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# Major Success for University of Bonn: Two new initiatives join existing six clusters in race for Excellence funding

**The University of Bonn has some excellent news to report, with two new cluster initiatives given the green light to apply for funding as part of the Excellence Initiative of the German government and federal states. The German Research Foundation and the German Council of Science and Humanities made the announcement earlier today. The two new cluster initiatives are thus among the 41 chosen from the 143 draft proposals in all from across the country that were evaluated. In 2019, the University of Bonn secured an already impressive six clusters, more than any other university in Germany.**

All of these clusters are applying to maintain their status, putting the University in with a chance of hosting eight Clusters of Excellence.

"The Excellence contest is now tougher than ever, so today's decision represents a fantastic achievement by the University of Bonn," says its Rector Prof. Dr. Dr. h.c. Michael Hoch. "Our six existing clusters have made very successful progress in recent years, and the international experts appraising the applications now believe that two more of our research projects have the potential to be competitive on the global stage. My heartfelt thanks go to everyone who's contributed to the outstanding result we've achieved at this interim stage." It is now a question of lending all the current clusters and the two new initiatives the best possible support, he adds: "Our stated aim is to retain our leading position among the most successful universities in the contest."

The University of Bonn will need to submit all its Cluster of Excellence applications by August of this year. The funding decision is slated for May 2025, with any funding set to start in early 2026.

With six Clusters of Excellence receiving funding, the University of Bonn is the most successful university in the grant program at present. In 2019, it became one of only eleven universities and alliances in Germany—and one of only two in North Rhine-Westphalia—to be awarded the status of a University of Excellence and is thus currently the most successful university in the entire contest. Since then, it has become firmly established as a leading university in Germany and Europe in the most significant global rankings and is among the top 100 in the world.

The University of Bonn will now be submitting a full application for the following new initiatives for Clusters of Excellence:

- "Color meets Flavor"—Search for new phenomena in strong and weak interactions
- Our Dynamic Universe

Brief profiles of the new cluster initiatives are provided later on in this press release.

The following Clusters of Excellence at the University of Bonn currently receive funding:
- Hausdorff Center for Mathematics (HCM)
- ImmunoSensation2
- PhenoRob
- ECONtribute: Markets & Public Policy
- ML4Q—Matter and Light for Quantum Computing
- Bonn Center for Dependency and Slavery Studies (BCDSS)

Profiles of the existing Clusters of Excellence at the University of Bonn for which continued funding will be applied for can likewise be found further down this press release.

Profiles of the new cluster initiatives:

1. "Color meets Flavor"— Search for new phenomena in strong and weak interactions

The existence of dark matter and the matter-antimatter asymmetry in the Universe point to gaps in our understanding of the world around us. Even though virtually all the measurements that we can make in particle physics can already be described in detail by the Standard Model, deciphering the structure of subatomic matter is one of the most pressing questions in fundamental physics. Specifically, researchers are wondering where new phenomena of fundamental physics might be hiding.
Some of the most intriguing measurements in recent years have involved interplay between the strong ("color") and weak ("flavor") interaction. It is this interplay that the researchers in the Cluster of Excellence being proposed together with TU Dortmund University, the University of Siegen and Forschungszentrum Jülich now want to investigate in more detail in a close partnership between theory and experimentation. They will focus on the physics of quarks and the question of how these fundamental building blocks of matter form complex bonding states and are also intending to explore the properties of the Higgs boson and continue the hunt for the axion. With the masses of the six known quarks spanning several orders of magnitude, the experimental infrastructure needed to study them ranges from experiments at low-to-medium energy levels at the ELSA particle accelerator in Bonn all the way through to ultra-high-energy experiments using the Large Hadron Collider (LHC) at CERN in Geneva, which will also offer an opportunity to investigate the Higgs boson.

Speaker:
Prof. Dr. Jochen Dingfelder, Elementary Particle Physics, Institute of Physics, University of Bonn;
Speaker for the Research and Technology Center for Detector Physics

Universities involved:
TU Dortmund University, University of Siegen

Institutions involved:
Forschungszentrum Jülich

2. Our Dynamic Universe

The structure and development of our Universe is shaped by countless phenomena that follow some very different timescales, ranging from fractions of a second to billions of years. This Cluster of Excellence, which is being proposed in partnership with the University of Cologne, brings the various processes of astrophysics together through a combination of observations using new instruments, theory backed by innovative simulation and data science methods, and laboratory astrophysics. The aim is to come up with a complete description of the evolution of matter and energy flows

over time. Within the Bonn/Cologne region, the cluster initiative is based in a internationally acclaimed center of expertise for radio astronomy, underpinned by four main pillars: (1) building state-of-the-art detectors and instruments for international telescopes; (2) leading large-scale observation programs; (3) running a world-class laboratory for astrophysics; and (4) simulating the dynamic evolution of planets, stars and galaxies on high-performance computers.

Speaker:
Prof. Dr. Stefanie Walch-Gassner, Astrophysics, University of Cologne

Speaker in Bonn:
Prof. Dr. Cristiano Porciani, Astrophysics, University of Bonn

Universities involved:
University of Cologne (applicant)

Institutions involved:
Max Planck Institute for Radioastronomy, Bonn
Forschungszentrum Jülich
German Aerospace Center (DLR), Bonn

Profiles of the existing Clusters of Excellence at the University of Bonn:

1. Hausdorff Center for Mathematics (HCM)

The Hausdorff Center for Mathematics (HCM) was founded in 2006 as the first-ever Cluster of Excellence for mathematics in Germany. It has evolved into an internationally significant center for mathematical research and teaching and for academic dialogue. The HCM produces a host of world-renowned award winners every year. Its research interests range from pure and applied mathematics and questions of economics through to interdisciplinary projects involving colleagues from fields such as materials research and the life sciences.

Speaker:
Prof. Dr. Valentin Blomer, Mathematical Institute, University of Bonn

Institutions involved:
Max Planck Institute for Mathematics

2. ImmunoSensation2

The ImmunoSensation2 Cluster of Excellence was set up in 2012 with the mission of improving our understanding of the immune system beyond the boundaries of conventional immunology. As part of this philosophy, the immune system is viewed as a "sensory organ" for our health. The cluster's research focuses on the immune sensors—the receptors of the innate immune system—and their role in illness-related processes. To study these mechanisms following a systematic approach, ImmunoSensation2 has put together an interdisciplinary team of immunologists, cell biologists, biochemists and mathematicians. Its translational objective is to develop precise interventions into the functioning of the immune system and thus improve the treatment of inflammatory diseases.

Speaker:
Prof. Gunther Hartmann, MD, Institute of Clinical Chemistry and Clinical Pharmacology, University Hospital Bonn, University of Bonn

Institutions involved:
German Center for Neurodegenerative Diseases (DZNE)

3. PhenoRob

PhenoRob is Germany's only Cluster of Excellence that combines the agricultural sciences with engineering. It was established in 2019 and studies new ways of revolutionizing how crops are grown. PhenoRob aims to bring in technology and AI to support crop production while minimizing the negative impact on our ecosystems. Its researchers come from various fields—robotics, geodesy, computer science, agricultural sciences, economics and ecology—and are collaborating on new approaches for making agricultural cultivation more sustainable with the help of cutting-edge technologies. This involves, for example, using AI to train robots and drones so that they can phenotype plants and not only determine their current needs (water, fertilizer, pesticide) but also satisfy these needs in a targeted way. The Cluster of Excellence has already given rise to several market-ready products.

Speakers:
Prof. Dr. Cyrill Stachniss, Photogrammetry and Robotics, University of Bonn
Prof. Dr. Heiner Kuhlmann, Geodesy, University of Bonn

Institutions involved:
Forschungszentrum Jülich

4. ECONtribute: Markets & Public Policy

ECONtribute, Germany's only Cluster of Excellence in economics, has been run jointly by the University of Bonn and the University of Cologne since 2019 and focuses its research on markets caught between the conflicting demands of the economy, politics and society. Its researchers, who cover disciplines from economics, business administration and psychology through to ethics, social sciences, politics and law, are aiming to gain a better understanding of challenges such as digitalization, global financial crises, growing inequality and political polarization and to make recommendations for how politicians can respond based on the evidence.

Speakers:
Prof. Dr. Thomas Dohmen, Applied Micro-Economics, University of Bonn
Prof. Dr. Matthias Heinz, Director of the Reinhard Selten Institute, University of Bonn and University of Cologne
Prof. Dr. Pia Pinger, Economics, University of Cologne

Universities involved:
University of Cologne

Institutions involved:
Max Planck Institute for Research on Collective Goods, Bonn

5. ML4Q—Matter and Light for Quantum Computing

Quantum computers lie at the heart of the ML4Q Cluster of Excellence, which was founded in 2019 by the University of Bonn, the University of Cologne and RWTH Aachen University together with Forschungszentrum Jülich. The cluster aims to lay the foundations for new computer and network architectures that are based on the principles of quantum mechanics and are more powerful than conventional computers. To this end, it works to analyze and optimize the quantum materials required to create various qubit platforms such as semiconductor qubits, superconducting qubits, topological qubits and Rydberg atoms. The cluster's researchers are also devising algorithms for fault-tolerant quantum computing and strategies for quantum error correction.

Speaker:
Prof. Yoichi Ando, Solid State Physics, University of Cologne

Speaker in Bonn:
Prof. Dr. Simon Stellmer, Quantum Metrology, University of Bonn

Universities involved:
University of Cologne, RWTH Aachen University

Other institutions involved:
Forschungszentrum Jülich

6. Bonn Center for Dependency and Slavery Studies (BCDSS)

"Asymmetric dependency"—with this new guiding concept,
the Bonn Center for Dependency and Slavery Studies (BCDSS) Cluster of Excellence has offered a new route to accessing slavery and dependency research since 2019. It studies all forms of deep social dependency such as slavery, serfdom, debt bondage and other kinds of permanent dependency relationship. The researchers involved cover disciplines as varied as anthropology, American studies, anthropology of the Americas, archaeology, Asian studies, history, Islamic studies, law and theology. They study all time periods, regions and cultures as well as all shades on the spectrum between "free" and "not free." Through its broad-based approach, the Cluster of Excellence is opening up dependency research to some completely new transcultural perspectives and comparisons.

Speaker:
Prof. Dr. Stephan Conermann, Islamic Studies, Universität Bonn

Institutions involved:
Max Planck Institute for Legal History and Legal Theory, Frankfurt am Main
Bonn International Center for Conflict Studies (BICC), Bonn
German Institute of Development and Sustainability (IDOS), Bonn
Rautenstrauch-Joest Museum, Cologne
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Volker Lannert / University of Bonn