RUHR-UNIVERSITÄT BOCHUM

RUB

AG Protein Crystallography

Research Seminar

Dr. Daniel Mann

(Forschungszentrum Jülich)

New tools for CryoEM: better samples, smarter optics, higher resolution and chemical contrast

Thursday, 4.12.2025, 16:00 s.t.

Lecture hall ND 03/99

Guests are most welcome!

Host: Prof. Dr. Eckhard Hofmann, AG Protein Crystallography

Abstract:

Cryoelectron microscopy (CryoEM) is a leading method in structural biology, yet it remains challenging for certain targets, such as small or flexible proteins. This talk will cover the entire process of obtaining high-resolution, three-dimensional (3D) reconstructions using CryoEM and highlight our attempts to overcome some of the method's limitations. Optimized methods for sample preparation will be introduced, hardware advances in the microscopy column will be discussed and an alternative illumination method for structural biology will be demonstrated: Cryo scanning transmission electron microscopy (CryoSTEM), enabling 3D reconstructions at near-atomic resolution with chemical contrast.

About the speaker:

Dr Daniel Mann studied Biology at Ruhr University Bochum with focus on biomolecular simulations and infrared spectroscopy of GTPase proteins. His PhD thesis about molecular mechanisms in heterotrimeric G-Proteins received the Ruth Massenberg prize for best dissertation in natural sciences at RUB. He learned CryoEM in his postdoc at the University of Sheffield with Dr Julien Bergeron and moved to Forschungszentrum Jülich, where he is now a staff scientist working at the Ernst Ruska Centre 3 with Prof. Dr. Carsten Sachse. His research is focused on advancing scanning transmission electron microscopy and spherical/chromatic aberration correction and making these methods available to structural biologists worldwide via the ERC user facility in Jülich.