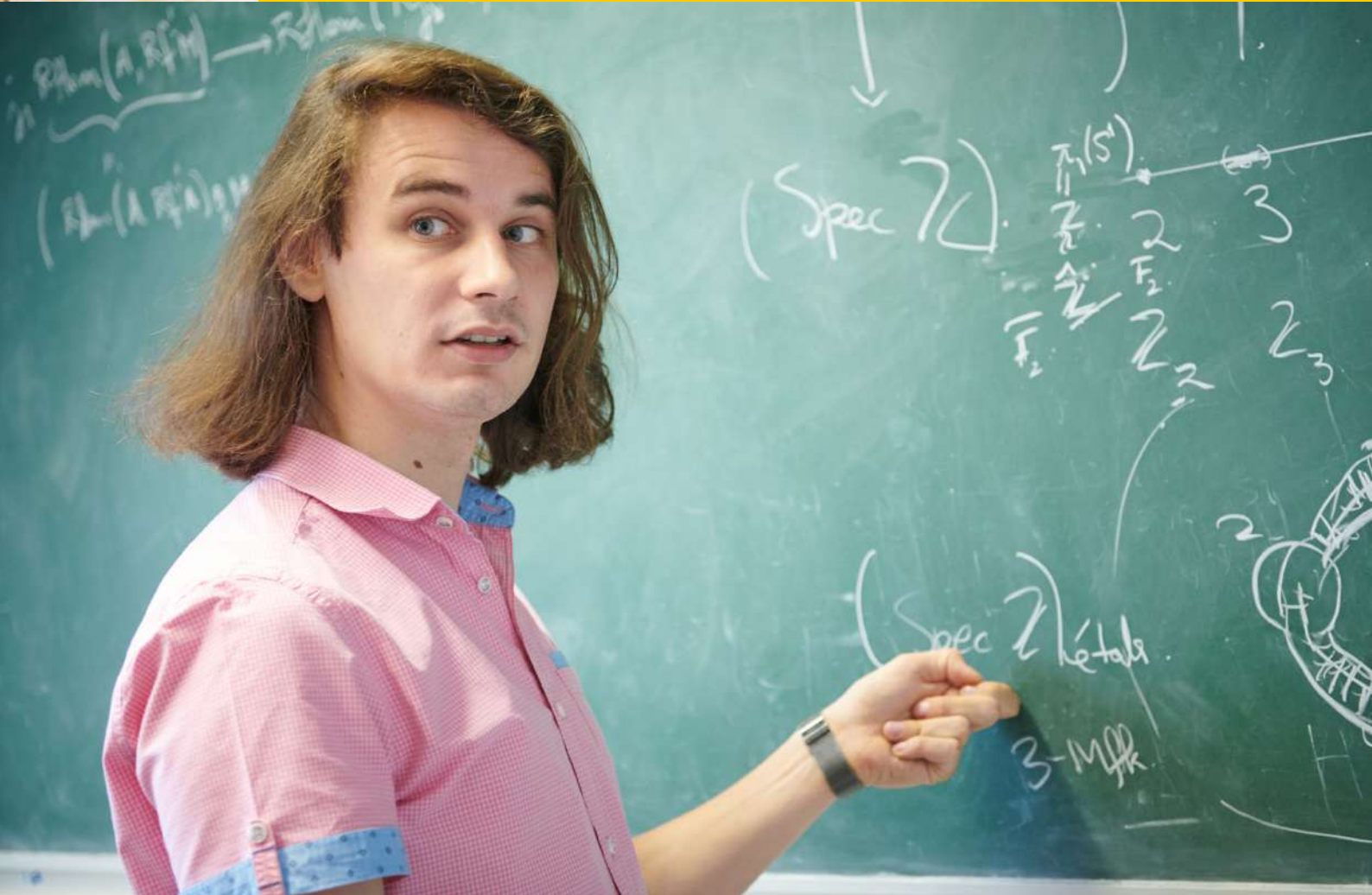# Pius XI Medal Awarded to Peter Scholze

Peter Scholze, director at the Max Planck Institute for Mathematics and member of the HCM, has been awarded the Pius XI Gold Medal by the Pontifical Academy of Sciences. The medal is awarded every two years to a young scientist under the age of 45, chosen for his or her exceptional dedication. After Luis A. Caffarelli (1988), Laure Saint-Raymond (2004), and Cédric Villani (2014), Peter Scholze is only the fourth mathematician to receive this honor.

The Pontifical Academy of Sciences is the only supranational academy of sciences in the world. Founded in Rome in 1603 as the first exclusively scientific academy in the world with the name Linceorum Academia, to which Galileo Galilei was appointed member in 1610, it was reestablished in 1847 by Pius IX with the name Pontificia Accademia dei Nuovi Lincei. The Academy was moved to its current headquarters in the Vatican Gardens in 1922, and given its current name and statutes by Pius XI in 1936. The mission is to honor pure science wherever it may be found, to ensure its freedom, and to encourage research for the sake of scientific progress.

The 80 Pontifical Academics are appointed for life by the Pope upon proposal by the academic body and they are chosen with no ethnic or religious discrimination amongst the most eminent scientists and scholars of the mathematical and experimental sciences across the world. Developmental scientist Joachim von Braun, who works at the University of Bonn, has been President of the Academy since 2017; he became a member in 2012.

HAUSDORFF PEOPLE

Bonn graduate Maryna Viazovska received the Fields Medal

Maryna Viazovska became the second woman ever to receive the Fields Medal this year, which was presented at the International Congress of Mathematicians (ICM) in Helsinki in early July. The 37-year-old mathematician comes from Ukraine and is a professor at EPFL (École polytechnique fédérale de Lausanne) in Switzerland.

Maryna Viazovska received the Fields Medal for her solution to the problem of sphere packing in dimensions 8 and 24. The question of how to pack spheres as close together as possible has occupied mathematics for more than four centuries. As early as 1611, Johannes Kepler suspected that this could best be achieved in the form of a pyramid. His hypothesis was not proven until 1998.

Viazovska solved the problem for dimensions 8 and 24; there the solutions are particularly elegant. "The difficulty is that although the problem remains the same, each dimension is different and the optimal solution depends strongly on the dimension," the mathematician said. Experts praised the originality and elegance of her proof, which made use of the modular forms that were a focus of her dissertation.

As a PhD student under Don Zagier at the Max Planck Institute for Mathematics in Bonn, Viazovska attended our Bonn International Graduate School of Mathematics (BIGS).

Today's award marks the third time that the Fields Medal has gone to a former PhD candidate from Bonn - following Maxim Kontsevich, who also earned his PhD under Don Zagier in Bonn in 1992 and received the medal in 1998, and Peter Scholze, who was honored with the Fields medal in 2018.

Maryna Viazovska was born on December 2, 1984, in Kiev, Ukraine. After earning a bachelor's degree in Kiev, she completed a master's degree at the Technical University of Kaiserslautern and then moved to the University of Bonn to pursue a doctorate, which she completed in 2013. After a Postdoc position in Berlin, she joined EPFL in 2016, where she was promoted from a tenure-track assistant professorship to a full professorship in 2017.

Teaching Awards for Peter Scholze and Heiko Röglin

Two HCM members have received this year's Teaching Award from the University of Bonn: Peter Scholze (Mathematics) and Heiko Röglin (Computer Science).

A total of 13 university lecturers at the University of Bonn have been awarded the teaching prizes for their services. The students themselves had selected those lecturers who now received awards for their achievements. The ceremonial presentation of the certificates by the Vice-Rector for Studies, Teaching and University Development, Klaus Sandmann, took place in the garden of the Rectorate building.

Ana Caraiani wins the New Horizons in Mathematics Prize and Vera Traub wins the Maryam Mirzakhani New Frontiers Prize

Ana Caraiani, our new Hausdorff Chair, has been awarded a highly endowed research prize: the New Horizons Prize in Mathematics. The $100,000 award is awarded to early-career researchers who have already made a significant impact on their field. In addition, Vera Traub, junior professor at the Research Institute for Mathematics, received the Maryam Mirzakhani New Frontiers Prize worth $50 000, which is awarded to up to three outstanding female mathematicians who have completed their PhDs within the past two years.

Langlands Program and arithmetic geometry. In 2007, the Association for Women in Mathematics awarded Ana Caraiani the Alice T. Schafer Prize. In 2018, she was one of the winners of the Whitehead Prize of the London Mathematical Society, and in 2020 she won the EMS Prize. Having started her position at Bonn some weeks ago, Ana is very convinced of the excellent opportunities here: "Bonn is one of the best places in the world to work on arithmetic geometry."

The world's largest science prize, the Breakthrough Prize awards up to five $3 million prizes each year for major contributions to fundamental physics, life sciences and mathematics. For the eleventh year, the Breakthrough Prize, renowned as the "Oscars of Science," recognizes the world's top scientists. Each prize is $3 million and presented in the fields of Life Sciences, Fundamental Physics and Mathematics. In addition, up to three New Horizons in Physics Prizes, up to three New Horizons in Mathematics Prizes and up to three Maryam Mirzakhani New Frontiers Prizes are given out to early-career researchers each year. The Breakthrough Prizes were founded by Sergey Brin, Priscilla Chan and Mark Zuckerberg, Julia and Yuri Milner, and Anne Wojcicki and have been sponsored by foundations established by them. Selection Committees composed of previous Breakthrough Prize laureates in each field choose the winners.

Vera Traub was awarded the Maryam Mirzakhani New Frontiers Prize for "advances in approximation results in

classical combinatorial optimization problems, including the traveling salesman problem and network design". Vera was also recently appointed to the University of Bonn as a junior professor at the Research Institute for Discrete Mathematics. She is also a member of the HCM. Previously, she was a postdoctoral researcher in Rico Zenklusen's group at ETH Zurich. Like Ana Caraiani, Vera Traub has a long-standing relationship with the University of Bonn: she completed her dissertation in 2020 under the supervision of Jens Vygen at the Research Institute for Discrete Mathematics and received prestigious awards for this work (the Hausdorff Memorial Prize and the EATCS Distinguished Dissertation Award). In her PhD thesis, Vera Traub made important breakthroughs on open questions of the Traveling Salesman Problem (TSP). Subsequently, she achieved fundamental advances in network design. The TSP and network design are among the most prominent problems in combinatorial optimization.

Ana Caraiani is awarded the New Horizon in Mathematics Prize for "diverse transformative contributions to the Langlands program, and in particular for work with Peter Scholze on the Hodge-Tate period map for Shimura varieties and its applications". She has recently taken up a Hausdorff Chair at the HCM. Since the establishment of the Hausdorff Center, these additional W3-professorships have been filled with outstanding international scientists based on a candidate-focused search. The 37-year-old Romanian is the first woman to hold this position. Ana Caraiani already had a close connection to Bonn: In 2016, she became a Bonn Junior Fellow and, after her appointment at Imperial College London, remained associated with the Hausdorff Center as a Bonn Research Fellow. She works at the interface between the

ERC Grants for Valentin Blomer and Georg Oberdieck

Good news for the Hausdorff Center: Two members of the Mathematical Institute received a coveted grant from the European Research Council (ERC) and with this funding of millions of euros for the next five years. Valentin Blomer received an Advanced Grant, Georg Oberdieck a Starting Grant.

"Automorphic Forms and Arithmetic" (AuForA) - this is the name of the project led by Valentin Blomer that is in the field of basic mathematical research. In this project, Blomer investigates connections between classical number-theoretic objects such as integer matrices or integer solutions of equations on the one hand and complex and highly structured functions, the so-called automorphic forms, on the other hand.

At the center are three fundamental mathematical conjectures – unsolved for more than 15 years – whose common conceptual feature is the statistical behavior of automorphic forms in certain families. The project aims to help achieve substantial progress and solutions for these three conjectures. The ERC Advanced Grant will provide Blomer with approximately two million euros for his research over the next five year**s.**

Enumerative geometry is a classical area of mathematics that deals with the question of how many objects of a certain type exist on a given geometric space, or more precisely on an algebraic variety. Studying and possibly solving these counting problems helps to understand new aspects of the geometry of these spaces and often leads to interesting new algebraic structures as well as to new connections between geometry and other subfields of mathematics. In the project **"Correspondences in enumerative geometry: Hilbert schemes, K3 surfaces and modular forms" (K3Mod)** Georg Oberdieck investigates the enumerative geometry of algebraic surfaces, in particular the so-called K3-surface.

The focus is on proving correspondences between different enumerative theories and thereby gaining new insights into these theories. A central goal is to determine the Gromov-Witten theory of Hilbert schemes of points on algebraic surfaces. Part of Oberdieck's approach is to prove symmetries of generating functions of invariants and thereby to establish a connection to modular forms, a classical branch of number theory. This allows complicated structures to be computed by determining a few coefficients. The K3Mod project is part of algebraic geometry, but it also features numerous connections with representation theory, number theory and physics. It is funded by the ERC Starting Grant with about 1.5 million euros.

Georg Oberdieck receives the Dubrovin Medal

Georg Oberdieck has received the Dubrovin Medal 2022, for his extraordinarily masterful and creative cycle of papers on the enumerative geometry of Hilbert schemes in K3 surfaces, and related manifolds, culminating in his paper on holomorphic anomaly equations for the Hilbert scheme of points of a K3 surface.

The Dubrovin medal, in memory of Boris Anatolievich Dubrovin, Professor at SISSA from 1993 to 2019, is awarded by SISSA, with the support of the Moscow Mathematical Society, the "Gruppo Nazionale per la Fisica Matematica" (GNFM) and the "Gruppo Nazionale per le Strutture Algebriche, Geometriche e le loro Applicazioni" (GNSAGA), which are part of the Istituto Nazionale di Alta Matematica (INDAM). It is a special prize that recognizes exceptionally promising young researchers who have made outstanding contributions to the fields of Mathematical physics and Geometry. The medal is awarded every two years since 2020.

Jessica Fintzen wins the Whitehead Prize of the London Mathematical Society

Jessica Fintzen, professor at our Mathematical Institute and member of the Hausdorff Center for only a few months now, was awarded the Whitehead Prize of the London Mathematical Society (LMS) for her groundbreaking work in representation theory, in particular as it relates to number theory via the (local) Langlands program.

The 2022 LMS Prize winners were announced at the Society Meeting on July 1, 2022. The Whitehead Prize is awarded yearly by the London Mathematical Society to multiple mathematicians working in the United Kingdom who are at an early stage of their career. The prize is named in memory of homotopy theory pioneer J. H. C. Whitehead.

The laudatio says: "Fintzen's main work has contributed to the understanding of the representations of a p-adic group, especially its supercuspidal representations. Among other things, Fintzen's work has led to the construction of previously unknown representations, sharpened our understanding of when tame constructions of types and representation are valid, and extended results into the modular representation setting."

It took Jessica Fintzen a few days to fully grasp the significance of the award herself. She received the news at a time when she was on conference travel in the UK and her laptop broke down. Only more detailed research a few days later made her realize the significance of the Whitehead Prize, and she learned which famous mathematicians had won it in the past: among them the Fields Medalists Caucher Birkar, Simon Donaldson, Timothy Gowers, Martin Hairer, and James Maynard, but also Andrew Wiles and Richard Taylor. Some current Bonn mathematicians have also been among the prize winners in recent years: Ana Caraiani, Barbara Niethammer, and Catharina Stroppel.

Gossen Award for Christian Bayer

Christian Bayer, an economist at the University of Bonn and HCM member, has received this year's Hermann Heinrich Gossen Award from the Verein für Socialpolitik (VfS) in recognition of his outstanding and internationally recognized research achievements. The prize is awarded once a year to an economist under the age of 45 from a German-speaking country. It is endowed with 10,000 euros and is intended to promote the internationalization of economics.

The main criterion for awarding the prize are publications in internationally recognized journals. "Christian Bayer has made numerous significant contributions to the empirical analysis of macroeconomic impact mechanisms," lauds VfS Chairman Georg Weizsäcker. Bayer's contributions are consistently innovative, and in some (much-cited) cases can be categorized as foundational methodological research.

Christian Bayer deals with models with heterogeneous agents. For example, different firms are affected very differently by macroeconomic shocks, which raises the empirically important question of their different responses to a shock. In several empirical papers, Christian Bayer, for example, demonstrates the widely dispersed response of entrepreneurial investment decisions.

However, the study of heterogeneity in Christian Bayer's work also relates to household responses to economic shocks. For example, an incipient recession leads to noticeably higher income risks for households, which is why some households opt for more liquid financial portfolios out of caution. This can exacerbate a crisis, as the withdrawal of funds from illiquid forms of investment also lowers aggregate investment. Significant further aspects of household heterogeneity relate to the labor market: wage fluctuations, labor supply and migration decisions, for example, vary with some household characteristics, which is picked up in Christian Bayer's sophisticated empirical analyses. "Macroeconomic shocks do not affect all market participants equally, nor do they act simultaneously. The analyses of models that include heterogeneous agents, developed by Christian Bayer and his co-authors, have significantly increased the understanding and quantification of the transmission of shocks," emphasizes Weizsäcker.

The prize is named after the Prussian lawyer Hermann Heinrich Gossen (1810 - 1858). With his work "The Development of the Laws of Human Intercourse, and the Rules for Human Action Flowing Therefrom," Gossen is considered one of the most important precursors of the modern marginal utility school.

Humboldt Research Award for Bill Cook

Bill Cook from the University of Waterloo (Canada) has received a research award of the Alexander von Humboldt Foundation. He will intensify the collaboration with Bernhard Korte, Director of the Research Institute for Discrete Mathematics. The prize is endowed with 60,000 euros.

Bill Cook is considered a world-leading expert on the traveling salesman problem. How can a round trip through different cities be organized along the shortest route? Mathematicians have been racking their brains over this optimization problem for many decades. Cook is also the world's leading expert in the algorithmic solution of this problem. For example, he solved a 3,038-city problem optimally in 1992. This piece of work was selected by Discover Magazine as one of the 50 best scientific achievements. Recently, together with Keld Helsgaun of Denmark, he calculated a tour of the three-dimensional position of 2,079,461 stars. He was able to prove that his solution can only deviate from the shortest possible solution by a factor of at most 0.0000074. To imagine this, consider a trip from Bonn to Berlin, which must not be more than one car length longer than the shortest possible route. This work was highlighted as a special achievement in New Scientist magazine in 2020.

Bill Cook conducts research and teaches at the University of Waterloo (Canada). With a research award from the Alexander von Humboldt Foundation, he will now visit the University of Bonn several times. "I will primarily be working with Professor Korte and other members of the Research Institute for Discrete Mathematics," says Bill Cook. "But I also look forward to participating in other activities at HCM." The scientist hopes to advance discrete optimization solutions at the University of Bonn, including the traveling salesman problem and its applications.

Bernhard Korte, Director of the Research Institute for Discrete Mathematics, has been conducting research at the highest international level in the optimization of highly complex computer chips for decades. To date, more than 3,000 chips have been designed worldwide using the BonnTools developed by the scientists, including the chip that defeated Kasparov in chess. Bill Cook is no stranger to Bonn. From 2006 to 2017, he was a member of the scientific advisory board of the Hausdorff Institute for Mathematics (HIM). "It was a great experience," Cook says. He also participated in HIM's Combinatorial Optimization trimester program. "HIM is an ideal setting for trimester programs," he says. "It gets researchers out of their offices and gets everyone talking."

HAUSDORFF EVENTS

Successful series of lectures on the Riemann conjecture

"The 7 Greatest Adventures in Mathematics"

In 2000, the Clay Mathematics Institute published a list of seven major mathematical problems. These millennium problems were considered the central questions of mathematics at that time. With only one exception, the Poincaré conjecture, they remain unsolved to this day. This year, the nationwide event series "The 7 Greatest Adventures in Mathematics" runs from June to November. Initiators of the series of events are the "Junge Akademie" and the German Mathematicians Association (Deutsche Mathematiker-Vereinigung; DMV). Different mathematical research sites organize their own events, which focus on one of the mathematical problems. In the lectures, renowned mathematicians explain how current relevant mathematical research works and make it visible even to laypersons why mathematics is so exciting. The series of events, which is also supported by the German Research Foundation (DFG), aims to bring out enthusiasm for the adventure of mathematics.

We at the Hausdorff Center contributed to this nationwide event with a series of lectures on the Riemann conjecture, perhaps the best-known representative of a millennium problem. A diverse overview of this problem was presented in an event for high-school students and in three public lectures. A musical concert completed the event. The lectures on Wednesday and Thursday were addressed to a broad audience; only the lecture on Friday required some prior mathematical knowledge.

The series of events started successfully with a workshop on prime numbers aimed at school students. Valentin Blomer, who not only organized the series but also participated as a lecturer and as a pianist, used the example of even numbers to explain how the "fundamental theorem of arithmetic" is far from self-evident. Afterwards, the students dealt with the statistical distribution of prime numbers: In a random drawing of n numbers, what is the probability of catching a prime number from the first n numbers? An "exact answer" would be given
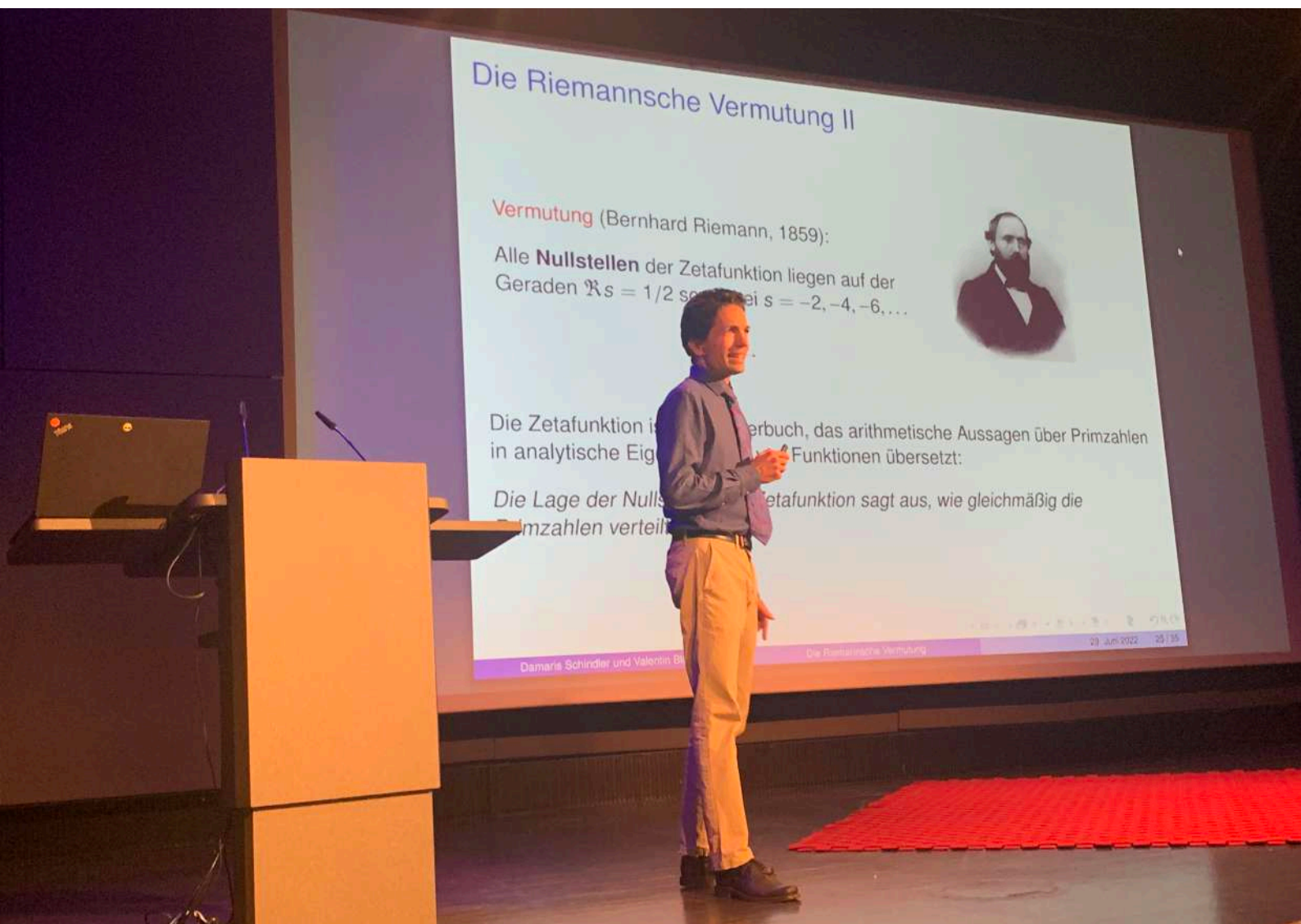
by Riemann's hypothesis, but already Gauss knew a very good approximation, with the help of which the students performed some thought experiments. Finally, Valentin Blomer explained in which applications prime numbers play an important role (cryptography, keyword RSA). There were many questions from the students, some of which also concerned the security of the method. We are happy that we created so much interest.

A week later, the program continued with public lectures in the beautiful LVR Landesmuseum. At the introductory lecture on Wednesday, about 100 guests in the lecture hall listened to Damaris Schindler and Valentin Blomer, explaining how two completely different versions of Riemann's hypothesis (arith-

metic vs. analytic) are closely connected. The didactically sophisticated lecture introduced laymen to the topic, but it definitely brought new insights for many mathematically educated listeners as well! On the second day of our series, the number of audience members even increased to 120 during the lecture and up to 150 during the concert. Norbert Schappacher told the story of some well-known key problems in mathematics, like the squaring of the circle, Fermat's last theorem and finally the Riemann Hypothesis. All of these conjectures greatly expanded the range of methods in mathe. matics, and often the original problem was solved with a so-called overkill (proving more general statements that contain the original problem only as a special case). Historical

anecdotes with incredible detailed knowledge enriched the lecture.

Afterwards, members of the Akos Quartet and Valentin Blomer delighted the audience with works by Debussy and Mendelssohn Bartholdy. On the last day, Valentin Blomer and Damaris Schindler presented us with the current state of research on the Riemann Hypothesis in an understandable way. Somewhat disconcertingly, there has been little significant progress made in recent years, and hardly any fundamentally new approaches have emerged in decades. Presumably - but who

knows for sure - we are still far, far away from a proof. On the other hand, we have been shown a lot of circumstantial evidence which leaves little doubt about the correctness of the Riemann Hypothesis. No role plays the number of zeros with real part 1/2, which were already found in numerical calculations. It was exciting to see which theorems arise from the Riemann hypothesis and how many problems are equivalent to it (keyword: random walk). All three events were moderate with passione and with high expertise by Thoralf Räsch. We thank all speakers and the moderator for three days of best entertainment and many exciting insights!

Festive Colloquium for Carl-Friedrich Bödigheimer - Many Contributions to Mathematics in Bonn

On June 24, 2022, the Mathematical Institute held a celebratory colloquium to mark the upcoming retirement of Carl-Friedrich Bödigheimer. The scientific lecture in the almost full occupied Lipschitz Hall was given by Ulrike Tillmann from the University of Oxford, a long-time colleague of Carl-Friedrich Bödigheimer and of Bonn mathematics. In her talk "60 Years of Configuration Spaces" Ulrike Tillmann spoke about one of Carl-Friedrich Bödigheimer's research topics, specifically the applications to moduli spaces of surfaces.

After a half-hour break, during which the guests could enjoy coffee, tea and cake, the traditional Praise and Criticism was announced as the second part of the event. This part was framed by two chamber music performances by musicians of the Bonn Beethoven Orchestra, who gladly took up the personal preferences of the honored guest and offered the guests an impressive little concert with a string quartet movement by Beethoven and the grandiose clarinet quintet by Brahms. The program booklet for the musical concert was marked with the initials CFB.

First of all - in the spirit and to the delight of the honoree and in strict adherence to the official order - Daniel Huybrechts from the Mathematical Institute, the Chairman of the Mathematics Department, Anton Bovier, the Dean of the Faculty of Mathematics and Natural Sciences, Walter Witke and the

Rector Michael Hoch addressed our honored guest. They thanked him for his almost 30 years of service at the University of Bonn. As expected, the criticism part was very modest. Only the rector did not miss the opportunity to mention in a very friendly and highly personal way the pointed but always accurate objections of Carl-Friedrich Bödigheimer, with which even he as rector was scolded from time to time during the numerous meetings. The audience smirked, as this is how his colleagues know and appreciate our honored person to be in the various joint meetings and discussions.

All speakers praised Carl-Friedrich Bödigheimers sense of duty, his commitment to the university and to the students. He served on so many boards, committees, and in so many offices during his time at the University of Bonn, that is now coming to an end, that none of the speakers made a serious attempt to present a complete list of his achievements. He was Executive Director of the Mathematical Institute several times, including most recently during the Corona pandemic, in which he led Bonn mathematics through this restrictive period with the necessary measures and policies. He was a member of the examination boards in mathematics for many years and played a major role in the design of the bachelor's and master's degree programs. Even before the founding of HCM, he oversaw the establishment of the BIGS graduate school in mathematics, which later became an important pillar of the

Cluster of Excellence. He was one of the driving forces behind the initial application for the Cluster of Excellence. He was in charge of the application for a graduate college in topology and then also speaker of this graduate college, which was very close to his heart from the beginning. He was the first chair of the Mathematics Department after the previous Mathematics/Computer Science Department split into two divisions. At the faculty level, he played a major role in the redesign of the PhD regulations in 2011 and was a member of the Faculty Council for many years.

Since Carl-Friedrich Bödigheimer has been working for the German National Academic Foundation ("Studienstiftung des deutschen Volkes") for more than 20 years as a lecturer, member of the Board of Trustees and most recently as a member of the Board of Directors, Annette Julius, the Secretary General of the German National Academic Foundation, did not miss the opportunity to thank him as well.

The last word of the afternoon was given to the honoree. He thanked the previous speakers, as well as his companions and colleagues, and in his entertaining but no less emotional speech he mentioned some of the highlights of his time at the University of Bonn. He made it clear that the work in academic self-administration, often described as dry and time-consuming, can have entertaining sides, for example when it comes to convincing the administration that the setting-up of a Christmas tree by the mathematics student council is more than desirable; an e-mail drafted for this purpose, unfortunately never sent to the administration, which was in his well-known manner very pointed and carefully crafted, caused much laughter among the guests.

The official ceremony was followed by a convivial reception and a buffet with wine and non-alcoholic beverages. Many anecdotes were exchanged, with the honored person always in the middle of the conversations.

Application Training for our Postdocs

IAs part of our Hausdorff School soft skills program, the workshop "Job application training" for our postdocs took place in May. It was led by coach Karin Bodewits. In the workshop, the participants received advice for a successful job application and learned interview strategies for scientists: how to 'sell' their skills, how to stand out from the crowd and how to score the job they really want. At the end of the workshop, Stefan Schwede as a senior researcher contributed some personal experiences and advice from his long-term involvement in selection committees and answered many questions. Following the workshop, most of our Postdoc students took the opportunity of individual consultations that was offered to them.
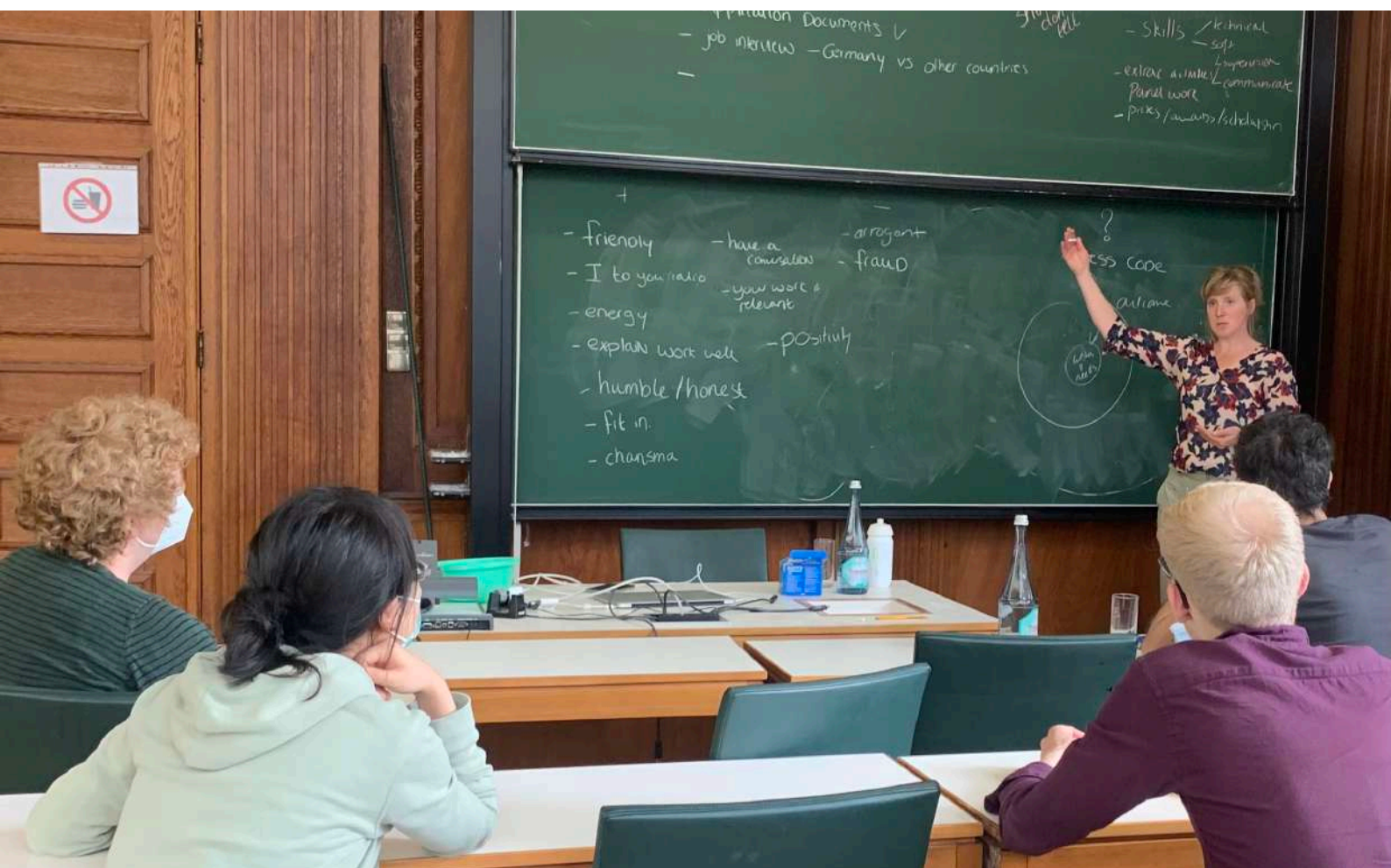
Pupils Week

At the beginning of September, our students' week took place. We worked on various mathematical topics such as knot theory, parquetization and discrete algorithms. This gave the students an insight into the daily routine of math studies. On Saturday, the week ended with a rally to get to know the Poppelsdorf campus better. Many thanks to all lecturers and tutors for the great dedication!

Bonner Math Tournament – with around 350 students

At the end of September, we hosted again our wonderful Bonn Mathematics Team Tournament for high-school students, with about 70 schools and 350 students taking part. In the first part of the competition, the so-called "relay", our HCM Dream Team with Sergio Conti, Jessica Fintzen, Christoph Thiele, Iris Hebbeker and Lars Becker participated out of competition. The topic of the second part of the competition was Max-Plus algebras and their applications in timetable optimization. The supporting program was very interesting: Rainer Kaenders held a teacher training on the topic "Integrate with paper! Unusual methods of area determination", while Martin Ulirsch from Frankfurt University introduced the students to tropical geometry and especially to matroids in a lecture after the tournament. The event was moderated by Thoralf Räsch and Julia Rötten and organized by the HCM school team. The first three places were taken by:

1st place: Stiftisches Gymnasium, Düren
2nd place: CJD Christophorusschule, Königswinter
3rd place: Ernst-Moritz-Arndt-Gymnasium, Bonn

All three schools will join the winning teams from the Netherlands and Belgium on a joint prize trip to Antwerp in January.

HAUSDORFF MIXED

German Research Foundation funds AI projects – HCM is involved

Artificial intelligence (AI) is getting a boost: the German Research Foundation (DFG) is funding a total of eight new AI research units with a total of 31.4 million euros. Two projects from the University of Bonn in the fields of geodesy and precision agriculture are among them and the Hausdorff Center for Mathematics is involved in the first of these two projects. The millions in funding will flow over the next four years wit the possibility of an extension.

The first of the two projects, "Algorithmic data analysis for geodesy", deals with the measurement of the Earth's surface and its dynamic processes, including, for example, sea-level rise or traffic flows. "Geodesists work with a wide range of spatiotemporal data and increasingly use methods from artificial intelligence," says Petra Mutzel, member of the Hausdorff Center for Mathematics. She is the spokesperson of the new research unit "Algorithmic Data Analysis for Geodesy (AlgForGe), which is expected to be funded by the DFG with up to three million euros over the next four years. Heiko Röglin and Anne Driemel from the Hausdorff Center are also involved.

The central goal of the new research unit is to bridge the gap between current research in the fields of artificial intelligence and geodesy. "The aim is to establish lasting links between the two disciplines in order to provide a more solid algorithmic foundation for future research on automation in geodesy," says Petra Mutzel.

The research unit is based at the Institutes of Computer Science and Geodesy and Geoinformation and is complemented by researchers from the Universities of Cologne and Düsseldorf. According to the spokesperson, "With its interdisciplinary research activity, the DFG research unit also strengthens the Center for Earth System Observation and Computational Analytics (CESOC) founded by the universities of Bonn, Cologne and the Research Center Jülich." The research unit has received funding from the Trandisciplinary Research Area (TRA) "Modelling" since its early phase and is also closely related to the TRA "Sustainable Futures" as well as to the two Clusters of Excellence Hausdorff Center for Mathematics and PhenoRob at the University of Bonn.

Impressions from the Euler Lecture in Berlin

As reported in the last newsletter, our HCM speaker (at that time) Wolfgang Lück had the honor to hold the famous Euler Lecture in Berlin this year. This prestigious event took place for the 29th time. The title of his lecture was "A panorama of L2-invariants". The laudatio with the remarkable title "Would you like some tea?", presented not merely the numerous impressive prizes and awards, but also a statistic with impressive and perhaps less known numbers from the academic life of Wolfgang Lück: 137 publications, 65 co-authors, 27 PhD students – of which 9 are now professors – 109 alumni in total, 63 conferences co-organized and the world record for the number of visits to the Mathematical Research Institute Oberwolfach (MFO)! Wolfgang came back from Berlin with great memories: "I was impressed by the professional organization and the ambience in the 'Blauen Palais' and in the salon of the Wefelscheid family at the Brandenburg Gate, where you could talk to many interesting people from science and other fields in a wonderful atmosphere."

Math trip of the Bonn Math Club

In mid-June, we organized a wonderful math trip with the Bonn Math Club for a whole weekend with a lively program. 24 high-school students, including 12 girls and 12 boys between the ages of 8 and 17, as well as three tutors (Iris, Eric and Stefan), made their way to Duisburg to the youth hostel Duisburg Land-schaftspark. The journey to the hostel was somewhat chaotic: in addition to the obligatory delay of the Deutsche Bahn, two streetcars were cancelled and the doors of two other street-cars were jammed, causing them to come to a standstill for several minutes. In addition, with two wheelchair-bound children participating, we realized that German train stations and streetcar stops are anything but barrier-free. But once we arrived, we were in good spirits and had a wonderful evening with games designed to get to know each other: Werewolf, Ubongo 3D and many more. The next day, things really got down to mathematics: In two groups, we taught a course on coding theory for five hours, inter-rupted only by a lunch break. This course continued on Sunday and dealt with numerous exciting topics with practical relevance: from parity codes with and without weights to EAN and ISBN13 numbers, codes using the Dieder group as they were used on the earlier DM bills, to the in-genious Hamming code and its error-correcting application in CD and DVD players. With the group of the older students, we covered even more ad-vanced topics. The program was rounded off by an exciting city rally where the high temperatures brought some of us to our physical limits, as well as by a long game evening on Saturday. We can only say: We are happy and proud to have so many very special, lovable and extremely talented children and teenagers in the Bonn Math Club!

Grants for Mathematics students from Ukraine

The Department of Mathematics offers 10 grants for Bachelor or Master students of Mathematics who had to leave their former university or their country due to the war in Ukraine. They are invited to continue their studies in Bonn and they will receive special support. The grants will amount to 900 € per month for two years, with a possible extension.

As a volunteer in Rwanda

Christian Kremer from our HCM team for school activities visited Rwanda to help organize math camps for Rwandan students. In Kigali, he prepared three camps with a team of international and local volunteers and with the African Institute for Mathematical Sciences - AIMS Rwanda - in Kamonyi, Musanze and Rwamagana. In the future, we will continue to send students form our team to African countries as volunteers and fund their travel. We are sure that our students will benefit a lot from this initiative, learn a lot and gain invaluable ex-perience! In this way, we are continuing the cooperation with AIMS, which we have already established quite successfully with the Young African Mathematicians Visitor Program (YAM) on another level as well.

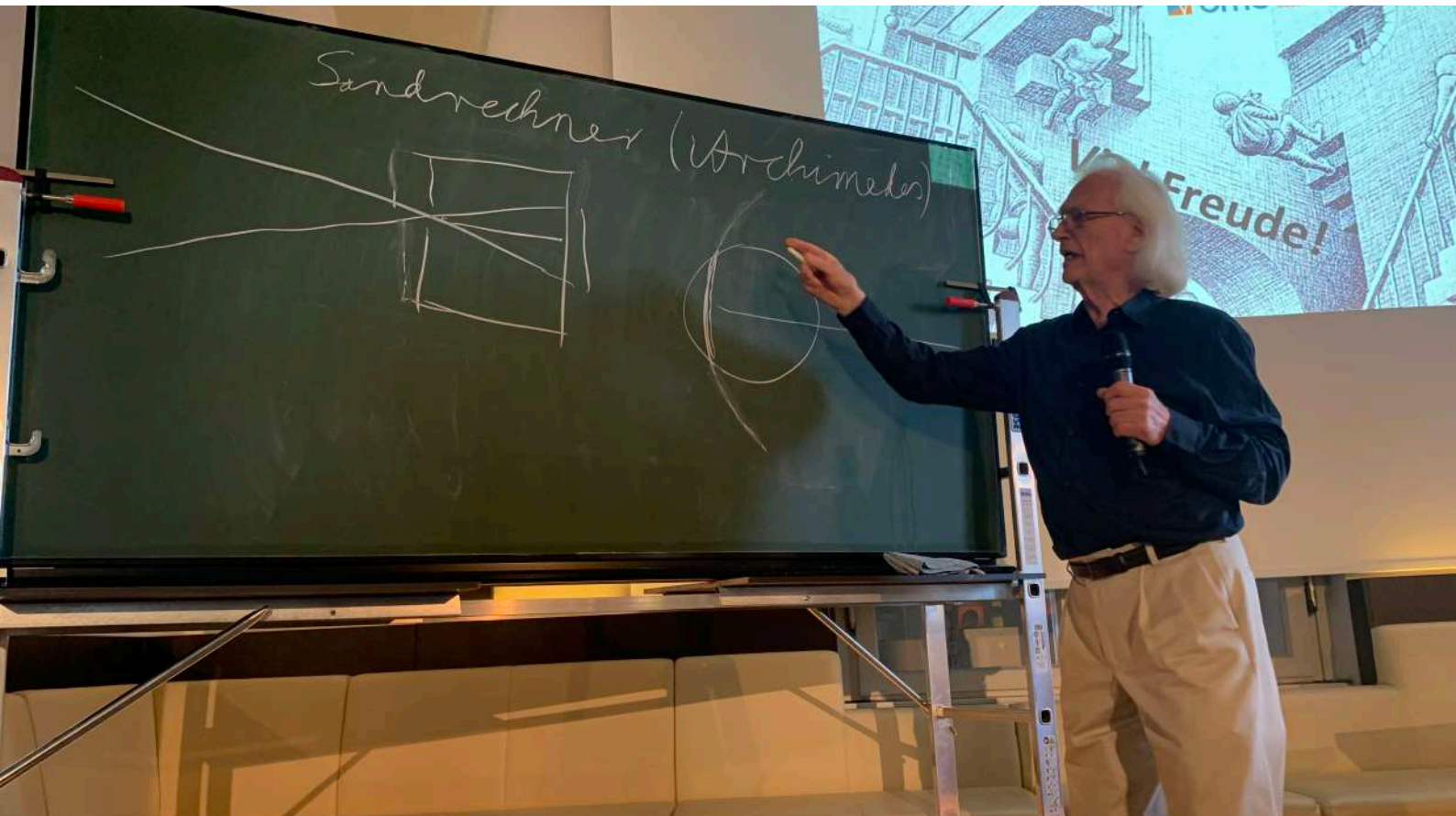**News from the Bonner Mathematischen Gesellschaft**

New logo

The Bonn Mathematical Society has a new logo. Of course, all mathematicians immediately recognize the cycloid. And this is how the "new" Bonn Mathematical Society sees itself: always on the move.

Valsche Vorträge Vestival

The Bonn Mathematical Society does not take itself and mathematics more seriously than necessary. And from time to time, it also takes a self-deprecating or critical look at mathematics. The event "Valsche Vorträge Vestival", which took place in the "Fritz Café" of the university's main building, was entirely in keeping with this motto. The speakers Karl Fegert, Hermann Karcher, Regula Krapf, Jochen Feldhoff and Aloisius Görg broke the rules for a lecture on mathematics, and showed in an intuitive, illogical, funny or absurd way the absurdity of selected problems from textbooks, or fooled the audience with deliberately false proofs. A highlight was certainly the performance of Rainer Kaenders as a completely excited American math professor "Canthat", who caused great amusement with a deceptively genuine-seeming nonsense lecture about commutative diagrams and exact sequences with "home" and "work" functors ("this sequence splits and this is called Home Office").