

Conference I

Emergent Quantum Mechanics

Time: Friday, November 11 to Sunday, November, 13, 2011

Location: University of Vienna, Small Ceremonial Hall

Friday, November 11, 2011

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| 08:15–08:30 | Welcome Address |
| 08:30–09:30 | Opening Lecture for both Conferences Yves Couder (Paris): “A Case of Wave-Particle Duality at Macroscopic Scale, Quantum-Like Behaviours Emerging out of Memory Driven Trajectories” |
| | Chair: Gerhard Grössing |
| 09:45–09:50 | Introduction |
| 09:50–10:35 | Stephen Adler (Princeton) (Keynote Lecture): “Quantum Theory as an Emergent Phenomenon: Foundations and Phenomenology” |
| 10:35–11:10 | Bei-Lok Hu (College Park): “Emergence, Gravity and Thermodynamics” |
| 11:10–11:45 | Hans-Thomas Elze (Pisa): “Quantum-Classical Hybrid Dynamics” |
| 11:45–12:00 | Coffee break |
| | Chair: Theo Nieuwenhuizen |
| 12:00–12:35 | GianCarlo Ghirardi (Trieste): “Can the Reduction Process Peacefully Coexist with Special Relativity?” |
| 12:35–13:00 | Catalina Curceanu (Frascati): “Experimental Tests of Quantum Mechanics” |
| 13:00–14:30 | Lunch break |
| | Chair: Àngel S. Sanz |
| 14:30–15:05 | Garnet Ord (Toronto): “Quantum Phase from the Twin Paradox” |
| 15:05–15:40 | Gerhard Grössing (Vienna): “The Quantum as an Emergent System” |
| 15:40–16:05 | John Bush (Cambridge): “Hydrodynamic Quantum Analogues” |
| 16:05–16:20 | Coffee break |
| | Chair: Hans-Thomas Elze |
| 16:20–16:45 | Mark Davidson (Palo Alto): “A Study of the Lorentz-Dirac Equation in Complex Space-Time for Clues to Emergent Quantum Mechanics” |
| 16:45–17:10 | Marek Czachor (Gdansk): “Regularized QFT that Emerges as a Consequence of a Quantum Weak Law of Large Numbers” |
| 17:10–17:35 | Lakhdar Gaffour (Sidi-Bel-Abbes): “Space-Time and Emergence of Quantum Mechanics” |
| 17:35–18:00 | Richard D. Bateson (London): “A Causal Net Approach to Relativistic Quantum Mechanics” |
| 18:00–18:25 | Felix Finster (Regensburg): “Quantum Mechanics in the Framework of Causal Fermion Systems” |

18:25–18:50 **Mark J. Everitt** (Loughborough, Cairo): “Measurement as Emergent Quantum Phenomena”

20:00 Conference Dinner

Saturday, November 12, 2011

Chair: Bei-Lok Hu
09:00–09:35 **Edward Nelson** (Princeton): “Review of Stochastic Mechanics”
09:35–10:10 **Piotr Garbaczewski** (Opole): “Probabilistic Whereabouts of the ‘Quantum Potential’”

10:10–10:35 **Ana María Cetto** (Mexico): “Quantization as an Emergent Phenomenon due to the Matter-Zeropoint Field Interaction”

10:35–10:45 Coffee break

Chair: GianCarlo Ghirardi
10:45–11:20 **Basil Hiley** (London): “Process, Clifford Algebras and ‘Weak Values’”
11:20–11:55 **Maurice de Gosson** (Vienna): “Schrödinger’s Equation is Classical. Cheers!”
11:55–12:20 **Ángel S. Sanz** (Madrid): “Quantumness beyond Quantum Mechanics”

12:20–14:00 Lunch break

Chair: Andrei Khrennikov
14:00–14:35 **Guido Bacciagaluppi** (Aberdeen): “Non-equilibrium in Nelsonian Mechanics”
14:35–15:00 **Mike Towler** (Cambridge): “Numerical Studies of the Approach to Quantum Equilibrium in de Broglie-Bohm Theory”
15:00–15:25 **Helmut Rauch** (Vienna): “Particle or/and Wave Features in Neutron Interferometry”

15:25–15:45 Coffee break

Chair: Maurice de Gosson
15:45–16:10 **Dieter Schuch** (Frankfurt): “Nonlinear Quantum Mechanics, Complex Classical Mechanics and Conservation Laws for Closed and Open Systems”
16:10–16:35 **Herbert Schwabl** (Vienna): “A Classical Framework to Explain Quantization”
16:35–17:00 **Manfried Faber** (Vienna): “Particles as Stable Topological Solitons”
17:00–17:25 **Werner A. Hofer** (Liverpool): “A Model of Extended Electrons”

Chair: Gerhard Grössing
17:25–18:10 **Lee Smolin** (Waterloo) (Keynote Lecture): “A Real Ensemble Interpretation of Quantum Mechanics”

20:00 City Hall Reception

Sunday, November 13, 2011

- Chair: Gerhard Grössing
- 09:00–09:45 **Gerard 't Hooft** (Utrecht) (Keynote Lecture): “Quantum Mechanics from Classical Logic”
- 09:45–10:10 **Giuseppe Vitiello** (Salerno): “Connes’ Noncommutative Spectral Geometry and the Seeds of Quantization”
- 10:10–10:35 **Fabio Scardigli** (Taipei): “Emergent Lorentz Symmetry in Quantum Mechanics and Doubly Special Relativity”

10:35–10:45 Coffee break

- Chair: Ana María Cetto
- 10:45–11:20 **José M. Isidro** (Valencia): “A Thermodynamic Approach to Emergent Quantum Mechanics”
- 11:20–11:55 **Lajos Diósi** (Budapest): “Coexistence of Classical Continuum and Quantum Theory”
- 11:55–12:20 **Alexander Davydov** (Rockville): “Wave-Particle Duality in Classical Mechanics”

12:20–14:00 Lunch break

- Chair: Lajos Diósi
- 14:00–14:35 **Andrei Khrennikov** (Växjö): “Quantum Mechanics as Theory of Classical Random Signals: The Problem of (Anti-)Bunching”
- 14:35–15:10 **Christof Wetterich** (Heidelberg): “Quantum Fermions from Classical Statistics”
- 15:10–15:35 **Alexander Burinskii** (Moscow): “What Tells Gravity on Emergence of Quantum Theory?”

15:35–15:45 Coffee break

- Chair: Manfred Faber
- 15:45–16:20 **Vitaly D. Rusov** (Odessa): “Quantization in Relativistic Classical Mechanics”
- 16:20–16:45 **Agung Budiyo** (Saitama): “Statistical Violation of Hamilton’s Principle”
- 16:45–17:10 **Louis H. Kauffman** (Chicago): “Discrete Physics and the Emergence of Quantum Mechanics”
- 17:10–17:35 **Petr Hajicek** (Berne): “Reformed Quantum Mechanics”
- 17:35–18:00 **Theo Nieuwenhuizen** (Amsterdam): “Elements of a Sub-Quantum Theory”

20:00 **Concert**

Poster presentations: Andrey Akhmeteli, Irina Basieva, Andrew Beckwith, Alain Bérard, Jarek Duda, Shan Gao, Konstantin A. Lukin, William McHarris, Johannes Mesa Pascasio, Roumen Tsekov.