44th Risø International Symposium on Materials Science:

Metal Microstructures and Additive Manufacturing

2nd – 6th of September 2024

This Symposium focusses on the microstructures of metallic samples and components prepared by additive manufacturing (AM), but covers also comparative aspects of microstructural evolution during conventional thermomechanical processing, where this is informative for understanding microstructures resulting from AM.

AM of metals has become very popular as a next generation digitally-driven manufacturing technique, and huge successes have already been achieved in obtaining high material densities, as well as in managing stress relief to allow precise control of component shapes. However, proper characterization of metal microstructures formed through AM still lags behind these successes. In particular, the potential for property optimization through microstructural engineering has hardly been explored yet for metal AM. As a reflection of this, the 44th Risø International Symposium will focus on 2D and 3D characterization of additively manufactured metal microstructures, the in-service microstructural evolution of components made using AM, relationships between microstructure and properties, and the possibilities for optimizing metal microstructures during the AM process, as well as by use of post-AM treatments, as studied through either experiments or simulations. Contributions regarding all types of metal AM processes are welcome, as are those relating microstructures to a wide range of properties, from mechanical to physical and chemical. Contributions based both on experimental as well as on theoretical work are embraced. As examples, presentations may cover:

- Characterization of AM microstructures
- Simulation of AM microstructures
- Relations between AM processing and AM microstructures
- Relations between AM microstructures and properties
- Comparison between AM microstructures and those evolving during conventional manufacturing (e.g. during rolling, and annealing)
- Design of defect-tolerant microstructures in additively manufactured metals
- Microstructural enhancements using advanced AM processing and metal combinations for better properties
- Possibilities in use of post-AM microstructural engineering treatments
- Microstructural evolution during in-service operation of AM components
- Challenges related to microstructural optimization for practical applications of AM components

The format of the Symposium will follow its traditional scheme, with all presentations being given in the Auditorium at the DTU Risø Campus near Roskilde. There will be no parallel sessions and the participants will have ample time for in-depth discussions both in plenum and during coffee breaks, lunches and dinners. All presentations must be accompanied by a paper published in open access format by IOP, and in a printed Symposium Proceedings book, which will be provided to all participants upon arrival at the Symposium.

VELUX FONDEN

This symposium is supported by Villum FONDEN (MicroAM - grant agreement No 54495)

Keynote speakers

K. Chen (Xi'an Jiaotong University, China)
"Resolving multiple challenges facing 3D-printed non-weldable Ni-superalloys"

J. Gockel (Colorado School of Mines, USA)
"Processing parameter and machine platform influence on microstructure in laser powder bed fusion additive manufacturing"

L. Levine (National Institute of Standards and Technology, USA)
"Building microstructures by welding millions of little bits of metals together: measurement approaches, model validation, and post-build processing"

P. Mayr (Technische Universität München, Germany)
"The Metallurgy of Additive Manufacturing: Potentials and Challenges towards Industrialisation"

V. Karthik Nadimpalli and T. Yu (Technical University of Denmark, Denmark)
"Microstructure evolution in open-architecture laser powder bed fusion"

T. Nakano (Osaka University, Japan)
"Control of crystallographic texture by metal additive manufacturing"

A. Rollett, (Carnegie Mellon University, USA)
"Simulation and experiments for understanding microstructures in printed heat exchangers for high temperature service"

M. Seita (University of Cambridge, UK)
"Novel alloy designs enabled by laser powder bed fusion"

M. Upadhyay, (Ecole Polytechnique, France)
"Do dislocation structures evolve during metal additive manufacturing?"

International advisory committee

P. Withers (University of Manchester, UK)
X. Huang (Chongqing University, China)
N. Tsuji (Kyoto University, Japan)
B. Boyce (Sandia National Laboratory, USA)
L. Lu (Shenyang National Laboratory for Materials Science, China)

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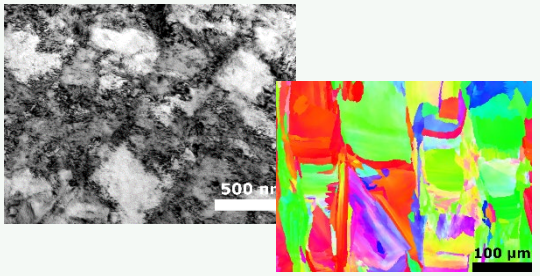


Important dates

15th of February 2024:	Abstract submission
1st of May 2024:	Paper submission
1st of July 2024:	Registration deadline

Abstracts of maximum 1 page should be submitted before 15th of February 2024.

Please send abstract to RisoeSymp@mek.dtu.dk

Proceedings

All the papers, including keynote, invited and contributed papers will be published in the open access journal "IOP Conference Series: Materials Science and Engineering", as well as being printed as a symposium proceedings to be distributed to the participants at the symposium.

Further information will be announced in due time on the symposium website: www.conferencemanager.dk/44thrisoesymposium2024

Registration

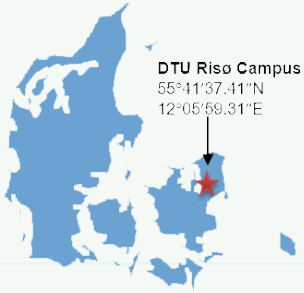
The registration fee is EUR 750 covering the Symposium proceedings, lunch and refreshments all days, two conference dinners, and social arrangements.

The registration fee for bona fide students is EUR 375.

Venue

The symposium will take place at the Niels Bohr Auditorium (building 112) at DTU Risø Campus.

DTU Risø Campus is situated by Roskilde Fjord, 7 km north of Roskilde. In the center of Roskilde you will find many cultural highlights e.g. Roskilde Cathedral which was built during the 12th and 13th centuries, and the Viking Ship Museum exhibiting viking ships found in the local fjord.



Accommodation

Hotel reservations must be made directly with the hotel. The following hotels in Roskilde (near DTU Risø Campus) and Copenhagen (close to the central railway station) are recommended:

Comwell Roskilde
Vestre Kirkevej 12, DK-4000 Roskilde
Phone: +45 4632 3131;
hotel.roskilde@comwell.dk

Scandic Roskilde
Ved Ringen 2, DK-4000 Roskilde
Phone: +45 4632 4632;
roskildepark@scandichotels.com

Zleep Hotel Roskilde
Algade 13, DK-4000 Roskilde
Phone: +45 7023 5635;
roskilde@zleep.com

Grand Hotel Copenhagen
Vesterbrogade 9, DK-1620
Copenhagen K
Phone: +45 3327 6900;
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