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ICTP
1964–2024

Joint ICTP-WE Heraeus School and Conference on Frontiers at the Intersection of Quantum Simulation and Machine Learning

Description:

The intersection of machine learning and quantum simulation is emerging as a fruitful research area. This combined school and workshop will bring together leading experts as well as interested students to foster exchange between communities and explore synergies between the fields.

8-19 April 2024

Trieste, Italy

Applications and Deadlines:
Requesting financial and/or visa support:
4 February 2024
For all other applicants:
8 March 2024

MORE DETAILS:

In the past two decades, major advancements in machine learning (ML) and quantum simulation have been achieved. ML algorithms define the state of the art in natural language processing and image recognition; quantum simulation is opening up new avenues to investigate correlated matter. Both fields are becoming increasingly intertwined in recent attempts to provide insights in quantum many-body physics. An objective of developing machine learning-enhanced numerical methods and quantum simulation is to push our capabilities to study exotic phases or non-equilibrium states. Furthermore, while quantum simulators emerge as a new tool to address these outstanding research topics, their advent raises further questions that ML approaches can potentially solve.

This event aims to discuss, where quantum challenges match the natural strengths of ML and, reversely, the quantum applications call for developing new ML techniques.

TOPICS:

- Quantum simulation of many-body systems,
- Data-driven characterization of quantum systems,
- Quantum state representation with machine learning models,
- Protocol optimization for quantum control.

SCHOOL SPEAKERS:

Francesca FERLAINO, University of Innsbruck and IQOQI
Eliska GREPLOVA, Delft University of Technology
Florian MARQUARDT, Max Planck for the Science of Light
Edwin Miles STOUDENMIRE, Flatiron Institute
Filippo VICENTINI, Ecole Polytechnique

CONFERENCE SPEAKERS:

Federico BECCA, University of Trieste
Marin BUKOV, MPI PKS
Ao CHEN, University of Augsburg
Alexandre DAUPHIN, Pasqal
Anna DAWID, Flatiron Institute
Vedran DUNJKO, Leiden University
Kaden HAZZARD, University of Rice
Johannes KOFLER, Johannes Kepler University Linz
Richard KUENG, Johannes Kepler University Linz
Zala LENARCIC, Jozef Stefan Institute
Julian LEONARD, TU Wien
Ludwig MATHEY, University of Hamburg
Friederike METZ, EPFL
Evert van NIEUWENBURG, Leiden University
Yusuke NOMURA, Tohoku University
Thereza PAIVA, Federal University of Rio de Janeiro
Max PRÜFER, TU Wien
Markus OBERTHALER, Heidelberg University
Anna SANPERA, Universitat Autònoma de Barcelona
Agnes VALENTI, ETH Zurich
Roberto VERDEL, ICTP
Benoit VERMERSCH, University of Grenoble-Alpes
Johannes ZEIHER, Max Planck Institute of Quantum Optics
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LOCAL ORGANISER:

Ralph GEBAUER, ICTP, Italy

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.

FURTHER INFORMATION:

E-mail: smr3928@ictp.it
Web: http://indico.ictp.it/event/10466/
Female scientists are encouraged to apply.