

Workshop: Testing Quantum Foundations in the 2025 Quantum Year

INFN-LNF, Frascati, in mixed modality (presence and online),

20-22 October 2025

Monday 20 October

Aula Salvini

Chair C. Curceanu

9:00 – 9:30 Registration

9:30 – 10:00 Welcome (Matteo Palutan, responsible of LNF Research Division and Catalina Curceanu)

10:00 – 10:30 Alessio Rettaroli, Quantum circuits for fundamental physics

10:30 – 11:00 Simone Manti, AI-Enhanced BEGe Detectors for Low-Energy X-ray Collapse Model Test

11:00 – 11:30 Coffee break

11:30 – 12:00 Luciano Petruzzello (online), Low-Energy Test of Quantum Gravity via Angular Momentum Entanglement

12:00- 12:30 Rosa-Laura Lechuga-Solis, Testing quantum collapse theories with cosmology

12:30 – 13:00 Hassan El Mounni (online), Testing the Complexity Conjecture in Regular Black Hole Geometry

13:00 – 13:30 Deepak Kumar, "Measuring degree of entanglement in medium using J-PET scanner

13:40 – 15:00 Lunch break

Aula Salvini

Chair: S. Manti

15:00 – 15:30 Magdalena Skurzok (online), Dalitz plot studies for $\pi^0\pi^0\pi^0 \rightarrow 3\gamma$ using the J-PET detection system

15:30 – 16:00 Pooja Tanty, Probing Charge Conjugation Symmetry via Spin statistics with J-PET

theory 16:00 – 16:30 Coffee Break

16:30 – 17:00 Alessio Porcelli (online), VIP-2 Improved sensitivity on measuring the Pauli Exclusion Violation using the modulation of the current

18:00 Public event in Frascati – Sala degli Specchi Comune di Frascati

Tuesday 21st October

Aula Salvini

Chair: D. Sirghi

9:30 – 10:00 Neha Chug, Improved sensitivity limits on CPT Symmetry test in positronium decays with J-PET

10:00 – 10:30 Daniel Sudarsky, Quantum fluctuations of the Electric dipole moment of the Neutron: a case study with lessons on Foundations

10:30 – 11:00 Massimo Blasone, Quantum correlations in elementary particle processes

11:00 – 11:30 Coffee Break

11:30 – 12:00 Kyrylo Simonov, The many flavors of Schrödinger's cat: Probing macrorealism in neutrinos and neutral kaons

12:00 – 12:30 Valerio Descontus, On the Double Copy at the Lagrangian level

12:30 – 13:00 Fabrizio Piacentini, Single-pair measurement of the Bell parameter: a new approach to quantum foundations investigation

13:00 – 13:30 Mihai Iliescu - tbc

13:30 – 15:00 Lunch

Aula Salvini

Chair: F. Sgaramella

15:00 – 15:30 Antonio Di Domenico, The "Back from the Future" quantum effect in entangled neutral kaons at KLOE/KLOE-2

15:30 – 16:00 Coffee Break

16:00 – 16:30 Issam Ibnouhsein (online), A superselection rule for quantum causality

16:30 – 17:00 Max Joseph Fahn (online), Decoherence from horizons with quantum geometries

17:00 – 17:30 Federico Nola, Probing Pauli Principle Violations through Neutron Star Equations of State

17:30 – 18:00 Luca De Paolis, Bio-photons – The Light of Life: Quantum Traces in Biological Signals?

20:00 Social Dinner

Wednesday 22nd October

Aula Salvini

Chair: F. Clozza

9:30 – 10:00 Francesco Artibani, Novel solid state CZT Detectors for fundamental physics

10:00 – 10:30 Flaminia Giacomini, What can we learn from testing the gravitational field of a quantum source?

10:30 – 11:00 Oliver.Friedrich (online), From 3D to 2D in flat space: holographic QFT

11:00 – 11:30 Coffee Break

11:30 – 12:00 Jonte Hance (online), External quantum fluctuations select measurement contexts

12:00 – 12:30 Antonino Marciano (online), The stochastic gradient flow approach to QCD confinement and mass gap generation

12:30 – 13:00 Andrei Khrennikov (online), Quantum-like modeling: applications of quantum formalism to cognition and decision making

13:00 – 13:30 Vladimir Korepin (online), Entanglement Entropy Production in Deep Inelastic Scattering

13:30 – 13:40 Final thoughts