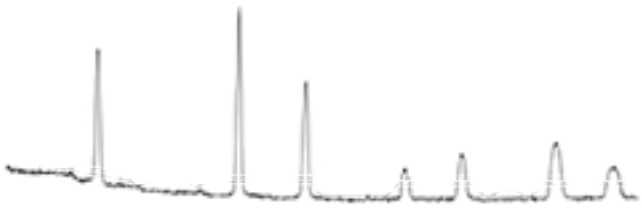

Contribution ID: **7** Type: **Invited talk**

Superalloys for mobility applications –In-situ characterization at high temperatures for optimized properties(Keynote 3)

Thursday, June 2, 2022 9:00 AM (45 minutes)

Superalloys for mobility applications –In-situ characterization at high temperatures for optimized properties

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Superalloys are key materials of our modern society. They are not only used in harsh environments of power plants for energy conversion but also in aerospace or marine applications, as they combine excellent mechanical properties at high homologous temperatures with very good oxidation and corrosion resistance. To further improve the efficiency of engines, advanced superalloys with improved properties are needed that can operate at significantly higher temperatures, for example at temperatures higher than the maximum application temperature of the most widely used polycrystalline wrought Ni-base superalloy IN718.
In this work, examples of new Ni- and Co-based superalloys are presented whose development and characterization was supported by neutron and high energy X-ray diffraction and scattering methods. It will be shown how neutron diffraction on simple, coarse grained experimental Co-Al-W-X alloys helped to determine the temperature-dependent lattice misfit between the main constituent phases, how in-situ high energy X-ray diffraction measurements revealed the deformation behaviour and formation of unwanted intermetallics phases during high temperature deformation and how small angle neutron scattering results could be used to adjust the alloys' heat treatments to optimize their mechanical properties.

Presenter: Dr NEUMEIER, Steffen (Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU))

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