

## **Extreme Events: Theory, Observations, Modeling, and Prediction**

### **Workshop scientific coordinators: H. Kantz, M.A. Matías**

EXEV08 is the opening workshop of the series *Trends in Complex Systems* between the MIPKs and IFISC, and was held at the IFISC (Palma de Mallorca) between November 10th to 14th, 2008.

**Main focus:** The workshop focused on the emerging field of very large self-generated short-time fluctuations in complex systems, so called extreme events. This involves theoretical physics and mathematics as far as theory and simple models are concerned, as well as many other disciplines where the real-world phenomena are observed and analysed quantitatively. Altogether 17 invited speakers, 46 participants and the two coordinators participated in the conference.

**Senior participants:** The participants included leading experts working in these fields, such as M. Ghil, N. Johnson, J. Kurths, B. Malamud, E. Ott, J. Peinke, S. Redner, L. Smith, S. Solomon, D. Sornette R. Toral

**Young scientists:** 9 out of the 35 talks given in the Workshop were presented by young scientists without tenure, typically at the postdoctoral level, and even a few of the talks were given by senior PhD students. A “best contribution award” (consisting in a book present sponsored by the European Physical Journal B) was awarded to Anja Garber, a PhD student, for her talk on finite size effects on extreme events, while the talk presented by Angeles Serrano (postdoc at IFISC) showing the occurrence of extreme events in texts was ranked second. The majority of the posters was presented by young people at the PhD or postdoc level. A three-minute presentation of each poster was arranged, so that the poster presenters could reach a wider audience.

**Scientific results:** Extreme events, for which the usual statistical prediction techniques fail, have tantamount importance in a number of fields, both related to Earth Sciences and also to Social Sciences. A dramatic example, addressed in Prof. Sornette’s talk, is the economic crisis we are living nowadays originated in subprime mortgages. The talks presented in the workshop covered a wide range of topics from listing systems and model classes where evidence for extreme events exists (for example, Prof. Ghil’s opening talk, who offered a review of the field), presenting current statistical tools for the characterization of extreme events including temporal and spatial correlations, and highlighting examples where a detailed understanding of underlying mechanisms has been achieved. This was completed by the

issue of prediction and predictability, of scoring and evaluating predictions, and control of extreme events, as well as considerations about the discrepancy between physical impact of some event and societal impact. The combination of contributions from experts primarily working in different areas, like Statistical Physics, Meteorology, Statistics, Nonlinear Dynamics, Sociophysics, etc. is a very unique and outstanding aspect of this meeting, which helped to create an stimulating atmosphere of discussions that can result in potentially important collaborations across disciplines. Our overall evaluation of the meeting is very positive. The meeting generated stimulating discussions, the average attendance in the activities was high, and the level of most contributions was excellent.

**Acknowledgments:** We would like to thank IFISC and Govern Balear (Conselleria d'Hisenda) for generous support and the ideal environment to carry out the Conference. Also the MPIPKS Visitor's Program for their help with the organization, specially Claudia Pönisch, Workshop Secretary, for efficiently and competently handling all kind of organizational issues. We also thank Rosa Rodríguez and Marta Ozonas for their help with all local aspects of organization.