5th Quantum Technology Conference

23 – 25 November 2021 | Live Virtual Event

FINAL PROGRAMME

Tuesday, 23 November 2021			
09:00	09:25	Registration	
09:25	09:35	Welcome	Franco Ongaro Director of Technology, Engineering & Quality (D/TEC), ESA
09:35	09:45	Opening Remarks	José Gavira Head of Mechatronics & Optics Division (TEC), ESA
Session 1: Quantum Communications **Chair: Clemens Heese — Head of the Optical Technologies Section (OPS), ESA**			
09:45	10:30	Keynote — Impact of space based quantum technologies on Cybersecurity	Jaya Baloo CISO - Avast
10:30	10:50	QUANGO: a new paradigm to share satellite infrastructure for quantum secure communication and 5G communication	Giuseppe Vallone University of Padova
10:50	11:10	Small Satellites for QKD Technology Demonstration	Klaus Schilling Zentrum für Telematik
11:10	11:30	Towards quantum-safe communication links with high-altitude platform stations	Christoph Wildfeuer University of Applied Sciences Northwestern Switzerland
11:30	11:50	Trade-off between security model and performance in quantum cryptography: a large space for progress	Romain Alléaume Télécom Paris - Institut Polytechnique de Paris
11:50	12:50	Lunch Break	
Session 2: Quantum Communications **Chair: Jorge Piris — Opto-Electronics Section (TEC), ESA**			
12:50	13:35	Keynote — From Test of Quantum Foundations to New Quantum Technologies	Jian-Wei Pan University of Science and Technology of China
13:35	13:55	Why self-certifying Quantum Random Number Generators are crucial to secure space communications	Wenmiao Yu Quantum Dice
13:55	14:15	Highly compact, space-suitable single- and entangled photon sources and analysis modules for BB84- and E91-protocol based QKD	Erik Beckert Fraunhofer IOF
14:15	14:35	Space Quantum Communications: Opportunities and Challenges	Andrew Thain Airbus Defence and Space
14:35	14:55	Quantum communication with satellites in curved spacetime	David Edward Bruschi Forschungszentrum Jülich
14:55	15:25	Coffee Break	
Session 3: Quantum Communications **Chair: Eric Wille — Optics Section (TEC), ESA**			
15:25	16:10	Keynote — Practical challenges for quantum space communications	Eleni Diamanti CNRS and Sorbonne University
16:10	16:30	A Quantum Communication Infrastructure for Europe's Digital Decade	Aymard de Touzalin European Commission
16:30	16:40	First Generation SAGA	Harald Hauschildt ScyLight Manager (TIA), ESA
16:40	17:00	Quantum Communication at OHB	Bettina Heim OHB
17:00	17:20	Quantum communication integrated with space telecom optical communication	Hugh Podmore Honeywell
17:20	17:40	Patent Trends for Quantum Technologies and Space	Tomas Hrozensky, European Space Policy Institute Johannes Schaaf, European Patent Office
17:40	18:00	Satellite Quantum Information Networks: Use cases, Architecture and Roadmap	Mathias Van Den Bossche Thales Alenia Space
18:00	18:15	Wrap up & Discussion	Eric Wille Optics Section (TEC), ESA
18:15		Close	

Wednesday, 24 November 2021			
09:15	09:45	Registration	
Session 1: Quantum Sensing **Chair: Olivier Carraz — Optical Instruments Section (EOP), ESA**			
09:45	10:30	Keynote — Quantum Technologies for Sensing Applications	Lisa Wörner DLR Institute for Quantum Technologies and University of Ulm
10:30	10:50	Technological developments of quantum gravity sensors for space geodesy	Bruno Desruelle iXblue
10:50	11:10	Sensitivity of Quantum Technology on satellites to Geophysical signals	Carla Braitenberg Department Of Mathematics And Geosciences University of Trieste
11:10	11:30	Activities and Perspectives on Quantum Space Gravimetry – COM and ESA	Pierluigi Silvestrin, ESA Gilles Lequeux, COM
11:30	11:50	Atomic Interferometer Gravity Gradiometer Mission for Earth Science	Scott Luthcke NASA
11:50	12:50	Lunch Break	
Session 2: Quantum Sensing **Chair: Eamonn Murphy — Opto-Electronics Section (TEC), ESA**			
12:50	13:35	Keynote — Multichannel laser cooling of atoms using an optical frequency comb	Ticijana Ban Institute of Physics, Zagreb, Croatia
13:35	13:55	Wafer-based atom traps and atom sources for optical atomic clocks	Tobias Leopold DLR
13:55	14:15	Enabling the mass production of chip-scale cold atom sensors	James McGilligan University of Strathclyde
14:15	14:35	Cold Atom Accelerometry For Atmospheric Density Measurement	Isabelle Riou Teledyne e2v
14:35	14:55	Development of an optical frequency reference within the DLR mission COMPASSO	Thilo Schuldt DLR Institute of Quantum Technologies
14:55	15:25	Coffee Break	
Session 3: Science & Exploration **Chair: Astrid Heske — Instruments Studies Section (SCI), ESA**			
15:25	16:10	Keynote — Quantum science and technology applications in space, the present and the future	Nan Yu JPL, Caltech
16:10	16:30	Self gravity test with ultracold atoms	Claus Lämmerzahl ZARM, University of Bremen
16:30	16:50	A roadmap for macroscopic quantum experiments in space	Rainer Kaltenbaek University of Ljubljana
16:50	17:10	Space-borne interferometry with Bose-Einstein condensates	Ernst Maria Rasel Leibniz University Hannover
17:10	17:30	Goals and feasibility of the Deep Space Quantum Link	Luca Mazzarella NASA JPL
17:30	17:45	Wrap up & Discussion	Eamonn Murphy Opto-Electronics Section (TEC), ESA
17:45		Close	

Thursday, 25 November 2021			
09:15	09:45	Registration	
Session 1: Quantum Computing **Chair: Gabriele De Canio — Strategy & Coordination Unit (OPS), ESA**			
09:45	10:30	Keynote — Quantum Computing as a Service: Secure and Verifiable Multi-Tenant Quantum Data Centre	Elham Kashefi University of Edinburgh, Sorbonne University, & VeriQloud
10:30	10:50	Applications and opportunities for Quantum Computing in Mission Data Systems	Evridiki Ntagiou Appl. & Robotics Data Systems Section, ESA
10:50	11:10	Quantum Computing: Updates from IBM	Jan-Rainer Lahmann IBM
11:10	11:30	Status of Security Accreditation and Certification process for Quantum Systems	Alex Kanaouris ESA Security Office
11:30	11:50	Quantum Computing for Radar Remote Sensing Applications	Sigurd Huber DLR
11:50	12:50	Lunch Break	
Session 2: Quantum Computing **Chair: Sarah Wittig — Components Section (TEC), ESA**			
12:50	13:35	Keynote — Where no one has gone before, how quantum technology can get us there	Ilana Wisby CEO - Oxford Quantum Circuits
13:35	13:55	Optimization as an application for Quantum Computers	Wolfgang Lechner ParityQC
13:55	14:15	tket: The Leading Quantum Development Platform	Mark Jackson Cambridge Quantum Computing
14:15	14:35	Meta-Heuristic Algorithms for the Quantum Circuit Compilation Problem	Angelo Oddi Italian National Research Council
14:35	14:55	Advances in quantum plenoptic imaging	Milena D'Angelo Università Degli Studi Di Bari
14:55	15:25	Coffee Break	
Session 3: Quantum Computing **Chair: Bertrand Le Saux — Phi-Lab Explore Office (EOP), ESA**			
15:25	16:10	Keynote — Quantum Machine Learning	Seth Lloyd MIT
16:10	16:30	Quantum Monte-Carlo: The Full Advantage in Minimal Circuit Depth	Steven Herbert Cambridge Quantum Computing
16:30	16:50	Quantum remote sensing for climate change assessment: improved signal-to-noise ratio and space resolution	Thomas Chen Academy for Mathematics, Science, and Engineering
16:50	17:35	Keynote — Quantum computing for Earth Observation and Particle Physics: Shared Experiences and Call to Action	Sofia Vallecorsa CERN
17:35	17:45	Wrap up & Discussion	Bruno Leone Opto-Electronics Section (TEC), ESA
17:45	17:50	Closing Remarks	Kyriaki Minoglou Head of Opto-Electronics Section (TEC), ESA
17:50		Close	