Summer Graduate School on Mathematics for Machine Learning

DESCRIPTION:

Machine learning and artificial intelligence now permeate nearly every aspect of contemporary life. Yet, despite their widespread impact, the theoretical understanding of why and when these methods work still lags behind practice—leaving important conceptual gaps that call for sustained effort from the research community.

15 - 26 June 2026

Trieste, Italy

Applications and Deadline:
Requesting financial and/or visa support
1 March 2026
For other participation
1 May 2026

MORE DETAILS:

This summer school offers an introduction to modern theoretical ideas developed to explain machine-learning algorithms and to clarify their domains of applicability. The emphasis will be on proof techniques and broadly useful mathematical tools. The lectures will be delivered by two internationally recognized experts. By the end of the school, participants should have an up-to-date view of the key conceptual and technical toolbox—drawing from statistics and statistical physics—needed to engage with current questions in the theory of machine learning.

LECTURERS AND TOPICS:

Andrea Montanari
"Rigorous approaches to modern machine learning"

Francesca Mignacco
"Statistical physics approach to high-dimensional learning problems"

In the application form, all applicants are requested to submit a brief research abstract for a poster presentation. A limited number of abstracts will be selected for the poster session.

DIRECTORS:
Claudio Arezzo, ICTP, Italy
Jean Barbier, ICTP, Italy
Domenico Marinucci, Roma Tor Vergata, Italy
Cristina Trombetti, University of Naples Federico II, INdAM
  Istituto Nazionale di Alta Matematica, Italy

LOCAL ORGANISER:
Jean Barbier, ICTP, Italy

FURTHER INFORMATION:
E-mail: smr4222@ictp.it

Web: https://indico.ictp.it/event/11148/

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.

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100 YEARS