



Two ERC Starting Grants for HCM Economists

Starting Grants from the European Research Council (ERC) are highly coveted, because they provide young researchers with funding of up to 1.5 million euros over five years. Two HCM researchers will now benefit from this funding: Francesc Dilmé and Joachim Freyberger.



Francesc Dilmé works at the Institute for Microeconomics. He wants to use the ERC Starting Grant to investigate price negotiations in dynamic markets: “The aim is to develop a new systematic analysis of markets where market participants have different levels of information.” Francesc Dilmé expects the EU funding to enable him to attract leading researchers from his field to Bonn and to have more time for his research. “The Starting Grant allows me to contribute to the understanding of how information is transmitted through prices in decentralized markets, such as real estate and financial markets”, he says. He also wants to examine the efficiency of these markets and assess the effectiveness of different regulations. Francesc Dilmé studied physics and mathematics in Barcelona (Spain) before graduating in economics at the London School of Economics (England) and completing a doctorate at the University of Pennsylvania (USA). He joined the University of Bonn in 2013 and has been a professor there since 2019. In 2017 he spent a six-month research stay at the University of California, Berkeley.

Joachim Freyberger from the Institute of Finance and Statistics plans to use his Starting Grant to develop new statistical methods. “The increasing availability of large data sets and, at the same time, the greatly increased processing power of computers offer new possibilities for analyzing data”, says Joachim Freyberger. The new methods should yield more reliable conclusions in various empirical applications. He would like to use the EU funding to strengthen his networking with international researchers and to train doctoral students. Born in Bonn, he studied econometrics and operations research in Maastricht (Netherlands) and received his doctorate in economics from Northwestern University (USA). After six years at the University of Wisconsin (USA), Joachim Freyberger has been a professor at the University of Bonn since 2019.

Congratulations!

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Andreas Eberle Receives the Teaching Award of the University of Bonn

Andreas Eberle was honoured with the teaching award of the University of Bonn. He is one of the four award recipients of the Faculty of Mathematics and Natural Sciences. Last semester teaching was a new challenge as the semester only took place digitally. This year the award ceremony took place in the rectorate of the University of Bonn, since the University festival had to be cancelled. Andreas Eberle is professor at the University of Bonn since 2003 and has been a member of the Hausdorff Center for Mathematics for many years. His research is based on the combination of methods from probability theory and other branches of mathematics, including differential equations and functional analysis, numerical analysis, geometry, and mathematical physics. During the last semester Andreas Eberle gave an advanced lecture on Markov processes and participated in an introduction to statistics for students who want to become teachers.

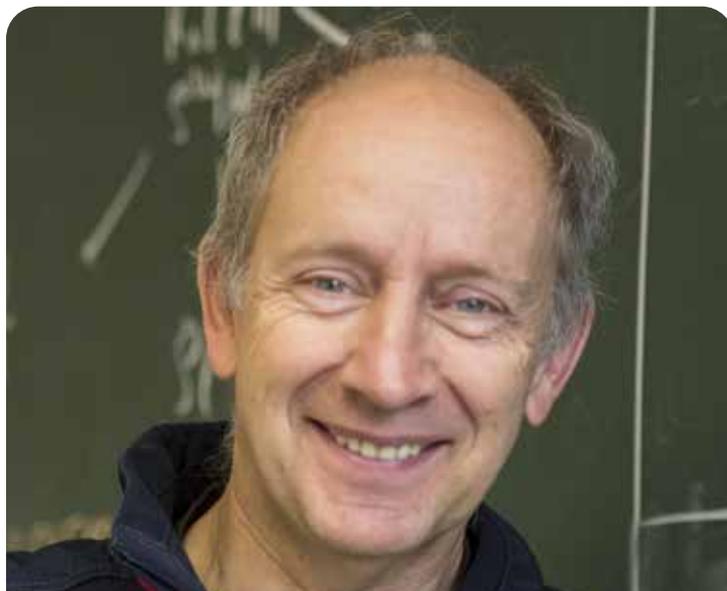
Welcome



Franca Hoffmann joined the Hausdorff Center as a Bonn Junior Fellow in September. She obtained her PhD from the University of Cambridge in 2017, and was a von Karman instructor in the department of Computing and Mathematical Sciences at California Institute of Technology from 2017 to 2020. Her research is focused on the applied mathematics/data analysis interface, driven by problems across disciplines. In particular, Franca Hoffmann is interested in the theory of nonlinear and nonlocal partial differential equations, as well as in developing novel tools for data analysis and mathematical approaches to machine learning. Her current work evolves around graph Laplacians and graph-based semi-supervised learning, gradient flows, calculus of variations, particle descriptions, Bayesian inversion and theoretical aspects of sampling algorithms. Franca Hoffmann has been sharing her passion for mathematics over the past decade organizing summer programs for high school students across Africa, and is now joining the African Institute of Mathematical Sciences in their efforts for African research capacity building.

Interview with Wolfgang Lück

Wolfgang Lück has been HCM spokesperson for a year. In a detailed interview with Stefan Hartmann, he speaks about the difficult start in this position and the special circumstances during the corona pandemic, as well as his personal situation. You can read the interview [here](#). The editor of this newsletter would like to specially thank Wolfgang Lück, for his immense input for the HCM this year, on behalf of the whole Bonn mathematics community.



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Martin Hairer is awarded the 2021 Breakthrough Prize

In the mid of September it was announced that Martin Hairer will be awarded the Breakthrough Prize 2021. Due to the corona pandemic, the awarding ceremony in Silicon Valley, USA, will be postponed to March 2021. The Breakthrough Prize award is \$3 million - the largest individual monetary prize in science worldwide. Martin Hairer, professor at Imperial College London and Austria's first and only Fields Medalist, is closely associated with the Hausdorff Center and a member of its Scientific Advisory Board. His research is linked to the research of our Hausdorff Chair Massimiliano Gubinelli. Martin Hairer deals with stochastic partial differential equations

(SPDEs). SPDEs describe non-smooth processes in nature influenced by random fluctuations. They allow to understand how a one-dimensional boundary between two substances or two phases behaves dynamically, for example the unpredictable route taken by the flame as it consumes a sheet of paper. These equations contain terms that cannot be studied in a mathematically rigorous way using classical methods. With the help of so-called regularity structures, Martin Hairer created a new world of mathematical tools with which such non-linear SPDEs can be tackled and solved.



Vera Traub Opening Speaker of IGAFIT Algorithmic Colloquium

Our BIGS Alumna Vera Traub, now at ETH Zurich, has been invited to be the opening speaker of the newly established biweekly IGAFIT Algorithmic Colloquium ([online](#), started on October 1st), whose goal is to present the most important recent results in algorithmic theory. The topic of her talk was a better algorithm for the asymmetric traveling salesman problem which she developed in her PhD thesis.

HAUSDORFF EVENTS

Bonn Math Tournament – A Digital Competition of Superlatives

The Bonn Mathematics Tournament took place on Friday, September 18th. The event was dedicated to the initiative “#dfg2020 - because research matters” of the German Research Foundation (Deutsche Forschungsgemeinschaft; DFG). Because of the corona pandemic it could not take place as usual in the Mensa Poppelsdorf, but was held as a video conference over Zoom. Thoralf Räsch and Julia Schuster moderated the main conference. Already the greetings were excellent: they were given by none other than Peter Scholze, our Fields medalist, and the Head of Zoom Germany, Peer Stemmler.

Thereafter, over 300 high-school students of 63 participating schools, were divided into just as many Zoom conferences. Each of them was supervised by a volunteer or a HCM student assistant. As teams the students coped with both the “Staffel” (20 highly demanding mathematical puzzles) and, after a lunch break, the “Sum of Us” (more complex exercises about “Mathematics and Sports” for which the students prepared themselves with preparation material provided by us). The main organizer Stefan Hartmann was relieved: There were no major technical issues. The HCM Dreamteam consisting of Christoph Thiele, Pavel Zorin-Kranich, Bertram Arnold, Alexander Ivanov und Carolin Kaffiné participated in the “Staffel” and reached 420 of 500 points - more than twice the points most school teams scored.



After a fascinating lecture for teachers by Matthias Ludwig (Frankfurt University) and a just as interesting online lecture by Axel Schüler (Leipzig University), both concerning „Mathematics and Sport“, the award ceremony took place. The winning teams are:

- 1. Place:** Friedrich-Ebert-Gymnasium Bonn (585 Points)
- 2. Place:** Albert-Schweitzer-Gymnasium Erlangen (540 Points)
- 3. Place:** Silverberg-Gymnasium Bedburg (525 Points)

The teams winning the first three prizes will venture on their price journey to Valkenburg, Netherlands, as soon as the pandemic allows it. There were also great prizes for the teams on the 4th to 10th place: calculators from Casio and math books from Springer Spektrum. We would like to thank both companies for their support! Furthermore, we would also like to thank the many volunteers, mostly Bonn math students, without whom such an elaborate and complex arrangement of this tournament would not have been possible.



1. Place: Friedrich-Ebert-Gymnasium Bonn

2. Place: Albert-Schweitzer-Gymnasium Erlangen



3. Place: Silverberg-Gymnasium Bedburg

Congratulations

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Mathematical Walks – now also Available in Siegburg

“Mathematical Walks” are now also available for students in Siegburg. In Bonn, after an exercise booklet for “Mathematical Walks” for grade 5-9 had been published in 2019, the offer is now extended for the participation of students in grade 10 to 13. The goal is to solve mathematical problems outside: in the city and in the nature. After this concept had found the students’ and teachers’ approval quickly, the project team under the lead of Antje Kiesel and Thoralf Räsch has now created two new brochures. The students are to solve questions of the following kind by modelling, measuring and calculating: What is the volume of the pyramid on the roof of the Art and

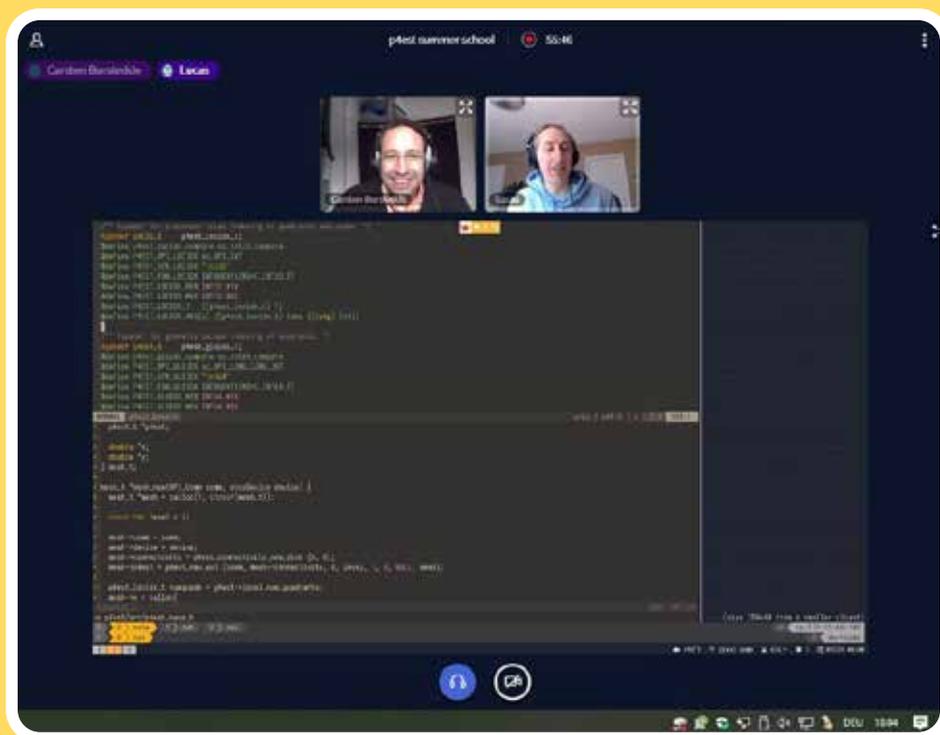
Exhibition Hall of Bonn? With which probability do cars take an exit at the “Trajektknoten” on the B9? How fast does the water flow in the mill race in Siegburg? At the end of September we were able to convince WDR to accompany a “Mathematical Walk” of a class of the Anno-Gymnasium Siegburg, during which the last two of the above mentioned questions had to be solved. We will not reveal the solution here. Try it yourself! Since WDR found this project very interesting, they invited Antje Kiesel to the studio “Lokalzeit Bonn”. You can watch the video [here](#) during the next few days.



Antje Kiesel and Thoralf Räsch



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Digital Hausdorff Schools and HCM Workshops

Most of our winter and summer Hausdorff schools and HCM workshops currently have to take place digitally or in hybrid formats. One of the first digital summer schools was “The p4est software for parallel adaptive mesh refinement - growth, harvest, and carpentry”, organized by Carsten Burstedde, Lucas C. Wilcox and Tobin Isaac. Adaptive mesh refinement (AMR) is a key technique for solving partial differential equations numerically. When using AMR for large-scale simulation, computation is performed parallel and mesh data is distributed. This has motivated the research of the extensive algorithms. One of the most scalable and well-known sets of algorithms is implemented in the p4est software. One participant, Bindi Nagda, PhD student at the Florida Institute of Technology, was so enthusiastic about the Hausdorff School that she immediately tried using this software and shared a video with us via our social media channels. She wrote:

“Last week I had the amazing opportunity to attend a week-long workshop organized by Hausdorff Center for Mathematics on the topic of Scalable Parallel Algorithms for AMR. Although the workshop was originally supposed to take place in Bonn, Germany, it was moved to a virtual event due to the

pandemic. Nonetheless, it was a wonderful platform through which I was able to learn about the cutting-edge research being done in High-Performance Computing and CFD. The participating cohort included grad students, scientists, and software developers from companies like ANSYS. I was really glad to be a part of this group. The short video clip is my attempt at simulating 2d advective transport using AMR techniques. I wrote the code in C and used the p4est library to enable adaptive mesh refinement. The code was implemented on a high-performance parallel cluster called Blueshark and I'm really pleased with the results. Simulations like these are useful in many fields, but in my case, I am using them to track movement of cells within a biological system.”

It is great to see that our schools get such a great feedback! In the meantime many scientific events have taken place digitally with great success. At the moment almost 300 participants from all over the world are taking part in the summer school of the current junior trimester program “New Trends in Representation Theory”.

Awesome!

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8th Place for the Bonn Team at the IMC - Outstanding Achievement by Jonas Walter

This year, we again sent a team from Bonn to participate in the International Mathematics Competition for University Students (IMC). This year the tournament did not take place as usual in Bulgaria, but happened digitally because of COVID-19. We, the HCM, naturally and as every year supported the Bonn team financially and logistically. The participants met up in the HIM for two days while observing the distance and hygiene regulations. The team leader Lucas Mann supervised the six Bonn students: Ferdinand Wagner, Nuno Hultberg, Jonas Walter, Sebastian Meyer, Iris Hebbeker and Martin Drees. The results are something to be proud of: five first prizes and one third prize in the individual ranking as well as the eighth place in the team ranking! A special highlight is Jonas Walter's shared 16th place in the overall ranking of a total of 546 participants as well as Iris Hebbeker's accomplishment: Only one single female student achieved better results. While the sensational results of second place for the Bonn team from last year could not be repeated, all participants can be very proud of their results. The Israeli national team won this years ICM, while the teams from St. Petersburg State University and Moscow Institute of Physics and Technology won second and third place, respectively.



Shanghai-Ranking: Sensational Worldwide 13th Rank for Bonn Mathematics

Bonn mathematics ranks in the subjects mathematics and economics on the first place german-wide. One has almost got used to it. Sensationally, however, is the 13th (last year: 30th place) place worldwide in the subject mathematics, even in front of universities such as Harvard and Columbia! This is something we can be very proud of. In the subject economics the University of Bonn is on the 46th place worldwide - also an outstanding result.



Wolfgang Lück with a Video Statement for the DFG Campaign

The German Research Foundation (Deutsche Forschungsgemeinschaft; DFG) established the campaign "DFG2020 - Because Research Matters" to convey its conviction for the free and knowledge-based research to society. We have also participated in this campaign with many public events such as, for example, our virtual workshops for students and the Bonn Mathematics Tournament. A focal point of the campaign are public statements of scientists, researchers and other socially relevant people in which they illustrate the personal meaning science has for them. Our spokesperson Wolfgang Lück has also contributed such a video statement, which you can find [here](#). Enjoy watching it!

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Hausdorff's Suicide Letter Handed Over to ULB

Felix Hausdorff's original suicide letter was handed over to the Universitäts- und Landesbibliothek Bonn (University and State Library Bonn; ULB) by the Bonn University Museum at the beginning of August. We attended this (due to Corona pandemic) small ceremony together with our mathematics historian, Walter Purkert, who has recently completed the Hausdorff Edition. Felix Hausdorff sent this letter to a friend, the lawyer Hans Wollstein, on January 26, 1942, when he and his wife chose suicide over the imminent deportation to a concentration camp. This suicide letter was assumed lost for many years. Eight years ago, in 2012, the document coincidentally reappeared. During a routine inspection, Thomas P. Becker, head of the Bonn University Archives, found Felix Hausdorff's suicide letter on a stack of empty leaflets. Now, the letter is in safe hands and the estate of Felix Hausdorff is fully reunited at the University and State Library after over 60 years.

IMPRINT

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