



School of Materials Science and Engineering



Seminar Topic:
***In situ* Transmission Electron Microscopy: A Versatile Technique
for Biological, Material Science and Device Characterizations**

Assistant Professor Martial Duchamp

Abstract

This seminar will tackle a few scientific questions from biological to material fields addressed by transmission electron microscopy (TEM) techniques, focusing on *in situ* (studies under liquid or gas environments or at variable temperatures) and *operando* observations. A selection of case studies will be presented. The subjects will spread from for time-resolved liquid-liquid phase separations (LLPS) of protein solutions, S–Se exchange in $\text{Cu}_2\text{ZnSnS}_4$ nanocrystals for solar cell applications, temperature controlled nanopores sizes in 2D materials, low temperature atomic resolution used to reveal the true structure of $\text{LiNi}_{0.5}\text{Mn}_{1.5}\text{O}_4$ material used as cathode in Li-ion and a structural description of LAPG electrolyte used in all-solid-state batteries.

Biography

Assistant Professor Martial Duchamp obtained his PhD from EPFL in Switzerland on the study of mechanical and electrical properties 1D materials such as ZnO nanowires and CNTs. He then pursued a post-doctoral fellowship at DTU, Copenhagen in the center of electron nanoscopy. During his first post-doctoral contract, he developed innovative approaches to measure low concentration of dopant in the context of thin-film solar cells using TEM techniques. He then moved to the Ernst Ruska-Centre for Microscopy and Spectroscopy with Electrons (ER-C), Jülich, Germany where he pursued his research using unique aberration corrected TEMs (Cs and Cc corrected). As shown in his list of publications, he worked on a broad range of subject, either material science or instrumentation development related topics. He joined MSE as an Assistant Professor in 2016.

Wednesday, 2 September 2020 || Time: 2:00 pm – 3:00 pm ||
Live Streaming Link (Zoom Meeting): <https://ntu-sg.zoom.us/j/94559052575>
Meeting ID: 945 5905 2575 Passcode: 5r594u
Hosted by: Associate Professor Liu Zheng

Office of Associate Chair (Research)
Email: vd-mse@ntu.edu.sg
www.ntu.edu.sg/mse