



XVI Symposium KCIK-ICTQT on **QUANTUM INFORMATION** 7-10 May 2025, Gdańsk-Sopot, Poland

PROGRAMME

The National Science Centre (NCN), as the coordinator of the European QuantERA program, will host the “Quantum Horizons” conference under Poland’s EU Presidency. The cooperation between the organizers – NCN, KCIK and ICTQT UG – has enabled the integration of these two events. On May 7, 2025, a scientific poster session in the evening and a banquet at the European Solidarity Centre will mark the conclusion of the “Quantum Horizons” conference while inaugurating the XVI KCIK-ICTQT Symposium. The detailed program of the “Quantum Horizons” can be found at: <https://quantera.eu/quantum-horizons-conference-science-policy-society/>.

Wednesday, May 7

Venue: European Solidarity Center, Solidarności Square 1, **Gdańsk**

10:00 - 11:15	Registration
11:15 – 18:00	“Quantum Horizons” event
18:00 – 18:30	Coffee break & Registration
18:30 – 20:00	Poster Session of the KCIK-ICTQT Symposium
20:00	Gala dinner

Thursday, May 8

Venue: Centrum Dydaktyczno-Konferencyjne (Conference Centre), University of Gdańsk, Piaskowa Street, 9, **Sopot**

10:00 – 11:30	Registration & networking	
Session I	Chair: Marek Kuś	
11:30 – 11:40	Welcome Speeches	
11:40 – 12:05	Michael Berry	Geometric phases old and new
12:05 – 12:30	Wojciech Żurek	Decoherence and Quantum Darwinism
12:30 – 12:55	Tomasz Dietl	Understanding of Quantum Hall Effects in Topological Quantum Wells
12:55 – 13:20	Karol Ławniczak	Quantum selective measurement as a nonlinear evolution
13:20 – 13:35	Conference Photo	
13:35 – 15:00	Lunch	

Session II	Chair: Marek Żukowski	
15:00 – 15:25	Anton Zeilinger	Schrödinger's cat is never dead and alive (on-line presentation)
15:25 – 15:50	Nicolas Gisin	Three ways beyond Bell inequalities
15:50 – 16:15	Jarosław Korbicz	Decoherence from the light bending interaction
16:15 – 16:40	Robert Fickler	Spin-Orbit Quantum Frequency Conversion
16:40 – 17:25	Coffee break	
Session III	Chair: Paweł Machnikowski	
17:25 – 17:50	Giovanna Morigi	Searching a quantum graph with long-range hopping
17:50 – 18:15	Erik Aurell	Average entanglement entropy of a subsystem in a constrained pure Gaussian state ensemble
18:15 – 18:40	Łukasz Cywiński	Towards scalable quantum computer based on silicon quantum dots

Friday, May 9

Venue: Centrum Dydaktyczno-Konferencyjne (Conference Centre), University of Gdańsk, Piaskowa Street, 9, **Sopot**

Session IV	Chair: Dariusz Chruściński	
09:30 – 09:55	Charles Bennett	Can we reason about our place in the universe without defining “us?”
09:55 – 10:20	Maciej Lewenstein	QI@ICFO-QOT
10:20 – 10:45	Klaus Mølmer	The state of monitored quantum systems – more than meets the eye
10:45 – 11:10	Zbigniew Puchała	Advances in Discrimination and Certification of Quantum Operations and Measurements
11:10 - 11:55	Coffee break	
Session V	Chair: Adam Miranowicz	
11:55 – 12:20	Martin Plenio	Numerical Methods for Open Quantum Systems: From Biology to Tensor Networks
12:20 – 12:45	Janine Splettstösser	Bounds on noise in quantum transport of fermions and bosons
12:45 – 13:10	Kay Brandner	Dynamics of Open Quantum Systems in the Weak-Memory Regime: A Mathematical Framework Beyond the Markov Approximation
13:10 – 13:35	Borhan Ahmadi	Nonreciprocal Quantum Batteries
13:35 – 15:00	Lunch	
Session VI	Chair: Jakub Rembieliński	
15:00 – 15:25	Karol Życzkowski	Discrete dynamics in the set of quantum measurements
15:25 – 15:50	Shukla Pragya	Many body quantum state ensembles: a complexity parameter formulation
15:50 – 16:15	Saverio Pascazio	Statistical mechanics of multipartite entanglement
16:15 – 17:00	Coffee break	

Session VII	Chair: Gerd Leuchs	
17:00 – 17:25	Volodymyr Tkachuk	Entanglement in Quantum Hypergraph States and Its Quantification on a Quantum Computer
17:25 – 17:50	Khrystyna Gnatenko	Detection of properties of multi-qubit quantum states corresponding to networks with quantum programming
17:50 – 18:15	Gniewomir Sarbicki	Entanglement detection by randomised measurement

Saturday, May 10

Venue: Centrum Dydaktyczno-Konferencyjne (Conference Centre), University of Gdańsk, Piaskowa Street, 9, **Sopot**

Session VIII	Chair: Artur Ekert	
09:30 – 09:55	Erika Andersson	Quantum cryptography beyond quantum key distribution: variants of quantum oblivious transfer
09:55 – 10:20	Konrad Banaszek	From multimode quantum information to optical communication in space
10:20 – 10:45	Zbigniew Ficek	Creation and conversion of correlations in a system of coupled bosonic modes
10:45 – 11:10	Marcin Syperek	Deterministically fabricated semiconductor quantum dot-based single-photon source for on-chip and telecom applications
11:10 - 11:55	Coffee break	

Session IX	Chair: Łukasz Paweł	
11:55 – 12:20	Matteo Paris	Information scrambling in quantum metrology
12:20 – 12:45	Patrycja Tulewicz	Resource-Efficient Quantum Correlation Measurement: A Multicopy Neural Network Approach for Practical Applications
12:45 – 13:10	Marek Mozzrymas	From port-based teleportation to Frobenius reciprocity theorem: partially reduced irreducible representations and their applications
13:10 – 13:30	Final Speech	
13:30 – 15:00	Lunch	
14:00 – 15:30	Meeting of the KCIK Scientific Council	
	Break	

PUBLIC SESSION

Venue: Gdańsk University of Technology (Main auditorium hall), Gabriela Narutowicza Street, 11/12, **Gdańsk**

Session X	Chair: Józef Sienkiewicz	
17:00 – 17:45	Charles Bennett	Quantum Information's birth and maturation
17:45 – 18:30	Michael Berry	How quantum physics democratised music: a meditation on physics and technology

List of posters

1.	Aaqib Ali	Optimized Error Filtration for Noise Mitigation in Quantum Systems
2.	André Hernandes Alves Malavazi	Two-time weak measurement protocol for ergotropy protection in open quantum batteries
3.	Fabrizio Berritta	ConSpiQuOS: Controlling Spins in Quantum systems in an Online Setting
4.	Bihalan Bhattacharya	Qubit Schwarz maps with diagonal unitary and orthogonal symmetries
5.	Rafał Bistrzeń*, Marcin Rudziński*	Benchmarking quantum devices beyond classical capabilities
6.	Wojciech Bruzda	Quantum Circuits for High-Dimensional Absolutely Maximally Entangled States
7.	Paweł Cieśliński	Conservation of coherence and entanglement under quantum reference frame transformations
8.	Piotr Dulian	QMetro++ - Python package for large scale quantum metrology
9.	Karol Horodecki	Bound on repeated key for all key correlated states
10.	Ryszard Kukulski	Quantum key distribution based on indefinite causal order
11.	Moein Naseri	Scalable Noisy Quantum Circuits for Biased Noise Qubits
12.	Yasser Omar	Towards Energetic Quantum Advantage in Trapped-Ion Quantum Computation
13.	Vivek Pandey	Fundamental limitations on the recoverability of quantum processes
14.	Łukasz Paweł	Quantum-aware Transformer model for state classification
15.	Sumit Rout	Non-local correlations enhance classical channel in minimal prepare and measure scenario
16.	Abhyoudai Sajeevkumar Shaleena	A semi-analytical optimization of Bell inequalities in a tripartite scenario
17.	Marek Sewerwain*, Joanna Wiśniewska, Roman Gielerek	FredLib: The Fredholm determinant for Schmidt decomposition of quantum continuous registers
18.	Leonard Sikorski	Quantification of the energy consumption of entanglement distribution
19.	Maciej Stankiewicz	SVTest: general purpose software for testing weakly random sources with exemplary application to seismic data analysis enabling quantum amplification
20.	Alexander Streltsov	Advances in entanglement catalysis
21.	Gerardo Suarez	Modeling Quantum Environments with QuTIP
22.	Abdelmalek Taoutioui	Certifying asymmetry in the configuration of three qubits
23.	Gianluigi Tartaglione	Geometric measure of nonlocality
24.	Anuradha Tonipe	Towards violation of Bell inequalities by position measurements for Dirac particles
25.	Masood Valipour	The role of entanglement in the excitation of a three-level atom by a propagating two-photon light

* person presenting a poster

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