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

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With the support of The Mission of Japan to the European Union.

MOONSHOT RESEARCH & DEVELOPMENT PROGRAM

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Registration: https://forms.gle/KQbwe6jBgndEw63R8

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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 fastest moving areas for fundamental research and innovative applications in a wide range of critical fields, addressing key economic and societal issues, as illustrated by this year's Nobel Prize in Physics. These technologies are leading to breakthroughs into inter alia advanced computing and AI, sensing and metrology, biomedical research, weather and climate modelling, cybersecurity and energy sustainability.

Quantum research is a crucial priority in Europe and in Japan, with both sides stepping up their efforts with increased public investments and innovative government/industry partnerships. It is also a key area of bilateral cooperation, as Japan and Europe join forces through strengthened policy coordination and enhanced scientific collaboration. The new *Quantum Europe Strategy*, Japan's National *Quantum Strategy*, and the commitment by the EU-Japan *Letter of Intent on Strengthening Cooperation in Quantum Sciences & Technologies*, confirmed at the July Summit in Tokyo - all underscore the strategic importance of an EU-Japan 'quantum partnership' in a fast-moving and 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.

As it presents the latest research, and outlines the policy context, the Conference will have as a key objective to encourage scientific exchanges and generate new collaborative projects between participating EU and Japanese organisations. It will also assess cooperation mechanisms as well as existing and potential new sources of funding in Europe and Japan, particularly in the perspective of a future Association of Japan to Horizon Europe.

This event, the 7th in the successful series of Waseda University Brussels' Annual Conferences, underlines the strong commitment by Waseda University to foster ongoing dialogue in S&T policy between Japan and the EU, and to develop concrete research collaborations with its European partners.






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SCHEDULE

08:30 - 09:00	Registration & Welcome Coffee

WELCOME WORDS & POLICY SESSION

09:00 - 09:55	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

INTRODUCTION OF QUANTUM TECHNOLOGY IN WASEDA

09:55 - 10:05	**Takao Aoki** (Waseda University)
10:05 - 10:20	Coffee break

SESSION I - EXPERIMENTS WITH LASER-COOLED ATOMS

10:20 - 12:00	Chair: **Takao Aoki** (Waseda University) **Arno Rauschenbeutel** (Humboldt University of Berlin) *Hybrid Trapping of Cold Atoms with Surface Forces and Blue-Detuned Evanescent Light on a Nanophotonic Waveguide* **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*
12:00 - 14:00	Networking Lunch & Poster Session

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SESSION II - EXPERIMENTS WITH ATOM-LIKE SYSTEMS IN SOLIDS

14:00 - 14:50	Chair: **Darrick Chang** (The Institute of Photonic Sciences) **Hugues de Riedmatten** (The Institute of Photonic Sciences) *Quantum network nodes with nano (micro) scale rare-earth based devices* **Hanna Le Jeannic** (Sorbonne University) *Quantum Light Generation and Collection via Solid-State Emitters on Optical Nanofibers*

SESSION III - THEORY

14:50 - 15:40	Chair: **Arno Rauschenbeutel** (Humboldt University of Berlin) **Darrick Chang** (The Institute of Photonic Sciences) *Realizing many-body complexity in quantum optics* **Saverio Pascazio** (University of Bari) *Dynamics and dissipation in waveguide QED*
15:40 - 15:55	Coffee break

SESSION IV - RELATED QUANTUM TECHNOLOGIES

15:55 - 16:45	Chair: **Hugues de Riedmatten** (The Institute of Photonic Sciences) **Stéphane Trebaol** (Institut Foton/University of Rennes) *Visible light sources for quantum technologies* **Nicolas Cerf** (Université Libre de Bruxelles) *From matrix permanents to many-photon multimode interferometry: Violating conjectures on permanents leads to anomalous bunching phenomena*

CONCLUDING WORDS

16:45 - 17:00	**Takao Aoki** (Waseda University)
17:00 - 18:30	Farewell Reception

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