**Nanomechanical Testing in Materials Research and Development IX**

**Giardini Naxos October 6th – October 11th 2024**

Sunday, October 6, 2024

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| 09:30 – 10:00 |  | Check-in for Optional Tutorial Session (UNA Hotel Lobby) |
| 10:00 – 13:00 |  | **MecaNano Tutorial Session** (Congress Center)  **Advanced nanoindentation testing to study Strain rate sensitivity and flow behavior**  Verena Maier-Kiener, Montanuniversität Leoben, Leoben, Austria  **Advanced Nanomechanical Testing Protocols: High-Speed**  **Nanoindentation and Machine Learning for Big Data Analysis**  Edoardo Rossi, Università degli studi Roma Tre, Rome, Italy |
| 14:30 – 15:45 |  | Conference Check-In (UNA Hotel Lobby) |
| 15:50 – 16:00 |  | Conference Welcome Remarks (Congress Center) |
| 16:00 – 16:50 |  | Plenary Talk 1  Three-dimensional interfaces in metallic nanolaminates  Irene J. Beyerlein, University of California, Santa Barbara, USA |
|  |  | Session 1A  Novel Nanoindentation and nanomechanical testing methods  Moderator: Prof. Sandra Korte-Kerzel, RWTH Aachen University, Germany |
| 16:50 – 17:10 |  | Spherical Nanoindentation – a Further Step towards Accelerated Materials Development  Verena Maier-Kiener, Montanuniversität Leoben, Department Materials Science, Leoben, Austria |
| 17:10 – 17:30 |  | A Framework for Nanoindentation of Soft Biomaterials and Polymers  Donna M. Ebenstein, Biomedical Engineering Department, Bucknell University, Lewisburg, USA |
| 17:30 – 17:50 |  | **Updated HTSI Method: Characterizing CaF2 Properties from TR to 800°C**  Gabrielle Tiphéne, IMAP, iMMC, UCLouvain, Louvain-la-Neuve, Belgium |
| 17:50 – 18:10 |  | **Lateral Nanoindentation: Energy Dissipation and Static Friction** John B. Pethica, Trinity College Dublin, Ireland |
| 18:10 – 18:30 |  | **Insights into the Origins of Friction from Two-axis Nanoindentation**  George M. Pharr, Department of Materials Science and Engineering, Texas A&M University, Texas, USA |
| 19:00 – 21:30 |  | Opening reception (Garden) and dinner (Buffet in Oasys Restaurant) |

Monday, October 7, 2023

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| 07:00 – 08:30 |  | Breakfast buffet (Oasys Restaurant) |
|  |  | **Session 1B**  **Novel Nanoindentation and Nanomechanical Testing Methods**  Moderator: Prof. Karsten Durst, TU Darmstadt, Germany |
| 08:30 – 09:00 |  | **Invited Talk**  **High Strain Rate Nanoindentation Testing: Recent Advancements, Challenges, and Opportunities**  Sudharshan Phani Pardhasaradhi, ARCI, Hyderabad, India |
| 09:00 – 09:20 |  | **A New Controller Specifically Designed for Very High Speed Nanoindentation**  Warren Oliver, KLA Corporation, Instruments group, Oak Ridge, USA |
| 09:20 – 09:40 |  | **Slip Statistics from High-data-acquisition Rate Nanoindentation of a Metallic Glass**  Wendelin J. Wright, Bucknell University, Lewisburg, Pennsylvania, USA |
| 09:40 – 10:00 |  | **Constant Strain Rate Nanoindentation up to 10,000/s Strain Rate for Reliable Extraction of Mechanical Properties and Deformation Activation Parameters**  Gaurav Mohanty, Materials Science and Environmental Engineering, Tampere University, Finland |
| 10:00 – 10:20 |  | **Strategies to Mitigate the Effect of FIB Damage during Micro Fracture Testing**  Christoph Kirchlechner, Institute for Applied Materials, Karlsruhe Institute of Technology, Karlsruhe, Germany |
| 10:20 – 10:50 |  | Coffee break |
| 10:50 – 11:00 |  | Communications for the day |
|  |  | **Session 2A**  **Multiscale Deformation Mechanisms (from Atomic to Meso-scale)**  Moderator: Graham Cross, Trinity College Dublin, ireland |
| 11:00 – 11:30 |  | **Invited Talk**  **Nanomechanics serving polymer-based composite research**  Thomas Pardoen,Institute of Mechanics, Materials and Civil Engineering (IMMC), UC Louvain, B-1348, Louvain‐la‐Neuve, Belgium and WEL Research Institute, avenue Pasteur 6, 1300 Wavre, Belgium |
| 11:30 – 11:50 |  | **Solute Effects on the Migration a of Single Twin Boundary in Magnesium**  Henry Ovri, Helmholtz-Zentrum Hereon, Institute of Materials Mechanics, 21502 Geesthacht, Germany |
| 11:50 – 12:10 |  | **Nanoindentation Study at Single Grain Boundaries of Oxide Ceramics**  Hiroshi Masuda, The University of Tokyo, Japan |
| 12:10 – 12:30 |  | **Room-temperature Multiscale Dislocation Plasticity in Oxides**  Xufei Fang, Institute for Applied Materials, KIT, Karlsruhe, Germany |
| 12:30 – 13:00 |  | **Invited Talk**  **Developing Multiscale Toughened Ceramics: The Role of Nano- and Micromechanical Testing**  Diletta Giuntini, Dept. of Mechanical Engineering, Eindhoven University of Technology, Eindhoven, The Netherlands |
| 13:00 – 14:30 |  | Lunch buffet |
| 14:30 – 15:30 |  | Networking time |
|  |  | **Session 3A - In-situ and Operando Nanomechanics**  Moderator: Prof. Christoph Kirchlechner, Karlsruhe Institute of Technology, Germany |
| 15:30 – 16:00 |  | **Invited Talk**  **Dislocation Pathways in and Interstitial Engineering of BCC Refractory Multi-Principal Element Alloys**  Daniel S. Gianola, Materials Department, University of California Santa Barbara, USA |
| 16:00 – 16:20 |  | **Investigation of the Deformation Mechanisms of MoS2 Fullerenes by in Situ Mechanical Tests in Environmental Transmission Electron Microscopy**  Karine Masenelli-Varlot, INSA Lyon, Universite Claude Bernard Lyon 1, CNRS, MATEIS, UMR5510, Villeurbanne, France |
| 16:20 – 16:40 |  | **Local Deformation Along the Iron Ore Reduction Cascade**  James P. Best, Max-Planck-Institut für Eisenforschung GmbH, Germany |
| 16:40 – 17:10 |  | Coffee Break |
|  |  | **Session 3B - In-situ and Operando Nanomechanics**  Moderator: Prof. Mathias Goeken, FAU Erlangen-Nuremberg University, Germany |
| 17:10 – 17:30 |  | **Martensitic Transformation in Ce-doped Zirconia: In-situ X-ray Diffraction during Mechanical Testing or Annealing on Synchrotron Beamlines**  Marcelo D. Magalhães, INSA Lyon – MATEIS, Villeurbanne, France |
| 17:30 – 17:50 |  | **Physical, Chemical and Architectural Metal-Ceramic Nanolaminate Design for Enhanced Mechanical Properties**  Xavier Maeder, Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland |
| 17:50 – 18:20 |  | **Invited Talk**  **Micro- and Nanomechanical in Situ Experiments to Address Fracture Processes**  Daniel Kiener, Montanuniversität Leoben, Austria |
| 18:45 – 20:00 |  | Poster Preview Session (odd-numbered posters)  (one minute each speaker) |
| 20:00 – 21:30 |  | Buffet dinner |
| 21:30 – 23:00 |  | Poster session with social time |

Tuesday, October 8, 2023

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| 07:00 – 08:30 |  | Breakfast buffet |
|  |  | **Session 4A - Nanomechanics in extreme conditions**  Moderator: Prof. Verena Maier-Kiener, Montanuniversität Leoben, Austria |
| 08:30 – 09:00 |  | **Invited Talk**  **Nanoindentation tests for understanding the effect of light environment on dislocations behavior in compound semiconductors**  Atsutomo Nakamura, Department of Mechanical Science and Bioengineering, Graduate School of Engineering Science, Osaka University, Japan |
| 09:00 – 09:20 |  | **In Situ Micromechanical Characterization of Multi-Layered Thin Films: Strain Rate, Size and Microstructure Related Experiments**  Szilvia Kalácska, CNRS LGF, Mines St. Etienne, France |
| 09:20 – 09:40 |  | **Electron Irradiation Induced Crack Suppression in Oxide Glasses**  Sebastian Bruns, Physical Metallurgy, Technical University of Darmstadt, Darmstadt, Germany |
| 09:40 – 10:00 |  | **Microscale Additively Manufactured 3D Metal-Ceramic Nanocomposites with Improved Strength and Thermal Stability**  Jakob Schwiedrzik, Laboratory for Mechanics of Materials and Nanostructures, Empa, Switzerland |
| 10:00 – 10:20 |  | **In-Situ Environmental TEM Study of the Effect of Hydrogen on Crack Propagation in Steel**  Lin Tian, Institute of Materials Physics, University of Göttingen, Germany |
| 10:20 – 10:50 |  | Coffee break |
| 10:50 – 11:00 |  | Communications for the day |
|  |  | **Session 4B - Nanomechanics in extreme conditions**  Moderator: Prof. Erik G. Herbert, Oak Ridge National Labs, USA |
| 11:00 – 11:30 |  | **Invited Talk**  **High Strain Rate Persistence of the Strength Anomaly in a L12 Intermetallic Compound Evidenced by Nanoindentation at Combined High Strain Rates and High Temperatures**  Benoit Merle, Institute of Materials Engineering, University of Kassel, Germany |
| 11:30 – 11:50 |  | **What can we expect from high strain rate micropillar compression of metals at the grain scale?**  Guillaume Kermouche, Mines Saint-Etienne, Laboratoire Georges Friedel, CNRS UMR 5307, France |
| 11:50 – 12:10 |  | **From Heat to Hardness: Probing Phase Changes in Pd-based Alloy with High-Temperature Nanoindentation**  Lea A. Lumper, Montanuniversität Leoben, Leoben, Austria |
| 12:10 – 12:30 |  | **Effect of Defects on the Dynamic Compression of Strontium Titanate Micropillars**  Bárbara Bellón, Max-Planck-Institut für Eisenforschung, Germany |
| 12:30 – 12:50 |  | **A new approach for in-situ electrochemical nanoindentation: side charging as a promising alternative**  Stefan Zeiler, Department of Materials Science, Montanuniversität Leoben, Leoben, Austria |
| 12:50 – 13:20 |  | **Invited Talk**  **Uncovering Extreme Dynamic Responses in Microscale Mechanical Metamaterials**  Carlos M. Portela, Department of Mechanical Engineering, MIT, USA |
| 13:20 – 14:45 |  | Lunch buffet |
| 15:00 – 22:30 |  | Excursion (including dinner) |

Wednesday, October 9, 2023

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| 07:00 – 08:30 |  | Breakfast buffet |
|  |  | **Session 2B**  **Multiscale deformation mechanisms (from atomic to meso scale)**  Moderator: Prof. Ralph Spolenak, ETH Zurich, Switzerland |
| 08:30 – 09:20 |  | Plenary Talk 2  Effects of Grain Boundary Structure and Chemistry on Plasticity in Metals  Gerhard Dehm, MPI for Sustainable Materials, Düsseldorf, Germany |
| 09:20 – 09:40 |  | **Relationship between sliding direction and crystal rotation under tribological loading**  Christian Greiner, Institute for Applied Materials (IAM), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany |
| 09:40 – 10:00 |  | **Mechanical Response of Varying Non-Equilibrium Grain Boundary States in Nanocrystalline Iron-Chromium**  Markus Alfreider, Department Materials Science, Montanuniversität Leoben, Leoben, Austria |
| 10:00 – 10:20 |  | **Shear Induced Amorphization: A New Deformation Mechanism for Silicates**  Patrick Cordier, Univ. Lille, F-59000 Lille, France and Institut Universitaire de France, Paris, France |
| 10:20 – 10:50 |  | Coffee break |
| 10:50 – 11:00 |  | Communications for the day |
|  |  | **Session 5A**  **Complex strain measurement methods and advanced data analysis**  Moderator: Prof. Wendy Wright |
| 11:00 – 11:30 |  | **Invited Talk**  **From the study of plastic strain localization to the study of discrete localized plastic deformation events in metals**  Jean-Charles Stinville, Materials Science and Engineering Department, University of Illinois at Urbana-Champaign, USA |
| 11:30 – 11:50 |  | **Evolution of nanoscopic stress and strain concentrations across notched microcantilevers during in situ bending**  Michael Meindlhumer, Department Materials Science, Montanuniversität Leoben, Leoben, Austria |
| 11:50 – 12:10 |  | **Micromechanics of thin films with digital image correlation: three case studies**  Oleksandr Glushko, Department of Materials Science, Montanuniversität Leoben, Leoben, Austria |
| 12:10 – 12:30 |  | **Advanced TEM techniques for measuring nanoscale stress fields during micromechanical testing of non-equilibrium materials**  Christoph Gammer, Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria |
| 12:30 – 13:00 |  | **Invited Talk**  **Process-structure-property relationship in 3D printed metals**  Steven Van Petegem, Photon Science Division, Paul Scherrer Institute, Forschungsstrasse, Switzerland |
| 13:00 – 14:30 |  | Lunch buffet |
| 14:30 – 15:30 |  | Networking time |
|  |  | **Session 6A**  **Integrated modelling and characterization**  Moderator: Prof. Nate Mara, UMN-CSE - University of Minnesota, USA |
| 15:30 – 16:00 |  | **Invited Talk**  **Solute Strengthening in FCC High Entropy Alloys: From Modeling to Alloy Design**  Céline Varvenne, MatéIS, INSA Lyon, France |
| 16:00 – 16:20 |  | **Relating the Distribution of Stochastic Nanomechanical Properties to Microstructural Mechanisms Using Molecular Dynamics Simulations**  Dan Mordehai, Faculty of Mechanical Engineering, Technion, Israel |
| 16:20 – 16:40 |  | **The Effect of Twin Boundaries on Nucleation-Controlled Plasticity of Metal Nanoparticles**  Eugen Rabkin, Department of Materials Science and Engineering, Technion, Haifa, Israel |
| 16:40 – 17:00 |  | **Finite Element and Microplane Modelling of Wc-Co Composites Based on Tomography Meshes, Nanoindentation and Microsample Testing**  Emilio Jiménez-Piqué, Universitat Politecnica de Catalunya, Campus Diagonal Besòs, Edifici A (EEBE) Barcelona, Spain |
| 17:00 – 17:30 |  | **Invited Talk**  **Unraveling the Origins of Fracture Toughness by Integrating Micromechanical Testing and Atomistic Simulations**  Erik Bitzek, Max Planck Institute for Sustainable Materials, Germany |
| 17:30 – 18:00 |  | Coffee break |
| 18:00 – 19:15 |  | Poster Preview Session (even-numbered posters)  (one minute each speaker) |
| 19:15 – 20:45 |  | Buffet dinner |
| 20:45 – 22:30 |  | Poster session with social time |

Thursday, October 10, 2023

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| 07:00 – 08:30 |  | Breakfast buffet |
|  |  | **Session 7A**  **Artificial Intelligence for nanomechanics**  Moderator: Prof. Edoardo Bemporad |
| 08:30 – 09:00 |  | **Invited Talk**  **Artificial Intelligence for Micro- and Nanomechanics**  Ulrich Kerzel, RWTH Aachen University |
| 09:00 – 09:20 |  | **Using data-based methods for microstructure characterization**  Ashish Chauniyal, ICAMS, Ruhr University Bochum, Germany |
| 09:20 – 09:40 |  | **Combinatorial and high-throughput discovery of metal alloy thin films with outstanding mechanical properties**  Johann Michler, Empa, Swiss Federal Laboratories for Materials Science and Technology, Thun, Switzerland |
| 09:40 – 10:00 |  | **Employing grain boundary segregation engineering for improved mechanical performance of nanostructured tungsten**  Julius F. Keckes, Department Materials Science, Chair of Materials Physics, Montanuniversität Leoben, Austria |
| 10:00 – 10:30 |  | **Invited Talk**  **Combinatorial and high-throughput investigation of nanoindentation techniques in the era of AI**  Andrea M. Hodge, University of Southern California, USA |
| 10:30 – 11.00 |  | Coffee break |
|  |  | **Session 8A**  **Correlative mechanical microscopy**  Moderator: Prof. Guillaume Kermouche, Ecole des Mines de Saint-Etienne, France |
| 11:00 – 11:30 |  | **Invited Talk**  **Operando Correlative Mechanical Microscopy**  Jeffrey M. Wheeler, FemtoTools AG and ETH Zurich, Switzerland |
| 11:30 – 11:50 |  | **Oxygen, a Strengthening and Embrittling Element for Titanium Inherited from High Temperature Oxidation: A Multimodal Framework Using High Speed Nanoindentation Mapping and Micropillar Compression**  Damien Texier, Institut Clement Ader (ICA) - CNRS, Albi, France |
| 11:50 – 12:10 |  | **Micro-scale Strain Partitioning Studies in Heterogeneous Microstructures**  Nagamani Jaya Balila, Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology, Bombay, India |
| 12:10 – 12:30 |  | **Atomic Scale Characterization of Deformation and Fracture Phenomena Using a MEMS-based in Situ STEM Loading System**  Eita Tochigi, Institute of Industrial Science, The University of Tokyo, Japan |
| 12:30 – 13:00 |  | **Invited Talk**  **Physical Micrometallurgy: Localized Electrodeposition Based Additive Approach**  Rajaprakash Ramachandramoorthy, Max-Planck-Institute für Eisenforschung (MPIE), Düsseldorf, Germany |
| 13:00 – 14:30 |  | Lunch buffet |
| 14:30 – 15:30 |  | Networking Time |
|  |  | **Session 9A**  **Application of nanomechanics to industrially relevant materials and devices**  Moderator: Prof. Damien Texier, Institut Clément Ader – CNRS, France |
| 15:30 – 16:00 |  | **Invited Talk**  **In situ tensile testing of nanocomposite thin films on flexible polymer substrates**  Barbara Putz, Empa, Thun, Switzerland |
| 16:00 – 16:20 |  | **Insights into micropillar compression during hydrogen charging**  Maria Jazmin Duarte Correa, Max-Planck-Institut für Eisenforschuing, Germany |
| 16:20 – 16:40 |  | **In-situ electrical resistance in metallic films under cyclic loading reveals mechanical damage mechanisms**  Megan J. Cordill, Erich Schmid Institute of Materials Science, Austrian Academy of Sciences Leoben, Austria |
| 16:40 – 17:00 |  | **Deciphering the puzzle of plastic deformation in cubic c15 laves phases: surprising insights and future paths**  Sandra Korte-Kerzel, Institut für Metallkunde und Materialphysik, RWTH Aachen University, Germany |
| 17:00 – 17:20 |  | **High throughput assessment of creep behavior of advanced nuclear reactor alloys by nanoindentation**  Nathan A. Mara, University of Minnesota-Twin Cities, USA |
| 17:20 – 17:50 |  | Coffee Break |
|  |  | **Session 9B**  **Application of nanomechanics to industrially relevant materials and devices**  Moderator: Prof. Megan J. Cordill, Erich Schmid Institute of Materials Science, Austrian Academy of Sciences Leoben, Austria |
| 17:50 – 18:10 |  | **Tailoring microstructural heterogeneities in thin film metallic glasses and crystal/glass ultra-fine nanolaminates to enhance their mechanical properties**  Matteo Ghidelli, Laboratoire des Sciences des Procédés et des Matériaux (LSPM), CNRS, France |
| 18:10 – 18:30 |  | **Investigating enhancements in fracture reliability of 3d-printed micro-ceramics via ALD coatings**  Edoardo Rossi, Department of Civil, Computer Science and Aeronautical Technologies Engineering, Rome Tre University, Italy |
| 18:30 – 18:50 |  | **The mechanics of solid-state battery materials: the hidden surprise of lithium metal and amorphous separators**  Erik G. Herbert, Oak Ridge National Laboratory, TN, USA |
| 20:00 – 22:30 |  | Conference Banquet |

Friday, October 11, 2023

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| 07:00 – 09:00 |  | Breakfast and departures. |

Poster presentations

1. Length Scale Effects on Power Law Creep of Materials: Cases of Uniform and Graded Stress Fields

Praveen Kumar, Indian Institute of Science, India

1. High temperature scanning indentation: latest results on materials

Fatima-Zahra Moul-el-ksour, LTDS, UMR CNRS 5513, ECL, France

1. In-situ crack initation and propagation of 3rd generation medium mn steel: microtensile tests and micromechanical characterization

Nuria Cuadrado Lafoz, Eurecat, Technological Center of Catalonia, Unit of Metallic and Ceramic Materials, Spain

1. Comprehensive micro-scale investigation of deformation mechanisms in superplastic biodegradable Zn alloys

Wiktor Bednarczyk, Warsaw University of Technology, Poland

1. Evolution of dislocation substructures in metals via high strain rate nanoindentation

Yuwei Zhang, Department of Material Science and Engineering, Texas A&M University; College Station, Texas, 77840, USA.

1. Micro-beam bending combined with AFM and FEM for matrix-reinforcement interfacial strength analysis

Piotr Jenczyk, Institute of Fundamental Technological Research, Polish Academy of Sciences, Warsaw, Poland

1. Complementary contributions of nanoindentation and nanomechanical mapping by atomic force microscopy to characterize the elastic properties of a semi-crystalline polymer from micro to nano scale

Christophe Tromas, Pprime Institute, University of Poitiers, France

1. Plasticity in BCC bi-crystals with high angle grain boundary at cryogenic condition by micropillar compression

Chunhua Tian, Empa, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Mechanics of Materials and Nanostructures, Switzerland

1. Promotion of the plastic deformability of high-strength Al2O3-GdAlO3 ceramics through refined eutectic microstructure

Yuta Aoki, The University of Tokyo, Japan.

1. Electrically induced viscous flow in oxide glasses at room temperature: electrical-nanoindentation tests vs e-beam effect

Morgan Rusinowicz, Mines Saint-Etienne, CNRS, UMR5307 LGF, Centre SMS

1. Understanding Anisotropic Hardening in Ferrite

Angelica Medina, Institute for Applied Materials, Karlsruhe Institute of Technology, Germany

1. Unraveling the Void Strengthening Effect in Electrodeposited Zinc

Maria Watroba, Empa Swiss Federal Laboratory for Materials Science and Technology, Switzerland

1. Correlative Mechanical Microscopy to Assess Processing and Environmental Damage in Titanium Thin Foils

Valerio Savo, Department of Civil, Computer Science and Aeronautical Technologies Engineering, University of Roma Tre, Rome, Italy

1. Additive manufacturing of polymer-derived ceramics with multiscale architectures (AM-PDCs)

Jiongjie Liu, Mechanical Engineering, Eindhoven University of Technology (TU/e)

1. In-situ superelastic nano-compression tests in arrays of pillars

Jose M. San Juan, Dept. of Physics, University of the Basque Country, UPV/EHU, Spain

1. Identifying Characteristic Features for the Mechanical Behavior of Aperiodic Ceramic Nanomultilayers

Danielle White, University of Southern California, USA

1. Enriching nanoindentation with in situ electrical measurements and SEM observations

Fabien Volpi, Université Grenoble Alpes, Grenoble-INP, CNRS, SIMaP, France

1. Size effects and strain rate sensitivity in nanocrystalline High Entropy Alloys studied by nanoindentation and micropillars compression.

Mateusz Włoczewski, Faculty of Material Science and Engineering, Warsaw University of Technology, Poland

1. Micromechanical testing of silicon using mems stage: modeling and characterization

Muhammad Muzammil, Computational Sciences and Engineering Program, Koç University, Rumelifeneri Yolu,Turkey

1. Hydrogen-induced hardening effect and the diffusion behavior in bcc FeCr alloys by in situ nanoindentation

Jing Rao, Max-Planck-Institut für Eisenforschung, Germany

1. Identifying Characteristic Features for the Mechanical Behavior of Aperiodic Ceramic Nanomultilayers

Ujjval Bansal, Institute of Applied Materials, Karlsruhe Institute of Technology, Germany

1. Investigation of intermetallic-mg interface strength using in situ microshear testing

Anwesha Kanjilal, Department of Structure and Nano-/Micromechanics of Materials, Max-Planck Institut für Eisenforschung GmbH, Germany

1. Grain Orientation Dependance on the Micromechanical Properties of Multimetal Carbides

Nidhin George Mathews, Tampere University, Finland

1. Transition from static to sliding friction in few-layer graphene lubricated, high pressure shearing of mesoscale contacts

Ahmed Uluca, AMBER/CRANN Institute, School of Physics, Trinity College Dublin, Ireland

1. High Speed Nanoindentation: An Innovative Method for the Correction of Errors Resulting from Pile-Up

Daniele Duranti, Department of Civil, Computer Science and Aeronautical Technologies Engineering, University of Roma Tre, Rome, Italy

1. Room temperature migration of a σ5 copper grain boundary during micropillar compression

Mohammed Kamran Bhat, Max-Planck-Institut für Eisenforschung GmbH, Germany

1. Towards data-driven in-situ materials testing in SEM

Fang Zhou, Carl Zeiss Microscopy GmbH, Carl-Zeiss-Strasse 22, 73447 Oberkochen, Germany

1. Nanoengieered high entropy alloys thin films with large and tunable mechanical properties

Davide Vacirca, LSPM-CNRS, 99 Av. Jean Baptiste Clément, 93430 Villetaneuse, France

1. Measuring failure of coatings by naoscratch testing

Hannah Zhang, National Physical Laboratory

1. Understanding the plasticity of silicon at high temperatures and small length scales

Gerald J. K. Schaffar, Department Materials Science, Montanuniversität Leoben

1. Fabrication of single crystal copper micro-tensile specimens using the femtosecond-laser and plasma-focused ion beam

Laurent Tôn-Thât, Research Institute of Hydro-Quebec, Varennes QC J3X 1S1, Canada

1. Microscale mechanical and viscoelastic properties of bone affected by osteogenesis imperfecta

Michael Wurmshuber, FAU Erlangen-Nürnberg, Germany

1. Exceptional plastic behavior of amorphous oxide films

Nidhin George Mathews, Tampere University, Finland

1. High temperature fracture mechanics of ternary and quaternary diboride

Anna Hirle, Christian Doppler Laboratory for Surface Engineering of High-performance Components, TU Wien, Austria

1. Study Of Strain Localization And Crystal Reorientation At The Early Stage Of Plastic Deformation Using Laser Scanning Confocal Microscopy, HR-EBSD And DCT-6d

Damien Texier, Institut Clement Ader (ICA) - UMR CNRS 5312, France

1. Comparative Analysis of Nanomechanics and Microstructure of Rat and Cat Vibrissae to Inform the Design of Bioinspired Whiskers

Donna M. Ebenstein, Biomedical Engineering Department, Bucknell University, Lewisburg PA USA

1. High Strain Rate Nanoindentation on a Low Angle Grain Boundary in Copper

Hendrik Holz, Max Planck Institute for Sustainable Materials, Germany

1. Determination of stress-strain curves by indentation tests with spherical indenters and analysis of the measurement data using inverse analysis strategies

Kian Tadayon, Fraunhofer Institute for Ceramic Technologies and Systems IKTS, Germany

1. Characterization of a Multiphase Rock Mapped at Different Temperatures

Wolfgang Stein, SURFACE

1. Exploring Slip Behavior of Graphene under Uniaxial Strain via Analysis of G-mode Raman Spectroscopy

Haowei Zhang, School of Physical and Chemical Sciences, Queen Mary University of London, London, UK

1. Fatigue Damage Mechanisms in Freestanding Gold Thin Films and Their Dependence on Film Microstructure and Temperature

Anna Krapf, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

1. Randomised Impact Testing at >800 °C to Simulate High Temperature Erosion

Ben Beake, Micro Materials Ltd., UK

1. Micromechanical Assessment of Fracture Properties of Austenitic Stainless Steel Grain Boundaries Oxidized in a Pressurized Water Reactor Environment

Marc Legros, CEMES-CNRS, Toulouse, France

1. Multi-scale Mechanical Characterization of Zr-2.5Nb Pressure Tube Alloy

Vineet Bhakhri, Canadian Nuclear Laboratories (CNL), Reactor Fleet Sustainability Directorate, Chalk River, Ontario, Canada

1. Measuring Thin Film Elastic Constants Using Combined X-Ray Microdiffraction and Micromechanical Testing

Rainer Hahn, Christian Doppler Laboratory for Surface Engineering of high-performance Components, TU Wien, Austria

1. Mechanical Damping at the Nanoscale in Cu-Based Shape Memory Alloys

Jose F. Gómez-Cortés, Dept. of Physics, University of the Basque Country UPV/EHU, Spain

1. Nanoindentation Methods for Analysis of Thermally Activated Processes at Elevated Temperatures

Marcel Sos, Technical University Darmstadt, Physical Metallurgy, Darmstadt, Germany

1. Grain Boundary Segregation in Magnesium Alloys: From Infinitesimally Diluted Solid Solutions to Synergistic Effects

Zhuocheng Xie, Institut für Metallkunde und Materialphysik, RWTH Aachen, Germany

1. Deformation Twinning Unraveled in Α-Titanium through Micropillars Compression Loading over a Wide Range of Strain Rate

Kamila Hamulka, EMPA, Thun, Switzerland

1. Copper Micro-honeycomb Architectures: Fabrication, Characterization and High Strain Rate Testing

Kuan Ding, Max-Planck-Institut für Eisenforschung GmbH, Max-Planck-Straße 1, 40237 Düsseldorf, Germany

1. 3D Mapping of Local Stress By n3D-XRD-CT

Thomas Edward James Edwards, NIMS, 1-2-1 Sengen, Tsukuba, 305-0047, Japan

1. In Situ Cyclic Micro Deformation of NiMnGa Ferromagnetic Shape-memory Alloy with Concurrent AE Detection

Dávid Ugi, Department of Materials Physics, ELTE Eötvös Loránd University, Pázmány Péter sétany 1/a, 1117 Budapest, Hungary.

1. A Nanomechanical Approach for Efficient Substitution of Cobalt In High-Entropy Alloys and Hardmetals for Thermal Sprayed Coatings

Giulia Gigante, Department of Civil, Computer Science and Aeronautical Technologies Engineering, Roma Tre University, Rome, Italy

1. Study of Thermo-Mechanical Fatigue of Metallizations Using Correlative in-Situ Methodologies

Sebastian Moser, KAI Kompetenzzentrum Automobil- und Industrieelektronik GmbH,

Europastrasse 8, 9524 Villach, Austria

1. Nanoscale Evaluation of Light Illumination Influence on the Basal Slip in GaN Single Crystals

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1. Defects Nucleation and Stability in Pt Nanoparticles Using Bragg Coherent X-Ray Diffraction

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1. Toward High Strain Rate Spherical Nanoindentation Testing

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1. Nanomechanical Testing of Nitrided and Nitrogen Ion Implanted High Entropy Alloys

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1. Enhanced Analysis of High-Speed Nanoindentation Data Using Skew-Normal Mixture Methodology: Insights from WC-Base Cemented Carbides

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1. In Situ Laue Micro-Diffraction During Micro-Pillar Testing: Investigating a Magnetic Heusler Alloy

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1. A Setup for Nanoindentation with In-Situ X-Ray Nanodiffraction

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1. The Onset of Plasticity in Pt Sub-Micron Particles Revealed by Bragg Coherent X-Ray Diffraction Imaging during Nano-Indentation

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1. Multi-Scale Analysis Of Toughening Mechanisms In Ceria-Stabilized Zirconia Ceramics

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1. Correlative AFM-SEM Microscopy of Bacteria-Diamond-Metal Nanocomposite

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1. Design and Development of Micromechanical Testing Stages for Cantilever Bending

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1. Tailor-Made Non-Silicon AFM Probes for Nanomechanical and Nanotribological Testing

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1. Mechanical Properties of Performance-Critical Regions in Hard Ceramic Thin Films Correlated with Nanoscale Gradients of Residual Stresses and Microstructure

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1. Investigation of Strain Rate Sensitivities of Body Centered Cubic Single Crystals Using High Strain Rate Nanoindentation up to 10,000 s-1

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1. Understanding the Grain Boundary Sliding Behavior in Ni Bicrystal via in Situ High Temperature Pillar Compression

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1. Mechanical and Electrical Properties of Nanostructured Thin Film Metallic Glasses for Flexible Electronic Applications

Marco Ezequiel, Laboratoire des Sciences des Procédés et des Matériaux (LSPM), CNRS, France

1. Tribochemistry of DLC Coatings with Gas Phase Lubricant Additives: Characterization with Electronic Spectroscopies

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1. Understanding Transient Plasticity Through Indentation Creep Tests Using Different Indenter Geometries

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1. High Temperature Scanning Indentation: Applications, Limitations and Perspectives

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1. Effects of the Topologically Close-Packed (TCP) Phase in the Ni-Based Superalloy

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1. Mechanical Properties of Sinterless 3D Printed Silica Glass: A Multi-Technique Comparative Study

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1. Use of Nanocrystalline Nickel Microforce Sensors in Practice

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1. High Strain Rate Mechanical Behavior of Materials Treated by Surface Mechanical Attrition (SMAT)

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1. Micromechanical Investigation of Lead-Free Soft Solder by in-Situ Microcompression Experiments and Advanced Nanoindentation

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1. Probing Stress Distribution in Silicon Nanowires: Integrating Resonance Testing and Raman Spectroscopy

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1. Scratching the Surface: a GND Based Analysis of the Lateral Size Effect

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1. High Strain Rate Nanoindentation of Fused Silica, Silicon, and Nanocrystalline Nickel

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1. An Ontology and Metadata for Nanomechanical Testing

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1. Deformation of Silicon Oxides under Electron-beam Irradiation and its Atomistic Mechanisms

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1. Study of the Mechanical Properties and Plasticity of the C14 Laves and µ-Phase in the Ta-Fe(-Al) System

Christina Gasper, RWTH Aachen University, Germany

1. Analyzing the Effect of Cyclic Loading on Microstructural Changes Using Micro-cantilever and Indentation Fatigue in nc and sc Ni

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1. Nanomechanical Properties of Superconducting Nb3Sn–Based Wires Measured by Nanoindentation

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1. Surface Integrity of Ti6Al4V Alloy as a Function of AM Workpiece Vibration

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1. Exploring Micromechanical Behavior of Additively Manufactured Multi-Layered Medium-Entropy Alloy

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1. Graphene Rupture and Nucleation of Auto-Kirigami Graphene Pleats by 2-Dimensional Nanoindentation

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1. Doping-Regulated Room-Temperature Dislocation Plasticity in SRTIO3: A Multiscale Approach

Chukwudalu Okafor Department of Materials and Earth Sciences, Technical University of Darmstadt,

Darmstadt, Germany.

1. Assessment of Nanomechanical Properties and Residual Stresses in Multilayer TIW-Au-TIW Thin Films of MEMS Micro-Structure

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1. Incipient Plasticity in Bulk Metallic Glasses: Insights from Statistical Nanoindentation at Ambient and Elevated Temperatures

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1. Plasticity of Ca-Mg-Al Laves Phases and its Temperature and Chemistry Dependence

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1. Stability Investigation of Nanocrystalline Silicon Carbide under the Extreme Conditions

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1. Effect of Silver Addition on Micro- and Nanohardness of the Cu-10Al-7Ag Shape Memory Alloy

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Technologies, Vukovarska 58, 51 000 Rijeka, Croatia

1. Tribological Stress Field Model Validation by Using Deformation Twins as Probes

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1. Residual Stress-based Improvement of the Fatigue Life of TiAlN Coated Ti-6Al-4V

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1. Mechanical Properties of B2 FeAl as a Function of Composition Using Targeted Nanoindentation on Diffusion Couples

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1. Nanoindentation Assisted Acoustic Measurements

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1. Borate Cross-linked Graphene Oxide–Chitosan as Robust and High Gas Barrier Coatings

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1. Sol-Gel Nano-coatings for Anti-microbial Applications: a Nano-mechanical Study

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1. Instrumented Indentaiton Testing on Engineering Materials: Effect Of Temperature

Hannah Zhang, National Physical Laboratory, UK

1. Multi Scale Micromechanical Testing for New Polymer Core Solder Ball (PCSB) Interconnections Reliability in Operating Conditions

Sergio Sao-Joao, Mines Saint-Etienne, Laboratoire Georges Friedel, CNRS, Saint Etienne – France

1. The Influence of Microstructure on Fracture Toughness of Tungsten and Doped Tungsten Fine Wire

Hannah Luise Lichtenegger, Department Materials Physics, Montanuniversität Leoben, Austria

1. Thermal Activation in Yielding of Single Crystalline Tungsten

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1. Residual Stress Measurement with Global Method FIB-DIC on Thin Coatings

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1. The Origins of Enhanced Strength in Nanoporous Silver Made via Nanoscale Additively Manufactured

Rebecca Anne Gallivan, ETH Zurich, Switzerland

1. Plastic Deformation Behaviour of Structurally Related Intermetallic Phases of the Binary Samarium-Cobalt System

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1. In-Situ SEM Nanomechanical Testing of Graphene Sheet

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1. Impact of Shape and Size on Mechanical Properties of Metallic Nanoparticles

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1. High Throughput Analysis of Irradiation Hardening in Reduced Activation Ferritic-Martensitic Steels for Future Fusion Applications

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1. Nanoindentation Characterization of Local Mechanical Properties of Cu-Ag Wires

Hanane Idrir, Institut Pprime, UPR 3346 CNRS-Université de Poitiers-ENSMA, France

1. Nanoindentation Meets APT, XRD, and EBSD: Multiphysical Characterization of White Etching Layers in Pearlitic Rails

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1. Micromechanical Properties of Lamellar Ovine Bone at Quasi-Physiological Conditions and High Strain Rates

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1. Compressive Strength as a Mechanical Indicator of Long-Range Order in L10 Fe-Pd Nanoparticles

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1. Micromechanical Assessment of Fracture Properties of Austenitic Stainless Steel Grain Boundaries Oxidized in a Pressurized Water Reactor Environment

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1. Temperature Dependent Indentation Size Effect in Silicon Iron Single Crystal

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