



The Abdus Salam
International Centre
for Theoretical Physics



School and Workshop on Ultrafast Electronics Meets Quantum Thermodynamics

DESCRIPTION:

This school & workshop at ICTP Trieste connects two fast-growing quantum technology fields: ultrafast single-electron physics and quantum thermodynamics, bringing students, early-career researchers, and experts together to foster cross-disciplinary dialogue and new collaborations.

MORE DETAILS:

The drive for faster, more precise, and energy-efficient quantum devices is pushing technology into a regime where individual quantum entities—single electrons, photons, and the like—take center stage. Ultrafast Single-Electron Electronics enables the generation, control, and detection of individual charges with extreme temporal precision, while Quantum Thermodynamics provides the framework to understand their stability, efficiency, and fundamental limits. How do thermodynamic laws apply at the single-particle level? The school combines lectures, tutorials and journal clubs to build foundations in both fields, while the workshop highlights recent advances. The program also promotes strong participation from developing countries, in line with ICTP's mission of global scientific exchange. Since the present activity and the Joint ICTP-WE Heraeus College on Advances in Topological Quantum Matter (smr 4242) will take place consecutively, applications for both events are welcome.

TOPICS:

- Single-particle excitations with integer and non-integer charge
- Solid state qubits and quantum algorithms
- Quantum materials
- Quantum thermodynamics
- UltraFast quantum nanoelectronics

CONFIRMED LECTURERS:

1st week

G. Haack
Univ. of Geneva, Geneva, Switzerland
V. Kashcheyevs
Univ. of Latvia, Riga, Latvia
M. Kataoka
NPL, Teddington, UK
C. Mora
Univ. Paris Cité, Paris, France
S. Shevchenko
B.Verkin ILTPE of NASU, Kharkiv, Ukraine
M. Zgirski
IoP PAS, Warsaw, Poland

2nd week

S. Birner
nextnano GmbH, Garching, Germany
M. Horodecki
Univ. of Gdańsk, Gdańsk, Poland
J. Pekola
Aalto Univ., Aalto, Finland
G. Platero
ICMM, CSIC, Madrid, Spain
J. Splettstoesser
Chalmers UoT, Göteborg, Sweden
X. Waintal
Univ. Grenoble Alpes-CEA, Grenoble, France

INVITED SPEAKERS:

A. Ambainis Univ. of Latvia, Riga, Latvia	D. Ferraro Univ. of Genova, Genova, Italy	P. Roulleau CEA Saclay, Saclay, France
M. Acciai ICTP, Trieste, Italy	C. Flindt Aalto Univ., Aalto, Finland	I. Safi Université Paris-Saclay, Saclay, France
L. Arrachea CONICET-CNEA, Bariloche, Argentina	G. Georgiou Univ. of Glasgow, Glasgow, UK	R. Sanchez UAM, Madrid, Spain
G. Blasi IFISC (CSIC-UIB), Palma, Spain	G. Guarnieri Univ. of Pavia, Pavia, Italy	C. Spånslätt Karlstad Univ., Karlstad, Sweden
P. Bursset UAM, Madrid, Spain	B. Karimi Univ., Aalto, Finland	S. Takada Osaka Univ., Osaka, Japan
A. Chatterjee Delft UoT, Delft, Netherland	M. Mitchison Trinity College Dublin, Dublin, Ireland	M. Urdampilleta Institut NEEL, Grenoble, France
I. D'amico Univ. of York, York, UK	M. Myronov Univ. of Warwick, Warwick, UK	Y. Yin Sichuan Univ., Chengdu, China
K. Ensslin ETH Zurich, Zurich, Switzerland	D. Pomaranski Univ. of Tokyo, Tokyo, Japan	K. Yoshioka NTT-BRL, Atsugi, Japan
N. Fabbri Univ. of Florence, Florence, Italy	J. Rech Aix-Marseille Univ., Marseille, France	



21 September - 09 October 2026



Trieste, Italy



Applications and Deadlines:

1 June 2026

for applicants needing visa support

15 June 2026

for all other applicants

DIRECTORS:

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G. Haack, Univ. of Geneva, Geneva, Switzerland
M. R. Lopez Gonzalo, IFISC (CSIC-UIB), Palma, Spain
M. Moskalets, NTU "KhPI", Kharkiv, Ukraine

LOCAL ORGANISER:

A. Jelic, ICTP, Italy

FURTHER INFORMATION:

E-mail: smr4238@ictp.it

Web: <http://indico.ictp.it/event/11164/>

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.



Co-Sponsors:



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