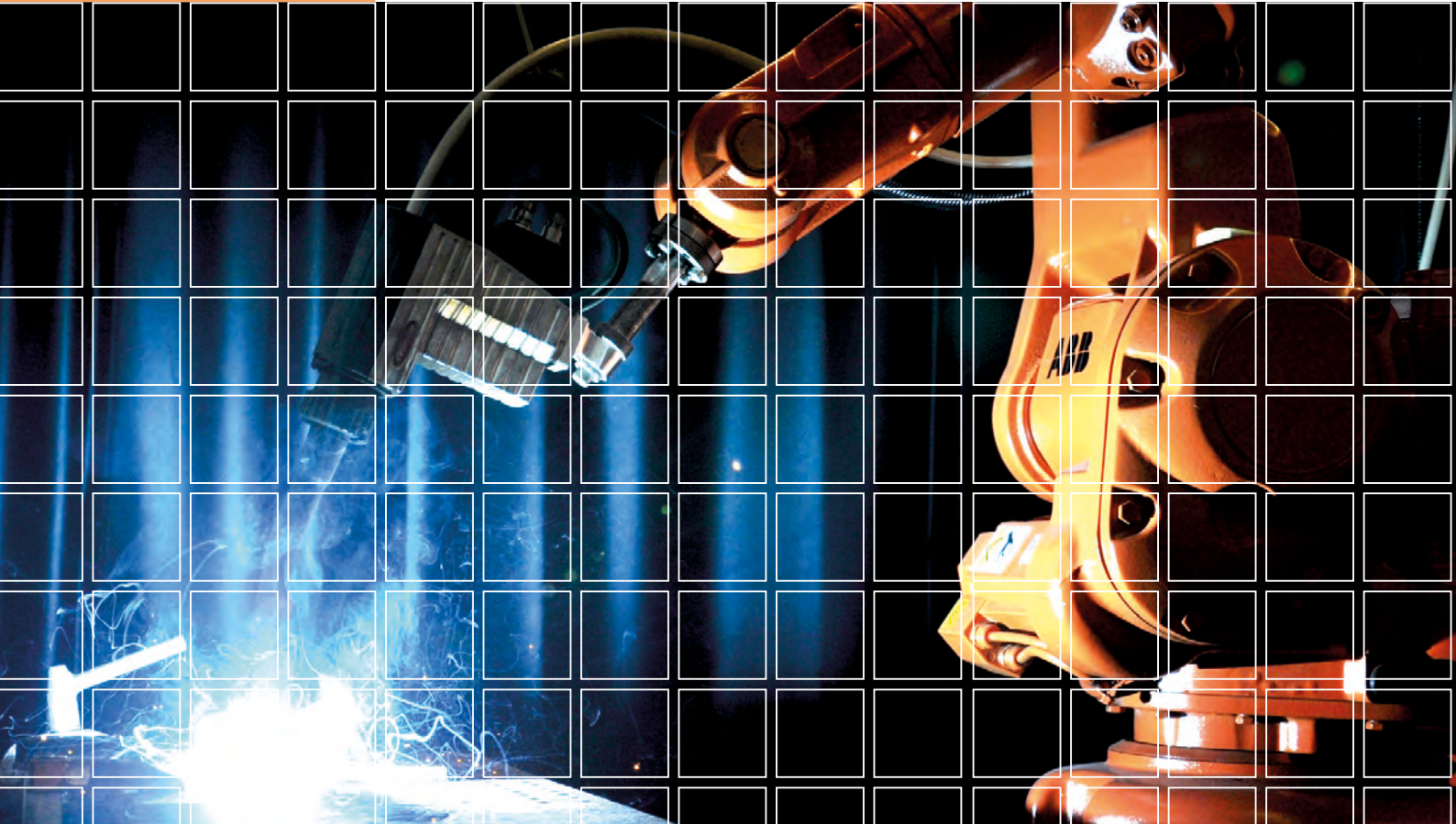


IWS

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Institute of Materials Science and Welding

Univ.-Prof. Dipl.-Ing. Dr.techn. Christof Sommitsch

IWS

Mission

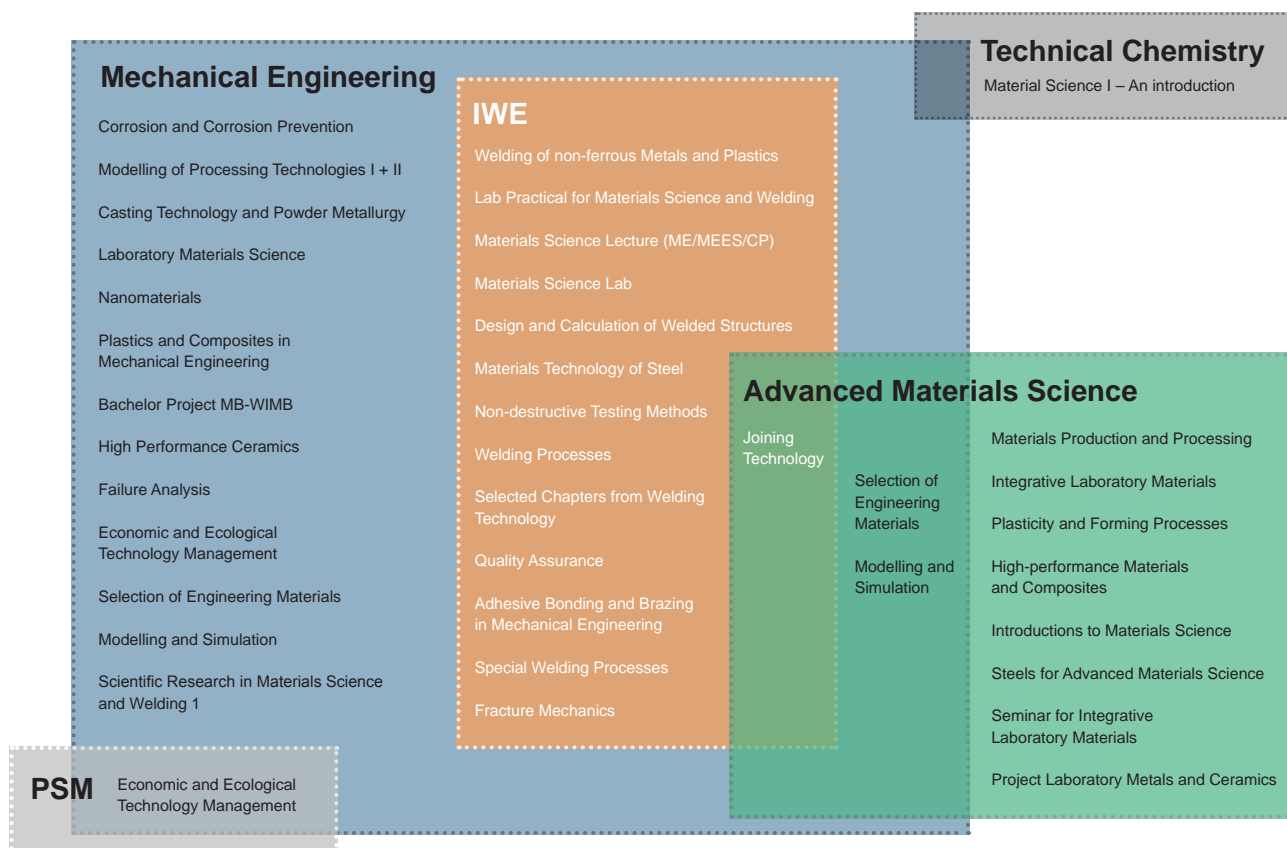
Passionate Lecturers and Researchers

Due to our high standards in teaching and research and the acquired external funds, we have managed to gradually create an exciting and stable working environment to ensure a maximum of freedom for each member of staff and student to acquire and deepen knowledge in the respective subject areas – all in compliance with international standards.

Vision

Materials Science for a Modern Society

In the future, we will represent an international centre for developing, modelling and joining socially relevant, future-oriented, high-performance structural materials and feed the knowledge thus generated back into teaching and services.



Bachelor and Master Programs

- Mechanical Engineering
- Mechanical Engineering and Economic Sciences
- Advanced Materials Science
- Production Science and Management
- Technical Chemistry
- Chemical and Process Engineering

IWE – International Welding Engineer

- Welding Processes and Facilities of Equipment
- Materials and their Behaviour during Welding
- Construction, Design and Calculation
- Manufacturing and Application Techniques

Doctoral School Mechanical Engineering

■ Joining

The joining group works on different tasks with a variety of international partners. Feasibility studies, prototype development as well as process development and optimisation are typical challenges faced. Focus is put on the material's behaviour during joining and subsequent service.

■ Key Competences

- Experimental and Numerical Process Development
- Feasibility Studies
- Similar and Dissimilar Joining
- Conventional and Innovative Arc Processes
- Friction and Friction Stir Welding
- Electron Beam Welding

Metal JOINing

*K-Project Network of Excellence
for Metal JOINing*

(JOIN)

www.join.tugraz.at

■ Laboratories

- Metallography
- Microscopy
- Physical Testing
- Heat Treatment
- Joining
- Corrosion
- Creep

■ Consulting

- Materials Selection
- Process Optimisation
- Training
- Failure Case Analysis
- Expertise
- Feasibility Studies



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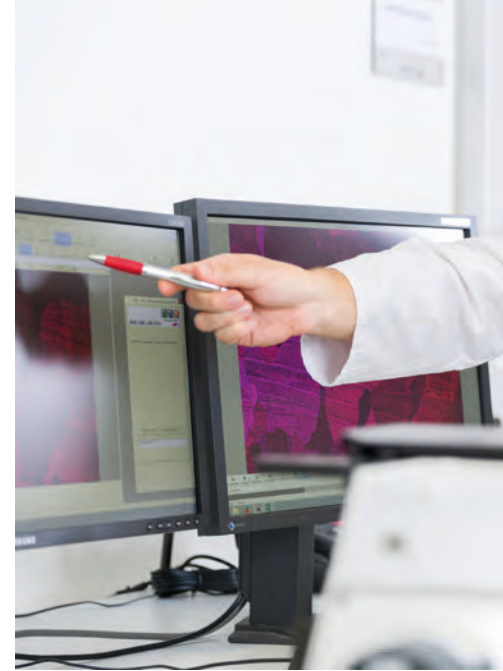


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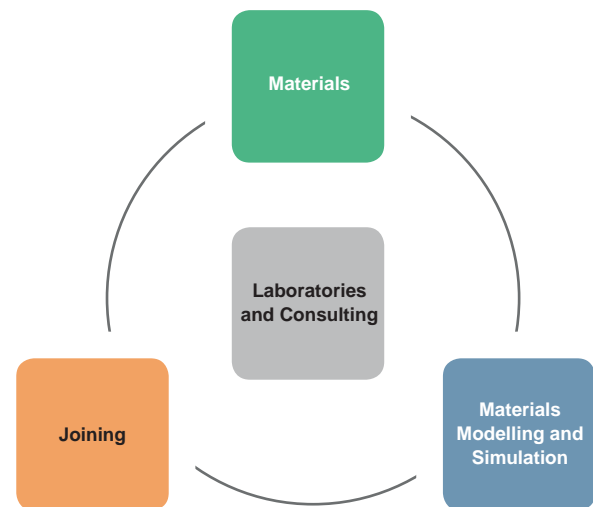
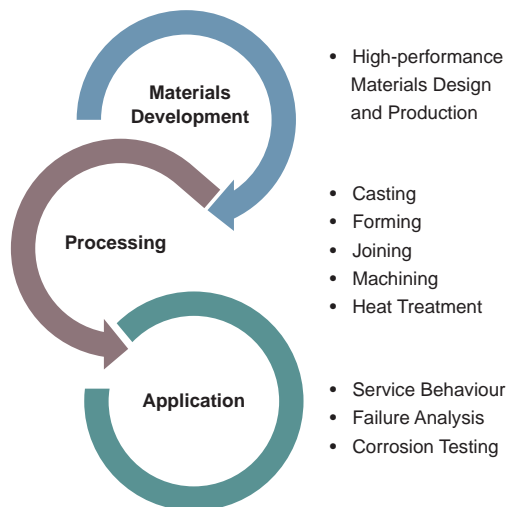
Wir verschweißen Sie mit der Zukunft!

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■ Areas of Research Interest

- Development and Processing of Advanced Engineering and Bio Materials
- Joining Technologies and Corrosion Testing
- Materials Modelling and Process Simulation
- Innovative Experimental Investigations and Microstructure Analysis
- Failure Analyses, Consulting and Expertise



■ Materials

The materials development group works on alloy development as well as the optimization of production and processing technologies of high performance metallic both engineering and bio materials. Most advanced experimental characterisation techniques are applied together with new sophisticated modelling tools in order to characterise mechanical and structural properties.

■ Selected Key Materials and their Applications

- Creep-resistant Materials (Ferritic and Austenitic Steels, Nickel-based Alloys) for Thermal Power Plants
- Al-alloys for Transport Applications
- Advanced High Strength Steels for Automotive Applications
- High-strength Micro-alloyed Steels for Civil Engineering Applications
- TiAl-alloys and Nickel-based Superalloys for Turbine Blades and Discs
- Ti- and Mg-alloys for Biomedical Applications



■ Materials Modelling and Simulation

The modelling group focuses on a variety of multi-scale models to predict and optimise material properties in service, by understanding, describing and simulating microstructural evolution in metals during processing. Experimental validation is carried out at laboratory scale.

■ Key Competences

- Modelling of Precipitation Kinetics
- Grain Structure Modelling during Thermo-mechanical Treatment
- Simulation of Creep Deformation and Creep Damage
- Finite Element Simulation of Selected Manufacturing Processes
- Physical Simulation of Metal Deformation
- Theoretical and Experimental Investigation of Metal Deformation

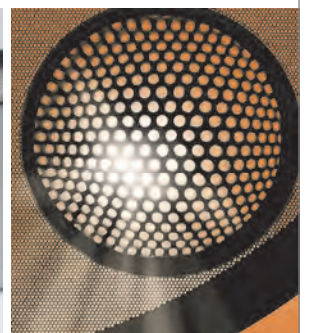
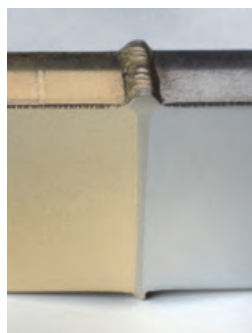
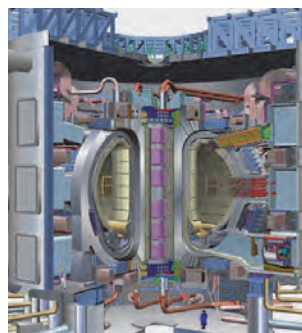
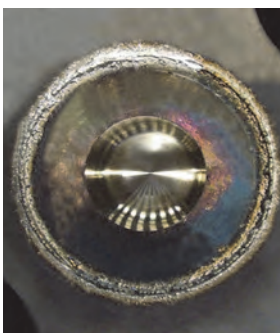
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