FREIE UNIVERSITÄT BERLIN

Excellence Strategy

Einstein Research Units

BUA Projects for an Integrated Research Area in Berlin

How can quantum computers solve computing problems that even supercomputers can't solve? What can people in the Berlin-Brandonburg region learn about the consequences of climate change for the water supply? Scientists in the Einstein Research Units want to find answers to these and similar pressing contemporary issues by working in tailor-made interdisciplinary collaborative groups to address specific aspects of the issues.

While funding as part of the *Exploration Projects* in the Grand Challenges on Social Cohesion and Global Health concentrates on the development of new topics and networks, the goal of the *Einstein Research Units* is to anchor the research topics in the university structures. The Einstein Foundation Berlin provides up to two million euros per year for these research units. The initial funding period is up to three years with an option to extend it for another two years. Through the Einstein Foundation Berlin the Berlin University Alliance, which is funded by the Excellence Strategy of the German federal and state governments, gains additional funds from the State of Berlin.

So far two Einstein Research Units are being funded. A third one is in preparation.

Perspectives of a Quantum Digital Transformation: Near-term Quantum Computational Devices and Quantum Processors

Chairpersons

- **Prof. Dr. Jens Eisert (Chair), Freie Universität Berlin**
- Prof. Dr. Çiğdem İşsever (Vice Chair), Humboldt-Universität zu Berlin

Principal Investigators

- Prof. Dr. Oliver Benson, Humboldt-Universität zu Berlin
- Dr. Anna Pappa, Technische Universität Berlin
- Prof. Dr. Arno Rauschenbeutel, Humboldt-Universität zu Berlin
- Prof. Dr. Stephan Reitzenstein, Technische Universität Berlin
- Dr. Tim Schröder, Humboldt-Universität zu Berlin,
- Prof. Dr. Jean-Pierre Seifert, Technische Universität Berlin

How can quantum computers revolutionize the computational power of computers? What new insights do quantum computers offer for high energy physics or quantum chemistry? These are the questions that the first Einstein Research Unit (ERU) of the Berlin University Alliance will address. The interdisciplinary research team of the Einstein Research Unit has set itself the task of clarifying the potential of the quantum digital transformation. This uniquely brings together expertise in theoretical and experimental physics, applied mathematics, computer science, and machine learning.

For more information, see the project website.

Climate and Water under Change

Chairpersons

- **Prof. Dr. Britta Tietjen (Chair), Freie Universität Berlin**
- Prof. Dr. Jörg Niewöhner (Co-Chair), Humboldt-Universität zu Berlin

Other Members of the Executive Committee

- Prof. Dr. Dieter Scherer (Contact person for Case Study 1), Technische Universität Berlin
- Prof. Dr. Tobias Sauter (Contact person for Case Study 2), Humboldt-Universität zu Berlin
- **Prof. Dr. Uwe Ulbrich (Contact person for Case Study 3), Freie Universität Berlin**
- Prof. Dr. Birgit Kleinschmit, Technische Universität Berlin

The CliWaC consortium consists of 28 project leaders from Freie Universität Berlin, Humboldt-Universität zu Berlin, Technische Universität Berlin, and Charité. The Leibniz Centre for Agricultural Landscape Research ZALF and the Institute for Ecological Economy Research IÖW are external partners.

Water is a common resource. For this reason stakeholder groups from society are included in this research project. Image Credit: Nina Diezemann

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The Einstein Research Unit Climate and Water under Change (CliWaC) focuses on water-related risks under climate change in the Berlin-Brandenburg region. This research unit brings together social and natural science as well as practical expertise from stakeholders to support the governance of mitigation and adaptation measures in response to climate change.

For more information, see the project website.