



CRC/TRR 270

HoMMage



Offen im Denken

Hysteresis Design of Magnetic Materials for Efficient Energy Conversion

Tuesday, 22 November 2022, 9:00 s.t., TU Darmstadt, via Zoom



Prof. Martin Sahlberg
Department of Chemistry –
Ångström Laboratory,
Uppsala University, Sweden

Zoom information:

Meeting-ID: 650 3411 9984

Kenncode: 328167

Compositionally complex alloys for the sustainable society, hydrides and magnets

Abstract:

Only two decades after their discovery, compositionally complex alloys or “high entropy alloys” (HEAs) have made great impact in science. Several materials, inspired by the results on metallic alloys have lately been introduced, e.g. nitrides and oxides. These alloys have been shown to have unique properties like exceptional tensile strength, hydrogen storage capacity, magnetocaloric effect etc. Many of these unique properties are believed to originate from the distorted structure leading to a high internal strain in HEAs. The research is focused on developing an understanding of structure-property relations in compositionally complex alloys and its potential for developing even higher performing alloys.

The research covers synthesis and evaluation of compositionally complex alloys as advanced materials, with emphasis on physical properties. This includes predicting materials properties, designing new compounds, determining internal strain, optimizing microstructure, advanced characterization etc. During this lecture, I will give a general introduction to high entropy alloys in general as well as the use of these in hydrogen storage, followed by a discussion of some recent results. Focus will be on the use of X-ray and neutron scattering for the characterization. The talk will finish with some perspectives, challenges and the future prospects of this research field.

About the speaker:

Martin Sahlberg is professor in materials chemistry and Head of division for Inorganic chemistry at the Ångström Laboratory. He got his PhD in 2009 from Uppsala University.

Prof. Sahlberg is Chairman for the Uppsala University Centre for Neutron Scattering, Director for SwedNess (the Swedish research school in neutron scattering) and PI for the Nordic Neutron Science Programme, NNSP. He is the recipient of The Royal Society of Sciences “Benzelius award” in the area of Physics-Mathematics for achievements within energy related materials research.