Nanobrücken 2020 Schedule

Conference & User Meeting Venue

Max Planck Institute for Iron Research – Düsseldorf

Day 1: Tuesday, February 4th

Welcome

13:00 Opening Remarks
Gerhard Dehm, Max Planck Institute for Iron Research and Ude Hangen, Bruker

Session I

Chair: TBD

Invited Talk

13:15 "Compression of Cerium Oxide Nanocubes in an Environmental Transmission Electron Microscope"
K. Masenelli-Varlot, Univ Lyon, INSA-Lyon

13:45 "Effect of stacking fault energy on the ultimate strength of FCC Ni-Co nanoparticles"
Anuj Bisht, Technion – Israel Institute of Technology

14:00 "Orientation-dependent hardness of Mo_3Si phases in a Mo-17.5Si-6B alloy"
Weiguang Yang, Forschungszentrum Jülich

14:15 "Multi-dimensional property correlation with Nanoindentation Mapping"
Christopher M. Magazzeni, University of Oxford

14:30 "Measuring the elastic modulus Mo-based alloy thin films"
Megan J. Cordill, Austrian Academy of Sciences

Poster Set-Up

14:50 Short Break / Coffee Provided

Remarks

Session II

Chair: TBD

15:30 "In situ TEM nanomechanical testing of antigorite suggest weak interfaces"
Hosni Idrissi, University of Antwerp

15:50 "Quantitative in-situ deformation of nanocrystalline olivine in the transmission electron microscope"
Patrick Cordier, University of Lille

16:10 "Micromechanical testing of geological materials"
Diana Avadanii, University of Oxford

16:25 "Extreme *In Situ* Mechanics of Ni-based Superalloys and Bond Coating: 800°C and beyond"
Sanjit Bhowmick, Bruker

Invited Talk

16:45 "High Temperature Mechanical Properties of Hard TaSiN Coatings"
Miguel A. Monclús, IMDEA Materials Institute

Poster Session
All Posters are Eligible for Top Poster Prize

17:15 Poster Session / Barbecue (Prinzengrill Food Truck on-site) and parallel lab tour

Keynote Lecture

19:30 **"The shapes and colors of nanoindentation - from van Gogh to green chemistry"**
Dr. Etienne Barthel, CNRS Research Director, ESPCI, Sorbonne University, Paris

Day 2: Wednesday, February 5th

Bruker User Meeting (open to all participants)

09:00 Introduction
Oden Warren, Bruker

09:10 Exciting New Product Developments from Bruker Hysitron
Rhys Jones, Bruker

09:25 Tribo iQ for Hysitron TriboIndenter Series
Ude Hangen, Bruker

09:35 Tribo iQ for Hysitron PicoIndenter Series
Jaroslav Lukeš, Bruker

09:45 Q&A Session (opportunity for users to ask questions)

10:00 Short Break / Coffee Provided

10:30 Nanobrücken Conference – Opening Remarks

Session III

Chair: TBD

Invited Talk

10:35 "Deformation behavior of novel bio-based polymer hybrid coatings studied by nanoindentation and nanoscratching"
Ruth Schwaiger, Foschungszentrum Jülich GmbH

11:05 "Correlated nanomechanical, morphological, chemical, and crystallographic characterization of biological materials"
Rachel Board, Swansea University

11:20 "Mechanical Characterization of Individual Intercellular Interfaces in Wood Tissue"
Mohammad Tadayon, Technische Universität Dresden

11:35 "Characterizing Cross-Linking Within Polymeric Biomaterials in the SEM by Secondary Electron Hyperspectral Imaging"
Nicholas Farr, University of Sheffield

11:50 "Correlating Microstructure to in situ Micromechanical Behavior and Toughening Strategies in Biological Materials"
Richard E. Johnston, Swansea University

Lunch Break

12:10 Lunch Provided On-Site

Session IV

Chair: TBD

13:30 "Dislocation plasticity in FeCoCrMnNi high-entropy alloy: Quantitative insights from in situ transmission electron microscopy deformation"
Subin Lee, Max-Planck-Institute for Iron Research

13:50 "Characterization of the size-dependent indentation behavior of single-crystalline tungsten"
Jin Wang, Karlsruhe Institute of Technology (KIT)

14:05 "Size effect in bi-crystalline Cu micropillars with a coherent twin boundary"
Reza Hosseinabadi, Max-Planck-Institute for Iron Research

14:20 "Slip transmission in nanotwinned Ag under mechanical and thermomechanical loading"
Maya K. Kini, Max-Planck-Institute for Iron Research

14:40 "Combining electron microscopy and nanoindentation to characterize microstructure and hardness gradient of complex-phase steels"
Y. Chang, RWTH Aachen University

14:55 "Experiments and modeling of the Indentation size effects"
Junhe Lian, Aalto University

15:15 Short Break / Coffee Provided

Session V
Chair: TBD

Invited Talk

15:45 "Micro-indentation-based techniques to study the influence of mechanical stress on the electrical performance and structural integrity of microelectronic devices"
André Clausner, Fraunhofer Institute for Ceramic Technologies and Systems IKTS

16:15 "Thin film adhesion measurement by nanoindentation: Review of methodologies by means of finite element simulations"
Jan Albrecht, Fraunhofer Institute for Electronic Nanosystems ENAS

16:35 "Effect of Pretreatment on Interface Stability and Morphology of Ni/Al Hybrid Foams by in situ Microcantilever Fracture Experiment"
Jutta Luksch, Saarland University

16:50 "Multicomponent nitride (Cr0.21Fe0.28Co0.30) Nx as corrosion resistant coatings for fuel cells and batteries"
Smita G. Rao, Linköping University

Invited Talk

17:05 "Hydrogen-microstructure interactions at small scale by in-situ nanoindentation during hydrogen charging"
Maria Jazmin Duarte Correa, Max-Planck Institute for Iron Research

17:35 End of Session

18:30 Walking group meets at MPIE to walk to ArabesQ

Conference Banquet Dinner

19:00 ArabesQ
Ludenberger Strasse 1-1a
40629 Düsseldorf
https://arabesq.de/

Day 3: Thursday, February 6th

Session VI

Chair: TBD

Invited Talk

09:00 "Examples of third body formation in sliding metal surfaces"
Martin Dienwiebel, Karlsruhe Institute of Technology (KIT)

09:30 "Acquisition of Residual Stress and Fracture Toughness of Metals Through Nanoindentation"
Ömer Necati Cora, Karadeniz Technical University

09:50 "3D EBSD analysis of nanoindentation deformation fields"
Andrea Thöne, Bruker Nano GmbH (TBC)

10:10 Short Break / Coffee Provided

Session VII

Chair: TBD

10:45 "Characterization of lithium-ion battery electrodes via nanoindentation"
Achim Overbeck, Technical University of Braunschweig

11:05 "Nano- and micro-mechanical analysis of a laser-processed metallic glass"
James P. Best, RWTH Aachen

Invited Talk

11:25 "In-situ testing of energy storage materials"
David Armstrong, University of Oxford

11:55 Closing Remarks

12:00 End of Conference

Poster List

Ordered by last name of presenting author

1. "Interface monitoring by Nanoscratching on thick stack (product wafers)"
   Vincent Coutellier, STMicroelectronics
2. "Coupled electro-mechanical characterization of microstructures using advanced nanoindentation test"
   Amir Mirza Gheytaghi, TUDelft
3. "Qualitative determination of local hydrogen contents and release rates near grain boundaries in Nickel using Scanning Kelvin Probe Force Microscopy"
   Patrick Grünewald, Saarland University
4. "PI88Reader – a python tool for measurement files"
   Nathanael Jöhrmann, Technische Universität Chemnitz
5. "Local mechanical properties of hydrogen enriched Zr-1Nb zirconium alloy nuclear fuel claddings"
   Ondřej Libera, Centrum Výzkumu Řež s.r.o
6. "Image registration between EBSD and XPM nanohardness data maps using computer vision"
   Mingxuan Lin, RWTH Aachen
7. "Hardness and elastic properties of a tribological third body"
   Dominic Linsler, Fraunhofer IWM
8. "Determination of the flow behavior of the joining zones of hybrid semi-finished products by means of nanoindentation"
   Tim Matthias, Leibniz University Hannover
9. "Dentin-Adhesive Interface Characterization by Confocal Raman Microscopy and Atomic Force Microscopy"
   Martin Moos, 3M Deutschland GmbH
10. "Investigations on the Frictional Properties of the Fish Skin of the Spiny Eel (Macrognathus spec.)"
    Florian Pape, Leibniz University Hannover
11. "Hydrogen effects on the mechanical behavior of ferritic FeCr alloys investigated by in-situ nanoindentation"
    J. Rao, Max-Planck-Institut für Eisenforschung GmbH
12. "Investigation of Size Effects in Aerospace-Grade Epoxy on the Mechanical Properties by Mechanical Test in-situ TEM "
    Raz Samira, Tel Aviv University
13. "On the commensuration of plastic plowing at the microscale"
    Hanna Tsybenko, Max-Planck-Institut für Eisenforschung GmbH
14. "Plasticity during micro-wall wear test: single dislocation wall formation"
    Wenzhen Xia, Max-Planck-Institut für Eisenforschung GmbH

Pre-Event at Max Planck Institute for Iron Research

Tuesday, February 4th | 09:00 to 12:00

Prior to the Nanobrücken conference and user meeting, there will be a pre-event on Tuesday, February 4, 2020 from 09:00 - 12:00 at Max Planck Institute for Iron Research in Düsseldorf, with live demonstration on:

- Bruker's Hystron PI 95 TEM PicoIndenter
- Bruker's Hystron PI 88 SEM PicoIndenter with In-Situ SPM Imaging - ***NEW***
- Bruker's Hystron TI Premier

Registration is required to attend the pre-event.

To register for the pre-event, please email Davor Krusevljanin, Bruker (Davor.Krusevljanin@bruker.com).

Practical Information:

Nanobrücken 2020 Venue

Nanobrücken 2020 will be held at the Max-Planck-Institut für Eisenforschung GmbH (MPIE), located in Düsseldorf, Germany.

Düsseldorf is a vibrant city in the Rhineland Metropolitan Area as well as a cultural, business and touristic center in North-Rhine Westphalia. Including the Rhine-Ruhr Area, it is also one of the largest scientific hot spots in Germany with several big universities and research centers. The conference venue is located close to the city center, the famous Altstadt and the Rhine river. For accommodations, Bruker recommends Hotel NH Düsseldorf City Nord.

Talk Lengths

Student talks are 12 minutes in length, with an additional 3 minutes for discussion.
Contributed talks are 15 minutes in length, with an additional 5 minutes for discussion.
Invited talks are 25 minutes, with an additional 5 minutes for discussion.