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Press release

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Contests / awards, Research projects
interdisciplinary
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Great success: The University of Cologne is granted five Clusters of Excellence

Five proposals for Clusters of Excellence win funding in the federal competition / Clusters in the fields of aging research, astrophysics, plant sciences, quantum research and economics will receive funding

The University of Cologne is once again highly successful in the Excellence Strategy: Five Clusters of Excellence will be funded in the next funding period. This was announced today by the German Research Foundation (DFG) and the German Science and Humanities Council. The following Clusters will be funded for seven years: CECAD for aging research, CEPLAS for plant sciences, DYNAVERSE for astrophysics, ECONtribute for economics and ML4Q for quantum research. These Clusters reflect the academic fields of the natural sciences, life sciences, humanities and social sciences represented at the University of Cologne.

“We are delighted that five of the University of Cologne’s proposals were persuasive. This decision demonstrates that our scholars and scientists are conducting highly relevant and exceptional research. I would like to thank all those involved for the commitment and effort that went into the preparation of the six proposals. I would also like to thank our partner institutions and the state of North Rhine-Westphalia for their excellent cooperation and tremendous support. We will continue to be in ongoing dialogue with the group that was not accepted for funding this time to ensure its further development as an important component of our research strategy,” says Professor Dr Joybrato Mukherjee, Rector of the University of Cologne.

The UoC’s Clusters of Excellence are embedded in the research structure of the university’s Key Profile Areas, which streamline topics of high academic and social relevance. They are characterized by research in large consortia at the highest international level.

With the Excellence Strategy, the federal and state governments are striving to strengthen Germany’s position as a centre of science and research in the long term and to further improve its global competitiveness. The awarding of at least two Clusters of Excellence (first funding line) qualifies the University of Cologne to apply for the status of a University of Excellence (second funding line). In light of today’s result, the University of Cologne will prepare a letter of intent for the second funding line to be submitted to the German Science and Humanities Council by 27 June 2025.

The Clusters of Excellence at the University of Cologne are:

CECAD: Groundbreaking research on healthier aging

The CECAD Cluster of Excellence (Cologne Excellence Cluster for Aging and Aging-Associated Diseases) is dedicated to the study of aging processes and age-related conditions. With demographic change, the proportion of older people in our society is growing at a fast pace. As people age, the risk of chronic diseases also increases, and staying healthy in old age is an ever-growing challenge. The scientists in Cologne focus on a fundamental understanding of the molecular and cellular mechanisms that lead to aging and illnesses associated with the aging process, such as metabolic diseases and

diabetes, cardiovascular diseases and renal insufficiency, dementia or skin diseases. Through innovative research and the use of state-of-the-art technologies, CECAD aims to identify new targets for the prevention, diagnosis and treatment of age-related diseases so that people can stay healthy as they continue to age. “The new funding will enable us to investigate why people show different aging trajectories and disease risks,” says Professor Dr Carien Niessen, speaker of CECAD. In future, CECAD will investigate how environment, gender and genetic predisposition influence the aging process and cause people to age so differently and develop distinctly different diseases in old age. This research is expected to shed light on how to prevent disease and maintain health even in old age.

Within the Cluster of Excellence, leading scientists from various disciplines at the University of Cologne, University Hospital Cologne, the Max Planck Institutes for Metabolism Research and for Biology of Ageing and the German Centre for Neurodegenerative Diseases (DZNE) are working together on this major topic, one of the most significant of our time. The University of Cologne is the host university.

https://www.cecad.uni-koeln.de/home

CEPLAS: Plant research for tomorrow’s agriculture

The scientists at CEPLAS (Cluster of Excellence on Plant Sciences) are investigating how plants react to environmental changes. Deciphering the genetic and biochemical basis of plants opens up new possibilities for increasing resistance and yield. In this way, research contributes to overcoming challenges such as climate change, and to ensuring global food security. The scientists in this Cluster of Excellence develop innovative concepts for sustainable agriculture by providing new methods for improving plant health and productivity. “This approval signifies substantial recognition for CEPLAS as a leading international centre for plant and microbial sciences. The renewed funding will enable us to gain a comprehensive understanding of the genetics of plants and their associated microbes, as well as how they are influenced by environmental factors,” says Professor Dr Bart Thomma, speaker for the Cluster at the University of Cologne. In the next funding period, the focus will be on predicting which traits will optimize plant performance under changing conditions. This will allow the researchers to develop innovative strategies for sustainable food supply in the face of climate change.

Scientists from the University of Cologne, Heinrich Heine University Düsseldorf (host university), the Max Planck Institute for Plant Breeding Research, the Leibniz Institute of Plant Genetics and Crop Plant Research and Forschungszentrum Jülich are conducting research as part of the CEPLAS Cluster of Excellence.

https://www.ceplas.eu/en/home

DYNAVERSE: Astronomy between time-lapse and slow motion

The structure and evolution of the universe are controlled by countless phenomena that occur on very different time scales – from fractions of a second to billions of years. The DYNAVERSE Cluster of Excellence aims to find out how the coupling of extremely different time scales influences the universe. A comprehensive picture of the dynamic universe can only be developed by linking physical processes on different time scales.

Researchers from astrophysics, mathematics and computer science are focussing on three central tasks: ‘time-lapse astronomy’ is used to combine individual observations of processes that span epochs, such as the evolution of galaxies, into an explanatory ‘movie of the universe’. In ‘slow-motion astronomy’, fast key phenomena, such as supernova explosions, are studied in order to understand their influence on long-term processes. The third challenge is to study key turning points, known as ‘cosmic twists’, that gave the young Universe its structure and light. “We are proud and delighted that our Cluster was approved,” says speaker Professor Dr Stefanie Walch-Gassner. “I am particularly pleased to establish a research area that connects machine learning and AI with the scientific challenges posed by gigantic amounts of data that radio telescopes such as the Square Kilometer Array will generate.”

In addition to the University of Cologne, members of the consortium include the University of Bonn, the German Aerospace Centre in Cologne, Forschungszentrum Jülich, the Heidelberg Institute for Theoretical Studies and the Max Planck Institute for Radio Astronomy in Bonn.

https://dynaverse.astro.uni-koeln.de/

ECONtribute: Responses to economic and social crises

The ECONtribute Cluster of Excellence: Markets & Public Policy addresses pressing social and technological challenges such as global financial crises, rising inequality, political polarization, digitalization and climate change. Approximately 150 researchers from the field of economics and related disciplines develop innovative approaches to analysing markets and politics and to finding answers to challenges such as these. The central focus of the research is on people and their convictions, expectations and senses of justice – decisive factors for better understanding markets and deriving well-founded recommendations for how to design markets and policy measures.

“The decision to grant further funding confirms the high quality of our work, our international visibility and the interdisciplinary connections we have established in recent years,” says Professor Dr Pia Pinger, speaker at the University of Cologne. “The additional funding will enable us to expand on our successful research while further strengthening the exchange of knowledge between society, research and policy,” adds Professor Dr Matthias Heinz, also a member of the Cologne speaker team.

In the second funding phase, the researchers in this Cluster of Excellence will focus more intensively on the conditions under which political measures find social acceptance. ECONtribute will also focus on how economies can be made more resilient in times of crisis and how short-term political decisions can be aligned with long-term goals.

This Cluster of Excellence is a joint initiative of the Universities of Bonn and Cologne with the participation of the Max Planck Institute for Research on Collective Goods. All research activities are carried out under the umbrella of the joint Reinhard Selten Institute (RSI).

https://econtribute.de

ML4Q: Quantum research for the computers of the future

Quantum computers promise computing power beyond that of any conventional computer, a new form of information processing with potential applications in materials research, pharmaceuticals and artificial intelligence. The final breakthrough of this form of technology will be determined in the near future by advances in essential basic quantum technologies: fast and efficient quantum bits, the connection of quantum processors to modular structures, and novel forms of quantum software. This Cluster of Excellence brings together the unique expertise of its participating partners in three key disciplines of physics – solid state research, quantum optics and quantum information – to achieve advances in current quantum information technology. “The renewed funding will enable us to further streamline the synergetic strengths of this broad-based research network and to achieve breakthroughs in key areas of quantum technology,” says Professor Dr Alexander Altland, the designated speaker for the Cluster. In the next funding phase, the integration of quantum hardware and software will play a special role.

The Cluster of Excellence is a joint project of the University of Cologne, the University of Bonn, RWTH Aachen University and Forschungszentrum Jülich. The main applicant is the University of Cologne. Other collaborators are Freie Universität Berlin, Heinrich Heine University Düsseldorf, Ruhr University Bochum, Paderborn University and the University of Siegen.

ttps://ml4q.de/

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