Scientific Report

Workshop on "Small Systems far from Equilibrium: Order, Correlations, and Fluctuations"

The workshop has been focused on the following main topics: fluctuation and work theorems and their implications for the understanding of non-equilibrium entropy-production in small systems, the theory of large deviations, dynamically generated long-range correlations far from equilibrium, and emerging cooperative phenomena and their relation to microscopic dynamics. While these topics are certainly theoretically motivated, several talks provided a detailed comparison with state-of-the-art experiments in this field.

The workshop has been attended by some of the leading scientists in the field, as for example Udo Seifert (Stuttgart) and Sergio Ciliberto (Lyon) on fluctuation theorems , Bernard Derrida (Paris), Christian Maes (Leuven), and Hyunggyu Park (Seoul) on large deviations, Satya Majumdar (Orsay), Stefano Ruffo (Florence), and Kazumasa Takeuchi (Tokyo) on long-range correlations, Deepak Dhar (Tata Institute), Sid Redner (Boston) and Erwin Frey (München) on cooperative phenomena.

The workshop provided an opportunity for quite a large number of students and young scientists to present their work through oral and poster contributions which we found of very high quality. We are very pleased with their active participation, both during their presentations and in the general discussion. Our workshop was received with enthusiastic response by the community as demonstrated by the large number of high quality applications. In the workshop we had 24 invited speakers and 20 further participants selected out of 60 applicants. In addition, a considerable number of the researchers at the Max-Plank-Institut attended the different presentations.

The workshop provided an opportunity for researchers from various subfields of this broad and fast developing research area to intensively interact and exchange ideas. In particular, the current state of the art of the fluctuation theorems and their intricate relationship to non-equilibrium entropy production was presented and discussed in detail. The intensive discussions have resulted in a number of new collaborations.

The scientific coordinators

Malte Henkel
David Mukamel
Michel Pleimling
Gunter Schütz