

FOUNDATIONS2025

The 22nd European Conference on Foundations of Physics
June 30th – July 2nd, 2025, Gdańsk, Poland

PROGRAMME

Monday, June 30

Venue: Faculty of Mathematics, Physics and Informatics, University of Gdańsk, Wita Stwosza Street, 57, Gdańsk, Poland

08:30 –	Registration & networking		
09:30 – 09:45	Welcome Speeches – room C		
Session Transition Time – 10 min			
Session I	Session I A – room A	Session I B – room B	Session I C – room C
	Topic: History and philosophy of QM	Topic: Definition of SpaceTime	Topic: Causal Models
09:55 – 10:20	Guido Bacciagaluppi	Samuel Fletcher	Christopher Weaver
10:20 – 10:45	Noemi Bolzonetti	Antonio Ferreira	Charles Sebens
10:45 – 11:10	Simon Friederich	Jonathan Fay	James Read
11:10 – 11:35	Marcoen Cabbolet	Marta Pedroni	Nick Ormrod
Coffee break – 40 min			
Session II	Session II A – room A	Session II B – room B	Session II C – room C
	Topic: Philosophical Frontiers of QM	Topic: Thermodynamics	Topic: Foundations of Quantum Structure
12:15 – 12:40	Marek Kuś	Karol Horodecki	Sebastian Horvat
12:40 – 13:05	Johannes Fankhauser	Christine Aidala	Nicolás Medina Sánchez
13:05 – 13:30	Thijs Latten	Paweł Mazurek	Ryshard-Pavel Kostecki
Lunch break (not provided by the organisers) – 135 min		(14:20-15:20 Philosophy of Physics Society Annual General Meeting - room D)	
Session III	Session III A – room A	Session III B – room B	Session III C – room C
	Topic: Wigner Friend	Topic: Black Holes	Topic: Quantum Correlations and Non-Classicality
15:45– 16:10	Marcin Markiewicz	Sebastian De Haro	Lev Vaidman
16:10 – 16:35	Tom Rivlin	Källan Berglund	Joanna Luc
16:35 – 17:00	Yìlè Yīng	Dominic Ryder	Alexandre Orthey
17:00 – 17:25	Lorenzo Catani	Quentin Vigneron	Yanis Pianko
17:25 – 17:50			Albert Rico
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18:00	Banquet		
	Venue: Faculty of Biology, University of Gdańsk, Wita Stwosza Street, 59, Gdańsk, Poland		

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Tuesday, July 1

Venue: Faculty of Mathematics, Physics and Informatics, University of Gdańsk, Wita Stwosza Street, 57, Gdańsk, Poland

Session IV	Session IV A – room A	Session IV B – room B	Session IV C – room C
	Topic: „Rethinking” of QM	Topic: Gravity and Entanglement	Topic: Contextuality and Measurement
09:30 – 09:55	Marek Czachor	David Trillo	Matthew Leifer
09:55 – 10:20	Joppe Widstam	Amrapali Sen	Jonte Hance
10:20 – 10:45	Jer Steeger	Debarshi Das	Caroline Jones
10:45 – 11:10		Jorge Alberto Manero Orozco	Mritunjay Tyagi
Coffee break – 40 min			
Session V	Session V A – room A	Session V B – room B	Session V C – room C
	Topic: Fundamental aspects of QM	Topic: Thermal and Statistical Physics	Topic: „Rethinking” of QT
11:50 – 12:15	Moein Naseri	Bryan Roberts	Toru Ohira
12:15 – 12:40	Som Kanjilal	Pascal Rodríguez-Warnier	Alexei Grinbaum
12:40 – 13:05	Jan Dziewior		Marco Erba
13:05 – 13:15	Conference photo		
Lunch break (not provided by the organisers) – 135 min		(13:20-15:20 Panel Discussion: Quantum Gravity and the Philosophical Foundations of Physics (PP/ISQG Joint Session) – room D)	
Session VI	Session VI A – room A	Session VI B – room B	Session VI C – room C
	Topic: Quantum Technology	Topic: Problems in QFT	Topic: Mathematical Physics
15:30 – 15:55	Francisca Vasconcelos	Guilherme Franzmann	Enrico Maresca
15:55 – 16:20	Karthik Hosapete Seshadri	Silvester Borsboom	Michał Banacki
16:20 – 16:45	Giorgos Eftaxias	Alexander Niederklapfer	Manuel Mekonnen
Coffee break – 15 min			
17:00 – 19:00	Poster session		



ORGANISERS and PARTNERS

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The 22nd European Conference on Foundations of Physics
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Wednesday, July 2

Venue: Faculty of Mathematics, Physics and Informatics, University of Gdańsk, Wita Stwosza Street, 57, Gdańsk, Poland

Session VII	Session VII A – room A	Session VII B – room B	Session VII C – room C
	Topic: Nonclassicality and Measurement	Topic: Measurement prob	Topic: Interpretation QM
09:30 – 09:55	Lorenzo Braccini	Jan-Åke Larsson	Alyssa Ney
09:55 – 10:20	Peter Evans	Evan Gale	Stefano Furlan
10:20 – 10:45	Carlo Cepollaro	Antoine Soulas	Philipp Berghofer
10:45 – 11:10	Shashaank Khanna	Lucy Mason	
Coffee break – 40 min			
Session VIII	Session VIII A – room A	Session VIII B – room B	Session VIII C – room C
	Topic: SpaceTime	Topic: High energy	Topic: „Rethinking” Quantum Foundations 1
11:50 – 12:15	Antoine Tilloy	Nick Huggett	John Selby
12:15 – 12:40	Nicetu Tibau Vidal	Ohkyung Kwon	Hippolyte Dourdent
12:40 – 13:05	Niels Martens	Ward Struyve	Davide Rolino
13:05 – 13:30	Sanne Vergouwen	Henrique Gomes	Ladina Hausmann
Lunch break (not provided by the organisers) – 120 min			
Session IX	Session IX A – room A	Session IX B – room B	Session IX C – room C
	Topic: Gravity	Topic: CM/QM	Topic: „Rethinking” Quantum Foundations 2
15:30 – 15:55	James Weatherall	David Schmid	Alessandro Bisio
15:55 – 16:20	Eleanor March	Matthias Salzger	Márton Gömöri
16:20 – 16:45		Ved Kunte	Sina Soltani
16:45 – 17:00	Closing remarks		

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Programme in details

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08:30 –	Registration & networking	
09:30 – 09:45	Welcome Speeches – room C	
Session Transition Time – 10 min		
Session I A – room A		
Topic: History and philosophy of QM		
09:55 – 10:20	Guido Bacciagaluppi	Better than Bohr? Grete Hermann and the 'Copenhagen Interpretation'
10:20 – 10:45	Noemi Bolzonetti	Bohr and Heisenberg: Debate on the Gamma-Ray Microscope
10:45 – 11:10	Simon Friederich	Reproducing EPR correlations without superluminal signalling: backward conditional probabilities and Statistical Independence
11:10 – 11:35	Marcoen Cabbolet	The 100th birthday of quantum theory. Time to move on.
Session I B – room B		
Topic: Definition of SpaceTime		
09:55 – 10:20	Samuel Fletcher	The Definition of Spacetime Singularities, Revisited
10:20 – 10:45	Antonio Ferreira	Deflating the space-time/matter dichotomy
10:45 – 11:10	Jonathan Fay	On Reissner’s hypothesis: The current status of Machian theories for the unification of gravity and inertia
11:10 – 11:35	Marta Pedroni	Solve to sort: a new classification of spacetime singularities
Session I C – room C		
Topic: Causal Models		
09:55 – 10:20	Christopher Weaver	On Feynman Diagrams and Causal Models
10:20 – 10:45	Charles Sebens	Relativistic Locality from Electromagnetism to Quantum Field Theory
10:45 – 11:10	James Read	Is String Field Theory Background Independent?
11:10 – 11:35	Nick Ormrod	Causal Relational Quantum Theory
Coffee break – 40 min		
Session II A – room A		
Topic: Philosophical Frontiers of QM		
12:15 – 12:40	Marek Kuś	Everett intepretation, Lewis, modal realism, and Kripke’s semantics
12:40 – 13:05	Johannes Fankhauser	Epistemic Horizons From Deterministic Laws: Lessons From a Nomic Toy Theory
13:05 – 13:30	Thijs Latten	Visualising the Quantum World in Quantum Technology: On Realism, Pragmatism and Quantum Interpretations.

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Session II B – room B

Topic: **Thermodynamics**

12:15 – 12:40	Karol Horodecki	Quantification of energy consumption of quantum entanglement distribution
12:40 – 13:05	Christine Aidala	Classical mechanics as the high-entropy limit of quantum mechanics
13:05 – 13:30	Paweł Mazurek	Coherent Charging of Quantum Batteries by an Incoherent Source

Session II C – room C

Topic: **Foundations of Quantum Structure**

12:15 – 12:40	Sebastian Horvat	Reflections on a future quantum event-ontology
12:40 – 13:05	Nicolás Medina Sánchez	Geometric reconstruction of quantum theory: projectivity and unitarity
13:05 – 13:30	Ryshard-Pavel Kostecki	Topos-theoretic approach to vacuum algebraic quantum field theory over curved space-times

Lunch break (not provided by the organisers) – 135 min

(14:20-15:20 Philosophy of Physics Society Annual General Meeting - room D)

Session III A – room A

Topic: **Wigner Friend**

15:45– 16:10	Marcin Markiewicz	Quantum (Ir)reversibility: extended Wigner's Friends, relationalism and unitary quantum mechanics.
16:10 – 16:35	Tom Rivlin	Wigner's Friend Scenarios in the Presence of a Environment
16:35 – 17:00	Yilè Ying	A review and analysis of extended Wigner's friend arguments
17:00 – 17:25	Lorenzo Catani	An extended Wigner's friend no-go theorem inspired by generalized contextuality

Session III B – room B

Topic: **Black Holes**

15:45– 16:10	Sebastian De Haro	The Geometric View of Theories
16:10 – 16:35	Källan Berglund	Black Hole in Quantum Superposition: Space-time superpositions as fluctuating geometries
16:35 – 17:00	Dominic Ryder	Is Black Hole Evaporation Prediction Friendly?
17:00 – 17:25	Quentin Vigneron	Modifying general relativity on the basis of topological considerations from the Newtonian limit

Session III C – room C

Topic: **Quantum Correlations and Non-Classicality**

15:45– 16:10	Lev Vaidman	Quantum nonlocality
16:10 – 16:35	Joanna Luc	On randomness arguments against deterministic hidden variable programs
16:35 – 17:00	Alexandre Orthey	Geometric monotones of violations of quantum realism
17:00 – 17:25	Yanis Pianko	Modal interpretations, hidden-variables and completeness
17:25 – 17:50	Albert Rico	Quantum advantage in high-dimensional communication from correlations

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18:00

Banquet

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Session IV A – room A

Topic: „Rethinking” of QM

09:30 – 09:55	Marek Czachor	Heisenberg-Born-Jordan oscillators 100 years after: Field quantization revisited
09:55 – 10:20	Joppe Widstam	Inference and Fine-Tuning in Causal Explanations of Bell-Inequality Violations
10:20 – 10:45	Jer Steeger	Complementarity as infringement

Session IV B – room B

Topic: Gravity and Entanglement

09:30 – 09:55	David Trillo	The Diósi-Penrose model of classical gravity predicts gravitationally induced entanglement.
09:55 – 10:20	Amrapali Sen	Superluminal Quantum Reference Frames
10:20 – 10:45	Debarshi Das	Mass-Independent Scheme to Test the Quantumness of a Massive Object
10:45 – 11:10	Jorge Alberto Manero Orozco	On the detectability of arrival times as rest mass residues in the non-relativistic limit.

Session IV C – room C

Topic: Contextuality and Measurement

09:30 – 09:55	Matthew Leifer	Contextuality of the Quantum Zeno Effect
09:55 – 10:20	Jonte Hance	External quantum fluctuations select measurement contexts
10:20 – 10:45	Caroline Jones	Theory-independent monitoring of the decoherence of a superconducting qubit with generalized contextuality
10:45 – 11:10	Mritunjay Tyagi	Kochen-Specker non-contextuality in the light of quantization: Rethinking value assignments in quantum theory.

Coffee break – 40 min

Session V A – room A

Topic: Fundamental aspects of QM

11:50 – 12:15	Moein Naseri	Quantum Speed Limits for Change of Basis
12:15 – 12:40	Som Kanjilal	Unbounded Sequential Extraction of Nonlocality using Local Randomness Assisted Projective Measurements
12:40 – 13:05	Jan Dziewior	The Meaning of Weak Values

Session V B – room B

Topic: Thermal and Statistical Physics

11:50 – 12:15	Bryan Roberts	The reduction of thermodynamics to statistical mechanics
12:15 – 12:40	Pascal Rodríguez-Warnier	Fluctuation theorems and (ir)reversibility in statistical thermodynamics

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Session V C – room C

Topic: „Rethinking” of QT

11:50 – 12:15	Toru Ohira	Separated out of Entangled
12:15 – 12:40	Alexei Grinbaum	Operationalism on the march: conceptual lessons of indefinite causality
12:40 – 13:05	Marco Erba	The composition rule for quantum systems is not the only possible one
13:05 – 13:15	Conference Photo	

Lunch break (not provided by the organisers) – 135 min

(13:20-15:20 Panel Discussion: Quantum Gravity and the Philosophical Foundations of Physics (PP/ISQG Joint Session) – room D)

Session VI A – room A

Topic: Quantum Technology

15:30 – 15:55	Francisca Vasconcelos	Rethinking Quantum Advantage via the Quantum Singular Value Transform
15:55 – 16:20	Karthik Hosapete Seshadri	Coherence leveraged agnostic phase estimation
16:20 – 16:45	Giorgos Eftaxias	Advantages of multicopy nonlocality distillation and its application to minimizing communication complexity

Session VI B – room B

Topic: Problems in QFT

15:30 – 15:55	Guilherme Franzmann	Are quantum subsystems invariant?
15:55 – 16:20	Silvester Borsboom	Global Gauge Symmetry Breaking in the Abelian Higgs Mechanism
16:20 – 16:45	Alexander Niederklapfer	Localisation of Particles in Quantum Field Theory

Session VI C – room C

Topic: Mathematical Physics

15:30 – 15:55	Enrico Maresca	Noncommutative Geometry and the Problem of Chronogeometry in Quantum Gravity
15:55 – 16:20	Michał Banacki	On steering in the C*-algebraic framework
16:20 – 16:45	Manuel Mekkonen	Invariance under quantum permutations rules out parastatistics

Coffee break – 15 min

17:00 – 19:00 **Poster Session**

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Wednesday, July 2

Venue: Faculty of Mathematics, Physics and Informatics, University of Gdańsk, Wita Stwosza Street, 57, Gdańsk, Poland

Session VII A – room A

Topic: **Nonclassicality and Measurement**

09:30 – 09:55	Lorenzo Braccini	Collective Nonclassicality of a Macroscopic Qubit-Ensemble via Measurement-Induced Disturbance
09:55 – 10:20	Peter Evans	Reading out a quantum clock: what does measurement mean for time?
10:20 – 10:45	Carlo Ceperlaro	The classical limit of quantum mechanics through coarse-grained measurements
10:45 – 11:10	Shashaank Khanna	Which Causal Scenarios can support non-classical correlations

Session VII B – room B

Topic: **Measurement problem**

09:30 – 09:55	Jan-Åke Larsson	The Contextual Heisenberg Microscope
09:55 – 10:20	Evan Gale	The localization problem: an antinomy between measurability and causal dynamics
10:20 – 10:45	Antoine Soulas	An interpretation-independent formulation of the measurement problem
10:45 – 11:10	Lucy Mason	Can Measurement be Entirely Quantum?

Session VII C – room C

Topic: **Interpretation QM**

09:30 – 09:55	Alyssa Ney	Why Did Wheeler Reject the Everett Interpretation?
09:55 – 10:20	Stefano Furlan	The Participatory Universe and Bohr's Smoky Dragon: John Wheeler's 'It from Bit' in a Proper Light
10:20 – 10:45	Philipp Berghofer	Quantum Probabilities Are Objective Degrees of Epistemic Justification

Coffee break – 40 min

Session VIII A – room A

Topic: **SpaceTime**

11:50 – 12:15	Antoine Tilloy	The general structure of quantum-classical theories: for gravity and more
12:15 – 12:40	Nicetu Tibau Vidal	BMV experiment without observable spacetime superpositions
12:40 – 13:05	Niels Martens	Dark Energy & the Spacetime-Matter-Constant Trichotomy
13:05 – 13:30	Sanne Vergouwen	Black Holes as Massive Spacetime

Session VIII B – room B

Topic: **High Energy**

11:50 – 12:15	Nick Huggett	The Highs and Lows of Particle Physics (co-authored with Mike Schneider, University of Missouri)
12:15 – 12:40	Ohkyung Kwon	Quantum foundations are incomplete without holography in the background spacetime: Probing the ground state of gravitational entanglement
12:40 – 13:05	Ward Struyve	The action principle as a guide to substantial general invariance?
13:05 – 13:30	Henrique Gomes	Gauge theory doesn't need gauge symmetry

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Session VIII C – room C

Topic: „Rethinking” Quantum Foundations 1

11:50 – 12:15	John Selby	Generalised Process Theories
12:15 – 12:40	Hippolyte Dourdent	Simulating Noncausality with Quantum Control of Causal Orders
12:40 – 13:05	Davide Rolino	On Complementarity and Incompatibility
13:05 – 13:30	Ladina Hausmann	Against probability

Lunch break (not provided by the organisers) – 120 min

Session IX A – room A

Topic: Gravity

15:30 – 15:55	James Weatherall	Some Results on Natural Theories
15:55 – 16:20	Eleanor March	Minimal coupling, the strong equivalence principle, and the adaptation of matter to spacetime geometry

Session IX B – room B

Topic: CM/QM

15:30 – 15:55	David Schmid	Shadows and subsystems of generalized probabilistic theories: when tomographic incompleteness is not a loophole for contextuality proofs
15:55 – 16:20	Matthias Salzger	A decomposition framework for process theories in spacetime
16:20 – 16:45	Ved Kunte	Theories without local tomography need entanglement

Session IX C – room C

Topic: „Rethinking” Quantum Foundations 2

15:30 – 15:55	Alessandro Bisio	Higher order maps in general physical theories
15:55 – 16:20	Márton Gömöri	The Idol of Linear Probability Dynamics
16:20 – 16:45	Sina Soltani	Noncontextual ontological models of operational probabilistic theories
16:45 – 17:00	Closing remarks	

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List of Posters

1.	Antoni Antoszek	Why Defining Determinism of Axiomatic Physical Theories Fails and How to Correct It
2.	Bryan Cheng	Approximate Symmetries, Groups, and Heuristics: Analysing the Eightfold Way
3.	Daniele Colosi	An invitation to the General Boundary Formulation of quantum theory
4.	Niccolò Covoni	Progress Crucial Realism
5.	Anita Dąbrowska	Perfect excitation of a three-level atom by a propagating two-photon field
6.	Benjamin Engel	Models of paraconsistent logics in spectral presheaves
7.	Ulaş Eyüpoğlu	A Case for Ontology: A Bohmian Perspective on Weak Values
8.	George Hobart	Action without Reaction: A Critique of the Action-Reaction Principle and Implications for de Broglie-Bohm Theories
9.	Niyusha Hosseini	The time of arrival problem in the Page and Wootters formalism
10.	Caspar Jacobs	Conspiratorial Quantum Mechanics
11.	Vishal Johnson	Measurement in a Unitary World
12.	Miguel Jorquera Riera	Uncertainty Relations Relative to Phase Space Quantum Reference Frames
13.	Branko Kovac	Critique of the principle of equivalence
14.	Charlène Laffond	A Generalized Approach to Quantum and Classical Probabilities via Frequentist Interpretation
15.	Anastasiia Lazutkina	Evidence in Cosmology: How Galaxies Became Complicated
16.	Mor Lumbroso	Forming Concepts and Conceiving Forms: Physiology and Epistemology of Light in Bohr's Quantum Mechanics
17.	André Malavazi	Two-time weak measurement protocol for ergotropy protection in open quantum batteries
18.	Kaito Nakatsuka	Consistency between Local Realism and the Free Choice Assumption: A Consideration Based on Causal Statistical Inference
19.	Xabier Oianguren-Asua	Rigorous Schrödinger Quantum Mechanics of Infinitely Many Particles
20.	Cameron Peters	A no signalling theorem in the context of the Absorbing Boundary Rule model of particle detection
21.	Rodrigo Ramos	A finite form of de Finetti's theorem in generalized probabilistic theories
22.	Maria Rubio	From physics to mind: philosophical foundations of the Many Worlds and Many Minds Interpretations of Quantum Mechanics
23.	Ana Belen Sainz	Activation of post-quantum steering
24.	Shubhayan Sarkar	Operationally independent events can influence each other in quantum theory
25.	Konrad Schlichtholz	On physicality of electromagnetic potential from causal structure of flux quantization

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26.	Akshata Shenoy H.	Quantum state tomography of pure three-qubit states from its parts
27.	Rupert Smith	Scientific Representation and the Hole Argument: Insights from a Structuralist Approach
28.	Adamantia Zampeli	Composition of local observables in quantum field theory: Towards
29.	Tao Zhou	A non-relativistic theory of quantum mechanics and gravity with local modulus symmetry