MECANANO GENERAL MEETING #4

Scientific Programme

27-29 April 2026

Venue: The meeting will take place at the Department of Civil Engineering, Computer Science and Aeronautical Technologies, Università degli Studi Roma Tre.
Address: Via Vito Volterra, 62, Roma (RM), 00144 · Dipartimento di Ingegneria Civile, Informatica e delle Tecnologie aeronautiche · Università degli Studi Roma Tre

Monday, 27 April 2026

13:00	*Registration (60 min)*
14:00	**Opening remarks** Dr. Edoardo Rossi, Prof. Umberto Iemma (Department Vice Director) 10 min
14:10	ADVANCED NANOINDENTATION **Invited Talk** Marco Sebastiani High-speed nanoindentation mapping · 30 min
14:40	ADVANCED NANOINDENTATION **Contributed talk 1** Wheeler Jeffrey M. Correlated Mechanical Microscopy for Determining the Influence of Deformation and Texture on Local Mechanical Properties · 20 min
15:00	ADVANCED NANOINDENTATION **Contributed talk 2** Benoit Merle High Strain Rate Nanoindentation: Recent Advances and Applications · 20 min
15:20	ADVANCED NANOINDENTATION **Contributed talk 3** Uluca Ahmed A dynamic analysis of size- and scale-dependent static friction in spherical contacts · 20 min
15:40	*Coffee Break (30 min)*
16:10	MICROSTRUCTURE-DRIVEN SMALL-SCALE MECHANICS **Invited Talk** Verena Maier-Kiener Linking Nanoscale Phase Transformations to High-Temperature Mechanical Behavior · 30 min
16:40	MICROSTRUCTURE-DRIVEN SMALL-SCALE MECHANICS **Contributed talk 4** Chmielewska Julia Room Temperature Ductility and Elevated Temperature Strength in Hf–Mo–Nb–Ti Refractory Multi Principal Element Alloys · 20 min
17:00	MICROSTRUCTURE-DRIVEN SMALL-SCALE MECHANICS **Contributed talk 5** Divya Sri Bandla Decoupling grain boundary sliding from its accommodation mechanisms: Insights from high temperature micropillar compression · 20 min
17:20	MICROSTRUCTURE-DRIVEN SMALL-SCALE MECHANICS **Contributed talk 6** Szebesczyk Hanna Application of high-throughput materials science methods for rapid screening of ultra-strong light-weight aluminium alloys · 20 min
17:40	MICROSTRUCTURE-DRIVEN SMALL-SCALE MECHANICS **Contributed talk 7** Maria Watroba Electrochemical Microfabrication of Zinc Architectures: From Microstructure Control to Mechanical Performance · 20 min
18:00	**Closing remarks** Edoardo Rossi, Marco Sebastiani 10 min

Tuesday, 28 April 2026 - Morning

09:00	*Registration (10 min)*
09:10	NANOSCALE MECHANICAL BEHAVIOR: FATIGUE, INDENTATION & TRIBOLOGY **Invited talk** Brad Boyce Mitigating fatigue failure at the nanoscale · 30 min
09:40	NANOSCALE MECHANICAL BEHAVIOR: FATIGUE, INDENTATION & TRIBOLOGY **Contributed talk 1** Cruañes Diego Understanding nanoindentation statistical dispersion in ceramic–metal cemented carbides by numerical simulation and FIB tomography · 20 min
10:00	NANOSCALE MECHANICAL BEHAVIOR: FATIGUE, INDENTATION & TRIBOLOGY **Contributed talk 3** Preuss Oliver Tribological response in oxides by mechanically seeded dislocations: case study on $SrTiO_3$ · 20 min
10:20	NANOSCALE MECHANICAL BEHAVIOR: FATIGUE, INDENTATION & TRIBOLOGY **Contributed talk 2** Rabkin Eugen Modifying nanomechanical behavior of gold nanoparticles by chemical etching · 20 min
10:40	*Coffee Break (30 min)*
11:10	NANOSCALE FRACTURE AND SMALL-SCALE PLASTICITY **Invited talk** Thomas Pardoen Fracture toughness at nanoscale: experimental challenges and physical meaning · 30 min
11:40	NANOSCALE FRACTURE AND SMALL-SCALE PLASTICITY **Contributed talk 4** Wurmshuber Michael Achieving excellent combinations of strength, ductility and fracture toughness in UFG W via grain boundary engineering · 20 min
12:00	NANOSCALE FRACTURE AND SMALL-SCALE PLASTICITY **Contributed talk 5** Maeder Xavier Interface-mediated softening and deformation mechanics in amorphous Ta_2O_5/SiO_2 nanolaminates · 20 min
12:20	NANOSCALE FRACTURE AND SMALL-SCALE PLASTICITY **Contributed talk 6** Amodeo Jonathan Small-scale plasticity in UO2 nuclear fuel · 20 min
12:40	NANOSCALE FRACTURE AND SMALL-SCALE PLASTICITY **Contributed talk 7** Kroeker Philipp Nanoscale Characterisation of Twins and Dislocation Transmission Using In-Situ TKD-DIC Tensile Testing · 20 min
13:00	*Lunch break (80 min)*

Tuesday, 28 April 2026 - Afternoon

14:20	STRUCTURE–PROPERTY CORRELATIONS: MICROSTRUCTURE, DEFORMATION & IN SITU PROBES **Invited talk** Nathan Mara Structure-Mechanical Property Correlations in Pharmaceutical Crystals · 30 min
14:50	STRUCTURE–PROPERTY CORRELATIONS: MICROSTRUCTURE, DEFORMATION & IN SITU PROBES **Contributed talk 9** Gammer Christoph In situ 4D-STEM as a route to quantify deformation processes in arbitrarily complex materials · 20 min
15:10	STRUCTURE–PROPERTY CORRELATIONS: MICROSTRUCTURE, DEFORMATION & IN SITU PROBES **Contributed talk 10** Cios Grzegorz Resolving Overlapping EBSD Patterns by Experiment - Simulation Residuals Analysis · 20 min
15:30	STRUCTURE–PROPERTY CORRELATIONS: MICROSTRUCTURE, DEFORMATION & IN SITU PROBES **Contributed talk 11** Lemkova Valeria Bridging Mechanical Response and Atomic Structure: Insights from Activation Volume and Synchrotron Scattering · 20 min
15:50	**Remarks on dinner place and posters** 10 min
16:10	Poster Session (with Coffee break) (110 min)

Wednesday, 29 April 2026

08:50	*Registration (10 min)*
09:00	ATOMISTIC-TO-MULTISCALE NANOMECHANICS **Invited talk** Julien Guénolé Atomic-Scale Informed Dislocation Density Fields for Interface-Dominated Nanomechanics · 30 min
09:30	ATOMISTIC-TO-MULTISCALE NANOMECHANICS **Contributed talk 1** Anand Sriram Assessing the Reliability of Interatomic Potentials for Nanomechanical Simulations · 20 min
09:50	ATOMISTIC-TO-MULTISCALE NANOMECHANICS **Contributed talk 2** Wang Hexin Stochastic twinning in confined volume of Mg: Insights from nanomechanical testing & atomistic modelling · 20 min
10:10	ATOMISTIC-TO-MULTISCALE NANOMECHANICS **Contributed talk 3** Koch Peter Size-dependent dislocation processes in Pt nanoparticles under nanoindentation · 20 min
10:30	ATOMISTIC-TO-MULTISCALE NANOMECHANICS **Contributed talk 4** Alvarez Donado Rene Alberto Understanding Oxygen-Driven Plasticity in Amorphous Alloys via Multiscale Simulations and Ab Initio Trained Machine Learning Force Fields · 20 min
10:50	*Coffee Break (30 min)*
11:20	FAIR DATA AND SCALABLE MACHINE LEARNING FOR MECHANICS **Invited talk** Jakob Koenig Bridging Industry and Academia: A Practical Approach to FAIR Data Management · 30 min
11:50	FAIR DATA AND SCALABLE MACHINE LEARNING FOR MECHANICS **Invited talk** Claus O. W. Trost Using explainable machine learning to learn from nanoindentation mapping – Should we use more features? · 30 min
12:20	FAIR DATA AND SCALABLE MACHINE LEARNING FOR MECHANICS **Contributed talk 5** Huckfeldt Pia Micromechanical testing of Ni-Cu/-Au solid solutions · 20 min
12:40	FAIR DATA AND SCALABLE MACHINE LEARNING FOR MECHANICS **Contributed talk 6** Peivaste Iman Drastic Acceleration of Phase-Field Microstructure Simulations: A High-Performance Fourier Neural Operator Approach · 20 min
13:00	FAIR DATA AND SCALABLE MACHINE LEARNING FOR MECHANICS **Contributed talk 7** Zare Pakzad Sina Scalable Machine Learning Analysis of Resonance Behavior in Silicon MEMS Cantilevers · 20 min
13:20	**Closing remarks** Benoit Merle, Edoardo Rossi 10 min

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Poster List

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   Alaca B. Erdem
2. **LEED meets second strain-gradient elasticity : towards the identification of higher-grade elastic parameters?**
   amiot fabien
3. **Dry and Oil-Lubricated Sliding of Neat PEEK versus Modified PEEK against 42CrMo4+QT Steel in a Block-on-Ring Configuration**
   Baskutis Saulius
4. **Assessing humidity-induced fracture toughness degradation in polycrystalline alu-mina: microcantilever study and phase-field modeling of slow crack growth**
   Birocco Martina
5. **Severe plastic deformation of iron nanoparticles on sapphire substrate**
   Blecher Hen
6. **Multilayer Combinatorial Libraries and the Development of High-Strength, Thermally-Stable Asymmetric Nanolaminates**
   Bojarski Samuel
7. **Standardization of methods for characterization of mechanical properties of soft samples at nanoscale**
   Brázdilová Barbora
8. **Transitions in silica glass studied by High Temperature Scanning Indentation**
   Bruns Sebastian
9. **The Role of Oxide Interlayer Thickness in Metal-Polymer Adhesion**
   Byloff Johanna
10. **Investigation of fracture toughness of nanomultilayer coated micro ceramics: the role of aperiodicity**
    CHENG WENJUAN
11. **Constant strain rate nanoindentation at high strain rates: A systematic study on silica glasses**
    Cherukuri Rahul
12. **The Influence of creep effects on nanoindentation results and the comparison of indentation creep with conventional creep tests at room temperature**
    Chudoba Thomas
13. **Silver Wire Drawing Characterization via Nanoindentation**
    CORA Ömer Necati
14. **Machine Learning-Assisted Quantitative Analysis of Indentation Size Effects in Nanostructured Al–Cu Thin Films**
    Der Oguzhan
15. **In situ TEM investigation of stress-induced hydride formation and crack nucleation in titanium**
    Devulapalli Vivek
16. **Micromechanical Evaluation of Intermetallic Compounds in Binary Zinc-Based Alloys**
    Dybeł Aleksandra
17. **Thermomechanical Behavior of Metallic Multilayers Used in MEMS Microshutter Arrays with Variable Geometry**
    Elsaka Basma
18. **Micromechanical characterization of Ni-based cemented carbides at high temperature**
    Francesc Barbera
19. **Mechanical properties of geopolymer composite filled with tire rubber**
    Furtos Gabriel
20. **Abnormal Grain Growth Phenomena in electrodeposited nanocrystalline Cobalt-Copper observed after Nanoindentation Fatigue**
    Gaub Florentin
21. **Unveiling Microstructure-Property Relationships for the Design of Sustainable HEA and Cermet Coatings through High-Resolution Nanomechanical 3D High Speed Mapping**
    Gigante Giulia
22. **Strain rate dependent plasticity in Rhenium through micropillar compression**
    Hamulka Kamila
23. **Nanomechanical characterization of cold-spray deposited stainless steel**
    Hausild Petr
24. **Balancing Strength, Ductility, and Fracture Toughness in Aluminium-based Nanolaminates**
    Jansen Hendrik
25. **Bridging Dislocation Nucleation and Fracture Anisotropy in 4H-SiC: A Multi-scale Study on Mechanical Size Effects**
    Jun-Yu Wang
26. **Dry and Oil-Lubricated Sliding of Neat PEEK versus Modified PEEK against 42CrMo4+QT Steel in a Block-on-Ring Configuration**
    Kačinskas Tomas
27. **Fabrication of Large Arrays of Ceramic Micropillars by ICP-CVD for High-Throughput Mechanical Characterization**
    Kaekel Eireen
28. **Microstructure and phase stability in combinatorially sputtered W–Cr thin-film alloys**
    Kanczewska Maria
29. **Elastic modeling and total energy calculations of “free-standing” pseudomorphic GaN/AlN superlattices**
    KARAKOSTAS THEODOROS
30. **Mechanical properties at the nanoscale of GaAs/In(Al,Ga)As core/shell nanowires**
    KOMNINOU PHILOMELA
31. **Experimental and DFT Analysis of Antisite Disorder and Griffiths Phase in Dy_2CoMnO_6: Structural, Electronic, and Magnetic Insights**
    Kumar Vipin

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34 **Nanoindentation testing of agarose–silk fibroin hydrogels**
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35 **Nanobiotechnology Core Facility: Atomic Force Microscopy and Nanomechanical Characterization of Biological Systems**
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36 **Nanoengineering mechanical properties and adhesion in interface-dominated materials**
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37 **Applied nano-micro mechanics: bioreactors**
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38 **Nanoindentation stress relaxation tests**
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39 **Linking Local Electrochemical Functionality and Mechanical Properties in Nickel–Manganese–Cobalt (NMC) Battery Cathodes**
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40 **Mechanical Properties of Disordered Fe-Co Nanoparticles**
Nathan Yarden

41 **ON-CHIP NANOMECHANICAL STUDY OF THE EFFECT OF GRAIN SIZE ON PLASTICITY AND TIME-DEPENDENT DEFORMATION OF SPUTTERED PT THIN FILMS.**
Neshani Roozbeh

42 **Avalanche Dynamics in Stick-Slip Cutting of Molybdenum Disulfide**
Nicolini Paolo

43 **Indenter blunting – and how to deal with it**
Nohava Jiri

44 **The thermomechanical and structural properties of PMMA/SiC films**
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45 **Interpretable depth-resolved classification of high-speed nanoindentation maps using CNN curve-to-image learning and PCA–Random Forest**
Ortiz-Membrado Laia

46 **Exploring the Effect of Nanocrystalline Structure on the Elastic Modulus of AA7075**
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48 **A Multiscale Framework for Predicting Crack Evolution in Thin Films and Coatings Integrating Digital Material Representation, Cohesive Zones, XFEM and Molecular Dynamics**
Perzynski Konrad

49 **Optimal design and loading in Graphene/Formvar/PDMS nanocomposite under thermo-mechanical loading by multi-parameter optimizations**
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50 **Correlative BioAFM for nanomechanical mapping of soft, living and hydrated samples: from cells to fibrotic tissues**
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51 **Effects of oxygen incorporation on mechanical behavior of ZrCu thin film metallic glasses**
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52 **Deciphering the HEDE Mechanism via Tritium-based In Situ Micro-cantilever Fracture**
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53 **Simulation of the heterogeneous deformation response of amorphous polymers at the mesoscale via shear transformation zone theory**
Reitmair Daniel

54 **Controlling adhesion and debonding of metal films on polymer substrates**
Sandulli Federica

55 **Non-basal plasticity in structurally related Sm-Co crystals**
Schneider Malik

56 **Impact of heat treatment on microstructural changes and mechanical behaviour in ASTM A694 F65 steel**
Serban Nicolae

57 **Probing the nano-mechanical properties of thermo-responsive microgels**
SODHI MANMEET KAUR

58 **Expanding nanomechanical testing to lateral forces. Indentation hardness and scratch resistance at high temperatures using the sm@rt lateral force stage**
Stein Wolfgang

59 **Mathematical modelling accounting for a variable entanglement density: Validation against NEMD Atomistic Simulations**
Stephanou Pavlos

60 **Data-driven exploration of the compositional hyperspace of refractory high-entropy alloys via high-throughput materials engineering**
Wieczerzak Krzysztof

61 **Dynamic nanoindentation at cryogenic temperatures as a tool for determining the brittle-to-ductile transition temperature**
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62 **Microstructure and mechanical properties of tungsten fabricated by electron beam powder bed fusion**
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