The Abdus Salam International Centre for Theoretical Physics

1964 40th anniversary 2004

School and Conference on Fundamental Aspects of Complexity

Organizer(s): M. Marsili, M. Mezard, F. Ricci-Tersenghi, R. Zecchina
Trieste - Italy, 06 - 10 September 2004

Venue: Main Building Main Lecture Hall

Final programme

SCHOOL DAY 1

6 September 2004

08:30 - 09:45	(Room: Main Building, Lobby) **REGISTRATION**
09:45 - 10:00	**Opening remarks**
10:00 - 11:30	**Sherrington, D.** / *University of Oxford* **An introduction to spin glasses and related topics - part I**
11:30 - 13:00	**Cavagna, A.** / *Università degli Studi di Roma "La Sapienza"* **Structural glasses and complexity: an overview**
13:00 - 15:00	--- LUNCH BREAK ---
15:00 - 16:30	**Domany, E.** / *the Weizmann Institute of Science* **Analysis of gene expression data: methods and applications (to cancer, stem cells etc) - part I**
16:30 - 17:15	**Marsili, M.** / *the Abdus Salam ICTP* **Review on market models and minority games**

SCHOOL DAY 2

7 September 2004

09:00 - 10:30 **Sherrington, D.** / *University of Oxford*
An introduction to spin glasses and related topics - part II

10:30 - 11:00 --- COFFEE BREAK ---

11:00 - 12:30 **Domany, E.** / *the Weizmann Institute of Science*
Analysis of gene expression data: methods and applications (to cancer, stem cells etc) - part II

12:30 - 14:30 --- LUNCH BREAK ---

14:30 - 16:00 **Achlioptas, D.** / *Microsoft Corporation*
The second moment in spin glasses and random constraint satisfaction

16:00 - 16:30 --- COFFEE BREAK ---

16:30 - 18:00 **Yedidia, J.** / *Mitsubishi Electric Research Labs*
An introduction to error correcting codes

CONFERENCE DAY 1 - Glasses (I)

8 September 2004

09:00 - 09:30 **Giardina, I.** / *Università degli Studi di Roma "La Sapienza"*
Cavity method for supersymmetry breaking spin glasses

09:30 - 10:00 **Toninelli, F.L.** / *Universität Zürich*
Beyond mean field spin glasses: models with long but finite interaction range

10:00 - 10:30 **Kurchan, J.** / *Ecole Supérieure de Physique et de Chimie Industrielles*
Topological annealing

10:30 - 11:00 --- COFFEE BREAK ---

11:00 - 11:30 **Bray, A.** / *University of Manchester*
Spin glass complexity: new perspectives on old results

11:30 - 12:00 **Marinari, E.** / *Università degli Studi di Roma "La Sapienza"*
Circuits in random graph

12:00 - 12:30 **Moore, M.** / *University of Manchester*
Perturbation theory and spin glasses

12:30 - 14:30 --- LUNCH BREAK ---

CONFERENCE DAY 1 - Glasses and Bioinformatics

8 September 2004

14:30 - 15:00 **Biroli, G.** / *CEA/Saclay*
Dynamical heterogeneity and growing dynamical correlation length in structural glasses

15:00 - 15:30 **Lässig, M.** / *Universität zu Köln*
Structure and evolution of bio-molecular networks

15:30 - 16:00 **Domany, E.** / *the Weizmann Institute of Science*
Analysis of DNA chip and antigen chip data: studies of cancer, stem cells and diabetes

16:00 - 16:30 **Alava, M.** / *Helsinki University of Technology*
Focused simulated annealing and the XORSAT-problem

16:30 - 17:00 --- COFFEE BREAK ---

17:00 - 18:30 **Short oral presentations by DYGLAGEMEM post-docs**

Generalized Bose-Einstein phase transition in large -m component spin glasses (Aspelmeier, T.) 15'

High-frequency vibrationss of topologically disordered systems (Ciliberti, S.) 15'

Applications of cluster Monte Carlo algorithms in spin glasses (Jörg, T.) 15'

The effect of cooling procedure on sub-aging behaviour in spin glasses (Parker, D.) 15'

Some aspects of non-equilibrium dynamics of 2d-disordered elastic systems (Schehr, G.) 15'

The birth of extensive barriers at clustering transitions (Semerjian, G.) 15'

18:30 - 20:30 (Room: Main Building Room 237)
DYGLAGEMEM Network members meeting

CONFERENCE DAY 2 - Computer Science and Codes (I)

9 September 2004

09:00 - 09:30 **Mertens, S.** / *Otto-von-Guericke Universität Magdeburg*
Universal phase transition in combinatorial optimization

09:30 - 10:00 **Achlioptas, D.** / *Microsoft Corporation*
A new look at the second moment method

10:00 - 10:30 **Dubois, O.** / *CNRS Université de Paris 6*
Additive decomposition

10:30 - 11:00 --- COFFEE BREAK ---

11:00 - 11:30 **Kirkpatrick, S.** / *the Hebrew University of Jerusalem*
Games on networks

11:30 - 12:00 **Montanari, A.** / *Ecole Normale Supérieure Paris*
Maxwell construction: a link between statistical mechanics and computational complexity

12:00 - 12:30 **Yedidia, J.** / *Mitsubishi Electric Research Labs*
Distributed source coding using error correcting codes

12:30 - 14:30 --- LUNCH BREAK ---

CONFERENCE DAY 2 - Computer Science and Codes (II)

9 September 2004

14:30 - 15:00 **Goerdt, A.** / *Technische Universität Chemnitz*
Efficient certification of co-NP-complete problems on random instances

15:00 - 15:30 **Boettcher, S.** / *Emory University*
Numerical results for low-energy properties of lattice and mean-field spin glasses

15:30 - 16:15 **Brunel, N.** / *Université René Descartes - Paris 5*
Optimal information storage and the distribution of synaptic weights: experiment vs theory

16:15 - 16:45 --- COFFEE BREAK ---

16:45 - 18:45 **Short oral presentations, including STIPCO post-docs**

Statistical mechanics of dilute minority games (Galla, T.) 15'

Threshold values, stability analysis and high-q asympotics for the coloring problem on random graphs (Krzakala, F.) 15'

Heterogeneous dynamics and length scales in granular compaction (Lefevre, A.) 15'

Message passing, factor graphs and analog electrical circuits (Dauwels, J.H.G.) 15'

Numerical results for spin glasses in a magnetic field for spin glasses in a magnetic field (Palassini, M.) 15'

Dynamical susceptibility in models of glasses (Toninelli, C.) 15'

On the Bethe lattice (Rizzo, T.) 15'

18:45 - 19:45 (Room: Main Building Room 237)
STIPCO Network members meeting

CONFERENCE DAY 3 - Econophysics and Games

10 September 2004

09:00 - 09:30 **Burda, Z.** / *Jagellonian University Krakow*
Clustering in complex networks

09:30 - 10:00 **Bianconi, G.** / *the Abdus Salam ICTP*
Clogging and self-organized criticality in dynamical networks

10:00 - 10:30 **J.-P. Nadal** / *Ecole Normale Supérieure Paris*
Statistical physics of social interactions: multiple equilibria in a market with heterogeneous agents

10:30 - 11:00 --- COFFEE BREAK ---

CONFERENCE DAY 3 - Glasses (II)

10 September 2004

11:00 - 11:30 **Müller, M.** / *Rutgers, the State University of New Jersey*
The glass transition, marginal stability, and the Coulomb gap in electron glasses

11:30 - 12:00 **Martin, O.C.** / *LPTMS, Orsay*
Ground states and excited states in glassy systems