

Convolutional neural network-assisted recognition of nanoscale L12 ordered structures in face-centred cubic alloys (12 min talk + 3 min discussion)

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L12-type nano-ordered structures are typically fully-coherent with FCC matrix, which is challengeable to be characterized. Spatial distribution maps are used to probe local order within reconstructed APT data. However, it is almost impossible to manually analyse the complete point cloud in search for the partial crystallographic information retained within the data. Here, we proposed an intelligent L12-ordered structure recognition method based on convolutional neural networks. The approach was successfully applied to reveal the 3D distribution of L12-type nanoparticles with an average radius of 2.54nm in an Al-Li-Mg system. The minimum radius of detectable nanodomain is even down to 5 Å.

Poster title

Primary author: LI, Yue (Max-Planck-Institut für Eisenforschung GmbH)

Co-authors: Dr ZHOU, Xuyang (Max-Planck Institut für Eisenforschung GmbH); COLNAGHI, Timoteo (Max Planck Computing and Data Facility); Dr WEI, Ye (Max-Planck Institut für Eisenforschung GmbH); MAREK, Andreas (Max Planck Computing and Data Facility); Prof. LI, Hongxiang (University of Science and Technology Beijing); Dr BAUER, Stefan (Max-Planck-Institut für Intelligente Systeme); RAMPP, Markus (Max Planck Computing and Data Facility (MPCDF)); STEPHENSON, Leigh (Max-Planck Institut für Eisenforschung GmbH)

Presenter: LI, Yue (Max-Planck-Institut für Eisenforschung GmbH)

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