HAUSDORFF SPECIALS

World of Numbers

Third quarter of the 200th anniversary
year of the University of Bonn

Bonn Mathematics participates in the festivities on the occasion of the 200th anniversary of the University of Bonn with many events between July and September. During the third quarter of the year which is titled "Welt der Zahlen" ("World of Numbers") the focus is on ... numbers: Numbers in science, but also in other disciplines like philosophy, art, or religion. Of course, the mathematical dimension must hold a prominent spot here. Be it cultural history, chip design, infinity, game theory, digital film studio, music, or painting - with a series of lectures, mathematicians from Bonn will convey (possibly surprising) insights in their métier to everyone who is interested. At the open day at the Max Planck Institute (on Sept 14) and at the "Aktionstag Mathematik" ("Action Day for Mathematics") at the Mathematics Center in Bonn (on Sept 15) guests and mathematicians will get together. There will be talks and interactive programs for young and old where they can get a multifaceted experience of mathematics.

Moreover, our "Week for high school students" and the "Bonn Mathematical Tournament" will take place in the third quarter. During these events high school students are given the opportunity to get to know mathematics in a different context than in school lessons.

At another big event, the world of numbers will be approached from yet another angle: In our "Excellence Slam" (on Aug 27), a science slam organized by the two Clusters of Excellence, Hausdorff Center for Mathematics and Immunosensation, supported by the iGEM team Bonn. Both clusters will send three contestants each from mathematical and immunological areas to compete against each other.

In November, we give special attention to Felix Hausdorff. Using his alias 'Paul Mongré', he wrote the play "Der Arzt seiner Ehre" ("The doctor of his honor") which will be performed (on Nov 3 & 4) in honor of his 150th anniversary on November 8, 2018, by the theater group of the Protestant Students Community Bonn.

Suitable for the FIFA World Cup, the quarter started with the opening talk "**Das Spiel dauert 90 Minuten – wer rechnet da-mit?**" (on July 9) in which numbers in top-level competitive sports were examined.
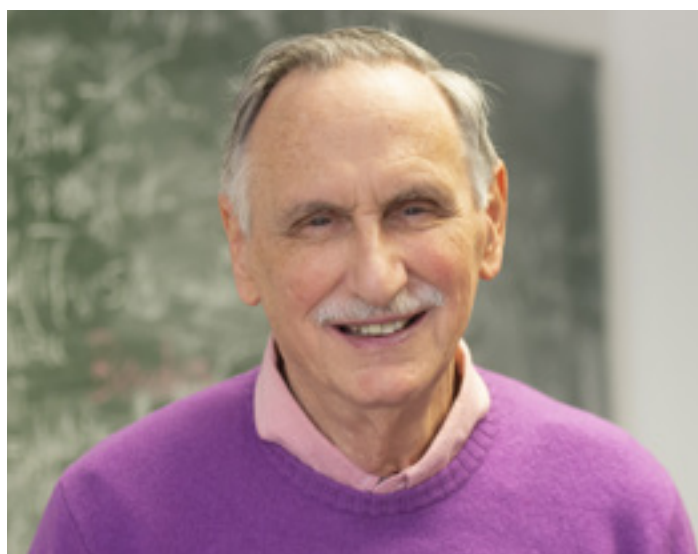
Overview on the program of Bonn Mathematics

Program of the third quarter of the University of Bonn

Wir SEIT 200 JAHREN

HAUSDORFF SPECIALS

Jens Frehse received Golden Commemorative Medal

Professor (em.) Jens Frehse was awarded the Golden Commemorative Medal of the Faculty of Mathematics and Physics of the Charles University in Prague for his extraordinary scientific career and significant contributions to the Analysis of Partial Differential Equations.

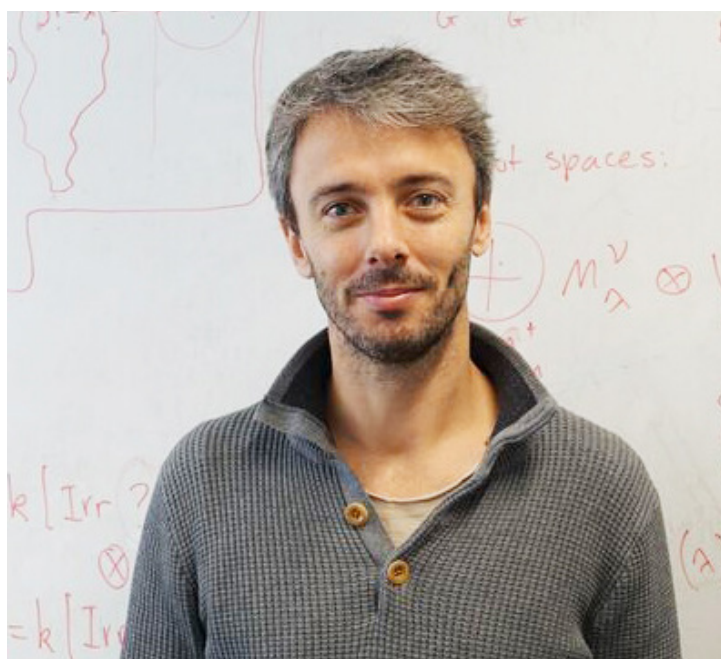### Honorary Doctorate for Sergio Albeverio

The Stockholm University will award Professor (em.) Sergio Albeverio the honorary doctorate "Doctorate of Philosophy honoris causa". Since the University's founding, only eight other mathematicians have been awarded this honor: P. Painlevé, E. Lindelöf, P. Myrberg, A. Kolmogorov, H. Cartan, J.-P. Serre, H. Langer, and G. van der Geer. The award ceremony of the honorary doctorate will take place on September 28 in Stockholm.

Geordie Williamson elected Fellow of the Royal Society

Bonn Research Fellow Geordie Williamson was elected Fellow of the Royal Society. He is the youngest scientist ever to receive that honor. From 2011 to 2016, he was an Advanced Researcher at the Max Planck Institute for Mathematics and member of HCM. Since 2017, he is Professor for Mathematics at the University of Sydney and, since 2018, he is also Bonn Research Fellow at HCM.

For his fundamental contributions to the field of representation theory, Geordie Williamson has already received various prizes including the Chevalley Prize of the American Mathematical Society, the European Mathematics Society Prize, the Clay Research Award, and the New Horizons Prize in Mathematics (with Ben Elias). This year, he was invited to give a plenary talk at the International Congress of Mathematicians in Rio, Brazil.

The Royal Society is the oldest scientific institution of its kind in the world. It was established in 1660 in the UK and has about 1,600 Fellows and Foreign Members from the UK and the Commonwealth. Each year, the Fellows elect up to 52 new Fellows and up to 10 new Foreign Members from a group of about 700 candidates, who are also proposed by the Fellows.

Sources: Royal Society and Max Planck Institute for Mathematics

HAUSDORFF EVENTS

Girls' Day 2018 – An insight into the world of encryption

April 26, 2018

Emails and messages which are sent with a smartphone should not be read by a third party. That is why they are encrypted most of the time. About 30 participants of the Girls' Day got to know various methods of encryption and how to encode messages on their own. Moreover, they had the opportunity to talk to students as well as academics in mathematics and ask them all the questions they had.

HAUSDORFF PEOPLE

Since June 1, **Dr. Christina Lienstromberg** is a new postdoc in the group of Professor Stefan Müller and in SFB 1060. Before coming to Bonn, she worked as postdoc at the University of Hannover. She also did her PhD studies there and at Université Paris-Saclay / École Normale Supérieure in Cachan in the scope of a Cotutelle graduation under the supervision of Professor Joachim Escher (Hannover) and Dr. Pierre Gosselet (Cachan). In her PhD thesis she examined coupled systems of partial differential equations to describe the dynamics of microelectromechanical systems. After that she started to work on thin films of non-Newtonian fluids.

Summer School on Types, Sets and Constructions
Hausdorff School und Trimester Program Activity

May 03 to 09, 2018

HAUSDORFF EVENTS

Dies Academicus

May 16, 2018

The Faculty of Mathematics and Natural Sciences invited the public to the inaugural lectures in mathematics given by Dr. Philipp Lücke and Dr. Diogo Teixeira de Oliveira e Silva to complete their "Habilitation". Dr. Philipp Lücke gave his inaugural lecture on "Turing-Maschinen und Grenzen der Berechenbarkeit" ("Turing machines and the limits of computability"). He talked about the question whether every mathematical problem can be solved by a computer. He showed, among other things, that limitations of computers can be demonstrated with the help of the Turing machine, a concept developed by Alan Turing. Dr. Diogo Teixeira de Oliveira e Silva explained in his talk "How to turn it?" what is the smallest area whithin the plane which is required to rotate a unit line segment by 180 degrees. The answer was found in 1927: an arbitrarily small area. The solution of the problem had an extensive impact on different fields of mathematics, from the theory of partial differential equations to number theory and combinatorics. Both speakers were awarded the title "Privatdozent".

In commemoration of the 100th anniversary of the death of Georg Cantor, Professor Walter Purkert gave a talk on the quantification of infinity at the International Center for Philosophy NRW.

11.
Bonn Science Night and Science Tent

May 17 to 18, 2018

How to find the shortest round trip between several cities? Visitors of the booth of HCM at the science tent on the Münsterplatz in Bonn had the opportunity to see how far they could get towards the solution of the problem with the hands-on exhibits. This problem is based on the traveling salesman problem, which was picked in the framework of the overall topic of the science night, "Kreisläufe" ("Circuits"). A team of students gave the visitors an understanding of the matter, and PhD student Vera Traub of the Research Institute for Discrete Mathematics explained her latest research results in this area, for which she received a "Best Paper Award" together with Professor Jens Vygen.

Mathematical Salon

May 24, 2018

"Wittgenstein and Gödel: The great philosopher and the great logician of the 20th century attend a lecture in Vienna"

Professor Taschner of the Technical University of Vienna and founder of the project "math.space" told a mathematical story made for a mathematical salon. He did not need any presentation slides and only one sketch on the blackboard to make his point. He talked in a very entertaining manner about the memorable lecture in 1926 which both Wittgenstein and Gödel attended and which then had a remarkable impact on further developments in mathematics. A piano quartet in variable formation (Lilian Steinhäuser - violin, Susanne Hilger - viola, Kristian Hess - violoncello, Benjamin Hilger - piano) accompanied the evening with a music performance.

Summer festival at Campus Poppelsdorf
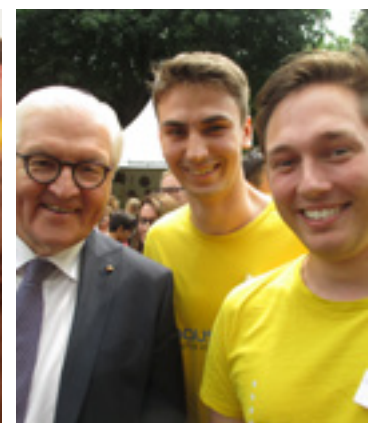
June 9, 2018

Large crowds came to visit the summer festival of the University of Bonn at Campus Poppelsdorf. More than 15,000 people gathered to celebrate together with the University. Many of them also visited the booth of the Hausdorff Center. Hands-on exhibits as for example soap films, with which the shortest connection between three or more points could be found, tesselation with small wooden planks, and the kids game "House of Nikolaus" invited the visitors to solve mathematical problems with a lot of fun in a summerly ambience. At the beginning of the festival, Thoralf Räsch entertained the guests with a small "Excellence Slam", introducing the big "Excellence Slam" that will take place on August 27.

Open day at Villa Hammerschmidt

June 24, 2018

The traveling salesman problem, fractals, graph theory, and probability: guests at the open day at the Villa Hammerschmidt, to which Bundespräsident Frank-Walter Steinmeier and his wife Elke Büdenbender had invited the public, were introduced in surprising ways to all of these mathematical topics. Young and adult visitors were invited to try to solve the "House of Nikolaus", find the shortest roundtrip between cities with a string on a map, or create fractals with nail polish at HCM's booth. Also the mayor of Bonn, Ashok Sridharan, solved some mathematical problems with the students.

For one hour, HCM presented itself also at the booth of the University of Bonn. Professor Sergio Conti and Vera Traub answered questions of the visitors there.

HAUSDORFF CALENDAR

Workshop: Proofs and Computation
Trimester Program Activity
July 2 to 6

Toeplitz Kolloquium 2018
Johan Deprez (Löwen)
July 2

BIGS Poster Exhibition 2018
July 5 to 6

Growth in Topology and Number Theory: Volumes, Entropy, and L2-torsion
July 9 to 13

Der Zauber der Zahlen
Prof. Dr. Don Zagier
July 10
* World of Numbers

Hausdorff Kolloquium 2018
Ana Vargas (Universidad Autónoma de Madrid)
Peter Koellner (Harvard University)
July 11

Alles was zählt - Kulturgeschichte des Rechnens
Prof. Dr. Ina Prinz
July 11
* World of Numbers

7 Nanometer and beyond - Mathematik des Chipdesigns
Prof. Dr. Dr. h.c. Bernhard Korte
July 18
* World of Numbers

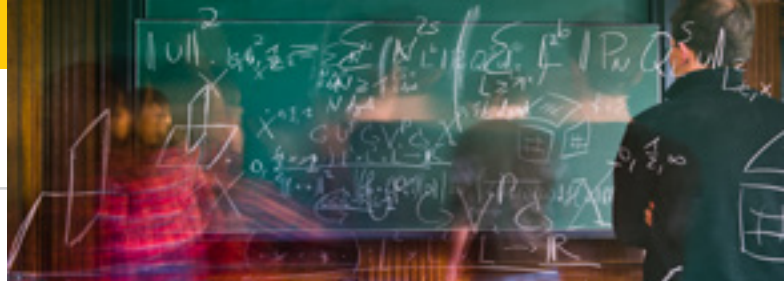**Optimal Transport meets Economic Theory**
Hausdorff School
July 23 to 27

Workshop: Constructive Mathematics
Trimester Program Activity
August 6 to 10

Mathematische Theorien unendlicher Zahlen
Prof. Dr. Peter Koepke
August 6
* World of Numbers

Combinatorial Optimization
Hausdorff School
August 20 to 24

Follow-up Workshop to Trimester Program "Combinatorial Optimization"
August 27 to 31

Mathematik in Entwicklung 2018 Advanced teacher training
August 27 to 31

Excellence Slam
August 27
* World of Numbers

Unique continuation and inverse problems
Summer School
September 2 to 7

Logic and Algorithms in Group Theory
Trimester Program
September 3 to December 20

SchülerInnenwoche 2018
September 5 to 8

Hinterm Komma geht's weiter
Prof. Dr. Rainer Kaenders
September 6
* World of Numbers

Summer School on Logic and Algorithms in Group Theory
Hausdorff School and Trimester Program Activity
September 10 to 14

Das Spiel mit der Zahl - Spieltheorie
Prof. Dr. Dezsö Szalay
September 10
* World of Numbers

Title: T.B.A.
Prof. Dr. Sergio Conti
September 12
* World of Numbers

Max Planck Day - Open day at the MPI for Mathematics
September 14
* World of Numbers

Action Day for Mathematics at HCM
September 15
* World of Numbers

Mathematik im digitalen Filmstudio
Prof. Dr. Martin Rumpf
September 19
* World of Numbers

Bonner Mathematikturnier 2018
September 21

Young Women in Mathematical Physics
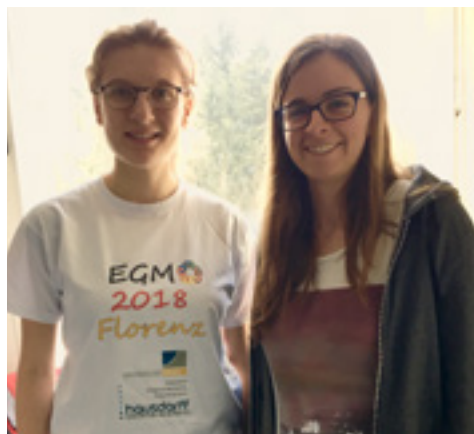**September 24 to 26**

Talks and events for the 200th anniversary of the University of Bonn for the public are marked with: ** World of Numbers*
All these talks are in German.

Wir SEIT 200 JAHREN

HAUSDORFF MIXED

HCM supports Germany's girls' team together with IBM

left: Luise Puhlmann and Susanne Armbruster lead the German team; **above:** Three of the four members of the German team together with „Mathematigerin", the German mascot, at the preparatory seminar in Bonn.

First participation of Germany in the European Girls' Mathematical Olympiad

Since 2012, the European Girls' Mathematical Olympiad (EGMO) has been taking place annually. During the seventh EGMO this year in Florence from 9 to 15 April 2018, for the first time a German team attended. Under the leadership of Susanne Armbruster and Luise Puhlmann, the high school students Kerrin Bielser, Katharina Albert, Annegret Seibt, and Carmen Brannath competed for Germany. In the years before, Germany's participation had failed - due to missing financial support. For HCM, the promotion of young scientists as well as an increase of women in mathematics are very important concerns. In addition, Bonn has a long tradition in maths competitions and is the favored choice with former participants of the International Mathematical Olympiad (IMO): over 58 % (!) of all German IMO participants of the last 10 years who have finished school are studying or have studied in Bonn, including the current German team leader. Therefore, it was no question for the Hausdorff Center, when it was asked, to support the German team in this year's competition. From 23 to 25 March, a final preparatory training took place in Bonn, which was financially supported by HCM and organized by Bonn master and PhD students, including the current BIGS PhD student and former IMO participant Malte Lackmann. HCM also helped the German team to find external donors and sponsors. IBM Germany - in the framework of its program "Women in Blue" - agreed to bear the incurred travel and accommodation costs in Florence.

The German team ranked on 33rd place, in the middle of the table.
Kerrin Bielser received a bronze medal.

Find here an **interview with Annegret Seibt and Katharina Albert** (in German).

New Horizons in Mathematics Prize for Maryna Viazovska

The former BIGS student Maryna Viazovska was awarded the New Horizons in Mathematics Prize 2018 "for the remarkable application of the theory of modular forms to the sphere packing problem in special dimensions". Already in 2017, she received the Ramanujan Prize. Maryna Viazovska was a doctoral student of Professor Don Zagier in the MPIM graduate school from 2008 to 2012. She obtained her PhD from the University of Bonn in 2013.

Since 2016, the New Horizons in Mathematics Prize is awarded annually to young scientists who have already made important contributions to research in their fields. It is funded by Mark Zuckerberg and Yuri Milner.

Source: Max Planck Institute for Mathematics, Breaktrough Prize Photo: https://breakthroughprize.org/Laureates/3/L3820