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FEBRUARY 27-MARCH 3, 2022
ANAHEIM CONVENTION CENTER & ANAHEIM MARRIOTT
ANAHEIM, CALIFORNIA, USA
#TMSAnnualMeeting

SUBMIT AN ABSTRACT FOR THE FOLLOWING TMS2022 SYMPOSIUM:

NANOSTRUCTURED MATERIALS

30 Years of Nanoindentation with the Oliver-Pharr Method and Beyond

The origin of nanoindentation can be traced to the 1980s with the development of the first instrumented hardness testers providing submicrometer accuracy. However, it took the 1992 seminal publication by W.C. Oliver and G.M. Pharr to effectively launch the field. Their novel data evaluation procedure, later dubbed the "Oliver-Pharr method", has directly enabled numerous transformative research efforts in a diverse range of fields spanning materials science, geology, biology, and medicine. Up to now, it remains indispensable for ensuring the service performance and lifetime of essential small components, such as thin films and coatings, electronic sensors, and MEMS.

This symposium aims at bringing together the different generations of researchers, as well as the different fields and applications. It will highlight the amazing range of applications and the robustness of the Oliver-Pharr method. A mixture of well-established invited speakers and promising younger researchers will address how everything started, how nanoindentation is currently used, and what the future of small-scale mechanical testing might look like.

Topics of interest:

- General aspects of nanoindentation including historical background
- Nanoindentation in-method development, standardization
- New approaches towards data science
- Dynamic nanoindentation (CSM, CMX, dynamics….)
- Refinements in understanding
- Indentation size effects
- Thermally activated deformation behavior
- Extreme testing environments, e.g., high and low temperatures, irradiation, electrochemical or high strain rates
- Complex loading conditions, such as cyclic fatigue, fracture testing
- In-situ testing in SEM, TEM, or synchrotron
- Stress-strain measurements, e.g., from spherical nanoindentation
- Structural and functional materials; thin films, metals, ceramics, amorphous & crystalline
- Soft and viscoelastic materials behavior

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