PROGRAM

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FRIDAY, OCTOBER 23rd

VARIETIES OF REALIST APPROACHES TO QUANTUM MECHANICS

Chair: Gerhard Grössing

8:00–8:45
Registration

8:45–9:00
Welcome Address

9:00–9:30
Jan Walleczek and Gerhard Grössing (Introduction EmQM15)
Is the World Local or Nonlocal? - Towards an Emergent Quantum Mechanics 80 Years after EPR

9:30–10:15
KEYNOTE LECTURE
Yakir Aharonov *(Tel Aviv University, IL, and Chapman University, Orange, USA)*
Time Symmetric Reformulation of Quantum Mechanics

10:15–10:30
Coffee break

10:30–11:00
Matt Leifer (*Perimeter Institute, Waterloo, CA*)
The reality of the quantum state from Kochen-Specker contextuality

11:00–11:30
Martin Ringbauer *(Griffith University, Brisbane, AU)*
Measurements on the Reality of the Wavefunction

11:30–12:00
Eric Cavalcanti *(Griffith University, Brisbane, AU)*
The Two Bell’s Theorems of John Bell and Causal Emergence

12:00–14:00
Lunch break

Chair: Markus Arndt

14:00–14:45
KEYNOTE LECTURE
Nicolas Gisin *(Université de Genéve, CH)*
Quantum correlations in Newtonian space and time:

arbitrarily fast communication or nonlocality

14:45–15:15
Travis Norsen *(Smith College, Northampton, USA)*
Bohmian conditional wave functions and the reality of the quantum state

15:15–15:30
Coffee break

15:30–15:50
Xavier Oriols *(Universitat Autònoma de Barcelona, ES)*
Can Decoherence make quantum theories unfalsifiable?
Understanding the quantum-to-classical transition without it

15:50–16:20
Jan Walleczek *(Phenoscience Laboratories, Berlin, DE)*
Free Will Theorems in Nonlocal Information Transfer
without Nonlocal Communication

16:20–16:50
Gerhard Grössing *(Austrian Institute for Nonlinear Studies, Vienna, AT)*
Conditions for Lorentz-invariant superluminal information
transfer without signaling

16:50–17:05
Coffee break
Chair: Theo Nieuwenhuizen

17:05–17:25
Herman Batelaan *(University of Nebraska, Lincoln, USA)*
Double slit electron diffraction

17:25–17:45
Ana María Cetto *(Univ. Nacional Autónoma de México, MX)*
Two-electron system correlated by the zero-point field:
physical explanation for the spin-statistics connection

17:45–18:05
Hrvoje Nikoli? *(Ruder Boškovi? Institute, Zagreb, HR)*
How to reconcile non-local reality and local non-reality

18:05–18:25
Ariel Caticha *(University at Albany, USA)*
Trading drift and fluctuations in entropic dynamics:
a new symmetry for quantum mechanics

18:30-20:00
Dinner Buffet and Poster Presentations

20:00–22:00
Poster Presentations and Discussion

SATURDAY, OCTOBER 24th

NEW EXPERIMENTS AND THEORIES IN QUANTUM FOUNDATIONS

Chair: Jan Walleczek

9:00–9:45
KEYNOTE LECTURE
Aephraim Steinberg *(University of Toronto, CA)*
Probing “surreal” elements of quantum physics using weak measurements

9:45–10:15
Markus Arndt *(University of Vienna, AT)*
Quantum optics with nanobiological matter

10:15–10:30
Coffee break

10:30–11:00
Jeff Tollaksen *(Chapman University, Orange, USA)*
The Quantum pigeonhole principle and localizing
Kochen-Specker contextuality with weak measurements

11:00–11:20
Yuji Hasegawa *(Atominstitut, TU Vienna, AT)*
Foundations of Quantum Mechanics studied in Matter-Wave Optics.
Quantum Cheshire-Cat and Uncertainty Relations

11:20-11:40
Gregor Weihs *(University of Innsbruck, AT)*
Multipath Interference Tests of Quantum Mechanics

11:40–12:10
Konstantin Y. Bliokh *(CEMS, RIKEN, JP)*
Field-Theory Revolution for Optics:
Revisiting Momentum and Angular Momentum of Light

12:10–14:00
Lunch break

Chair: Jeff Tollaksen

14:00–14:45
KEYNOTE LECTURE
Howard Wiseman *(Griffith University, Brisbane, AU)*
Ensembles of Bohmian trajectories: Real, Surreal, and Hyper-real

14:45–15:15
Basil Hiley *(University of London, UK)*
Weak Values, Local Momentum and Tangent Groupoids

15:15–15:35
Robert Flack *(University College London, UK)*
Measuring the weak value of atomic spin

15:35–15:50
Coffee break

Chair: Nicolas Gisin

15:50–16:20
Peter F. Barker *(University College London, UK)*
Weak measurements of atomic momentum in a matter-wave interferometer

16:20–16:40
Maurice de Gosson *(University of Vienna, AT)*
Weak values and the reconstruction problem in Born-Jordan quantization
16:40–17:00
Angelo Bassi *(Univ. Trieste and INFN, Trieste, IT)*
Models of spontaneous wave function collapse:
what they are, and how they can be tested
17:00–17:15
Coffee break
17:15–17:45
Helmut Rauch *(Atominstitut, TU Vienna, AT)*
Ignorance governs quantum experiments
17:45–18:05
Bill Poirier *(Texas Tech University, Lubbock, USA)*
Quantum Mechanics Without Wavefunctions: When quantum worlds collide
19:00–23:00
Gala Dinner

SUNDAY, OCTOBER 25th

EMERGENT SPACE-TIME, GRAVITY, AND THE MEASUREMENT PROBLEM

Chair: Lajos Diósi
9:00–9:45
KEYNOTE LECTURE
Gerard ´t Hooft *(Spinoza Institute and Utrecht University, NL)*
How quantization of gravity leads to a discrete space-time
9:45–10:15
Bei-Lok Hu *(University of Maryland, College Park, USA)*
Gravitational Cat State
10:15–10:30
Coffee break
10:30–11:00
?aslav Brukner *(University of Vienna, AT)*
Quantum Clocks and Time
11:00–11:30
Silke Weinfurtner *(University of Nottingham, UK)*
Hydrodynamic simulations of rotating and non-rotating black holes
11:30–11:50
Hans-Thomas Elze *(University of Pisa, IT)*
Quantum Features of Natural Cellular Automata
11:50–14:00
Lunch break

Chair: ?aslav Brukner

14:00–14:45
KEYNOTE LECTURE
Thanu Padmanabhan *(Pune University, IN)*
Atoms of Spacetime and the Nature of Gravity

14:45–15:05
Lajos Diósi *(Wigner Center for Physics Research, Budapest, HU)*
Nonlinear Schrödinger Equation in Foundations: Summary of 4 Catches

15:05–15:25
Lev Vaidman *(Tel Aviv University, IL)*
Ontology of the wave function

15:25–15:40
Coffee break

Chair: Hans-Thomas Elze

15:40–16:00
Hans De Raedt *(University of Groningen, NL)*
The unreasonable effectiveness of quantum theory:
a logical inference approach

16:00–16:20
Marian Kupczynski *(Université de Québec, CA)*
EPR Paradox, Quantum Nonlocality and Physical Reality

16:20–16:40
Theo Nieuwenhuizen *(Univ. of Amsterdam, NL)*
“Walking on quantum foundations”

16:40–17:00
Closing Ceremony