



Waseda University
Brussels Office

PROGRAMME

7th Waseda Brussels Conference

Next-Generation Quantum Technology
through the Fusion of Nanophotonics and
Atomic Physics

**WBO
CONFERENCE**

Tuesday 25 November, 2025

BrIAS Seminar Hall - Building AB level 0, Blvd. Général Jacques 210 1050 Ixelles



With the support of the Ministry of Foreign Affairs of Japan & The Mission of Japan to the European Union.



Next-Generation Quantum Technology through the Fusion of Nanophotonics and Atomic Physics

Quantum Sciences and Technologies – new technologies and systems using the properties of quantum mechanics - are one of the hottest areas for fundamental research and innovative applications in a wide range of critical fields, addressing key economic and societal issues. These are leading to breakthroughs into inter alia advanced computing and AI, sensing and metrology, biomedical research, weather and climate modelling and simulations, cybersecurity and energy sustainability.

Given the huge scientific and technological challenges, the EU and Japan are stepping up their efforts in quantum research, increasing investments, reinforcing public/private partnerships, and joining forces through political coordination and enhanced research cooperation. The new Quantum Europe Strategy, the National Quantum Strategy led by the Japanese Cabinet Office, and the recent EU-Japan Letter of Intent on Strengthening Cooperation in Quantum Sciences & Technologies all underline the strategic importance of an EU-Japan ‘quantum partnership’ in a challenging international environment.

In this context, the Conference will specifically explore how recent advances in quantum technology have accelerated the development of physical platforms for quantum computing and quantum networks. Among them, nanoscale photonic devices enable strong light confinement and allow for strong interactions between light and matter. At the same time, laser-cooled atoms offer exceptional quantum coherence and precise controllability, making them an ideal medium for quantum information processing. The fusion of these two fields—nanophotonics and atomic physics—is expected to drive the development of innovative next-generation quantum technologies that can realize large-scale distributed quantum computing and global quantum networks.

Beyond the science itself, the Conference will have as a primary objective to foster dialogue and develop concrete research and innovation projects between participating EU and Japanese organisations. It will assess sources of funding and cooperation mechanisms in Europe (Quantum Calls in Horizon Europe and future FP10) and Japan (Moonshot, Q-LEAP and SIP programmes, JST’s ASPIRE calls). It will also seek to build on existing initiatives, such as the ongoing collaboration between Japan’s National Institutes for Quantum Science and Technology and its European partner universities.





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SCHEDULE

08:30 - 09:00 Registration & Welcome Coffee

WELCOME WORDS & POLICY SESSION

09:00 - 10:00 Chair: **Jean-Louis Moortgat** (Waseda University Brussels Office)
Masahiko Gemma
Vice-President for International Affairs & International Fundraising,
Waseda University
Anne Weyembergh
Vice-Rector for External Relations & Cooperation, ULB
Franz Deconinck
Co-Director, Brussels Institute for Advanced Studies
H.E. Kazutoshi Aikawa
Ambassador, Mission of Japan to the European Union
H.E. Jean-Eric Paquet - Video message
Ambassador of the European Union to Japan
European representative (TBC)

INTRODUCTION OF QUANTUM TECHNOLOGY IN WASEDA

10:00 - 10:15 **Takao Aoki** (Waseda University)

10:15 - 10:30 Coffee break

SESSION I - EXPERIMENTS WITH LASER-COOLED ATOMS

10:30 - 12:30 Chair: **Takao Aoki** (Waseda University)
Arno Rauschenbeutel (Humboldt University of Berlin)
Collective Emission and Emerging Coherence in a Cascaded Quantum System
Julien Laurat (Sorbonne University)
Quantum optics with cold atoms trapped along nanowaveguides
Sebastian Hofferberth (University of Bonn)
Waveguide QED with Rydberg Superatoms
Lucia Hackermueller (University of Nottingham)
Bayesian sensing and photon storage in micromachined waveguides

12:30 - 14:30 Networking Lunch & Poster Session



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SESSION II - EXPERIMENTS WITH ATOM-LIKE SYSTEMS IN SOLIDS

14:30 - 15:30	Chair: Darrick Chang (The Institute of Photonic Sciences) Hugues de Riedmatten (The Institute of Photonic Sciences) <i>Quantum network nodes with nano (micro) scale rare-earth based devices</i> Hanna Le Jeannic (Sorbonne University) <i>Quantum Light Generation and Collection via Solid-State Emitters on Optical Nanofibers</i>
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15:30 - 15:45	Coffee break
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SESSION III - THEORY

15:45 - 16:45	Chair: Arno Rauschenbeutel (Humboldt University of Berlin) Darrick Chang (The Institute of Photonic Sciences) <i>Realizing many-body complexity in quantum optics</i> Saverio Pascazio (University of Bari) <i>Dynamics and dissipation in waveguide QED</i>
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SESSION IV - RELATED QUANTUM TECHNOLOGIES

16:45 - 17:45	Chair: Hugues de Riedmatten (The Institute of Photonic Sciences) Stéphane Trebaol (Institut Foton/University of Rennes) <i>Visible light sources for quantum technologies</i> Nicolas Cerf (Université Libre de Bruxelles) <i>From matrix permanents to many-photon multimode interferometry: Violating conjectures on permanents leads to anomalous bunching phenomena</i>
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CONCLUDING WORDS

17:45 - 18:00	Takao Aoki (Waseda University)
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18:00 - 19:30	Farewell Reception
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Waseda University Brussels Office

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<https://www.waseda.jp/inst/brussels-office/news-en/>

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