

## SUMMARY

Large scale facility research, namely at Neutron Sources and Synchrotron Rings, offers world-class materials characterization. The superior properties of Neutrons (penetration capability, types of interaction) and the brilliance of Synchrotron sources indeed offer capabilities unequalled by lab equipment. While access to both neutron and synchrotron facilities is neither cheap nor continuous (unlike some laboratory equipment), scientific arguments have to date been identified why we should use such sources and even expand their capacity. So, the European Spallation Source is upcoming and the European Synchrotron Radiation Facility will be strongly upgraded. This workshop is thought as impulse for the industrial and materials science community around BAM to the use of such expensive but indeed invaluable tools. It aims at giving an overview of what is currently established and ready-to-go, and what is under development at such large scale facilities. The grand goal is that the industrial community could invest more (time and money) in such instruments, and leverage on their unique capabilities to solve technological problems, thereby increasing their impact on society. A fan of techniques and materials science problems will be discussed, from imaging techniques to stress determination, hosting world experts in the field.

## LOCATION AND CONTACT

Bundesanstalt für Materialforschung  
und -prüfung (BAM)  
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D-12205 Berlin, Germany

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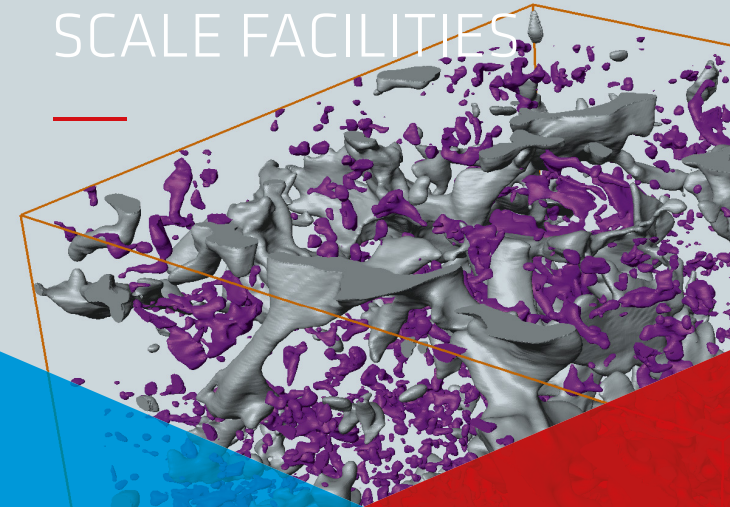
Registration:  
✉ sekretariat-8.5@bam.de

The symposium will be hosted by BAM and will take place in Berlin on 9<sup>th</sup> to 10<sup>th</sup> of March, 2020.

Please note:  
Travel and accommodation costs shall be covered by the participants.  
There is no participation fee for the event. Coffee breaks during the symposium will be provided by BAM.  
A compulsory registration should be made by February 29<sup>th</sup>, 2020 at sekretariat-8.5@bam.de.

Sicherheit in Technik und Chemie

## SYMPOSIUM LARGE SCALE FACILITIES



**WHAT DO WE USE LARGE SCALE  
FACILITIES FOR IN MATERIALS  
SCIENCE?**

9<sup>th</sup> – 10<sup>th</sup> March 2020

# PROGRAM

## 9<sup>th</sup> March 2020

08:30 Registration

09:00 Giovanni Bruno (BAM, Germany)  
Welcome

### Session 1 - Residual Stress and Mechanical Behavior

09:10 Alexander Evans (BAM, Germany)  
Residual stress in Additive Manufacturing

09:35 Michael Hofmann (FRM II, Germany)  
Materials Science at FRM II

10:00 Ricardo Fernandez (CENIM Spain)  
Aluminum alloys fractal creep substructure and neutron diffraction

10:25 COFFEE BREAK & NETWORKING

11:10 Christoph Genzel (HZB, Germany)  
Near surface X-ray diffraction stress analysis under synchrotron and laboratory conditions – a comparative study

11:35 Fabrizio Fiori (Univ. Ancona, Italy)  
Effect of microstructure on mechanical properties and residual stresses in interpenetrating aluminum-alumina composites fabricated by squeeze casting

12:00 Gaspar Gonzalez-Doncel (CENIM, Spain)  
Reversible and irreversible nature of microscopic residual stresses in structural materials

12:25 LUNCH

### Session 2 - Imaging

14:00 Andy King (Soleil, France)  
Synchrotron X-ray tomography: Time resolved in-situ experiments and combining tomography and diffraction at the PSICHE beamline, Synchrotron SOLEIL

14:25 Axel Griesche (BAM, Germany)  
Application of Neutron Tomography on Hydrogen Embrittlement Problems

14:50 Ingo Manke (HZB, Germany)  
Neutron Imaging in Materials Science

15:15 COFFEE BREAK & NETWORKING

16:00 Burkhard Schillinger (FRM II, Germany)  
Applications of Neutron Imaging to the solution of problems in Materials Science

16:25 Christian Gollwitzer (PTB, Germany)  
Synchrotron X-ray Computed Tomography - Applications in Metrology and Material Science

16:50 Guillermo Requena (DLR, Germany)  
The use of 3D-4D imaging to assist the development of novel Ti alloys tailored to additive manufacturing

17:15 END

## 10<sup>th</sup> March 2020

### Session 3 - Applications

09:00 Grethe Vestergaard Jensen (DTI, Denmark)  
Access to large scale facilities at industrial level

09:25 Gabriel Cuello (ILL, France)  
Neutron Total Scattering and Disordered Materials

09:50 Javier Campo (ICMA, Spain)  
What do we use Neutrons in Molecular Magnetism?

10:15 COFFEE BREAK & NETWORKING

11:00 Andreas Schönhals (BAM, Germany)  
Inelastic neutron scattering as a tool to investigate polymers of intrinsic microporosity for green membrane processes and electronic applications

11:25 Brian Richard Pauw (BAM, Germany)  
More of the same, please! Standardizing a perfectionist X-ray Scattering methodology for labs and synchrotrons

11:50 Francesco Grazzi (CNRS, Italy)  
Neutron imaging and diffraction for Heritage Science

12:15 LUNCH

### Session 4 - Residual stress and mechanical behavior

13:45 Gerardo Garcés (CENIM, Spain)  
Plasticity of magnesium alloys

14:10 Joe Kelleher (ISIS, United Kingdom)  
Effects of slip, twinning and phase transformation driven deformation on mechanical performance in metals

14:35 Gizo Bokuchava (FLNP, Russia)  
Stress analysis and high resolution diffraction with RTOF method at long-pulse neutron source

15:00 COFFEE BREAK & NETWORKING

15:40 Giovanni Bruno (BAM, Germany)  
A critical discussion of the residual stress determination by diffraction methods

16:05 Question and Answer Session

16:30 END