

Scientific report on the focus workshop
Energy Dissipation in Nanocontacts and
Molecular Bonds (EDINAM)

October 12, 2009

The workshop took place at the MPIPKS from Sept. 28 until Oct. 1, 2009, and was organized by Roland Bennewitz, Hendrik Hölscher, Peter Reimann, and André Schirmeisen. The main objective of this focus workshop is to bring together practitioners from several related fields, lately evolving into similar directions and thus calling for a forum to exchange those newly upcoming ideas on nanoscale dissipation. Particular emphasize has been put on friction force microscopy, non-contact atomic force microscopy, dynamic force spectroscopy, and related topics like cell rolling and adhesion, macroscopic friction and fracture, and irreversibility per se.

There were 32 invited talks, 14 poster contributions, and 3 participants without contribution. The workshop attracted participants from 3 continents and 14 different countries. Since several PhD-students and younger post-docs presented their results as talks and poster, we are convinced that there was a good balance between contributions by established senior researchers, younger post-docs and PhD-students.

A first highlight of the workshop was the colloquium talk by Robert W. Carpick (University of Pennsylvania), entitled “New insights into dissipative processes: Damping, adhesion, friction, and wear at the nanometer and atomic scale”, showing that surfaces and interfaces become the primary regions where energy is dissipated, but that the essential underlying physics is still not satisfactorily understood in detail.

After the colloquium talk, a very vivid and inspiring poster session took place until late evening.

As a further highlight we mention the special final talk by Michael Urbakh (Tel Aviv University) on the subject “Temperature dependence of nanoscale friction”. This talk summarized and exemplified in a very convincing manner the initial main idea of the conference, namely to bring together practitioners from different fields – in particular nanofriction and biophysics – lately evolving almost independently of each other into similar directions and thus calling for a timely forum to exchange those newly upcoming ideas.

The local organization was handled by Claudia Pönisch very smoothly and professionally. We like to thank her for the very enjoyable collaboration, the MPIPKS for providing infrastructure and financial support, and the SFB 613 for contributing supplementary traveling money.