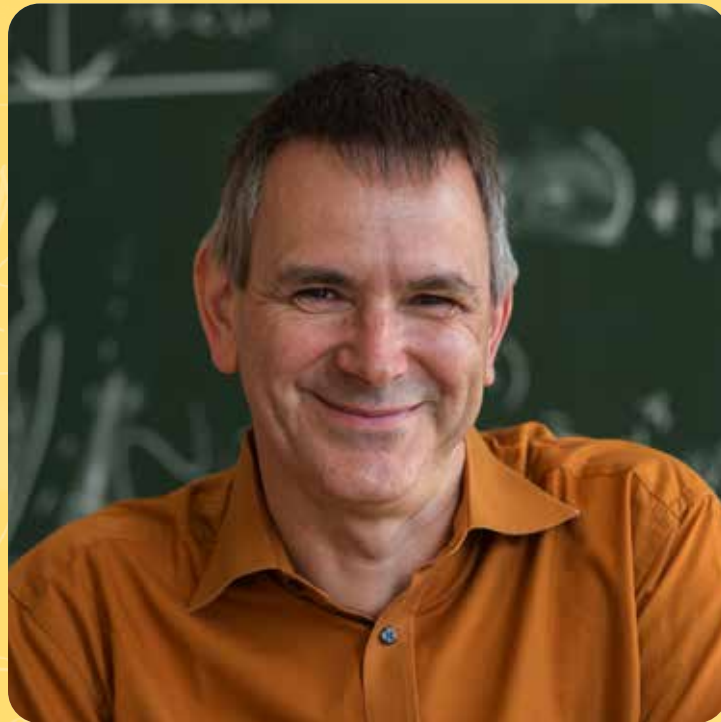


hcm NEWS 1/2021



Continuation of the SFB 1060 “The Mathematics of Emergent Effects”

The German Research Foundation (Deutsche Forschungsgemeinschaft; DFG) has decided to prolong our Cooperative Research Center (Sonderforschungsbereich; SFB) “The Mathematics of Emergent Effects” for the next four years. Up to 6,8 million euros were allocated for this purpose. The spokesman for the SFB 1060 is Stefan Müller, who, at the same time, is also the HCM’s deputy spokesman. The SFB 1060 is part of the Transdisciplinary Research Area “Mathematics, Modelling and Simulation of Complex Systems”.

The scientists involved want to understand the emergence of new effects at larger scales from the interaction of many units at a smaller scale. For this purpose, new rigorous mathematical concepts and tools are going to be developed and through explicit examples sharpened and tested to address this phenomenon. The SFB sets three priorities: the analysis of the collective behaviour of many-particle systems in

both quantum and classical mechanics, the investigation of stochastic systems and the effective behavior they describe on larger spatial and temporal scales, and understanding the geometrical structures that underlie these high-dimensional problems and developing efficient numerical algorithms. Stefan Müller explained that the close collaboration of mathematicians from three different areas: analysis, probability theory and numeric, is a decisive advantage for the SFB in this internationally very active research area and competition.

The Hausdorff Centers’ resources and its far-reaching reputation attracted scientists from internationally renowned institutes such as the UCLA in Los Angeles, the Oxford University and the Max Planck Society. SFB is a collaboration of Bonn University’s Institute for Applied Mathematics, Institute for Numerical Simulation and Mathematical Institute.

HAUSDORFF PEOPLE



Two Honors for Michael Ortiz

Two honors for our Bonn Research Chair Michael Ortiz: Ortiz was named 2020 Argyris Visiting Professor of the University of Stuttgart, Germany, and inaugural Distinguished Timoshenko Fellow in Mechanical Engineering at Stanford University, USA.

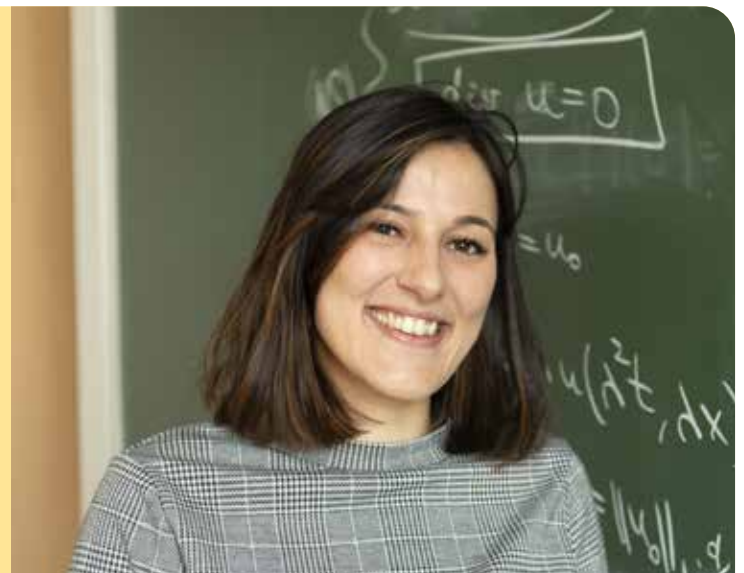
SimTech_Stuttgart, a Cluster of Excellence at the University of Stuttgart, annually awards the Argyris Visiting Professorship to a scientist from the field of simulation science in order to enhance international and interdisciplinary cooperation. The award is presented to researchers who – similar to the name given – have drawn attention to themselves with pioneer work in simulation technology.

As part of his role as Adjunct Professor of the Departments of Mechanical Engineering and Aeronautics at Stanford University, Michael Ortiz will be inaugural Timoshenko Distinguished Fellow.

Michael Ortiz joined the Hausdorff Center for Mathematics as a Research Chair in July 2016. He spends half of his time in Bonn. His research focuses on solid mechanics, an area that connects physics, computational mechanics, engineering, and applied mathematics.

Professorship Offers for Alessia Nota

Alessia Nota, until recently HCM and SFB 1060 member as postdoctorate, has received multiple professorship offers this summer. Alessia Nota has accepted the offer of Università degli studi dell'Aquila als Ricercatore di tipo B (Type B fixed-term researchers, RTDB). Her position can be elevated to a position as Professore Associato in case of a positive appraisal.



HAUSDORFF PEOPLE



Economics Nobel Prize Winner with Close Ties to Benny Moldovanu

The American economists Prof. Dr. Paul R. Milgrom and Prof. Dr. Robert B. Wilson from Stanford University have received this year's Economics Nobel prize for their work in the area of auction theory and the invention of new auction formats. In recent years Paul Milgrom has enriched and encouraged the scientific exchange of knowledge through speeches and lectures at the University of Bonn. In 2009 he participated in the HIM-trimester program "Mechanism Design and Related Topics" organized by Benny Moldovanu. Benny Moldovanu has often met both awardees and is well acquainted with them: "I

am very happy that they have received the Nobel prize as the award was long overdue. They have revolutionized auction research. They initiated many practical applications and made great contributions in mathematical theory. In other words: They are pioneers in the development of markets for complex objects, which are difficult to buy and sell. Moreover both are generous scientists, who have excellently instructed many students. They have also inspired and fascinated many young students through their lectures and seminars at Bonn."



Dies Academicus

This year's Dies Academicus took place virtually. Lectures were presented by Jürgen Dölz ("Numerical Procedure for non local Phenomenon" („Numerische Verfahren für nichtlokale Phänomene")), Daniel Kasprowski ("Fermat's Two-Square-Theorem" („Der Zwei-Quadrate-Satz von Fermat")) und Tim Laux ("Grain Growth in Polycrystals: Algorithms for Mean Curvature Flow" („Kornwachstum in Polykristallen: Algorithmen für den mittleren Krümmungsfluss")). Our Bonn Junior Fellow Tim Laux caused turmoil when the University of Bonn's logo dissolved during one of his simulations. We congratulate all three of them on the award Venia Legendi!

HAUSDORFF PEOPLE

Thoralf Räsch and Antje Kiesel are “Math-Creator of the Month”

Since 2008 the German Mathematical Society (Deutsche Mathematiker-Vereinigung; DMV) awards the “Math-Creator of the Month“ („Mathemacher*innen des Monats“). Math-Creators are ambassadors of mathematics and support the DMV’s most important mission: Fascinating as many people as possible for mathematics. In December 2020 Antje Kiesel and Thoralf Räsch were selected and portrayed. The reason was, next to their long-standing commitment to teaching and public relations, surely the very successful project “Mathematical Walks”, which they both initiated and organised. Further information and an in-depth interview with Anja Kiesel and Thoralf Räsch can be found [here](#).



HAUSDORFF EVENTS

Joint Math Night with the Mathematics Cluster Münster

After the very successful first virtual Bonn Math Night in spring, our colleges from Münster came up with the idea of organizing a joint Math Night next. We happily agreed and hence “The big Math Night from Bonn and Münster” took place in November.

The workshops for children and adolescents were already a big success with more than 100 participants. Afterwards a panel discussion with around 200 spectators was excellently moderated by Thoralf Räsch. Wolfgang Lück and Christopher Deninger, both spokesmen, debated in an entertaining fashion the meaning and worth of mathematics, as well as how mathematicians think and work. They also exchanged anecdotes and recollected their time together in Münster.

We saw Christopher Deninger’s spectacular guest performance stabbing a can in the punk band “Fresse” ’s video. We learned that Wolfgang Lück was an almost as talented soccer player as he is a mathematician and that he and his team won one or two trophies in Münster. Unfortunately, an

injury troubled him back then. Or should one say luckily? Otherwise, he might have become a star soccer player and been lost to the world of mathematics...

Mathematically the evening continued with fascinating lectures by Katrin Tent (“Undecidable Problems in Mathematics – from Polynomials to Gödel and back Again” - „Unentscheidbare Probleme in der Mathematik – von Polynomen zu Gödel und zurück“), Ursula Hamenstädt (“Origami Geometry and Dynamic with Scissors and Glue” - „Origami-Geometrie und -Dynamik mit Schere und Klebstoff“), Martin Rumpf (“Geometric Abstraction sets Digital Characters in Motion” – „Geometrische Abstraktion setzt digitale Charaktere in Bewegung“) and Ramona Sasse (“How Tumor Cells spread - a Mathematical View” - „Wie sich Tumorzellen ausbreiten – ein mathematischer Blick“).

The next Math Night will be held solo by Bonn again. An interesting program is being prepared for the 14th March, the international Pi Day.

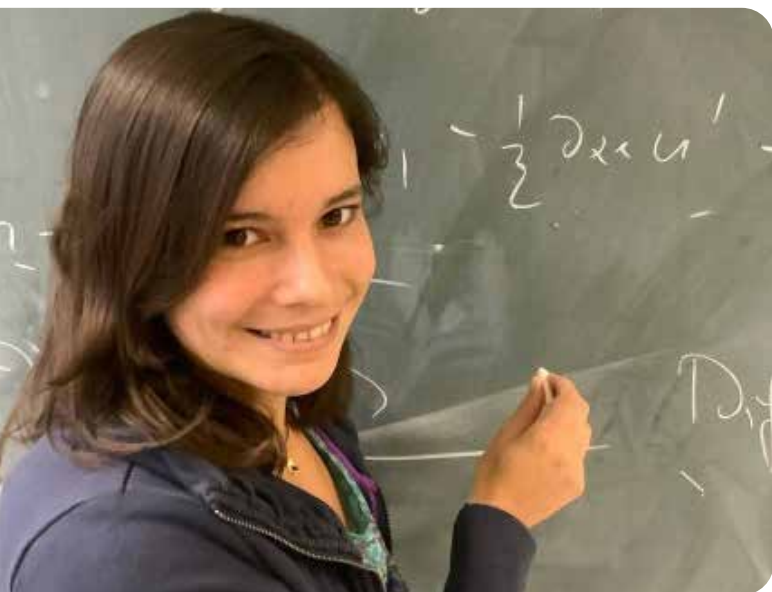
HAUSDORFF MIXED

Initiative Prize for Corona School

Every year, the University Society Bonn honors student engagement with its Initiative Prize with prize money of 2,000 euros. Groups and individuals, who volunteer to assist other students, establish contact between students and the working world and contribute to the dialogue with the public, are considered for this award. This year the Corona School, which we already discussed in detail, won the prize. The Corona School was founded as initiative by Bonn mathematics students in the

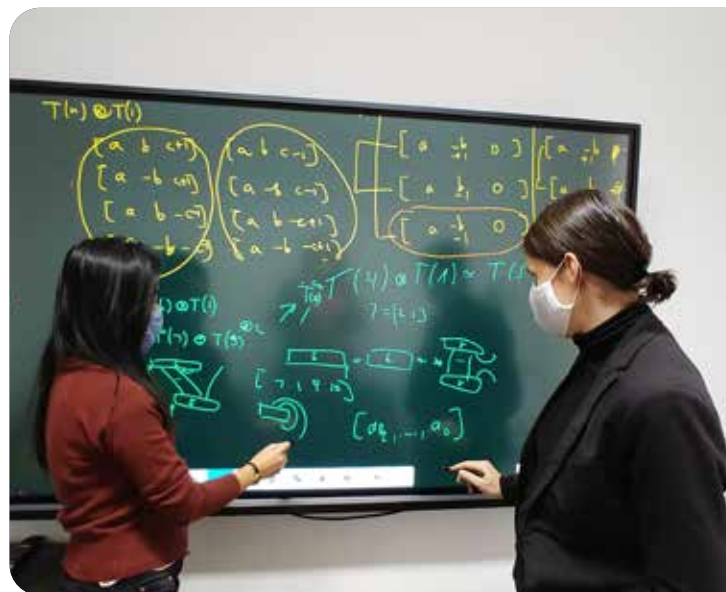


spring of 2020, when schools closed and many pupils needed learning support. The Corona School members created a digital platform to enable free and digital video contact between students and pupils for learning assistance. Now Corona School cooperates across Germany and connects 10.000 students and 12.000 pupils with each other. Congratulations to the mathematics students in Bonn and the whole team!



Lisa Hartung in Interview with FAZ

Our former BIGS doctorate Lisa Hartung has recently become a professor at the University of Mainz with a permanent position after a postdoctorate stay at the Courant Institute of Mathematical Sciences in New York. In an interview with the German newspaper Frankfurter allgemeine Zeitung she speaks about her early university studies as a pupil, the quote of female mathematicians, and their salary. She explicitly thanks her doctoral thesis supervisor, Anton Bovier, for his great support during her education. One can find the interview (in German) [here](#).



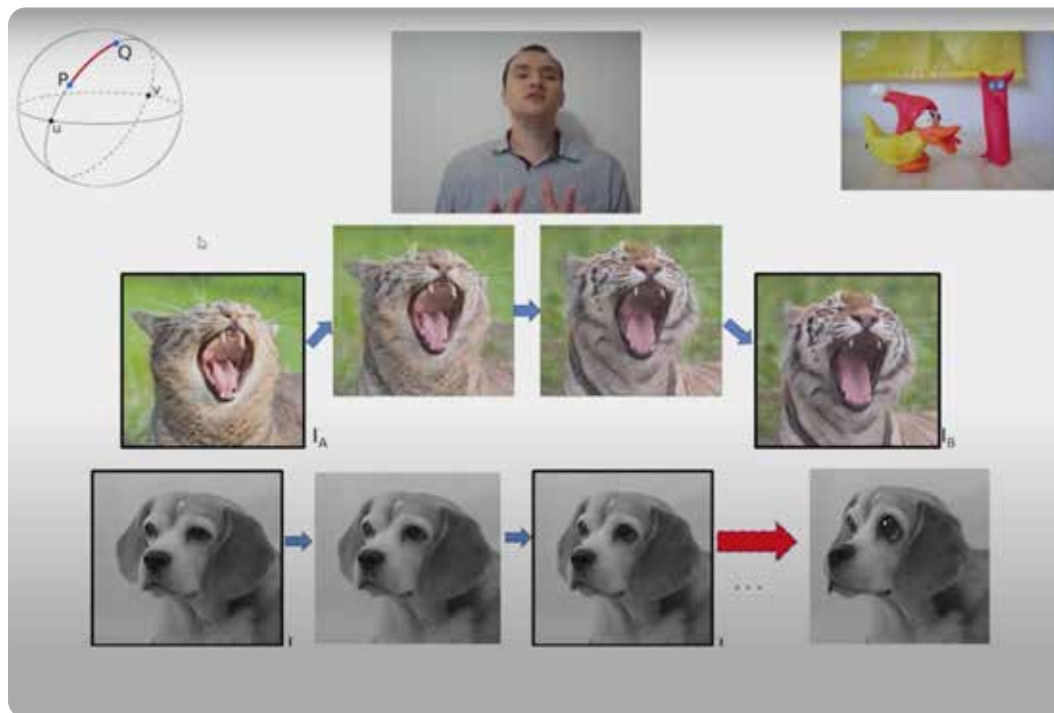
Interactive Whiteboards at HIM

We at the Hausdorff Research Institute for Mathematics (HIM) used the Summer and Autumn to advance our technology - in particular digital applications and events. Now, every office in the Poppelsdorfer Allee 45 has an interactive whiteboard, which participants of the Junior Trimester Program eagerly used for discussions while following Corona regulations. The participation in Zoom conferences to work together on ideas with corporation partners over long distances is also being supported and improved.

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Best of Luck Marko Rajković

Our BIGS PhD student Marko Rajković (Institute for Numerical Simulation, Supervisor Martin Rumpf) is currently taking part in a 3 minute thesis competition in Bosnia and Herzegovina. This competition challenges Ph.D. students to communicate the significance of their projects to a non-specialist audience in just three minutes. Marko Rajković talks in this [video](#) about “Machine Learning in Riemannian Spaces of Images”. At the moment the videos are being evaluated. Further information can be found [here](#). Best of luck!



Bonn Math Circle is Being Extended

Since March the Bonn Math Circle takes place every Saturday virtually and the offer is being extended. In 2021 there will be weekly workshops for younger children in grades 5 and 6. Many talented pupils from all over Germany now participate in the virtual Bonn Math Circle. To preserve this treasure, this virtual offer will be continued with four parallel workshops every Saturday even when on-site Bonn Math Circles will take place again. This elaborate offer and form is probably unique in Europe. Role models will also be continued to be invited to share their experiences and give advice, but to also make their field of expertise more accessible to the pupils. In October and December the guests were Hanno Becker, a former BIGS doctorate and now Senior Security Engineer at the company Arm in England, and Franca Hoffmann, our newest Bonn Junior Fellow.

IMPRINT

Hausdorff Center for Mathematics
Endenicher Allee 62
53115 Bonn
presse@hcm.uni-bonn.de

Person responsible: Stefan Hartmann
Editorial Staff: Stefan Hartmann
Photos: Volker Lannert, Barbara Frommann, Caltech, Tim Laux, Paul Wedrich, Anton Bovier, privat, Screenshots
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