Is Quantum Theory exact? From quantum foundations to quantum applications

Monday, 23 September 2019 - Friday, 27 September 2019

Laboratori Nazionali di Frascati INFN

Scientific Programme

“Is Quantum Theory exact?
From quantum foundations to quantum applications”

LNF-INFN, Frascati, Sept 23 - Sept 27, 2019, Aula Touschek

Organizers:

Catalina Curceanu (LNF-INFN), Chair
Pawel Moskal (Jagellionian University, Krakow, Poland)
Johann Marton (SMI-Vienna, Austria)
Alessandro Scordo (LNF-INFN)
Magdalena Skurzok (LNF-INFN)
Kristian Piscicchia (Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi, Roma and LNF-INFN)

PROGRAM

Monday 23/09

Chair: Magdalena Skurzok

9:45 - 10:30 Registration
10:30 - 10:45 Welcome
10:45 - 11:15 Coffee break
11:15 - 11:50 Elisabetta Pace: Ultra-weak biophotons - general aspects and new experimental data
11:50 - 12:25 Luca de Paolis: Experimental search of the Pauli Exclusion Principle violation – the VIP-2 experiment

12:25 - 13:00 Paweł Moskal: Total-Body J-PET - a research facility for natural sciences and medicine
13:00 - 13:35 Eryk Czerwiński: Dr. Phd or: How I Learned to Stop Worrying and RTFM
13:35 - 14:45 Lunch

Chair: Michal Silarski

14:45 - 15:05 Szymon Niedźwiecki: Status of assembly of modular PET from plastic scintillators
15:05 - 15:25 Marek Gorgol: Modifications of positron annihilation chambers for J-PET experiments
15:25 - 15:45 Łukasz Kapłon: Technical attenuation length measurement of long plastic scintillators for the total-body J-PET scanner
15:45 - 16:15 Coffee break
16:15 - 16:35 Shivani Shivani: Developement of J-PEM based on plastic scintillator and WLS
16:35 - 16:55 Neha Chug: First tests of the J-PET module at the Proton Therapy Center in Cracow
16:55 - 17:15 Marcin Kajetanowicz: FPGA based readout electronics for J-PET

Tuesday 24/09

Chair: Wojciech Krzemień

10:20 - 10:45 Raffaele del Grande: Dalitz plot analysis for the o-Ps ->3gamma decay
10:45 - 11:15 Coffee break
11:15 - 11:50 Beatrix Hiesmayr: A quantum information theoretic view on the positronium decay and its potentiality to gather a quantum view on human body processes
11:50 - 12:25 Giuseppe Nistico: Wave equations derived from first order invariance conditions
12:25 - 13:00 Marek Pietrow: Detection of light irradiation produced in the process of positronium formation
13:00 - 13:35 Ewa Ł. Stępień: Epigenetics as a new approach for biomarkers discovery
13:35 - 14:45 Lunch

Chair: Ewa Stepien

14:45 - 15:05 Kamil Dulski: Positronium Lifetime Imaging by J-PET Detector
15:05 - 15:25 Ewelina Kubicz: Positronium lifetime as a new biomarker in cancer diagnostic
15:25 - 15:45 Zuzanna Bura: Comparison of positonium lifetime in living tissues for PALS detector and J-PET tomograph
15:45 - 16:15 Coffee break
16:15 - 16:35 Monika Szczepanek: Application of a 3D model of cancer cells in research on the effectivness of neutron therapy (BNCT) in the treatment of melanoma

Wednesday 25/09

Chair: Beatrix Hiesmayr

10:05 - 10:25 Roman Shopa: Optimisation of parameters for single-event based TOF FBP image reconstruction
10:25 - 10:45 Lech Raczyński: Some remarks on Total Variation regularization based PET imaging
10:45 - 11:15 Coffee break
11:15 - 11:35 Daria Kisielewska: J-PET Monte Carlo simulation with Geant4 package
11:35 - 12:10 Wojciech Krzemień: What Alice can find through the Looking-Glass - About mirror matter searches with the J-PET detector
12:10 - 12:45 Armin Shirazi: Toward Implementing Heisenberg's Distinction in the Quantum Formalism
12:45 - 13:20 Sandro Donadi: Optomechanical systems as noise spectrometers
13:20 - 14:40 Lunch

Chair: Catalina Curceanu

14:40 - 15:15 Lajos Diosi: Spontaneous Wave Function Collapse with Frame Dragging
15:15 - 15:50 Kristian Piscicchia: Wave function collapse searches in the cosmic silence
15:50 - 16:15 Coffee break
16:15 - 17:15 Roger Penrose: Wave-function Collapse as a Resolution of a
Tension between General Relativity and Quantum Theory

Thursday 26/09

Chair: Pawel Moskal

10:25 - 10:45 Kyrylo Simonov: Gravity, entanglement, and CPT violation in particle mixing
10:45 - 11:15 Coffee break
11:15 - 11:35 Krzysztof Kacprzak: Reconstruction of photon interactions in plastic scintillators in Big Barrel and Modular J-PET detectors
11:35 - 11:55 Meysam Dadgar: Image reconstruction of J-PET by QETIR and limitations
11:55 - 12:15 Monika Niedzwiecka: Determination of the spatial resolution for the J-PET prototype
12:15 - 12:35 Sushil Sharma: Efficiency determination of J-PET detector based on photons scattering angles
12:35 - 12:55 Jyoti Chhokar: A feasibility study of positronium decays in view of Charge Symmetry violation using J-PET detector
12:55 - 13:15 Juhi Raj: Precision tests for T- symmetry violation in Positronium decay using the J-PET detector
13:15 - 15:00 Lunch

Chair: Johann Marton

15:00 - 15:20 Muhsin Mohammed: Study of angular correlations in the ortho-positronium annihilation with the J-PET detector for the search of CPT symmetry violation
15:20 - 15:40 Hannieh Karimi: Studies of spheroids formed from melanoma cell lines by means of microCT and Positron Annihilation Lifetime Spectroscopy (PALS)
15:40 - 16:15 Coffee break
16:15 – 16:45 Stefano Bellucci: Topologically nontrivial Braneworlds with compact dimensions and Vacuum Currents

Friday 27/09

Chair: Carlo Guaraldo

10:25 - 10:45 Vahagn Ivanyan: Designing of Veto Cosmic Ray detector for JPET
10:45 - 11:15 Coffee break
11:15 - 11:50 Anupam Mazumdar: Spin entanglement witness to test quantum aspects of gravity
11:50 - 12:25 Alessandro Scordo: New perspectives for high precision X-ray detection experiments
12:25 - 13:00 Sergey Mayburov: Nuclear decay oscillations as possible signal of quantum nonlinearity
13:00 - 13:30 Conclusions and Farewell