MM 32: Invited talk Eberl

Time: Thursday 9:30–10:00   Location: H43

Invited Talk   MM 32.1   Thu 9:30   H43

The Digital Transformation in Materials Science and Solid State Physics — •Chris Eberl et al. — Fraunhofer IWM. Wöhlerstr. 11, 79346 Freiburg — Albert-Ludwigs-Universität, Georges-Koehler-Allee 078, 79110 Freiburg

The Digital Transformation increasingly impacts society as a whole, even if future developments are still difficult to predict. Nevertheless, it is already obvious that data and information is becoming increasingly available across domains or disciplines through Open Data initiatives, sophisticated analytical tools, machine learning and artificial intelligence and simply 'connected apps'. Furthermore, validated physics based material models and statistical representations (e.g. generated by machine learning, artificial intelligence) allow to predict the future behavior and perform status updates in real time. As a result, increasingly complex interrelationships can be accessed. Last but not least, the increasing data flow associated with this development, have led to projects which aim to structure and standardize data and information by the use of a common ontology and use knowledge graph-based databases. However, the real potential will be unfolding when these tools and infrastructure are combined and integrated in a seamless way. Within this talk, examples will be shown of how the integral use of physics and data based modelling can be used and how it is changing experimental approaches. In the future, we might be able to develop complex relationships between manufacturing processes, properties and materials behavior under various load conditions (e.g. online lifetime assessment coupled with predictive maintenance).