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Katrin Piecha

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Forschungsprojekte, Wettbewerbe / Auszeichnungen
fachunabhängig
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Seven ERC Starting Grants for the University of Bonn

There have never been so many ERC Starting Grants at once at the University of Bonn: no fewer than seven researchers have been successful with their applications in the highly competitive European Research Council (ERC) funding process. With their funding of some €1.5 million each, the researchers from the fields of ethics, mathematics, economics, soil science, computer science and astronomy will be able to realize their projects over the next five years.

Astronomy, Assistant Professor Andrina Nicola: Dark energy and Inflation

In her ERC Starting Grant project, "PiCo—Towards constraining the Pillars of our Cosmological model using combined probes", Assistant Professor Andrina Nicola from the Argelander Institute for Astronomy at the University of Bonn will be exploring two fundamental questions of modern physics: What mechanism gave rise to the primordial fluctuations seeding all the structures seen in the Universe today? And what is the cause of the Universe's late-time accelerated expansion? To answer these questions, she combines different cosmological probes such as galaxy clustering, weak gravitational lensing and galaxy clusters. Her research group will then apply their newly developed analysis methods to data from the Rubin Observatory Legacy Survey of Space and Time and the Simons Observatory. "With our work, we aim to shed light on two fundamental pillars of our cosmological model, dark energy and inflation," said Assistant Professor Andrina Nicola, who is also a member of the Matter Transdisciplinary Research Area (TRA) at the University of Bonn.

Computer Science, Prof. Florian Bernard: Visual Computing Combines Machine Learning and Human Knowledge

"The field of visual computing is making more and more use of machine learning methods," explains Professor Florian Bernard from the Institute for Computer Science II—Visual Computing. "These approaches have already helped solve several problems over the past few years, such as the synthesis of photorealistic images and the automated creation of statistical shape models of 3D organs. However, a major drawback is that progress has mainly been achieved by increasing the amount of resources used, such as energy, data or hardware." Armed with his ERC Starting Grant worth some €1.6 million, Bernard now intends to tackle this problem in his project entitled "Harmonising Observations and Underlying Principles for Visual Data Association," or "Harmony" for short.

Ethics, Dr. Stefan Partelow: Amplifying social justice and environmental sustainability in the world's oceans

Rapid growth in the ocean economy is happening in nearly all economic sectors including tourism, shipping, offshore energy, aquaculture and deep-sea mining. Unfortunately, this rapid growth has created inequitable distribution of risk and benefits. To address this, the UN passed a new High Seas Treaty in 2023 (where "high seas" refers to ocean areas beyond national jurisdiction, which make up approximately 50 percent of the ocean surface), which declares that these ocean areas are to be governed under shared rights models. "So far, however, our knowledge of how to govern shared rights models effectively at larger scales is not as well developed as it is on local levels or smaller scales ," says Dr. Stefan Partelow from the Center for Life Ethics at the University of Bonn. "We need to learn from existing approaches at local and regional levels, and find ways to transfer the principles and practices of successful risk and benefit sharing to

global governance processes."

Economics, Prof. Sarah Auster: How Does Uncertainty Affect How Information Is Acquired and Disseminated?

Our world is becoming more and more complex, risks increasingly difficult to assess. Therefore, it is often difficult to accurately predict the ultimate impact of important decisions. Professor Sarah Auster from the Institute for Microeconomics at the University of Bonn is studying how uncertainty influences the acquisition, processing and strategic dissemination of information in her project, entitled "Information Economics with Fundamental Uncertainty: Robustness, Commitment, and Strategic Incentives (INFORM)." "Whereas the traditional approach of information economics is primarily based on scenarios with clearly defined risks, I'm focusing on complex learning situations," Professor Auster explains. In addition, the project will analyze how strategic incentives to share information change when potential recipients have only a partial picture of the possible sources of information to which other parties have access.

Economics, Dr. Tomáš Jagelka: A spotlight on inequality

What individual preferences and abilities are important for a good life? Economist Dr. Tomáš Jagelka from the Institute for Applied Microeconomics at the University of Bonn is investigating these questions in his "FELICITAS" project, which is being funded by the ERC in the amount of €1.5 million. "There are many inequalities in life outcomes," explains Dr. Jagelka, who is also a member of the ECONtribute Cluster of Excellence at the Universities of Bonn and Cologne. His project focuses on understanding which personal characteristics are important in order to be successful in different areas of life. What is the value that people attribute to family and to having a stable social network? Furthermore, what life conditions do people prefer as they age and how much would they be willing to pay to avoid diseases such as cancer or Alzheimer's? These results could be used to inform healthcare and social policy and to adapt medical research priorities accordingly.

Mathematics, Prof. Markus Hausmann: The Symmetry of Spaces

Professor Markus Hausmann from the Mathematical Institute at the University of Bonn is a mathematician whose research covers algebraic topology and its interaction with algebraic geometry, representation theory and tensor triangular geometry. He is engaging in basic mathematical research with his project, entitled "Bordism of symmetries: From global groups to derived orbifolds" (BorSym), in which he will use algebraic methods to study the symmetry of spaces. As he explains: "The project combines a number of exciting areas of mathematics that have seen a lot of progress made in recent years and that are linked together in a surprising way. We're expecting this interaction to uncover new findings for tackling some problems that have remained unresolved for a long time." Markus Hausmann, who is also a member of the University's Hausdorff Center for Mathematics Cluster of Excellence, plans to use the ERC funding "to assemble a big team of postdocs and doctoral students so that we can address the unanswered questions together."

Soil Science, Dr. Melanie Braun: Tracking down the tiniest plastic particles in the soil

There is hardly any soil left in the world that does not contain plastic residues. The majority of studies in this area focusing on microplastics—particles measuring between one micrometer and five millimeters in size. However, with colloidal and nanoplastics even smaller plastic particles exist; with sizes below 1,000 or 100 nanometers, they are smaller than human cells. In her ERC Starting Grant project 'NanoSoil: Nano- and colloidal plastics in soil: input, plant uptake and risk assessment', Dr. Melanie Braun from the Institute of Crop Science and Resource Conservation (INRES) at the University of Bonn will spend the next five years investigating nanoplastics in the soil-plant system. Asked to explain her motivation, she said: "We suspect that nanoplastics in particular exert a range of harms, including on human health". Dr. Braun is also a member of the PhenoRob Cluster of Excellence at the University of Bonn.

Further information about the projects:
https://www.uni-bonn.de/en/news/seven-erc-starting-grants-for-the-university-of-bonn

wissenschaftliche Ansprechpartner:

Media contacts:
Dr. Melanie Braun
Institute of Crop Science and Resource Conservation (INRES)
University of Bonn
Phone: +49 228 73-2194
Email: melanie.braun@uni-bonn.de

Professor Markus Hausmann
Mathematical Institute
University of Bonn
Email: hausmann@math.uni-bonn.de

Dr. Tomáš Jagelka
Institute for Applied Microeconomics
University of Bonn
Phone +49 228 73-9480
Email: tjagelka@uni-bonn.de

Dr. Stefan Partelow
Center for Life Ethics
University of Bonn
Phone: +49 228 73 66210
Email: stefan.partelow@uni-bonn.de

Seven researchers from the University of Bonn receive an ERC Starting Grant
Collage: Gregor Huebl
Collage: Gregor Huebl / Universität Bonn