

**SCHOOL ON  
"STATISTICAL PHYSICS,  
PROBABILITY THEORY AND  
COMPUTATIONAL COMPLEXITY"**

**followed by**

**CONFERENCE ON  
"TYPICAL-CASE COMPLEXITY,  
RANDOMNESS AND  
ANALYSIS OF SEARCH  
ALGORITHMS"**

**26 August - 7 September 2002**

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**26 August - 7 September 2002**

*Miramare, Trieste - Italy*

*Co-sponsored by:*

- **IISI** - Intelligent Information Systems Institute, Cornell University, Ithaca, New York, U.S.A.
- **MICROSOFT RESEARCH** - Redmond, Washington, U.S.A.

The last years have witnessed an increasing interaction among the disciplines of discrete mathematics, computer science and statistical physics on combinatorial problems over random structures and related algorithmic issues. Motivated by the rate of progress in such interdisciplinary area of research, the Abdus Salam International Centre for Theoretical Physics will organize a **School on "Statistical Physics, Probability Theory and Computational Complexity"**, from 26 August to 4 September 2002. The School will be followed by a topical **Conference on "Typical-Case Complexity, Randomness and Analysis of Search Algorithms"**, from 5 to 7 September 2002.

The aim of both School and Conference is to encourage young, qualified mathematicians, computer scientists and theoretical physicists to broaden their horizons, learn new subjects and apply the sophisticated tools developed in mathematics and theoretical physics to the field of computer science.

**DIRECTORS**

C. Borgs - Microsoft Research, Redmond  
J. Chayes - Microsoft Research, Redmond  
R. Monasson - ENS, Paris  
B. Selman - Cornell University, Ithaca  
R. Zecchina - the Abdus Salam ICTP, Trieste

**SCHOOL (26 August - 4 September 2002)**

**Main topics**

- *Introduction to Statistical Mechanics*
- *Disordered Systems*
- *Graph Theory and Networks: Random Graphs*
- *Threshold Phenomena in Random Combinatorial Structures*
- *Complexity Theory and Analysis of Algorithms*
- *Heuristic Algorithms*
- *Modelling from Real World Applications: Error correcting codes, Bio-informatics, Planning problems, Networks, Game theory and decision under uncertainty, Protein folding as an optimization problem*

## Lecturers

L. Barabasi - University of Notre Dame, U.S.A.  
B. Bollobas - University of Memphis and Cambridge University, U.K.  
C. Borgs - Microsoft Research, Redmond  
J. Chayes - Microsoft Research, Redmond  
P. Flajolet\* - INRIA, Rocquencourt  
C. Gomes - Cornell University, Ithaca  
R. Impagliazzo - University of California at San Diego  
G. Kalai - Hebrew University, Jerusalem  
H. Kautz - University of Washington  
M. Magnasco - Rockefeller University, New York  
A. Maritan - SISSA, Trieste  
S. Mertens - University of Magdeburg  
M. Mezard - LPTMS, Orsay  
R. Monasson - ENS, Paris  
G. Parisi\* - University La Sapienza, Rome  
B. Selman - Cornell University, Ithaca  
A. Sinclair - University of California at Berkeley  
J. Spencer - New York University  
R. Urbanke - EPFL, Lausanne  
M. Weigt - University of Göttingen

\*To be confirmed

## TOPICAL CONFERENCE (5 - 7 September 2002)

### Main topics

- *Complexity Theory (including Average-case)*
- *Combinatorial Optimization over Random Structures*
- *Sharp Thresholds*
- *Random Graphs*
- *Out-of-equilibrium Dynamics of Randomized Search Algorithms*
- *Heuristic Algorithms*

### List of speakers tentatively includes:

D. Achlioptas - Microsoft Research, Redmond	S. Kirkpatrick - Hebrew University, Jerusalem
B. Bollobas - Memphis Univ./Cambridge Univ., U.K.	L. Kirousis - University of Patras
C. Borgs - Microsoft Research, Redmond	O.C. Martin - INPN, Paris
J. Chayes - Microsoft Research, Redmond	S. Mertens - University of Magdeburg
J. Culberson - University of Alberta, Edmonton	M. Mezard - LPTMS, Orsay
H. Daudé - University of Provence, Marseille	R. Monasson - ENS, Paris
O. Dubois - LAFORIA, Paris	G. Parisi - University La Sapienza, Rome
M. Dyer - University of Leeds	B. Selman - Cornell University, Ithaca
J. Franco - University of Cincinnati	A. Sinclair - University of California, Berkeley
E. Friedgut - Hebrew University, Jerusalem	D. Spielman - MIT, Cambridge
I. Gent - University of Strathclyde, Glasgow	H. van Maaren - Delft University of Technology
C. Gomes - Cornell University, Ithaca	T. Walsh - University of York
R. Impagliazzo - Univ. of California, San Diego	M. Weigt - University of Göttingen
M. Jerrum - University of Edinburgh	D.B. Wilson - Microsoft Research, Redmond
G. Kalai - Hebrew University, Jerusalem	R. Zecchina - the Abdus Salam ICTP, Trieste
H. Kautz - University of Washington	

## **PARTICIPATION**

Scientists and students from all countries that are members of the UN, UNESCO or IAEA may attend the activity. The main purpose of the Centre is to help research workers from developing countries through a programme of training activities within a framework of international cooperation. However, students, post-doctoral scientists and researchers from developed countries are also welcome to attend. As the activity will be conducted in English, participants should have an adequate working knowledge of that language. Applicants to the School requesting financial support should not be older than 45 at the time of the activity.

As a rule, travel and subsistence expenses of the participants are borne by their home institutions. However, limited funds are available for applicants from, and working in, developing countries to be selected by the organizers. The sponsorship from IISI (Intelligent Information Systems Institute of Cornell University, Ithaca, NY, U.S.A.) will make it possible to provide a limited number of travel grants to some young researchers in the U.S.A. There is no registration fee for attending the activities.

**Deadline for receipt of requests for participation is:**

**15 April 2002**

Applicants to the School and/or Conference should complete and sign the request for participation form, to be found at the end of this Bulletin (also obtainable via e-mail: [smr1423@ictp.trieste.it](mailto:smr1423@ictp.trieste.it), by typing on the subject line "get index", or via WWW server: <http://www.ictp.trieste.it>), and send it to:

the Abdus Salam International Centre for Theoretical Physics  
**School and Conference on Statistical Physics (smr.1423)**  
c/o Ms. Nicoletta Ivanissevich  
Strada Costiera 11  
I-34014 Trieste, Italy

School and Conference updatings:

**<http://www.ictp.trieste.it/complex/2002.html>**

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION  
and  
INTERNATIONAL ATOMIC ENERGY AGENCY  
the ABDUS SALAM INTERNATIONAL CENTRE FOR THEORETICAL PHYSICS

Strada Costiera 11  
I-34014 Trieste  
Italy

Telephone: +39-040-2240383  
Telefax: +39-040-224163  
E-mail: SMR1423@ictp.trieste.it

REQUEST FOR PARTICIPATION

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26 August - 4 September 2002

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5 - 7 September 2002

VERY IMPORTANT: please specify if applying for the School and/or the Conference (see last page)

**INSTRUCTIONS**

Each question must be answered clearly and completely. Type or print in ink. If more space is required, attach additional pages. This form should be forwarded to: the Abdus Salam International Centre for Theoretical Physics, School and Conference on Statistical Physics (c/o Ms. N. Ivanissevich), Strada Costiera 11, I-34014, Trieste, Italy, **to arrive no later than 15 April 2002.**

A recent photograph of the candidate should be attached here, signed legibly on the reverse.

**NOTE:** This request will be processed only if the permanent address (and present address, if different) is clearly indicated. The ICTP cannot process any visa request, unless all requested personal data are provided.

PERSONAL DATA

SURNAME/FAMILY Name: MAIDEN Name: First name: Middle name(s): Sex:  
For women only (if applicable)

**IMPORTANT: PLEASE ALSO COMPLETE THIS SECTION, IF YOUR NAME(S) IN YOUR PASSPORT ARE SPELT DIFFERENTLY FROM THE ABOVE.**

SURNAME/FAMILY Name: MAIDEN Name: First name: Middle name(s):  
For women only (if applicable)

Place of birth (City and Country): Present nationality: Date of birth:  
Day - Month - Year

Full name/address of permanent Institution: Institute: Tel. No.  
Telefax  
Your Office: Tel. No.  
Telefax  
E-mail: \*

Full name/address of present Institution : Institute: Tel. No.  
(if different from permanent) Telefax  
Your Office: Tel. No.  
Telefax:  
E-mail: \*

until: Date .....

Home address: Tel. No.

Mailing address - please indicate whether: Permanent  Present  Home

Name and address of person to notify in case of emergency - Relationship: Tel. No.

\* I agree that my e-mail address(es) may be made public on the ICTP WWW page: YES  NO

EDUCATION (higher degrees)

University or equivalent

Name and place

Years attended

From

to

Degrees

---

Seminars, summer schools, conferences or research

Name and place

Year

---

SCIENTIFIC EMPLOYMENT AND ACADEMIC RESPONSIBILITY

Research Institution or University

Name and place

Period of duty

From

to

Academic

responsibilities

Present employment and duties, and foreseen employment upon return to home country after the activity:

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Have you participated in past ICTP activities? If yes, which?

Yes

No

Are you applying to any other 2002 ICTP activities? If yes, which?

Yes

No

Mention briefly your previous research experience, and explain your reasons for wishing to participate in this activity:

**NB:** Our Scientific Information System keeps track of all applications made by the candidate to earlier ICTP activities. As a consequence, when the subject of the present activity is far from your previous applications, an explanation (not more than 200 words) of your change of interest should be included.

PRESENT FIELD OF INTEREST (please indicate on the list below your **TWO** primary fields of interest, in order of priority).

**10. PHYSICS OF CONDENSED MATTER**

- 11. Solid State Physics
- 12. Atomic and Molecular Physics
- 13. Materials Science
- 14. Surfaces and Interfaces
- 15. Statistical Physics
- 16. Computational Physics in Condensed Matter

**20. PHYSICS OF HIGH AND INTERMEDIATE ENERGIES**

- 21. High Energy and Particle Physics
- 22. Relativity, Cosmology and Astrophysics
- 23. Plasma Physics
- 24. Nuclear Physics

**30. MATHEMATICS**

- 31. Applicable Mathematics, including:  
*Mathematical Ecology,*  
*Systems Analysis*  
*Mathematical Economy*  
*Mathematics in Industry*
- 33. Algebra
- 34. Geometry
- 35. Topology
- 36. Differential Equations
- 37. Analysis
- 38. Mathematical Physics

**40. PHYSICS AND ENERGY**

- 41. Physics of Nuclear Reactors
- 42. Physics of Controlled Fusion
- 43. Non-Conventional Energy  
(*Solar, Wind & others*)
- 44. Nuclear Energy related technologies

**50. PHYSICS AND ENVIRONMENT**

- 51. Solid Earth Geophysics
- 52. Soil Physics
- 53. Climatology and Meteorology
- 54. Physics of the Oceans
- 55. Physics of Desertification
- 56. Physics of the Atmosphere, Troposphere, Magnetosphere, Aeronomy
- 57. Environmental Monitoring and Remote Sensing

**60. PHYSICS TEACHING**

- 61. English
- 62. French
- 63. Spanish
- 64. Arabic

**80. MISCELLANEOUS**

- 81. Others
- 82. Digital Communications & Computer Networking

**90. PHYSICS OF THE LIVING STATE**

- 91. Neurophysics
- 92. Biophysics
- 93. Medical Physics

**AO. APPLIED PHYSICS**

- A1. Physics in Industry
- A2. Microelectronics
- A3. Fibre Optics for Communications
- A4. Instrumentation
- A5. Synchrotron Radiation
- A6. Non-destructive Evaluation
- A7. Lasers
- AA. Applied Superconductivity

**B1. SPACE PHYSICS**

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Kindly supply a keyword description of your current scientific activities, as follows (*strictly within indicated lengths*) :

1) Area of research: (e.g. STATISTICAL PHYS.)

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(no more than 15 characters)

2) Specific topic of interest: (e.g. GRAPH THEORY)

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(no more than 30 characters)

List your **scientific publications** including books and articles (authors, title, Journal) in the last five years:

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Kindly state any positions you hold in the scientific administration of your Institution or any of the national scientific Institutions.

It would be of assistance to the Selection Committee if this request for participation were accompanied by a letter of recommendation, especially for junior physicists

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Indicate below your proficiency in the English language

Reading:	Good	<input type="checkbox"/>	Writing:	Good	<input type="checkbox"/>	Speaking:	Good	<input type="checkbox"/>
	Average	<input type="checkbox"/>		Average	<input type="checkbox"/>		Average	<input type="checkbox"/>
	Poor	<input type="checkbox"/>		Poor	<input type="checkbox"/>		Poor	<input type="checkbox"/>

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**APPLICABLE ONLY FOR CANDIDATES FROM DEVELOPING COUNTRIES** (**Important:** Owing to limited funds, support for travel will be granted only in exceptional cases. Therefore, every effort should be made by applicants to secure support for their fare (or at least a partial contribution) from their home country).

Request for Financial Assistance: (**Please tick ONE box only**)

- |  |   |
|--|---|
| <input type="checkbox"/> Full Travel + Subsistence | <input type="checkbox"/> Subsistence only               |
| <input type="checkbox"/> Half Travel + Subsistence | <input type="checkbox"/> No financial support requested |
| <input type="checkbox"/> Travel only               |   |

**I certify that if granted funds for my travel, I shall attend the whole activity**

.....  
Signature

Applicants to the School requesting financial support should not be older than 45 at the time of the activity.



