

«Measurement and control of quantum systems : theory and experiments»

Paris April 16th – July 13th, 2018

Workshop «Observability and estimation in quantum dynamics»

Paris, May 15th – 17th, 2018

Amphitheater Hermite



All lectures will be videotaped



Organizers: Etienne Brion (University Paris-Sud, ENS Paris-Saclay), Eleni Diamanti (Sorbonne University Paris FR), Alexei Ourjoumtsev (Collège de France & CNRS), Pierre Rouchon (Mines ParisTech & Inria)

Invited speakers :

Gerardo Adesso (University Nottingham, UK)
Tristan Benoist (University Toulouse, FR)
Cristina Butucea (University Marne-la-Vallée, FR)
Rafal Demkowicz-Dobrzanski (University Warsaw, PL)
Emmanuel Flurin (ENS Paris, FR)
Rémi Geiger (Observatoire de Paris, FR)
Liang Jiang (University Yale, US)
Andrew Jordan (University Rochester, US)
Richard Kueng (California Institute of Technology, US)

Janek Kolodynski (ICFO, Barcelona, ES)
Chiara Macchiavello (University Pavia, IT)
Sabrina Maniscalco (University Turku, FI)
Valentina Parigi (Sorbonne University, Paris, FR)
Clément Pellegrini (University Toulouse, FR)
Marc-Olivier Renou (University Geneva, CH)
Andrea Rocchetto (University College London, UK)
Antoine Tilloy (Max Planck Institute for Quantum Optics, DE)
Geza Toth (University of the Basque Country, ES)

PROGRAM

Tuesday May 15th

08.30 am – 09.00 am	Registration and welcome coffee – IHP ground floor	
09.00 am – 09.45 am	Andrew Jordan	Estimating with continuous quantum measurements.
09.45 am – 10.30 am	Gerardo Adesso	Towards superresolution surface metrology: Quantum estimation of angular and axial separations.
10.30 am – 11.00 am	Coffee break	IHP ground floor
11.00 am – 11.45 am	Chiara Macchiavello	Witnessing quantum capacities of noisy communication channels.
11.45 am – 12.30 pm	Valentina Parigi	Reconfigurable optical implementation of quantum complex networks.
12.30 pm – 02.30 pm	Lunch break	
02.30 pm – 03.15 pm	Andrea Rocchetto	Machine learning techniques in quantum information theory: a selection of results.
03.15 pm – 04.00 pm	Cristina Butucea	Local Asymptotic Equivalence of Quantum Gaussian Models.
04.00 pm – 04.30 pm	Coffee break	IHP ground floor
04.30 pm – 05.15 pm	Rafal Demkowicz-Dobrzanski	The Grand Unified Theory of Quantum Metrology.

Wednesday May 16th

09.00 am – 09.45 am	Liang Jiang	Achieving the Heisenberg limit in quantum metrology using quantum error correction.
09.45 am – 10.30 am	Tristan Benoist	Repeated quantum measurements: Hypothesis testing and instrument discrimination.
10.30 am – 11.00 am	Coffee break	IHP ground floor
11.00 am – 11.45 am	Janek Kolodynski	Bayesian filtering for quantum-enhanced atomic sensors.
11.45 am – 12.30 pm	Rémi Geiger	Precision Inertial Measurements with Cold Atom Interferometers.
12.30 pm – 02.30 pm	Lunch break	
02.30 pm – 03.15 pm	Geza Toth	Entanglement between two spatially separated atomic modes.
03.15 pm – 04.00 pm	Marc-Olivier Renou	Macroscopic Quantum Measurement: In What direction does a large ensemble of Spin Points?
04.00 pm – 04.30 pm	Coffee break	IHP ground floor
04.30 pm – 05.15 pm	Clément Pellegrini	Invariant measure of quantum trajectories: product of random matrices.

06.00 pm – 08.30 pm **Discussions and Cocktail Dinner – IHP ground floor**

Thursday May 17th

09.00 am – 09.45 am	Sabrina Maniscalco	Bosonic Complex Quantum Networks: What, when and why.
09.45 am – 10.30 am	Richard Kueng	Recovering quantum gates from few average fidelities.
10.30 am – 11.00 am	Coffee break	IHP ground floor
11.00 am – 11.45 am	Antoine Tilloy	Signal correlation functions for parameter estimation.
11.45 am – 12.30 pm	Emmanuel Flurin	Dynamics of Quantum Trajectories under Simultaneous Measurement of Non-Commuting Observables.

Abstracts are available on the website of the trimester «Measurement and control of quantum systems: theory and experiments»

<https://sites.google.com/view/mcqs2018/2-workshops/observability-and-estimation-in-quantum-dynamics>

