

*Scientific report for the International Workshop  
“Mathematical Physics of Complex Networks:  
From Graph Theory to Biological Physics”*

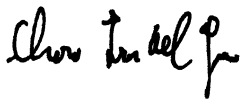
The workshop, which was held May 14 – 18, 2012, was intended to bring together an interdisciplinary mix of many of the world’s leading researchers in the field of complex networks. Its principal aim was to promote the development of analytic results and computational methods and to connect those results to important real world applications. To achieve this goal, a diverse collection of speakers were invited, including researchers whose interests focus on more fundamental issues and methods, as well as researchers investigating applications. The event brought together top scientists from different backgrounds, creating a stimulating environment for fruitful exchange of ideas and starting collaborations. The workshop exposed the participants to different methods and points of view in the broad topic of complex networks, thereby providing them with approaches they were potentially unfamiliar with and that they might use to the benefit of their research.

In attendance were 76 scientists from 28 countries and 5 continents. These attendees included senior researchers, postdocs, as well as doctoral students. The program included a keynote lecture by Prof. A.-L. Barabási from Northeastern University, USA, 25 invited talks, 2 poster sessions mit 35 presenters, 2 social programs, and an official conference dinner. Among the renowned participants, together with the aforementioned Prof. Barabási were Prof. A. Arenas from the “Rovira i Virgili” University, Spain, Prof. G. Bianconi from Northeastern University, USA, Prof. M. Boguñá from the University of Barcelona, Spain, Prof. B. Drossel from TU Darmstadt, Germany, Prof. S. Dorogovtsev from the University of Aveiro, Portugal, Prof. P. Erdős from the Alfred Rényi Institute for Mathematics, Hungary, Prof. C. Greenhill from the University of New South Wales, Australia, Prof. B. Kahng from Seoul National University, Korea, Prof. G. Korniss from Rensselaer Polytechnic Institute, USA, Prof. S. Redner from Boston University, USA, and Prof. Z. Toroczkai from the University of Notre Dame, USA.



Overall, we believe the conference was highly successful and met all its intended goals. A number of very interesting topics were discussed, including graph sampling, explosive percolation, spectral analysis of graphs, and adaptive network behaviour involving the interplay of topology and dynamical processes. Additionally, many applied topics were also discussed, including neural networks, gene regulatory networks, opinion dynamics, and language development. Of particular note was the presence of many young researchers, who actively participated by presenting their results and by contributing to lively discussions. Indeed, the stimulating environment provided by the institute produced many discussions that will undoubtedly result in new fruitful collaborations.

We would like to thank the Institute for making this event possible. We are especially grateful for the exceptional effort that Frau Sabine Strecker gave to every aspect of coordinating it.



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