

October 10, 2023  
Auditorium 1

## Welcome

9:00 a.m. **Welcome**  
**S. Weihe**, MPA University of Stuttgart, Germany

## Plenary Session

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| 1 | 9:05 a.m.  | <b>Additive Manufacturing of Ti Alloys</b><br><b>P. Wagenblast</b> , N. Arnold, J. C. Schauer, TRUMPF Additive Manufacturing, Ditzingen, Germany  |
| 2 | 9:35 a.m.  | <b>Human Factor Aspects and Impacts on Material Research</b><br><b>O. Sträter</b> , Department of Mechanical Engineering, University of Kassel, Germany   |
| 3 | 10:05 a.m. | <b>Transport of Hydrogen to Baden Wuerttemberg and Hesse - Contribution of the Natural Gas Infrastructure to the Energy Transition</b><br><b>H. Drosch</b> , terranets bw GmbH, Stuttgart, Germany  |
|   | 10:35 a.m. | Communication Break   |
| 4 | 10:55 a.m. | <b>Future Energy Systems and Road Transportation - A Key Factor to Reach CO2 Neutrality</b><br><b>M. Bargende</b> , Institute of Automotive Engineering (IFS), University of Stuttgart, Germany   |
| 5 | 11:25 a.m. | <b>Combination of Additive Manufacturing and HIP-Potentials for Cost Reduction and Strength Improvement</b><br><b>C. Broeckmann</b> , A. Kaletsch, Institute for Materials Application in Mechanical Engineering, RWTH Aachen University, Germany |
|   | 11:55 a.m. | Communication Break   |

## Keynotes

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| 6  | 1:00 p.m. | <b>Critical Assessment of the Safety of Innovative, Future-proof Manufacturing Processes for Internationally Relevant SMR Concepts: A Project Overview</b><br><b>M. Werz</b> , L. May, S. Sewalski, MPA University of Stuttgart, Germany |
| 7  | 1:30 p.m. | <b>Materials Behaviour of High Temperature Materials</b><br><b>A. Neidel</b> , Siemens Energy/TU Berlin, M. Giller, Siemens Energy, Berlin, Germany  |
| 8  | 2:00 p.m. | <b>Framatome in International Nuclear Projects, Participation and Challenges</b><br><b>W. Däuwel</b> , Framatome GmbH, Erlangen, Germany   |
|    | 2:30 p.m. | Communication Break  |
| 9  | 2:50 p.m. | <b>Multi-Material Laser Powder Bed Fusion</b><br><b>M. Villa Vidaller</b> , I. Prestes, F. Schulz, E. A. Jägle, Institute of Materials Science, Universität der Bundeswehr München, Neubiberg, Germany                                   |
| 10 | 3:20 p.m. | <b>From Welding to Advanced Manufacturing Using Additive Technologies</b><br><b>P. Mayr</b> , <b>E. Kabliman</b> , TUM School of Engineering and Design, Garching b. Munich, Germany   |

## Research Work at MPA Stuttgart

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| 11 | 4:00 p.m. | <b>Additive Manufacturing in the Context of Safety Critical Applications</b><br><b>L. Mally</b> , MPA University of Stuttgart, Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart, M. Werz, S. Weihe, MPA University of Stuttgart, Germany |
| 12 | 4:25 p.m. | <b>Investigation of the Master Curve Concept for Ferritic Ductile Cast Iron: First Results of the Experimental Program</b><br><b>M. Holzwarth</b> , MPA University of Stuttgart, W. Baer, Bundesanstalt für Materialfor-   |

- schung und -prüfung (BAM), Berlin, U. Mayer, S. Weihe, MPA University of Stuttgart, Germany
- 13 4:50 p.m. **Experimental and Numerical Investigations of MAG Weld Ends under Multiaxial Non-proportional Cyclic Loading**  
A. Oßwald, MPA University of Stuttgart, Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart, M. Werz, S. Weihe, MPA University of Stuttgart, Germany
- 14 5:15 p.m. **Multiscale Materials Modelling at IMWF**  
V. Guski, Institute for Materials Testing, Materials Science and Strength of Materials (IMWF), University of Stuttgart, S. Weihe, MPA University of Stuttgart, Germany

## October 11, 2023

### Auditorium 1

#### Advanced and Additive Manufacturing I

- 15 8:40 a.m. **Fatigue Testing of Additive Manufactured Alloy 718 with Tubular Specimen Filled with Pressurized Hydrogen Gas**  
F. Ebling, H. Oesterlin, K. Wackermann, Fraunhofer Institute for Mechanics of Materials IWM, Freiburg, Germany
- 16 9:10 a.m. **Investigation of Strategies for Laser Power Reduction in Hybrid-Additive Manufacturing of Tool Components Using Laser Metal Deposition**  
E. T. Koopmann, H. Eberle, C. Kaminsky, Mercedes-Benz AG, Sindelfingen, H. Zeidler, Institute for Machine Elements, Design and Manufacturing, TU Bergakademie Freiberg, Germany
- 17 9:40 a.m. **Research and Manufacturing of Blades of Steam Turbine by Metal 3D Printing**  
Y. Wang, L. Sun, L. Mei, Shanghai Electric Power Generation Equipment Co., Ltd. Turbine, VR China
- 18 10:10 a.m. **In-situ Alloyed Titanium Aluminides Manufactured by Wire-based DED-LB in Vacuum: Microstructure and Mechanical Properties**  
K. Schmidt, H. Dahoud, Neue Materialien Bayreuth GmbH, J. Weiser, Evobeam GmbH, Nieder-Olm, U. Glatzel, Neue Materialien Bayreuth GmbH, University of Bayreuth - Metals and Alloys, Germany
- 10:40 a.m. Communication Break

#### Advanced and Additive Manufacturing II

- 19 11:00 a.m. **The Effects of Distinct Additive Manufacturing Capabilities and Processing Characteristics on Inconel Alloy 617**  
U. Woy, Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC) University of Sheffield, England
- 20 11:30 a.m. **TBD**  
M. Fitzlaff, Institute of Design and Production in Precision Engineering, University of Stuttgart, Germany
- 12:00 p.m. Communication Break

#### NDT, Life Assessment, Integrity II

- 21 1:15 p.m. **A Tool for Modeling Graphite Degradation and Component Assessment**  
J. Bass, A. Chereskin, R. Iyengar, United States Nuclear Regulatory Commission (NRC), Rockville, MD, USA
- 22 1:45 p.m. **Evaluation of Molten Salt Compatibility with Structural Alloys**  
W. Reed, B. Pint, D. Sulejmanovic, A. Savara, R. Pillai, A. Chereskin, R. Iyengar, United States Nuclear Regulatory Commission (NRC), Washington D.C., USA
- 2:15 p.m. Communication Break

## High Temperature Material Technologies

- 23 2:30 p.m. **Microstructure Development of Grade 91 Steel During Laser Powder Bed Fusion and Heat Treatment**  
T. Hatakeyama, K. Sawada, M. Suzuki, M. Watanabe, National Institute for Materials Science (NIMS), Tsukuba, Japan
- 24 3:00 p.m. **Highlights and Selected Results of the Joint R&D Project “VGB Calculation Methods” Including Perspectives on Updates of the European Standard on Calculation Methods**  
J. Rudolph, Framatome GmbH, Erlangen, Germany et al.
- 25 3:30 p.m. **Effect of Temperature and Medium Environment on Corrosion Fatigue Behavior of Inconel 625**  
A. R. Ghazi, H. I. Khan, University of Engineering and Technology, Lahore, Pakistan
- 26 4:00 p.m. **Classification and Evaluation of Creep Cavitation Damage Observed in Replica Inspections of High Temperature Installations**  
P. Aueraki, Kiwa Inspecta Oy, Vantaa/Tampere, Aalto University, Espoo, R. Pohja, Aalto University, Espoo, VTT Technical Research Centre of Finland, Espoo, S. Tuurna, Kiwa Inspecta Oy, Vantaa/Tampere, P. Vilaca, Aalto University, Espoo, Finland
- 27 4:30 p.m. **Observations in the High-Temperature Performance of Commercially Produced Diffusion Bonds for Future Advanced Energy Supply Applications**  
J. Shingledecker, V. Kumar, A. Bridges, Electric Power Research Institute (EPRI), Charlotte, NC, USA

## Auditorium 2

### NDT, Life Assessment, Integrity I

- 28 8:40 a.m. **Degradation Behavior During Long-term Creep and Nondestructive Evaluation in ASME Grade 91 Steel Welds**  
K. Sawada, T. Yasuhi, N. Takehiro, K. Kimura, National Institute for Materials Science (NIMS), Tsukuba, Japan et al.
- 29 9:10 a.m. **EMUS-4-STRESS – A New Thermal Fatigue Monitoring Approach Based on Electromagnetic Acoustic Transducers**  
M. Weikert-Müller, F. Weber, S. Thielges, K. Szielasko, Fraunhofer Institute for Nondestructive Testing IZFP, Saarbrücken, M. Smaga, RPTU Kaiserslautern-Landau, Kaiserslautern, F. Silber, MPA University of Stuttgart, J. Rudolph, S. Bergholz, E. Bechtgold, Framatome GmbH, Erlangen, Germany
- 30 9:40 a.m. **Failure Modes of the Reactor Coolant Pressure Boundary in High-Pressure Core Melt Accident Scenarios**  
C. Bläsius, J. Sievers, Gesellschaft für Anlagen -und Reaktorsicherheit (GRS) gGmbH, Cologne, S. Weihe, MPA University of Stuttgart, Germany
- 31 10:10 a.m. **International Leak Rate Benchmark: Phase Two Results of the OECD/NEA/CSNI Activity**  
K. Heckmann, Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH, Cologne, F. Silber, MPA University of Stuttgart, J. Arndt, GRS gGmbH, Cologne, R. Bass, OCI, Oak Ridge, USA et al.,
- 10:40 a.m. Communication Break

## Materials for Safety Relevant Hydrogen Service I

- 32 11:00 a.m. **Hydrogen for Energy – Addressing Gaps on Materials and Regulation**  
**P. Auerkari**, Kiwa Inspecta Oy, Vantaa/Tampere, S. Tuurna, R. Rintamaa, Clenercon Oy, Espoo, Finland
- 33 11:30 a.m. **Material Compatibility in Hydrogen Environment – Challenges (even) for Surface Technologies**  
**C. Godard**, N. Apel, D. Ritzinger, Freudenberg Technology and Innovation SE & Co. KG, Weinheim, P. Preikschat, SurTec International GmbH, Bensheim, Germany
- 12:00 p.m. Communication Break

## Materials for Safety Relevant Hydrogen Service II

- 34 1:15 p.m. **Reliable Hydrogen Determination in Metallic Materials and their Weld Joints: Parameters and Challenges**  
**M. Rhode**, Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Otto-von-Guericke University, Magdeburg, D. Czeskleba, BAM, Berlin, T. Kannengießler, BAM, Berlin, Otto-von-Guericke University, Magdeburg, T. Mente, BAM, Berlin, Germany
- 35 1:45 p.m. **Crack-Tip Fields Under Hydrogen Chemical Equilibrium**  
**A. Varias**, Public Power Corporation S.A., Pallini, Greece
- 2:15 p.m. Communication Break

## Materials for Safety Relevant Hydrogen Service III

- 36 2:3 p.m. **Fracture Mechanical Assessment of Hydrogen Assisted Fatigue Crack Growth in Hydrogen Operated Natural Gas Pipelines**  
**K. Heckmann**, B. Geyer, Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH, Cologne, Germany
- 37 3:00 p.m. **Influence of Hydrogen Pre-charging, Test Atmosphere and Temperature on Hydrogen Embrittlement of Ni-base Alloy 625**  
H. Teuber, S. Wanjura, S. Langer, **A. Luithe**, J. Barnikel, Siemens Energy Global GmbH & Co.KG, Mülheim a. d. Ruhr, Germany
- 38 3:30 p.m. **Optimization of the Layer Structure for Hydrogen Pressure Tanks Made of Wound, Fiber-reinforced Plastics by Simulation and Virtual Iteration**  
**P. Erdmann**, S. Martinez, T. Rief, Wölfel Engineering GmbH + Co. KG, Höchberg, Germany
- 39 4:00 p.m. **H<sub>2</sub>MatPerm - Standardized Setup to Determine Hydrogen Permeation Coefficients and Surface Cleanliness Levels of Sheet Materials**  
**M. Keller**, C. Breuninger, Fraunhofer Institute of Manufacturing Engineering IPA, Stuttgart, J. Böttcher, University of Stuttgart, Germany
- 40 4:30 p.m. **Diffusion in High-Pressure Hydrogen Charged Multi-Principal Element Alloys CoCrFeMnNi and CoCrNi vs. AISI 316L**  
**M. Rhode**, Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, Otto-von-Guericke University, Magdeburg, Germany, F. Steurer, Otto-von-Guericke University, Magdeburg, J. Nietzke, E. Askar, BAM, Berlin, Germany