

PROGRAM

First workshop of the Canada-France Quantum Alliance

22th - 24th May 2023 - Paris

MONDAY, 22th MAY 2023 - CNRS Villejuif – Conference Room

7 rue Guy Môquet 94800 Villejuif

09:00 - 09:30 Welcome

Landscape of 9 campuses - Themes and bridges between France and Canada

09:30 – 10:30 Université de Sherbrooke, Université de Montpellier, Université de Montréal, Sorbonne Université, University of Toronto, Université Paris Cité, McMaster University, Université Paris-Saclay, Université de Strasbourg

10:30 – 11h00 Coffee break

Quantum simulation & computing

- 11:00 – 13:00
- Mathieu Juan (U Sherbrooke) : *Coupling mechanical systems to quantum circuits, one brick at a time*
 - Thierry Lahaye (CNRS - U Paris-Saclay) : *Quantum simulation of spin Hamiltonians using arrays of single Rydberg atoms*
 - Alexandre Cooper-Roy (U Waterloo) : *Quantum Simulation for Materials Discovery – opportunities and challenges*
 - Elham Kashefi (CNRS - Sorbonne U) : *Scalable Benchmarking - Building trust in the quantum era*

13:00 – 14:30 Lunch break (Villejuif campus restaurant)

Landscape of 8 campuses - Themes and bridges between France and Canada

14:30 – 15:30 University of Waterloo, Université PSL, University of Calgary, Université Grenoble Alpes, University of British Columbia, Université Côte d'Azur, University of Ottawa, Université de Bordeaux

15:30 – 16:00 Coffee break

Large instruments / Quantum simulation & computing

- 16:00 – 17:30
- Aristide Lemaître (CNRS - U Paris-Saclay) : *III-V's for quantum science and technologies: epitaxy and processing*
 - Artur Izmaylov (U Toronto) : *Algebraic techniques for quantum chemistry on a quantum computer*
 - Dennis Salahub (U Calgary) : *From quantum chemistry to quantum-quantum chemistry*

17:30 – 18h30 **Equality, Diversity, and Inclusion (EDI)**
Moderators: Barry Sanders (U Calgary), Virginia d'Auria (U Côte d'Azur)



09:00 – 09:30

Welcome

Quantum materials & circuits

09:30 – 11:00

- Patrick Clancy (McMaster U) : *Exploring Kitaev Magnetism Beyond the Honeycomb Lattice*
- Julien Renard (CNRS - U Grenoble Alpes) : *Graphene based superconducting quantum circuits*
- André-Marie Tremblay (U Sherbrooke) : *Superconductivity in cuprates : a theoretical perspective*

11:00 – 11h30

Coffee break

11h30 – 13h00

Fundamental quantum science & quantum engineering

- Philippe St-Jean (U Montréal) : *Topological photonic matter in synthetic dimensions*
- David Spierings (U Toronto) : *(In)distinguishability creates spin textures in a condensate, and measurement localizes particles to a forbidden region*
- Sylvain Ravets (CNRS - U Paris-Saclay) : *Driven-dissipative physics in synthetic polariton matter*

13:00 – 14:30

Lunch break (Villejuif campus restaurant)

14:30 – 15:30

Quantum materials & circuits

- Jérôme Estève (CNRS - U Paris-Saclay) : *Quantum bath engineering in a superconducting resonator through quasiparticle tunneling*
- Matteo Michiardi (U British Columbia) : *Harnessing the power of spin and time-resolved ARPES: From quantum materials towards optically-driven spin devices*

15:30 – 16:00

Coffee break

16:00 – 18:00

Quantum sensing & metrology

- Patrice Bertet (CEA - U Paris-Saclay) : *Single electron spin magnetic resonance detection by microwave photon counting*
- Jeff Lundeen (U Ottawa) : *Quantum inspired and quantum enhanced optical precision measurements*
- Baptiste Battelier (CNRS - U Bordeaux) : *Strapdown Quantum Inertial Navigation Unit*
- Jess McIver (U British Columbia) : *Unlocking the Universe with quantum materials*



08:30 – 09:00 Welcome

09:00 – 12:20 **France - Canada collaborative framework in quantum sciences and technologies: global strategies and opportunities**

09:00 – **Introduction words**

- Antoine Petit (Chairman and CEO of the CNRS)
- The Honourable Stéphane Dion (Canada's Ambassador to France)
- Claire Giry (DG of Research and Innovation, French Ministry of Higher Education and Research)

9:20 – **Round table: International cooperation in the framework of national strategies**

Neil Abroug (Secrétariat général pour l'investissement), Norbert Lutkenhaus (U Waterloo), Michael Rosenblatt (Innovation, Science and Economic Development Canada), Sébastien Tanzilli (CNRS - U Côte d'Azur)

Moderators: Isabelle Philip (CNRS - U Montpellier), Barry Sanders (U Calgary)

10:10 – **Round table: Graduate and post-graduate training in the context of research cooperation**

Franck Balestro (U Grenoble Alpes), Sylvain Charbonneau (U Ottawa), Charmaine Dean (U Waterloo), Karine Samuel (U Grenoble Alpes), Arnaud Tourin (U PSL)

Moderators: Marco Aprili (CNRS - U Paris-Saclay), Louis Taillefer (U Sherbrooke)

11h15 – **Round table: Funding opportunities for research and training**

Alejandro Adem (NSERC), Yamine Ait-Ameur (French National Research Agency), Audrène Eloit (French Ministry for Europe and Foreign Affairs), John Hepburn (MITACS)

Moderators: Dominique Vernhet (CNRS - Sorbonne U), Louis Taillefer (U Sherbrooke)

12:05 – **Conclusions**

12:30 – 14:00 *Lunch break*

Quantum communications & optics

- 14:00 – 15:30
- Anais Dréau (CNRS - U Montpellier) : *Single-photon emitters at telecom wavelengths in silicon*
 - Kuntheak Kheng (U Grenoble Alpes) : *Blue-Green Room Temperature Single-Photon Emitters based on Nanowire Quantum Dots*
 - Alexei Ourjountsev (CNRS - Collège de France) : *Quantum engineering of light with an intracavity Rydberg superatom*

14:00 - 17:45

Parallel session on Quantum materials & circuits within the International Research Laboratory “Quantum Frontiers Lab” workshop

Université Paris Cité, Paris 13^{ème}

<https://irllfqparis2023.sciencesconf.org>

15:30 – 16h00 *Coffee break*



Quantum communications & optics

16:00 – 18:00

- Daniel Oblak (U Calgary) : *Large-bandwidth light-matter interfaces in rare-earth materials for quantum networks*
- Erik Kerstel (U Grenoble Alpes) : *From NanoBob to RIQS : Towards the Future Quantum Internet*
- Khabat Heshami (U Ottawa) : *Quantum communication from lab scale to global distances*
- Olivier Alibert (U Côte Azur) : *Quantum secured network across the French Riviera*

Reception at the Official Residence of the Canadian Ambassador to France

19:00 – 21:00

135 rue du Faubourg Saint-Honoré, Paris 8e

For more information

<https://quantumnetwork2023.sciencesconf.org>

Sponsoring partners

