

Probing Complex Quantum Dynamics through Out-of-time-ordered Correlators

International Workshop 11 - 15 October 2021

Scrambling, loss and possible retrieval of quantum information in many-body systems are important concepts presently studied in various setups. The workshop will discuss progress and future directions in the inter-related fields of information scrambling, complex quantum dynamics, chaos and criticality, by focusing on out-of-time-ordered correlators and related tools. Quantifying the time-growth of operators provides a unifying paradigm that favors the convergence of different physics communities to be represented at the workshop, comprising both theory and experiment.

Topics:

- Out-of-time-ordered correlators (OTOCs), spectral form factors, and related tools, as indicators for various types of quantum many-body dynamics
- Relation of OTOCs to other measures of (in)stability and complexity growth
- Experiments and experimental protocols
- Generality of the bounds on chaos
- Probing quantum chaos and holography
- Semiclassical approaches to OTOCs
- OTOCs, entanglement and quantum thermodynamics
- OTOCs and the eigenstate thermalization hypothesis
- Dynamical quantum phase transitions and many-body chaos near phase transitions

We plan for a **hybrid workshop** with a number of participants on-site and the others connected via video conference.

For accepted participants, online attendance will be possible in any case.

The organizers will decide and inform about an option of on-site attendance at a later stage.

Applications received before 31 August 2021 are considered preferentially.

Applications are welcome and should be made by using the application form on the event's web page. The number of attendees is limited.

The registration fee for the international workshop is 140 Euro and should be paid by all on-site participants. (No fee for remote participation.) Costs for accommodation and meals for on-site participants will be covered by the Max Planck Institute. Limited funding is available to partially cover travel expenses.

For further information please contact:

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<https://www.wassilykandinsky.net/work-33.php>

Invited speakers:

A. Altland (DE)
S. Das Sarma (US)
A. del Campo (LU)
L. Ferreira dos Santos (US)
M. Gärtner (DE)
V. Galitski (US)
I. García-Mata (AR)
M. Heyl (DE)
C. Jarzynski (US)
M. Knap (DE)
J. Kurchan (FR)
A. Lakshminarayanan (IN)
A. Lucas (US)
R. Moessner (DE)
T. Morita (JP)
H. Pastawski (AR)
X. Peng (CN)
S. Sachdev (US)

M. Srednicki (US)
S. Tomsovic (US)
M. Ueda (JP)
J.-D. Urbina (DE)
J. Verbaarschot (US)
C. von Keyserlingk (UK)
D. Wisniacki (AR)
N. Yunger Halpern (US)
W. Zurek (US)

Scientific coordinators:

Rodolfo A. Jalabert
Strasbourg, France
Klaus Richter
Regensburg, Germany

Organisation:

Katrin Lantsch
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