

Berlin Cluster Proposal MATH+ successful within the German Excellence Strategy How Berlin mathematics is shaping the future

Abstract

MATH+, the Berlin Mathematics Research Center, is a cross-institutional and transdisciplinary Cluster of Excellence where researchers will explore and further develop new approaches in application-oriented mathematics. Emphasis is placed on mathematical principles for using even larger amounts of data in life and material sciences, in energy and network research, and in the humanities and social sciences. The aim is to boost not only scientific progress, but also technological innovation and the comprehensive understanding of social processes. MATH+ is a joint project of the three major universities in Berlin – Freie Universität Berlin, Humboldt-Universität zu Berlin, and Technische Universität Berlin – as well as the Weierstrass Institute for Applied Analysis and Stochastics (WIAS) and the Zuse Institute Berlin (ZIB). It continues the success stories of the renowned MATHEON Research Center and of the Berlin Mathematical School, which has been supported by the Excellence Initiative since 2006.

Main part

“The decision of the German Research Foundation to support the MATH+ Cluster of Excellence confirms Berlin’s outstanding position as an internationally excellent location, where mathematics is being advanced across its entire breadth, from pure theory to a wide variety of mathematical application fields,” emphasizes Professor Martin Skutella, Professor at Technische Universität Berlin, Vice-President at ZIB, and one of the three chairs for MATH+. The consistent interdisciplinary orientation of MATH+ will contribute to progress on key issues for the future, such as the supply of sustainable energy, individualized medicine, and the analysis of social processes. “Our research is complemented by a transfer unit whose task is to bring research results to industry and society as promptly as possible,” explains co-chair Professor Michael Hintermüller from Humboldt-Universität zu Berlin and Director of WIAS.

However, the research program of MATH+ goes far beyond technology-driven research. “Our goal is to use mathematics to open up new topics in selected future fields,” explains Professor Christof Schütte of Freie Universität Berlin, President of ZIB and co-chair of the cluster. “We are thinking of unusual and new collaborations on socially relevant topics, especially with colleagues from the humanities and social sciences.” Alongside specific research projects, a new creative element called

the “Topic Development Lab” will also be founded, providing intellectual freedom and offering a framework for completely different research formats. It will bring together world-renowned scientists from all disciplines to explore new research topics. Moreover, MATH+ itself shall become an object of research: a sociological study will analyze the Cluster of Excellence’s role in the career development of young female mathematicians and the influence it has on career decisions and academic selection processes.

MATH+ wants to have a long-lasting impact on the development of mathematics in Germany and the world. For this reason, research training and education of talented young researchers is of the utmost importance. Here, MATH+ will build on and further develop the internationally renowned Berlin Mathematical School (BMS), with the aim, among other things, of closing the career gap between the phase as a post-doctoral researcher and a professorship.

Applicant research institutions:

Technische Universität Berlin (coordinating university)

Freie Universität Berlin

Humboldt-Universität zu Berlin

Weierstraß-Institut für Angewandte Analysis und Stochastik

Zuse-Institut Berlin

Cooperation partners:

BBAW (The Berlin-Brandenburg Academy of Sciences and Humanities)

DAI (Deutsches Archäologisches Institut)

FBH (Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik)

HZB (Helmholtz Zentrum Berlin für Materialien und Energie)

MDC (Max Delbrück Center for Molecular Medicine)

MPIMG (Max Planck Institute for Molecular Genetics)

PIK (Potsdam Institute for Climate Impact Research)

PTB (Physikalisch-Technische Bundesanstalt)

WZB (Berlin Social Science Center)