School on Quantum Information Theory and Thermodynamics at the Nanoscale

24 - 28 February 2020, Al-Hoceima, Morocco

***FINAL PROGRAMME** **

revised 21 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	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*
10:30 - 11:30	M. El Baz -- Introductory concepts	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		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	*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*
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	*Coffee Break*	*Coffee Break*	*Coffee Break*	*Coffee Break*	
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

21.02.2020