

School on Quantum Information Theory and Thermodynamics at the Nanoscale

24 - 28 February 2020, Al-Hoceima, Morocco

PRELIMINARY PROGRAMME*

revised 15 February 2020

	MONDAY 24 FEBRUARY	TUESDAY 25 FEBRUARY	WEDNESDAY 26 FEBRUARY	THURSDAY 27 FEBRUARY	FRIDAY 28 FEBRUARY
09:00 - 10:00	REGISTRATION OF VISITS All participants should please register locally their actual participation in the school	M. Paris -- I. An invitation to quantum metrology: Measurement and estimation	E. Ercolessi II -- The ground state structure of local Hamiltonians	S. Campbell -- IV. Quantum Speed Limits: open questions and recent advances	A. Buchleitner -- IV. Single vs many-particle quantum systems
10:00 - 10:30	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>
10:30 - 11:30	TBA	D. Chruscinski -- II. Open Quantum Systems: Quantum dynamical semigroup	A. Buchleitner -- II. Spectral properties of complex quantum systems	A. Buchleitner -- III. Dynamical properties of complex quantum systems	E. Ercolessi -- IV. Matrix Product States and numerical simulations
11:30 - 12:30	TBA	E. Ercolessi -- I. Quantum Many Body Models: some paradigmatic examples	D. Chruscinski -- III. Open Quantum Systems: Divisible dynamical maps and quantum Markovianity	M. Paris III -- III. An invitation to quantum metrology: Global quantum estimation theory	D. Chruscinski -- IV. Open Quantum Systems: Memory kernel master equations
12:30 - 13:30	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
14:00 - 15:00	D. Chruscinski -- I. Open Quantum Systems : Basic introduction to maps and quantum channels	S. Campbell -- II. Quantum Speed Limits in quantum control	M. Paris -- II. An invitation to quantum metrology : Hypothesis testing	M. Paris -- IV. An invitation to quantum metrology: Local quantum estimation theory	
15:00 - 15:30	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>	
15:30 - 16:30	G. Benenti -- I. Quantum Transport and Thermodynamics: Basic thermodynamics of non-equilibrium steady states	A. Buchleitner -- I. Chaos and complexity in classical and quantum systems (Intro + classical phase space)	G. Benenti -- III. Quantum Transport and Thermodynamics: Rate equations	E. Ercolessi -- III. Entanglement in Quantum Many Body Systems	
16:30 - 17:30	S. Campbell -- I. Quantum Speed Limits: Background and Basics	G. Benenti -- II. Quantum Transport and Thermodynamics: Scattering theory	S. Campbell -- III. Quantum Speed Limits in open quantum systems	G. Benenti -- IV. Quantum Transport and Thermodynamics: Thermodynamic bounds on heat-to-work conversion	
17:30 - 18:30	Discussion	Discussion	Discussion	Discussion	

Quantum Transport: Giuliano Benenti, Università degli Studi dell'Insubria, Como, Italy
Complex Quantum Systems: Andreas Buchleitner, Albert Ludwigs Universität Freiburg, Germany
Quantum Speed Limits: Steve Campbell, Trinity College Dublin, Ireland
Open Quantum Systems: Dariusz Chruscinski, Nicolaus Copernicus University, Torun, Poland
Many-body Quantum Simulations: Elisa Ercolessi, Università degli Studi di Bologna, Italy
Quantum Metrology: Matteo Paris, Università degli Studi di Milano, Italy

* Subject to minor changes

15.02.2020