

EUROMAT 2019 / Area B: Structural Materials

SYMPOSIUM: B1

Title: Advanced Steels		
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Abstract		
<p>This symposium will provide a platform for a discussion of the recent research work on advanced steels, i.e. AHSS, TRIP, TWIP, HSLA, press hardening steels, corrosion resistant stainless steels, tool steels, heat resistant steels, maraging steels and others. The main purposes are to give an up-to-date on the latest development and studies in the areas of advanced steels, to share the experience, ideas and strategies, and to discuss the current issues facing those involved in this field.</p> <p>This symposium invites contributions of advanced high strength steels developed for structural applications. New design methods including both, experimental approaches and simulation aspects, as well as new design concepts. Furthermore, application of high-resolution methods, as e.g. transmission electron microscopy (TEM), atom probe tomography (APT), and scattering methods (SANS, SAXS) for in-depth microstructural characterization of steels is in the focus of this symposium. The use of advanced steels for light-weight design like in transportation, energy, infrastructure, oil-gas and chemical industries or other challenging applications will be highlighted as well as advanced steels for the use of moderate service temperatures.</p> <p>The metallurgical processing of these materials, their manufacturing, their testing, usage and recycling require a sophisticated understanding of the physical phenomena involved. The symposium will provide a survey of recent steel developments, the usage of new tools and methods for materials characterization and the progress in understanding complex multiphase steels.</p> <p>Summary of topics to be covered:</p>		

- Recent development and progress of advanced steels (AHSS, TRIP, TWIP, HSLA, press hardening steels, corrosion resistant stainless steel, heat resistant steels, tool steels, maraging steels, or wear resistant steels)
- Application of advanced steels
- Process development for advanced steels
- Design of advanced steels
- Material characterization with TEM, APT, SANS, SAXS etc
- Correlation between microstructure and properties
- Partitioning of alloying elements
- Micro- and macro segregation
- Modeling and simulation on alloy design and development, process, structure evolution and properties
- Mechanisms for deformation, corrosion, fatigue and fracture, creep, wearing and others in advanced steels.