Dissipation Mechanisms in Nano/Mesoscale Tribological Systems

6 - 9 April 2020
Trieste, Italy

Further information:
http://indico.ictp.it/event/9032/
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Nano/mesoscale mechanical and rheological response with dissipation has become, thanks to the very broad range of experimental/theoretical approaches, a novel local diagnostic and even spectroscopic tool, as well as a playground of sophisticated non-equilibrium statistical physics.

Description:

The physics of nanoscale mechanical dissipation is relevant to sliding nanofriction, to technological themes such as lubrication or finger-touchscreen friction, to soft and granular matter, to nanofrictional emulation in optical lattices, to active matter, to quantum and classical processes in noncontact AFM, and beyond. Between condensed matter physics, nanomechanics, materials science and engineering, this interdisciplinary area is of considerable conceptual value as a modern subject in non-equilibrium physics, and of the potential relevance of neighbouring fields such as fatigue, wear, lubrication, rheology, and biomechanics. As is well established in ICTP Trieste since 1995, we will collect the world community active in these fields, including groups in emerging countries, mixing theoretical, simulation and experimental highlights, and identifying future directions of motion of research in this lively arena.

Topics:

- From dissipation to superlubricity
- Atomistic friction of 2D layered materials
- Nanomanipulation and dynamics of nano-objects at surfaces
- Tribology of confined systems and lubricants under shear
- Frictional dynamics in soft and active matter
- Friction in powders and granular systems
- Fundamentals of friction theory
- Electronic, magnetic and quantum friction
- Surface and bulk processes and transitions detected by noncontact AFM dissipation
- Tribochemistry, triboelectricity, biotribological effects
- Trends in experimental and computational techniques

Directors:

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Local Organiser:

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Speakers:

A. BENASSI, Chiesi Farmaceutici, Italy
R. BENNEWITZ, Leibniz Inst. for New Materials, Germany
X. CAO, University of Konstanz, Germany
X. CHENG, University of Minnesota, USA
G. DE VILHENA, University of Basel, Switzerland
A. ERDEMIR, Argonne National Laboratory, USA
N. ESPALLARGAS, Norwegian Univ. of Science and Tech., Norway
A. GIACOMELLO, Sapienza Univ. di Roma, Italy
E. GNECCO, University of Jena, Germany
N. GOSVAMI, Indian Institute of Technology, India
B. GOTSMANN, IBM Zurich Laboratories, Switzerland
T. HEIMBURG, University of Copenhagen, Denmark
E. KOREN, Technion, Haifa, IL
Q. LI, Tsinghua University, China
H. LÖWEN, University of Düsseldorf, Germany
M. MA, Tsinghua University, China
T. MA, Tsinghua University, China
N. MANINI, University of Milan, Italy
L. MARKS, Northwestern University, USA
J. M. MARTIN, Ecole Centrale de Lyon, France
R. PAWLAK, University of Basel, Switzerland
M. ROBBINS, Johns Hopkins University, USA
A. SIRIA, Ecole normale Supérieur Paris, France
M. URBAKH, Tel Aviv University, Israel

Participants are encouraged to submit abstracts of proposed poster contributions.
A number of short oral presentation slots will be available for some of them upon selection.

How to apply:

Online application:
http://indico.ictp.it/event/9032/

Female scientists are encouraged to apply.

Grants:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

Deadlines:

For applications needing financial support and/or visa:
15 January 2020

For applications not needing financial support and/or visa:
15 February 2020

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SISSA
Istituto Officina dei Materiali
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