



# SEMINAR

Friday, 7.04.2023, 14.00, IPS lecture hall

## Dynamic studies of nucleation and early growth stages of metals by using Electrochemical Liquid-Cell Transmission Electron Microscopy

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Electrochemical nucleation and growth of particles is a complex process that has puzzled scientists for decades. The current literature on nucleation and growth explains this process by two different theories – Classical Nucleation Theory (CNT)– and Non-Classical Nucleation Theories (NCNTs) the latter are used in conjunction with CNT to explain complex behaviour that are not accounted for by the former. Nevertheless, neither theory provide a complete explanation. Electrochemical Nucleation and growth is vital to applications such as thin film formation, nanoparticle synthesis and to the development of energy storage systems. Therefore, a better approach must be established to evaluate and describe it. So far, several ex-situ methodologies have been used to describe nucleation and growth, however, the real-time dynamic process can only be resolved by in-situ techniques. In-situ liquid cell electrochemical transmission electron microscopy is one approach that can elucidate these mechanisms. Since this approach has a high spatial and temporal resolution, it is possible to observe electrodeposition with close to real-time condition. This methodology will be used to study the deposition of different metals, with the objective of expanding the current understanding in this field

**Kindly invited.**