others show computer-optimized representations of weasels, or three-dimensional structures reminiscent of origami. For two days, they explain, calculate, or even amend and correct their posters on the spot. There is even an election: The PhD students vote for the best poster that is awarded a book prize.

Science Festival

What would a science festival of the University of Bonn be without a booth of the HCM? On July 9, the Hofgartenwiese was a place to look at, to touch and to participate in science. The colorful stage program with a physics show for the smaller science fans and various bands for those willing to dance could be heard everywhere on the square, so that one did not have to choose between listening and trying things out. University sports were also represented, offering opportunities for physical exercise in midsummer temperatures.

The HCM booth, led by Thoralf Räsch and Fabian Weidt from the HCM school team, was a station of the TRAllye, but also had a lot to offer in other ways: Soap suds were used to visualize the shortest paths in a body, fractals were formed between drops of nail polish, and the Traveling Salesman Problem became tangible in the truest sense of the word with a simple map and string. Luise Puhlmann, who is working on her PhD thesis at the Research Institute for Discrete Mathematics, answered numerous questions. In addition, a competitive board game that we developed ourselves,

enabled the visitors to experience how atoms behave during crystal growth when different spreading crystal regions get in each other's way. Here, Tim Laux was available as an expert, because this is exactly the kind of question he deals with in his research. Hands-on math. Not only the little ones participated enthusiastically.

The Bonn Math Club in Kazakhstan

Last year, for the first time in Germany, our Bonn Math Club hosted FEMO, a math Olympiad for elementary school children. In the newsletter of "Mathematik-Olympiaden e.V." was reported about it in detail. Some of the children qualified by very good results for the international round in Almaty, Kazakhstan. For most parents, the trip to such a distant and foreign country was too expensive and exhausting, but not for two particularly courageous children, namely first-grader Paul and fifth-grader Klymentii. "Klim" originally comes from Ukraine and is now a permanent member of the Bonn Math Club. Also present were Paul's mother and grandmother, as well as two tutors from the Bonn Math Club, namely Svetlana Nordheimer and Cindy Klink. Svetlana and Cindy were invited to Kazakhstan by the organizer to conduct the FEMO also in sign language for the first time. Ludvig, a deaf Armenian refugee boy, who lives in Germany and also regularly attends the Bonn Math Club, participated in this form of FEMO online. In the meantime, word has spread around the world about our efforts to get many children to participate in the math club, including those with physical disabilities. We hope that this will enable us to generate momentum beyond the Math Club. The local organizers came up with a lot of ideas for the supporting program: sports activities, trips to the steppe and the mountains, and much more, so that the children took home much more than just certificates. But the competition was also quite successful from a mathematical point of view: Paul won the team competition on site together with other children! Whether a Bonn team will fly to Kazakhstan again is rather written in the stars, but we have already been promised a digital participation opportunity for

next year. Here you can watch an impression video, a montage of our social media coverage.

Summer party of the Math Club

The Bonn Math Club had a wonderful summer party with about 100 participants. Even more families wanted to participate, but unfortunately, we had reached capacity.

The youngest ones tried their hand at the Soma cube, the huge Skyscraper puzzle (which had only just been assembled) and numerous match stick puzzles, while the slightly older children puzzled over riddles around the large chess board, competed against each other in a blitz chess tournament and solved combinatorial problems around the game SET with Regula Krapf. Afterwards we played a big game of Werewolf with everyone. We would like to thank the very young helpers, some of whom are still students themselves, and the extremely committed and generous parents for their fantastic support!

Diversity Days 2023

In May, the Diversity Days of the University of Bonn took place for the second time. The event was divided into a panel discussion and the Fair of Opportunities, coinciding with the Dies Academicus. The set up was already very inclusive:

alternating sign language interpreters, translation into English thanks to headphones, a ramp at the podium, posted awareness notices for respectful interaction and an awareness

team to help with questions or problems. The panel discussion highlighted the importance of addressing and resolving the assumed contradiction of diversity and excellence. A suggestion was made to provide rules of conduct addressing discrimination and violence at the beginning of each course to keep the topic present in a low-threshold way. This idea is actually one that we at HCM have already incorporated at the CLAP. Special attention was paid to disabilities. Accessibility and suitable accommodations require more resources. Many questions remain. Among them, how to reach those who are not open to the issue and how to regain the lost trust of marginalized groups. At the Fair of Opportunities, various points of contact inside and outside the university presented themselves with individual booths. Next year, HCM will be there as well!

Students' Week

Our student week ran this year with once again interesting topics: the mathematics of the game SET, as well as scales and nomograms. With the help of finite geometry and the pigeonhole principle, Antje Kiesel and Nik Oster showed the interested young people that with 21 cards there must always be a SET. Such statements can also be generalized to more attributes. On the final Saturday, there was a rally across the campus. We would like to thank all participants, the organizers from the HCM school team as well as the lecturers!

Hirzebruch Lecture

After a four-year Corona break, the Hirzebruch Lecture was held again in May. At the beginning, Catharina Stroppel once again commemorated the eponym of the series, Friedrich Hirzebruch, and presented the key data of his life. Afterwards, Rahul Pandharipande (ETH Zurich) gave a lecture on "Moduli in Mathematics" in the lecture hall of the University Club. The hall was filled to capacity. Fortunately, many young students were present in addition to the regular audience. For all those who do not want to wait until next year, there is good news: In November, the Hirzebruch Lecture will be continued. On 09.11. Bernd Sturmfels will give a lecture at the University Club. We are very excited and looking forward to it!
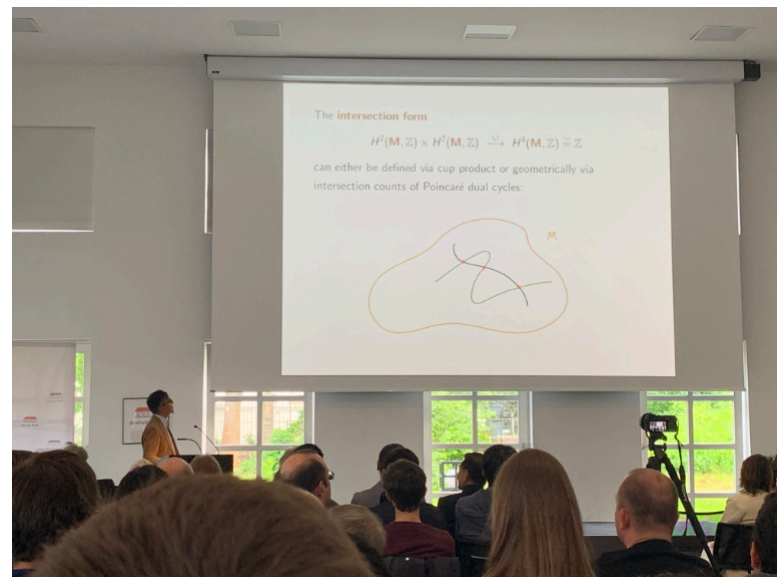
HAUSDORFF Inside HCM

What actually is ... a BJF?

Bonn Junior Fellows (BJF) are additional W2 professorships of HCM limited to five years, some of which have tenure track options. Excellent scientists who are at the beginning of their career are actively sought for these positions.

The positions have reduced teaching loads and come with postdoctoral fellows and their own travel and guest funds. Since BJFs are not hired to cover required classes, the best candidates worldwide can be selected, regardless of the research area.

Currently, these Bonn Junior Fellows are in Bonn:

Johannes Alt
(IAM, since 2023)

Research areas: Random matrices, in particular eigenvalue and eigenvector distributions of non-Hermitian random matrices and adjacency matrices of random graphs

Anne Driemel
(Computer Science, since 2018)

Research areas: efficient algorithms and data structures in metric spaces with application in machine learning and discrete algorithmic geometry

Florian Brandl
(Economics, since 2021)

Research areas: microeconomic theory, including social choice theory, decision theory, and game theory.

Tim Laux
(IAM, since 2020)

Research areas: non-linear partial differential equations, calculus of variations, and applied analysis, in particular geometric evolution equations

Christian Brennecke
(IAM, since 2021)

Research areas: mathematical physics, in particular the analysis of interacting many-body systems from quantum and statistical mechanics, such as Bose-Einstein condensates and spin glasses

Barbara Verfürth
(INS, since 2022)

Research areas: numerical methods for PDEs, multiscale methods (finite elements), numerical homogenization, (time-harmonic) wave propagation, Helmholtz and Maxwell equations, quasi-linear PDEs

Hanna, Claire + Mathis
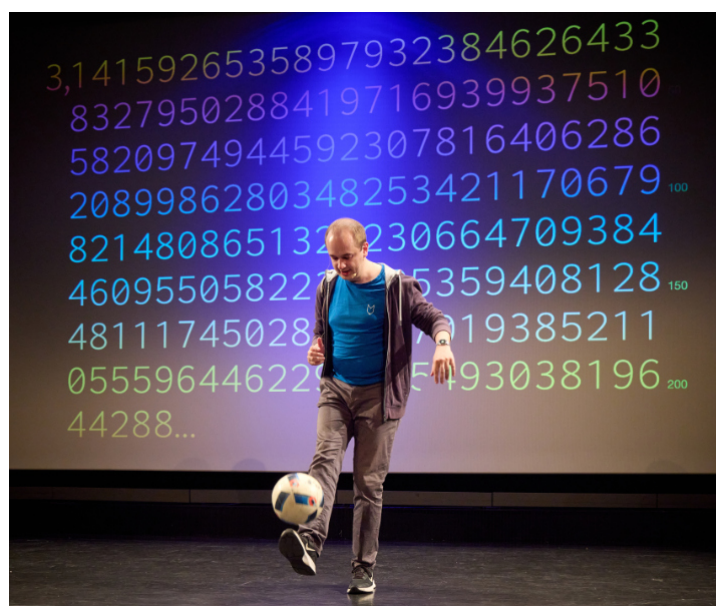
News from the Bonn Mathematical Society

A fantastic Circus Mathematicus with many highlights

The Bonn Mathematical Society, in cooperation with the HCM, hosted a magnificent and in this form unique "Circus Mathematicus". On the theater stage of the LVR-LandesMuseum Bonn, Bonn lecturers and students performed alongside some well-known superstars of the German mathematics outreach scene and delighted the audience, who joined in loudly and celebrated the performances throughout. With 260 spectators, including many children from the Bonn Math Club, the event was fully booked. We could have easily "sold" 1000 tickets - the event was of course free of charge. Circus director Thoralf "Thoralfio" Räsch led through the evening in a highly professional manner. To start with, the circus group "Adel Lombaggine" from the Sankt-Adelheid-Gymnasium in Bonn-Pützchen, under the direction of Julia Rötten, who also works in the HCM school team, thrilled the audience with acrobatics and juggling skills. Afterwards, the extremely charismatic clown Puòfarlo (alias Rainer Kaenders) pulled a calculating horse onto the stage, which later turned out to be 11-time mental arithmetic world champion Gert Mittring. The psychologist from Beuel, who was already a star guest at the Bonn Math Tournament in 2017, amazed the audience with numerous math tricks, including a difficult prime factorization, but also actively engaged the audience and explained in detail how simple multiplications can also be performed well without a calculator

using one's own hands. Handicapped by a hand injury, Jessica Fintzen unfortunately could not go on hands as planned, but shone with a one-handed cartwheel. The famous YouTuber DorFuchs performed twice: once with a rap song in which he proved the irrationality of Pi, and later with a live world record in which he recited the first 190 digits of Pi by heart while simultaneously juggling a soccer ball on his foot to the beat. In addition, Albrecht Beutelspacher enchanted the audience in his usual manner with paper, glue, Möbius strips, dodecahedra and hearts. Andreas Steiger (ETH Zurich) also succeeded with a lecture on the mathematics of

the so-called poi art as well as a grandiose light show. Some of our math students delivered a breathtaking and at the same time amusing performance as a knot dance group. From a mathematical point of view, behind the unfolding of the knots there is quite sophisticated mathematics (continued fractions or operations of the group $SL(2,Z)$). An amazing evening that ended after 3.5 hours with thunderous applause from the audience!