

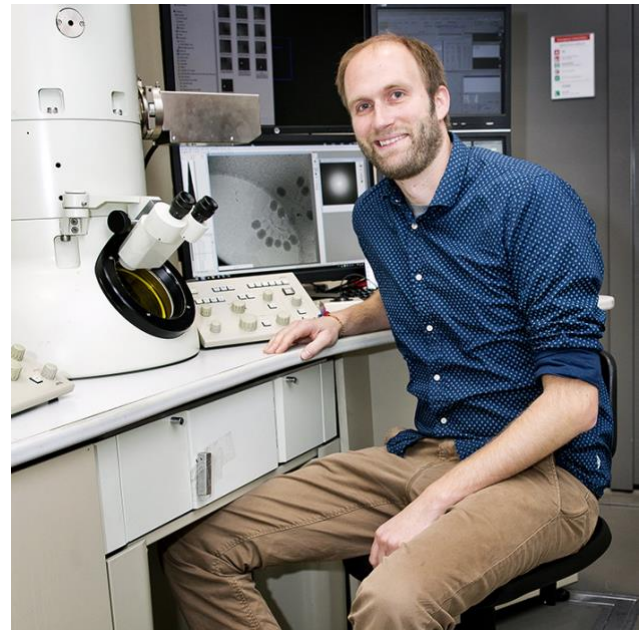
Seminar:

Prospects of nanofluidic cavities for cryo-EM sample preparation

Friday, Sept. 1, 2023, 12:00**EPFL / UNIL, Cubotron, BSP231 (Metro M1, stop UNIL-Sorge)**

Prof. Arjen Jakobi

Cryogenic electron microscopy has become an essential tool for 3D structure determination of biological macromolecules. Despite many technical advances, the difficulty to reliably prepare samples with uniform ice thickness and the excessive sample loss during grid preparation still present a barrier for routine high-resolution imaging and limit the current throughput of the technique. Nanofabrication techniques employed for Micro-/Nano-electromechanical Systems (M/NEMS) provide opportunities to miniaturise and automate cryo-EM sample preparation. We have recently shown that MEMS-based nanofluidic sample supports with well-defined geometry can be used to prepare cryo-EM specimens with uniform ice thickness from picoliter sample volumes, and allow for high-resolution structure determination. Despite these promising prospects, several key challenges remain to be addressed in order to transform this approach into a viable alternative to widely used holey support films.



I will show where we currently stand with our developments, report on recent efforts in addressing some of the outstanding challenges and elaborate on others that give us a hard time to solve. I will also showcase recent results demonstrating the potential of new chip generations to further automate the cryo-EM workflow, and to explore new frontiers for cryo-EM applications such as time-resolved imaging and high-throughput screening.

Arjen Jakobi is an assistant professor at the [Department of Bionanoscience](#) and heading the Electron Nanoscopy group at the [Kavli Institute](#) in Delft.

He studied molecular sciences at Leiden University and the University of Erlangen, initially focussing on the application of computational quantum chemistry methods to structure-based drug design. An interest in protein structure made him move into experimental biophysics and he obtained his PhD in structural biology at the Bijvoet Center for Biomolecular Research in Utrecht. He then joined the European Molecular Biology Laboratory (EMBL), where he has combined X-ray crystallography and electron cryo-microscopy (cryo-EM) to study large molecular assemblies involved in selective autophagy. He is also interested in the technical challenges for image processing and sample preparation in cryo-EM and XFEL imaging, and he develops computational methods with the aim to make the interpretation of high-resolution cryo-EM maps a more routine task.

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<http://cryoem.tudelft.nl/group/arjen-jakobi/>

■ LBEM

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