

EUROPEAN MECHANICS SOCIETY

METZ 2025
AUGUST 26-28

COLLOQUIUM 653
MECHANICS
OF INTERFACES

SCIENTIFIC PROGRAM (updated August 21, 2025)

Euromech Colloquium 653 “Mechanics of Interfaces”

S. Berbenni (Chairman), K. Kowalczyk-Gajewska, R. Dingreville (Co-chairs)

Building “Faculté de Droit Économie et Administration”

Amphitheater 2

University of Lorraine, Saulcy Campus, Metz



Day 1	Tuesday August 26, 2025
7:30 AM – 8:15 AM	<i>Registration of the attendees (Building: Faculté de Droit, Metz, Saulcy)</i>
8:15 AM – 8:30 AM	<i>Introduction by the Chairs of the Euromech Colloquium 653: S. Berbenni (Chairman), K. Kowalczyk-Gajewska, R. Dingreville (Co-chairs)</i>
8:30 AM – 10:30 AM	Session 1-I: Grain boundary motion (Chair: Rémi Dingreville)
8:30 AM – 9:00 AM	Marco Salvalaglio (TU Dresden, Germany) “Disconnection flow-mediated microstructure evolution”
9:00 AM – 9:30 AM	Luis Barrales (Georgia Institute of Technology Metz, France) “Quantification of the grain boundary structure and determination of migration mechanisms”
9:30 AM – 10:00 AM	Nicolas Combe (CEMES, CNRS, Toulouse, France) “Plastic displacement as a collective variable to study shear-coupled grain boundary migration and grain boundary phase transitions”
10:00 AM – 10:30 AM	<i>Coffee break (Faculté de Droit)</i>
10:30 AM – 11:50 AM	Session 2-I: Interface structures and properties (Chair: Laurent Delannay)
10:30 AM – 11:00 AM	Douglas Medlin (Sandia National Laboratories, Livermore, USA) “Relating Grain Boundary Structure to Dislocation Models”
11:00 AM – 11:30 AM	Patrick Cordier (Université de Lille, France) “Stress-induced amorphization and grain-boundary sliding”
11:30 AM – 11:50 AM	Joé Petrazoller (LEM3, CNRS, Metz, France) “Micromechanical modelling and atomistic simulations of solute atom segregation towards grain boundaries”
11: 50 AM – 1: 40 PM	<i>Lunch break (Saulcy campus)</i>
1:40 PM – 3:40 PM	Session 2-II: Interface structures and properties (Chair: Patrick Cordier)
1:40 PM – 2:10 PM	Laurent Delannay (IMMC, UC Louvain, Belgium) “How neighbour interactions influence rheology and grain rotations under Coble creep”
2:10 PM – 2:40 PM	Julien Guénoilé (LEM3, CNRS, Metz, France) “Dislocation density fields for bridging length scales in interface-dominated nanomechanics”
2:40 PM – 3:10 PM	Rémi Dingreville (Sandia National Laboratories, Albuquerque, USA) “Disconnection Mechanics: Segregation, Stability, and Mobility at Interfaces”
3:10 PM – 3:30 PM	Nicolas Lallemand (LEM3, CNRS, Metz, France) “Architected bi-lattice materials inspired by analogues in bi-crystal plasticity”
3:40 PM – 4:00 PM	<i>Coffee break (Faculté de Droit)</i>
4:00 PM – 5:30 PM	Session 1-II: Grain boundary motion (Chair: Marco Salvalaglio)
4:00 PM – 4:30 PM	Carl Krill (Ulm University, Germany) “Reverse Engineering Grain Growth Kinetics from Time-Resolved 3D Grain Maps and Machine Learning”
4:30 PM – 5:00 PM	Brad Boyce (Sandia National Laboratories, Albuquerque, USA) “Grain boundary migration under high-cycle fatigue conditions”
5:00 PM – 5:30 PM	Christian Motz (Saarland University, Germany) “Grain Growth in Nanocrystalline Metals induced by Mechanical Loading”
7:00 PM	<i>Dinner together for Euromech 653 participants (offered) Restaurant “El Theatris” – Address: 2 Place de la Comédie – Metz</i>

Day 2	Wednesday August 27, 2025
8:30 AM – 10:00 AM	Session 3-I: Deformation mechanisms at interfaces (Chair: Doug Medlin)
8:30 AM – 9:00 AM	Amit Misra (University of Michigan, Ann Arbor, USA) “Dislocation-Interface Interactions in Nanoscale Eutectics”
9:00 AM – 9:30 AM	Johan Hoefnagels (Eindhoven University of Technology, the Netherlands) “The intricate nanomechanics of martensite interfaces, unraveled by multi-scale in-situ testing & advanced CP modeling”
9:30 AM – 10:00 AM	João Quinta da Fonseca (University of Manchester, UK) “Grain boundary mediated deformation in a magnesium alloy at moderate temperatures and low strain rates”
10:00 AM – 10:30 AM	<i>Coffee break (Faculté de Droit)</i>
10:30 AM – 11:50 AM	Session 4-I: Damage and failure mechanisms at interfaces (Chair: Johan Hoefnagels)
10:30 AM – 11:00 AM	Hosni Idrissi (IMMC, UC Louvain, Belgium) “Electron beam induced giant ductility in amorphous Alumina (a-Al ₂ O ₃) and a- Al ₂ O ₃ /Al nanolaminates”
11:00 AM – 11:20 AM	Charaf-Eddine Ziouani (LEM3, Université de Lorraine, Metz, France) “Fracture of interfaces for Printed Circuit Boards application: Experimental characterization and numerical simulations”
11:20 AM – 11:50 AM	Albert Turon (University of Girona, Spain) “Characterization and Modeling of Interface Failure in Composites Under Complex Loading Conditions” (CANCELLED)
11:50 AM – 1:40 PM	<i>Lunch break (Saulcy campus)</i>
1:40 PM – 3:40 PM	Session 4-II: Damage and failure mechanisms at interfaces (Chair: Thomas Boehlke)
1:40 PM – 2:10 PM	Samuel Forest (CDM Mines Paris, France) “Full field modelling of viscoplasticity and intergranular damage in directionally solidified nickel-base superalloys”
2:10 PM – 2:40 PM	Dan Mordehai (Technion, Haifa, Israel) “The Role of Longitudinal Twin Boundaries on the Distribution of Failure Strains of Metallic Nanowires”
2:40 PM – 3:10 PM	Damien Texier (ICA, Toulouse, France) “Effect of strain rate and grain size on the oxidation-assisted intergranular cracking of the Alloy 718 at 650 °C”
3:10 PM – 3:40 PM	Samuel Hémery (Inst. Pprime, Futuroscope, France) “Low-stress deformation and early fracture at basal twist grain boundaries in titanium alloys”
3:40 PM – 4:00 PM	<i>Coffee break (Faculté de Droit)</i>
4:00 PM – 6:00 PM	Session 3-II: Deformation mechanisms at interfaces (Chair: Amit Misra)
4:00 PM – 4:30 PM	Laurent Capolungo (Los Alamos National Laboratory, USA) “Deformation Twinning in Metals with Hexagonal Close-Packed Crystal Symmetry: network formation and stability”
4:30 PM – 5:00 PM	Maciej J. Szczerba (Inst. of Metallurgy and Materials Science, Krakow, Poland) “Detwinning and the twin/matrix interface strength in FCC materials”
5:00 PM – 5:30 PM	Arthur Despres (SIMAP, Université de Grenoble-Alpes, France) “Elastic strain measurement at particle-matrix interfaces and at dislocations pile-ups by TEM”
5:30 PM – 6:00 PM	Katarzyna Kowalczyk-Gajewska (IPPT, Warsaw, Poland) “The role of matrix-twin interfaces in the void growth in HCP crystals”

Day 3	Thursday August 28, 2025
8:30 AM – 10:00 AM	Session 5-I: Multiscale and Multiphysics approaches to Interface Behavior (Chair: Laurent Capolungo)
8:30 AM – 9:00 AM	Sabine Enders (Karlsruhe Institute of Technology, Germany) “Density Functional Theory of Interphases”
9:00 AM – 9:30 AM	Xavier Feaugas (La Rochelle University, France) “Towards a better understanding of hydrogen implication on intergranular fracture in nickel-based alloys”
9:30 AM – 10:00 AM	Ralf Jänicke (TU Braunschweig, Germany) “Multiscale modelling of electro-chemo-mechanical interactions in particle composites with material interfaces” CANCELLED
10:00 AM – 10:30 AM	<i>Coffee break (Faculté de Droit)</i>
10:30 AM – 11:50 AM	Session 6-I: Heterogeneous interfaces and polycrystalline plasticity (Chair: Katarzyna Kowalczyk-Gajewska)
10:30 AM – 11:00 AM	Ricardo Lebensohn (Los Alamos National Laboratory, USA) “From voxels to interfaces: adapting FFT-based methods for geometric accuracy”
11:00 AM – 11:30 AM	Miroslav Zecevic (Los Alamos National Laboratory, USA) “Grain boundary constitutive equations implemented in a strain gradient FFT-based formulation”
11:30 AM – 11:50 AM	Claudius Klein (Karlsruhe Institute of Technology, Germany) “A size-dependent homogenization scheme for gradient plasticity in periodic laminates”
11:50 AM – 1:40 PM	<i>Lunch break (on campus)</i>
1:40 PM – 3:40 PM	Session 6-II: Heterogeneous interfaces and polycrystalline plasticity (Chair: Ricardo Lebensohn)
1:40 PM – 2:10 PM	Thomas Boehlke (Karlsruhe Institute of Technology, Germany) “Mean Field Modeling Including Interface Energies”
2:10 PM – 2:40 PM	Mohsen Rezaee-Hajidehi (IPPT, Warsaw, Poland) “Size-dependent patterns of propagating instabilities in shape memory alloy tubes”
2:40 PM – 3:10 PM	Jean-Charles Stinville (University of Illinois, Urbana-Champaign, USA) “Identifying the role of interfaces on mechanical properties of polycrystalline alloy by encoding microstructure and plasticity”
3:10 PM – 3:40 PM	Henry Proudhon (Mines Paris, France) “Correlative Diffraction Microscopy Imaging experiments to investigate crystal plasticity”
3:40 PM – 4:00 PM	<i>Coffee break (Faculté de Droit)</i>
4:00 PM – 4:20 PM	Session 5-II: Multiscale and Multiphysics approaches to Interface Behavior (Chair: Stéphane Berbenni)
4:00 PM – 4:20 PM	Yi-Ming Ren (Université Gustave Eiffel, Marne-la- Vallée, France) “A general imperfect interface model for strain-gradient elasticity”
4:20 PM – 4:40 PM	<i>Closure by the Chairs of the Euromech Colloquium 653:</i> <i>S. Berbenni (Chairman), K. Kowalczyk-Gajewska, R. Dingreville (Co-chairs)</i>
7:00 PM	<i>Gala dinner at Saint-Symphorien Metz Stadium (optional), shared with CFM event</i>