



The Abdus Salam
**International Centre
for Theoretical Physics**



Conference on Mixing Times between Probability, Computer Science and Statistical Physics

Description:

Driven by the growth of applications in MCMC methods, machine learning and high-dimensional statistics, the field of mixing times has registered a number of recent breakthroughs of both theoretical and applied interest. This conference aims to bring together researchers with diverse perspectives on this topic.

MORE DETAILS:

The focus of the conference will be on mixing properties of random systems, namely, timescales and phenomena occurring while reaching their equilibrium state. Examples of these systems include, among others, random walks in random environment and interacting spin systems.

Beyond the theoretical interest, a profound understanding of the mixing behavior of high-dimensional systems have immediate implications on the development of efficient sampling algorithms, which serve as a base tool to approach provably hard combinatorial problems.

Despite a remarkable effort made in the last decades, a satisfying general theory encompassing all observed phenomenologies is still lacking. One major open problem is that of developing a framework to explain the dynamical phase transition – known as “cutoff phenomenon” – exhibited by a number of high-dimensional processes.

TOPICS:

- Theory of Markov Chain Monte Carlo methods
- Efficient sampling
- Random walks in random environment
- Interacting particle systems
- Concentration of measure
- Phase transitions

MINI-COURSES SPEAKERS:

P. Sousi, Cambridge, UK
A. Stauffer, King's College London, UK

REGULAR SPEAKERS:

A. Caraceni, Scuola Normale Superiore, Italy
Z. Chen, GeorgiaTech, USA
S. Chewi, Yale, USA
A. Cipriani, University College London, UK
B. Dubail, KTH, Sweden
D. Elboim, (Princeton, USA)
S. Ganguly, Berkeley, USA
N. Gantert, TUM, Germany
I. Hartarsky, CNRS/Lyon 1, France
M. Jara, IMPA, Brazil*

K. Liu, MIT, USA
E. Nestoridi, Stony Brooks, USA
G. Perarnau, UPC, Spain
A. Sarkovic, Cambridge, UK
D. Schmid, Columbia, USA
A. Sinclair, Berkeley, USA*
A. Shapira, MAP5, France
A. Sly, Princeton, USA
C. Toninelli, CNRS/Paris Dauphine, France
*To be confirmed



5 - 9 May 2025



Trieste, Italy



Deadline:

15 February 2025

DIRECTORS:

P. Caputo, Roma Tre University, Italy
M. Quattropani, Roma Tre University, Italy
J. Salez, Université Paris-Dauphine & PSL, France
F. Sau, University of Milan, Italy
V. Silvestri, Sapienza University of Rome, Italy

LOCAL ORGANISER:

J. Babier, ICTP, Italy

FURTHER INFORMATION:

E-mail: smr4066@ictp.it

Web: <http://indico.ictp.it/event/10831/>

Female scientists are encouraged to apply.



GRANTS:

A limited number of grants are available to support the attendance of selected participants, with priority given to participants from developing countries. There is no registration fee.

