Preliminary Program

Nanomechanical Testing in Materials Research and Development V

October 4-9, 2015
Albufeira, Portugal

Conference Chair

Dr. Mark-Marc Legros
CEMES-CNRS
France
Sunday, October 4, 2015

14:00 - 15:30  
**Short Course: Digital Image Correlation**  
*Chairs:* Chris Eberl, Karlsruhe Institute of Technology and Marco Sebastiani, Roma TRE University, Italy

**Short Course: Fracture**  
*Chair:* Etienne Barthel, SIMM/ESPCI, France

16:30 - 18:00  
**Fracture and adhesion - An introduction (with comments on size effects)**  
Etienne Barthel, SIMM/ESPCI, France

17:00 - 19:00  
Conference check-in

18:15 - 18:30  
**Opening Remarks**  
*Conference Chair:* Marc Legros, CEMES-CNRS, France and ECI Technical Liaison, Ram Darolia

18:30 - 19:00  
**Invited**  
*Measuring surface dislocation nucleation in defect-scarce nanostructures*  
Daniel S. Gianola, University of Pennsylvania, USA

19:00 - 20:00  
Welcome Reception

20:00 - 21:30  
Dinner
07:30 - 09:00  Breakfast

**Invited**

09:00 - 09:30  Grain size strengthening – Just another length-scale effect?
Andy Bushby, Queen Mary University of London, United Kingdom

**Session 1**

09:30 - 09:50  A comprehensive study on the deformation behavior of ultra-fine grained and ultra-fine porous Au at elevated temperatures
Alexander Leitner, Department Materials Physics, Montanuniversität Leoben, Austria

09:50 - 10:10  Mechanical scaling behavior of nanoporous gold based on 3D structural analysis and indentation-based testing
Erica T. Lilleodden, Helmholtz-Zentrum Geesthacht, Germany

10:10 - 10:30  Size effect on fracture toughness of gold thin films studied by bulge testing
Eva Preiß, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany

10:30 - 11:00  Coffee break

**Invited:**

11:00 - 11:30  Probing grain boundary mechanisms by *in-situ* TEM
Frédéric Mompiou, CEMES-CNRS, France

**Session 2**

11:30 - 11:50  Boundary motion coupled with tensile and compressive deformation: TEM observation of twinning-like lattice reorientation in Mg micropillars
Evan Ma, Johns Hopkins University, USA

11:50 - 12:10  Deformation-induced ultrahigh lattice rotation via phase transitions in body-centered cubic Mo
Manling Sui, Institute of Microstructure and Properties of Advanced Materials, Beijing University of Technology, China

Marc’s table lists “Wang- Shenyang – Phase transition bcc Mo TEM”

12:10 - 12:30  Fracture strength testing at the micron-scale on an ultra-fine grained W-Cr10-Ti2 alloy
Moritz Lessmann, University of Manchester/Culham Centre for Fusion Energy, United Kingdom

12:30 - 12:50  High temperature mechanical properties of Ni-base superalloy and diffusion aluminide bond coating: An *in-situ* SEM nanoIndentation study
Sanjit Bhowmick, Hysitron, Inc., USA
**Monday, October 5, 2015 (continued)**

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<td>14:30 - 16:00</td>
<td>Free time / ad hoc sessions</td>
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<td>Afternoon coffee</td>
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<tr>
<td>16:30 - 17:00</td>
<td>Deformation mechanisms of twinned nanoparticles and nanowires</td>
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<td></td>
<td>Erik Bitzek, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Germany</td>
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**Session 3**

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<tr>
<td>17:00 - 17:20</td>
<td>Free energy function of dislocation densities by large scale atomistic simulations</td>
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<td></td>
<td>Christoph Begau, Interdisciplinary Centre for Advanced Materials Simulation (ICAMS), Ruhr-Universität Bochum, Germany</td>
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<tr>
<td>17:20 - 17:40</td>
<td>Size-dependent mechanical properties of crystalline nanoparticles</td>
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<td>Dan Mordehai, Technion, Israel</td>
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<td>17:40 - 18:00</td>
<td>In-situ nanomechanical testing using X-ray microscopy</td>
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<td>William M. Harris, Carl Zeiss X-ray Microscopy, Inc., USA</td>
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<tr>
<td>18:00 - 18:20</td>
<td>Residual strain and defects in metallic islands obtained by dewetting</td>
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<td>Marc Verdier, Université de Grenoble Alpes, CNRS, SIMaP, France</td>
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<td>18:30 - 19:50</td>
<td>Insights into dislocation grain-boundary interaction by x-ray µLaue diffraction</td>
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<td>Christoph Kirchlechner, Max-Planck-Institute für Eisenforschung, Germany</td>
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<td>Poster Session and Social Hour</td>
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Tuesday, October 6, 2015

07:30 - 09:00  Breakfast

Invited:

09:00 - 09:30  Thermally activated processes in materials probed by nanoindentation - challenges, solutions, and insights
Verena Maier, Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Austria

Session 4

09:30 - 09:50  Revealing dislocation structure around and underneath indentations in (001) strontium titanate single crystals at room temperature and 350 degrees C
Farhan Javaid, TU Darmstadt, Germany

09:50 - 10:10  High temperature indentation creep and nanoindentation testing of superalloys and TiAl alloys
Mathias Göken, Friedrich-Alexander-University Erlangen-Nürnberg (FAU), University Erlangen-Nürnberg, Germany

10:10 - 10:30  Nanoindentation cartography in Al/Al-Cu-Fe composites: Correlation between chemical heterogeneities and mechanical properties
Christophe Tromas, Institut Pprime - Université de Poitiers, France

10:30 - 11:00  Coffee break

Invited:

11:00 - 11:30  About the plastic response of silicate glasses at the micronscale
Guillaume Kermouche, Ecole des Mines de Saint-Etienne, France

Session 5

11:30 - 11:50  High-temperature small-scale fracture mechanics and plasticity of a hard-coating system
James P. Best, EMPA, Switzerland

11:50 - 12:10  Size effects and deformation mechanisms in diamond and silicon
Jeffrey M. Wheeler, ETH Zurich, Switzerland

12:10 - 12:30  Toward the understanding of the brittle to ductile transition at low size in silicon: Experiments and simulations
Julien Godet, Pprime Institut, France

12:30 - 12:50  An improved micromechanical method for investigating the mechanical properties of poly-silicon membranes
Holger Pfaff, Keysight Technologies, Germany

13:10 - 14:30  Lunch

14:30 - 16:00  Free time / ad hoc sessions
16:00 - 16:30  Afternoon coffee

Invited:

16:30 - 17:00  From micro-cantilever testing to deformation patterning in HCP polycrystals
Angus Wilkinson, University of Oxford, United Kingdom

Session 6

17:00 - 17:20  Mechanisms of plastic deformation of magnesium matrix nanocomposites elaborated by friction stir processing
Camila Mallmann, SIMAP-GPM2, France

17:20 - 17:40  Characterization of mechanical behavior of nanocrystalline layer induced by SMAT using micro-pillar compression technique coupled with finite element analysis
Zhidan Sun, University of Technology of Troyes, France

17:40 - 18:00  Understanding rate sensitivity in dual phase titanium alloys – a combined experimental and computational micro-pillar study
Tea-Sung (Terry) Jun, Imperial College London, United Kingdom

18:00 - 18:20  Variable temperature ultra-nanoindentation system: Elevated and cryogenic temperature measurements
Marcello Conte, Anton Paar TriTec SA/EMPA, Switzerland

Invited:

18:230 - 19:0050  Multiscale characterization of the micromechanics of pure Mg
Jon Molina-Aldareguia, IMDEA Materials Institute, Spain

20:00  Dinner on your own
Wednesday, October 7, 2015

07:30 - 09:00  Breakfast

**Invited:**

09:00 - 09:30  Modeling microplasticity: Dislocation avalanches and dislocation microstructures in micrometer-sized samples

N/ZMichael Zaiser, N/A, Erlangen-Nürnberg University, Germany

**Session 7**

09:30 - 09:50  Effect of hydrogen on the nucleation and motion of dislocations
Mohammad Zamanzade, Saarland University, Germany

09:50 - 10:10  Effect of hydriding on nanoscale plasticity mechanisms in nanocrystalline palladium thin films
Behnam Aminahmadi, University of Antwerp- EMAT, Belgium

10:10 - 10:30  Importance of dynamics in small scale mechanical testing: Fast constant strain rate and ballistic testing
Sudharshan Phani Pardhasaradhi, Nanomechanics Inc, USA

10:30 - 11:00  Coffee break

**Invited:**

11:00 - 11:30  In-situ observation of the onset of plastic deformation by prismatic loop emission
Sang Ho Oh, POSTECH, South Korea

**Session 8**

11:30 - 11:50  Performance of a single interface in a biocomposite structure measured using microcantilever modulation experiment
Igor Zlotnikov, Max Planck Institute of Colloids and Interfaces, Germany

11:50 - 12:10  Nanoindentation-based mechanical spectroscopy of wood cell walls
Joseph Jakes, USDA Forest Service, USA

12:10 - 12:30  In-situ strain softening and strain hardening of natural geomaterials on the microscale
Katherine Hull, Aramco Research Center, USA

12:30 - 12:50  How to perform nanoindentation in difficult conditions? applications to ultra soft materials and temperature environment
Michel Fajfrowski, Michalex, France
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Thursday, October 8, 2015

07:30 - 09:00  Breakfast

**Invited:**

09:00 - 09:30  Mechanical properties of lithiated silicon: A candidate electrode for lithium ion batteries
William D. Nix, Stanford University, USA

**Session 9**

09:30 - 09:50  Nanoindentation induced deformation anisotropy in WC, β-Si3N4 and ZrB2 crystals
Tamás Csanádi, Institute of Materials Research - Slovak Academy of Sciences, Slovakia

09:50 - 10:10  *In-situ* micropillar compression of bone shows remarkable strength and ductility but no damage
Jakob Schwiedrzik, Empa Swiss Federal Laboratory for Materials Science and Technology, Switzerland

10:10 - 10:30  Hydrogen effects on nanoindentation behavior of metallic glass ribbons
Yakai Zhao, Hanyang University, South Korea

10:30 - 11:00  Coffee break

**Invited:**

11:00 - 11:30  TBD
Easo George, Ruhr University Bochum, Germany

**Session 10**

11:30 - 11:50  Underpinning and benchmarking multi-scale models with micro- and nano-scale experiments
Kevin Hemker, Johns Hopkins University, USA

11:50 - 12:10  Nano-scale behavior of irradiated nano-structured alloys
David E.J Armstrong, University of Oxford, United Kingdom

12:10 - 12:30  Probing nanoscale damage gradients in irradiated materials with spherical nanoindentation
Nathan Mara, Los Alamos National Laboratory, USA

12:30 - 12:50  Anisotropy of ultrafine-lamellar and nanolamellar pearlitic structures revealed by *in-situ* micro compression testing
Marlene Kapp, Erich Schmid Institute of Materials Science, Austria
Thursday, October 8, 2015 (continued)

13:00 - 14:30  Lunch

14:30 - 16:00  Free time / ad hoc sessions

16:00 - 16:30  Afternoon coffee

**Invited:**

16:30 - 17:00  Length-scale dependent deformation behavior of nanolayered Cu-based micropillars
Gang Liu, Xi'an Jiaotong University, China

**Session 11**

17:00 - 17:25  Transition in plastic deformation of nanolayered thin films: Role of interfaces and temperature
Rejin Raghavan, Max-Planck-Institut für Eisenforschung, Germany

17:25 - 17:50  Deformation and fracture mechanisms of Al/SiC nanolaminates: Effect of layer thickness, orientation and temperature
Javier LLorca, Technical University of Madrid & IMDEA Materials Institute, Spain

17:45 - 18:15  Interface fracture resistance of thin films at elevated temperatures
Rafael Soler, Max-Planck-Institut für Eisenforschung, Germany

18:00 - 18:40  In-situ nano-mechanical tests in the light of µLaue diffraction
Thomas W. Cornelius, CNRS, IM2NP (UMR 7334), France

**Invited:**

18:20 - 18:50  In-situ mechanical testing at the synchrotron
Steven Van Petegem, PSI, Switzerland

18:50 - 19:10  Cross-sectional stress and strain fields in indented CrN-Cr and TiN thin films characterized by X-ray nanodiffraction
Jozef Keckes, Montanuniversität Leoben, Austria

20:00 - 22:00  Conference Banquet
Friday, October 9, 2015

07:30 - 09:00 Breakfast

Invited:
09:00 - 09:30 Cracking in brittle materials during nanoindentation: New insights gained from cohesive zone finite element modeling
George M. Pharr, University of Tennessee and Oak Ridge National Laboratory, USA

Session 12
09:30 - 09:50 Extraction of crystal plasticity parameters of IN718 using high temperature micro-compression
Bin Gan, IMDEA Materials Institute, Spain

09:50 - 10:10 Fracture toughness measurement with microscopic chevron-notched specimens
Goran Zagar, École Polytechnique Fédérale de Lausanne, Switzerland

10:10 - 10:30 In-situ fracture tests of brittle materials at the microscale
Giorgio Sernicola, Imperial College London, United Kingdom

10:30 - 11:00 Coffee break

Invited:
11:00 - 11:30 Some recent advances in nanomechanical testing: High strain rates, variable temperatures, fatigue and stress relaxation, combinatorial experimentation
Johann Michler, EMPA, Switzerland

Session 13
11:30 - 11:50 Limits of determining stress states by FIB method due to Ga implantation
Diana Courty, ETH Zurich, Switzerland

11:50 - 12:10 Thermo-mechanical characterization of polymer samples using nanoindentation - From bulk characterization to thin film properties
Christian Motz, Saarland University, Germany

12:10 - 12:30 Studying fatigue damage evolution at grain boundaries using micro mechanical test methods
Christian Motz, Saarland University, Germany

12:30 - 12:50 Accessing the phase transformation and deformation behavior of metastable stainless steels through cyclic nanoindentation
Ina Sapezanskaia, UPC, Spain

Thermo-mechanical characterization of polymer samples using nanoindentation - From bulk characterization to thin film properties
Dennis Bedorf, SURFACE, Germany

Studying fatigue damage evolution at grain boundaries using micro mechanical test methods
Christian Motz, Saarland University, Germany

Accessing the phase transformation and deformation behavior of metastable stainless steels through cyclic nanoindentation
Ina Sapezanskaia, UPC, Spain
13:00 - 14:00  Lunch and departures
1. **A new dynamic module for *in-situ* nanomechanical testing at high strain rate**
   Gaylord Guillonneau, EMPA/Laboratory for Mechanics of Materials and Nanostructures, Switzerland

2. **High temperature nanoindentation testing of amorphous silicon carbonitride thin films**
   Radim Ctvrtlik, Palacky University, Czech Republic

3. **Testing of nanostructure within active carbons particles**
   Bronislaw Buczek, AGH-University of Science and Technology, Poland

4. **The measurement of viscosity of ultrathin polymer films.**
   Dariusz Jarząbek, Institute of Fundamental Technological Research, Poland

5. **The measurement of the adhesion force between ceramic particles and metal matrix in ceramic reinforced-metal matrix composites.**
   Dariusz Jarząbek, Institute of Fundamental Technological Research, Poland

6. **Inelastic deformation and cracking during indentation in borosilicate glasses: Experiments and finite element modeling**
   Kurt E. Johanns, TU Darmstadt, Germany

7. **Using *in-situ* microLaue diffraction to understand plasticity in MgO**
   Ayan Bhowmik, Imperial College London, United Kingdom

8. **A comparison of nanotribology and nanoindentation**
   Steffen Brinckmann, Max-Planck-Institut für Eisenforschung, Germany

9. **Orientation dependence of dislocation transmission through twin-boundaries studied by *in-situ* µLaue diffraction**
   Nataliya Malyar, Max-Planck-Institut für Eisenforschung GmbH, Germany

10. **Fracture behavior of high strength pearlitic steel wires**
    Bernhard Völker, Montanuniversität Leoben, Austria

11. **Quantification of mechanical properties gradient by nano-indentation and micro-compression testing on mechanically-induced transformed surfaces**
    David Tumbajoy Spinel, Ecole des Mines de Saint-Etienne, LGF UMR5307 CNRS, Saint-Etienne, France

12. **Dislocation dipoles and the nucleation of cracks in silicon nanopillars**
    Jacques Rabier, DPMM, Institut P’, CNRS-Université de Poitiers-ENSMA, France

13. **Synthesis and microstructural characterization of highly dispersed hybrid Ge/GeO₂ nanoislands into BN layers for environmental application**
    Snejana Bakardjeva, Institute of Inorganic Chemistry ASCR v.v.i., Czech Republic
14. **Combining in-situ tensile testing and orientation microscopy in the SEM: A MEMS based setup for studying time dependent deformation of thin films by TKD and STEM**
    Jan Philipp Liebig, Materials Science & Engineering, Institute I, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

15. **Development and application of an in-situ nanoindenter coupled with electrical measurements**
    Solène Comby, University of Grenoble Alpes/SIMaP lab, France

16. **Comparison of in-situ micromechanical time dependent plasticity techniques: micropillar compression, nanoindentation and micro-tensile tests**
    Juri Wehrs, EMPA, Switzerland

17. **EBSD on the investigation of microstructure refinement by impact-based surface treatments**
    Xavier Maeder, EMPA, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Mechanics of Materials and Nanostructures, Switzerland

18. **Investigating the plastic deformation of molybdenum from -196°C to 950°C using nano- and micro-indentation**
    Katherine Plummer, Oxford University, United Kingdom

19. **On the stability of nanocrystalline metal thin film and its effect on mechanical properties**
    Ralph Spolenak, ETH Zurich, Switzerland

20. **Ultra small scale high cycle fatigue testing by micro-cantilevers**
    Jicheng Gong, Department of Materials, University of Oxford, United Kingdom

21. **A direct comparison of high temperature nanoindentation and tensile creep measurements for aluminum**
    Warren Oliver, Nanomechanics Inc., USA

22. **Nanindentation, micropillar compression and nanoscratch testing of ZrB$_2$ grains**
    Ján Dusza, Institute of Materials Research - Slovak Academy of Sciences, Slovakia

23. **On the statistical treatment of the grid indentation data**
    Petr Haušild, Czech Technical University in Prague, Czech Republic

24. **Acoustic emission study of correlations in the dislocation dynamics during smooth and jerky flow in an Al-Mg alloy**
    Mikhail Lebyodkin, Laboratoire d’Étude des Microstructures et de Mécanique des Matériaux, France

25. **Study of sub-surface ion-implanted hardened layers with depth-sensing indentation**
    Alexey Useinov, Technological Institute for Superhard and Novel Carbon Materials, Russia

26. **The role of grain boundaries and interfaces in the anisotropic mechanical response of nanocrystalline materials studied by micro-cantilever testing**
    Rostislav Daniel, Montanuniversität Leoben, Austria
27. Small scale mechanical response of WC-Co composites
   Joan Josep Roa Rovira, Universidad Politecnica de Cataluña, Spain

28. An improved method for point deflection measurements on rectangular membranes
   Benoit Merle, University Erlangen-Nürnberg (FAU), Germany

29. Anisotropic behavior of mild steel subjected to isotropic and kinematic hardening
   Ofa daghfas, LR-MAY-BP37 ENIT Belvedere 1002 Tunis Tunisia, Department of
   Mechanical Engineering, National School of Engineers of Tunis, Tunisia

30. Annealing effect on coherent-incoherent interface tri-component nanoscale metallic
    multilayer thin films
   Aidan A. Taylor, Empa, Switzerland

31. Physical mechanical characterization and durability of cementitious materials
    containing the waste of calcined sludge paper
   Youcef ghernouti, Research Unit: Materials, Processes and Environment, University
   M'Hamed Bougara of Boumerdes, Boumerdes, Algeria

32. On mechanisms of photoluminescence and mechanoluminescence of fine-disperse
    powder of SrAl2O4(Eu2+, Dy3+) phosphor in a photopolymer matrix
   Alexander F. Banishev, Institute on Laser and Information Technologies RAS (ILIT RAS),
   Russia

33. Obtaining mechanical properties of superelastic materials from microindentation data
   Dmitry Zhuk, National Research Nuclear University «MEPhI», Russia

34. Mechanical response of face-centered cubic metallic nanospheres under uniaxial
    compression
   Selim Bel Haj Salah, Institut Pprime, France

35. Micromechanical behavior of thermal barrier coatings after isothermal oxidation
   Carlos Serna, Universidad Nacional de Colombia, Colombia

36. Effects of lithiumation on the fracture toughness and mechanical properties of LiMn2O4
    cathode battery materials
   Marco Sebastiani, Roma TRE university, Italy

37. Chemomechanical effects in thin film and bulk oxides
   Steve Bull, Newcastle University, United Kingdom

38. Indentation of metallic film on elastic substrate
   Marc Verdier, Université Grenoble Alpes, CNRS SIMaP lab., France

39. Influence of temperature on the deformation behavior of single-and bi-crystal
    microbending beams
   Jorge Rafael Velayarce, Chair of Materials Science and Methods, Saarland University,
   Germany

40. Irradiation-induced ductilization in the Zr-based metallic glasses
   Jaewon Heo, Korea Advanced Institute of Science and Technology, South Korea
41. Numerical analysis of stress distributions in composite material
   Ali Benhamena, Laboratory LPQ3M BP 763, University of Mascara, Algeria

42. Nanomechanical testing of ODS steels irradiated with 1 MeV/amu heavy ions
   Vladimir Skuratov, JINR, Russia

43. Can be measured fracture toughness from repetitive nano-impacts test?
   Emilio Frutos Torres, Czech Technical University in Prague/Department of Control
   Engineering, Czech Republic

44. Environmentally controlled modulus mapping of biocomposite materials employing
   the concept of effective mass
   Bernd Bayerlein, Max Planck Institute of Colloids and Interfaces, Germany

45. Elevated temperature microcompression transient testing of nanocrystalline
   materials: Creep, stress relaxation and strain rate jump tests
   Gaurav Mohanty, EMPA, Switzerland

46. Combining nanoindentation with complementary techniques for mechanical and
   structural characterization of ultra uow-k (ULK) thin films
   André Clausner, Fraunhofer IKTS-MD, Germany

47. Nanoindentation of GaN irradiated by swift heavy ions
   Sophie Eve, CRISMAT / ENSICAEN, France

48. How residual stresses affect the fracture properties of layered thin films
   Daniel Kiener, Montanuniversität Leoben, Austria

49. Quantification of mechanical properties gradient by nano-indentation and micro-
   compression testing on mechanically-induced transformed surfaces
   David Tumbajoy Spinel, Ecole des Mines de Saint-Etienne, LGF UMR5307 CNRS, Saint-
   Etienne, France

50. Using in-situ microLaue diffraction to understand plasticity in MgO
   Ayan Bhowmik, Imperial College London, United Kingdom

51. Orientation dependence of dislocation transmission through twin-boundaries studied
   by in situ µLaue diffraction
   Nataliya Malyar, Max-Planck-Institut für Eisenforschung GmbH, Germany

52. Fracture behavior of high strength pearlitic steel wires
   Bernhard Völker, Montanuniversität Leoben, Austria

53. High temperature nanoindentation testing of amorphous silicon carbonitride thin
   films
   Radim Ctvrtlik, Palacky University, Czech Republic

54. Comparison of in situ micromechanical time dependent plasticity techniques: 
   micropillar compression, nanoindentation and micro-tensile tests
   Juri Wehrs, EMPA, Switzerland
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<td>Carlos Serna</td>
<td>Universidad Nacional de Colombia, Colombia</td>
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<td>Selim BEL HAJ SALAH</td>
<td>Institut Pprime, France</td>
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<td>Obtaining mechanical properties of superelastic materials from microindentation data</td>
<td>Dmitry Zhuk</td>
<td>National research nuclear university «MEPhl», Russia</td>
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<td>Annealing effect on coherent-incoherent interface tri-component nanoscale metallic multilayer thin films</td>
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<td>An Improved Method for Point Deflection Measurements on Rectangular Membranes</td>
<td>Benoit Merle</td>
<td>University Erlangen-Nürnberg (FAU), Germany</td>
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<td>Numerical Analysis of Stress Distributions in Composite Material</td>
<td>ali Benhamena</td>
<td>Laboratory LPQ3M BP 763, University of Mascara, Algeria, Algeria</td>
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<td>EMPA, Swiss Federal Laboratories for Materials Science and Technology, Laboratory for Mechanics of Materials and Nanostructures, Feuerwerkerstr. 39, CH-3602 Thun, Switzerland</td>
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<td>66.</td>
<td>Synthesis and microstructural characterization of highly dispersed hybrid Ge/GeO2 nanoslands into BN layers for environmental application</td>
<td>Snejana BAKARDJIEVA</td>
<td>Institute of Inorganic Chemistry ASCR v.v.i., Czech Republic</td>
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<td>Combining in situ tensile testing and orientation microscopy in the SEM: A MEMS based setup for studying time dependent deformation of thin films by TKD and STEM</td>
<td>Jan Philipp Liebig</td>
<td>Materials Science &amp; Engineering, Institute I, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany</td>
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68. Dislocation dipoles and the nucleation of cracks in silicon nanopillars
   Jacques Rabier, DPMM, Institut P', CNRS-Université de Poitiers-ENSMA, France

69. A Direct Comparison of High Temperature Nanoindentation and Tensile Creep Measurements For Aluminum
   Warren Oliver, Nanomechanics Inc., United States of America

70. On the stability of nanocrystalline metal thin film and its effect on mechanical properties
   Ralph Spolenak, ETH Zurich, Switzerland

71. On the statistical treatment of the grid indentation data
   Petr Haušild, Czech Technical University in Prague, Czech Republic

72. Deformation and Fracture Mechanisms of Al/SiC Nanolaminates: Effect of Layer Thickness, Orientation and Temperature
   Javier LLorca, Technical University of Madrid & IMDEA Materials Institute, Spain

73. Small scale mechanical response of WC-Co composites
   Joan Josep Roa Rovira, Universidad Politecnica de Cataluña, Spain

74. Study of sub-surface ion-implanted hardened layers with depth-sensing indentation
   Alexey Useinov, Technological Institute for Superhard and Novel Carbon Materials, Russia

75. How residual stresses affect the fracture properties of layered thin films
   Daniel Kiener, Montanuniversität Leoben, Austria

76. Ultra Small Scale High Cycle Fatigue Testing by Micro-cantilevers
   Jicheng Gong, Department of Materials, University of Oxford, United Kingdom

77. Chemomechanical effects in thin film and bulk oxides
   Steve Bull, Newcastle University, United Kingdom

78. Effects of lithiation on the fracture toughness and mechanical properties of LiMn2O4 cathode battery materials
   Marco Sebastiani, Roma TRE university, Italy

79. Can be Measured Fracture Toughness from Repetitive Nano-impacts Test?
   Emilio Frutos Torres, Czech Technical University in Prague/Department of Control Engineering, Czech Republic

80. Combining nanoindentation with complementary techniques for mechanical and structural characterization of ultra uow-k (ULK) thin films
   André Clausner, Fraunhofer IKTS-MD, Germany

81. Nanoindentation of gan irradiated by swift heavy ions
   Sophie Eve, CRISMAT / ENSICAEN, France
82. **A new dynamic module for in-situ nanomechanical testing at high strain rate**
   Gaylord Guillonneau, EMPA/Laboratory for Mechanics of Materials and Nanostructures, Thun, Switzerland

83. **Nanoindentation, micropillar compression and nanoscratch testing of ZrB2 grains**
   Ján Dusza, Institute of Materials Research - Slovak Academy of Sciences, Slovakia

84. **Environmentally controlled modulus mapping of biocomposite materials employing the concept of effective mass**
   Bernd Bayerlein, Max Planck Institute of Colloids and Interfaces, Germany

85. **The measurement of viscosity of ultrathin polymer films.**
   Dariusz Jarząbek, Institute of Fundamental Technological Research, Poland

86. **The measurement of the adhesion force between ceramic particles and metal matrix in ceramic reinforced-metal matrix composites.**
   Dariusz Jarząbek, Institute of Fundamental Technological Research, Poland

87. **Acoustic emission study of correlations in the dislocation dynamics during smooth and jerky flow in an Al-Mg alloy**
   Mikhail Lebyodkin, Laboratoire d’Étude des Microstructures et de Mécanique des Matériaux, France

88. **A comparison of nanotribology and nanoindentation**
   Steffen Brinckmann, Max-Planck-Institut für Eisenforschung, Germany

89. **Inelastic Deformation and Cracking During Indentation in Borosilicate Glasses: Experiments and Finite Element Modeling**
   Kurt E. Johanns, TU Darmstadt, Germany

90. **Indentation of Metallic Film on Elastic Substrate**
   Marc VERDIER, Université Grenoble Alpes, CNRS SIMaP lab., France

91. **Nanomechanical testing of ODS steels irradiated with 1 MeV/amu heavy ions**
   Vladimir Skuratov, JINR, Russia

92. **The role of grain boundaries and interfaces in the anisotropic mechanical response of nanocrystalline materials studied by micro-cantilever testing**
   Rostislav Daniel, Montanuniversität Leoben, Austria

93. **Elevated temperature microcompression transient testing of nanocrystalline materials: Creep, stress relaxation and strain rate jump tests**
   Gaurav Mohanty, EMPA, Switzerland

94. **Influence of temperature on the deformation behavior of single-and bi-crystal microbending beams**
   Jorge Rafael Velayarce, Chair of Materials Science and Methods, Saarland University, Germany, Germany