Mechanical Testing at Small Length Scales

Organised by Department of Materials Engineering, IIT Delhi in Association with Bruker & Industron

Probing the mechanical behaviour of materials at the nanoscale is necessary for the development of new nanostructured materials and continued miniaturization of engineering devices electronic components, thin films, and surface coatings. This program will cover topics related to cutting edge developments in nanoscale mechanical characterization of materials, such as metals, alloys, ceramics, and organic crystals, which will be used for such applications. The talks will demonstrate both operando and in-operando mechanical testing techniques such as high throughput testing, high temperature testing, in-situ measurements and introduce data science approaches for the same. The themes of the lectures will be relevant to audiences from academia and industry. The program schedule is mentioned below, and no registration fee shall be charged from the participants. **Please note that the time is mentioned in *Indian Standard Time Zone (IST)***

20th Oct 2020: Day 1: Session Chair: Prof Suresh Neelakantan (IIT - Delhi)

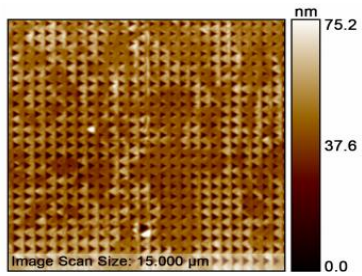
10:00 am – 10:15 am: Opening Remarks
Prof R L Narayan, Indian Institute of Technology-Delhi
1015 am – 11:15 am: Keynote Talk: Dynamic applications of nanoindentation: Beyond hardness and modulus
Prof Jae-il-Jang, Hanyang University
1115 am – 11:45 am: Small Scale Fracture Testing
Prof Nagamani Jaya Balila, Indian Institute of Technology- Bombay
11:45 am – 11:50 am: Break **(Bruker Product Videos)**
11:50 am – 12:20 pm: *In-Situ* Electromechanical Characterization technique and applications
Prof Kiran Mangalampalli, SRM University
12:20 pm – 12:50 pm: Application of nanoindentation in hydrogen embrittlement study: Examples in metallic glass & high-entropy alloy
Dr Yakai Zhao, Nanyang Technical University
12:50 pm – 01:20 pm: Tribochemistry and Triboprinting via Nanoscale Sliding Mechanical Contacts
Prof Nitya Nand Gosvami, Indian Institute of Technology-Delhi
01:20 pm – 01:30 pm: Closing Remarks

21st Oct 2020: Day 2: Session Chair: Prof Jayant Jain (IIT - Delhi)

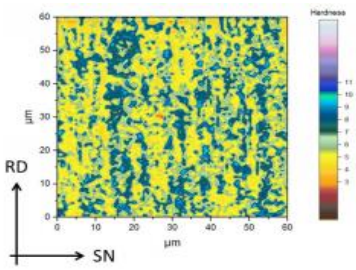
05:00 pm – 06:00 pm: In-Situ Nanoscale Mechanical Testing under Monotonic and Cyclic Loading
Prof Ming Dao, Massachusetts Institute of Technology - USA
06:00 pm – 06:30 pm: Understanding deformation twinning in Magnesium using In-situ experiments
Prof. Eswara Prasad Korimilli, Indian Institute of Technology - Indore
06: 30 pm – 06:35 pm: Break (Bruker Product Videos)
06: 35 pm – 07:05 pm: Probing mechanically soft organic crystals by nanoindentation
Prof C.M. Reddy, Indian Institute of Science Education & Research-Kolkata
07:05 pm – 07:35 pm: Recent developments in *In-Situ* Nanomechanical Testing
Dr S.A.Syed Asif, Industron Nanotechnology Pvt Ltd
07:35 pm – 07:55 pm: Demonstration of *In-Situ* Nanomechanical Testing
07:55 pm – 08:00 pm: Closing Remarks

Register Day 1

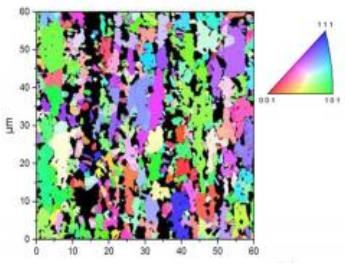
Register Day 2



Accelerated SPM image of DP 980 Steel Sample



Hardness Map of DP 980 Steel Sample


EBSD Map of DP 980 Steel Sample

For any support please contact Pratyank Rastogi at pratyank@industronnano.com /+91 9048542221