Workshop on Current Problems in Physics: Zielona Góra - Lviv

Zielona Góra, Poland, October 21-24, 2024

Tuesday, October 22, 2024

Building A-29, Lecture room 106

8.30 – 9.00 Registration

Session I — *Chair: W. Leoński*

9.00 – 9.15 Opening Ceremony

9.15 – 9.55 V. Tkachuk (Keynote speaker)
Quantum computing of partition function with complex temperatures and Fisher zeros

9.55 – 10.25 Kh. Gnatenko (Keynote speaker)
Properties of quantum states in directed networks and their study using quantum computing

10.25 – 10.45 Z. Ficek
Conversion of intra-mode correlations into inter-mode correlations

10.45 – 11.05 A. Kowalewska-Kudłaszyk
Opto-Mechanical Blockade in Hybrid Dissipative System

Coffee Break

Session II — *Chair: Y. Yaremko*

11.40 – 12.10 M. Zarichnyi (Keynote speaker)
Invariant measures generated by $*$-norms

12.10 – 12.40 J. Kříž (Keynote speaker)
Spectral properties of quantum waveguides and layers

12.40 – 13.00 W. Szumiński
Dynamics and non-integrability of the double spring pendulum

13.00 – 13.20 I. Wrona
Thermodynamic properties of the new superconducting ScC_2H_8 ternary hydride at moderate pressure

13.20 – 13.40 M. Jarosik
Cutting of Textile Materials Using a Laser Cutter with Three Galvanometric Heads

Lunch Break

Session III (Online Session) *Chair: Kh. Gnatenko*

15.00 – 15.20 O. Hryhorchak
Investigation of quantum-mechanical rectangular multi–barrier and multi-well systems within quantum wave impedance approach

15.20 – 15.40 M. Samar
Simulation of a q-deformed harmonic oscillator on a quantum computer

15.40 – 16.00 M. Stetsko
A novel charged dilatonic black hole and some aspects of its thermodynamics

16.00 – 16.20 I. Kindrat
Effect of silver co-doping on Dy^{3+} luminescence in lithium tetraborate glasses

16.20 – 16.40 Sz. Mieloch
Thermal effects in NV^- colour centres in diamonds

Conference Dinner

Wednesday, October 23, 2024

Building A-29, Lecture room 106

Session IV — *Chair: V. Tkachuk*

9.00 – 9.40 J. Peřina (Keynote speaker)
Experimental Optical Fields Based on Twin Beams: Nonclassicality and Quantum Correlations

9.40 – 10.00 N. Susulovska
Geometric measure of entanglement of quantum states represented by 3-uniform hypergraphs

10.00 – 10.20 R. Machulka
Quantifying Nonclassicality of sub-Poissonian Optical Beams via Artificial Neural Networks

10.20 – 10.40 E. Lange
The effect of interplay between atom and cavity dissipation on quantum battery charging

10.40 – 11.20 P. Horodecki (Keynote speaker)
TBA

Coffee Break

Session V — *Chair: M. Przybylska*

11.50 – 12.10 G. Chimczak
How to Improve Two-Photon Blockade by Increasing the Number of Atoms in an Optical Cavity

12.10 – 12.30 B. Biczuk
Machine learning methods for detecting sleep stages based on entropic descriptors of heart rate asymmetry

12.30 – 12.50 M. Klempka
Semi-empirical analysis of the fine and hyperfine structure of even parity configuration system of neutral lutetium

12.50 – 13.10 A. Drzewiński
Towards flexible electronics

Lunch Break

Session VI (Young Scientists Session) *Chair: Z. Ficek*

14.45 – 15.05 J. Bembenek
Application of attention visualisation methods in deep neural networks for pathomorphological diagnostics

15:05 – 15.25 I. Davydenko
The effect of quantum jumps on generation of entangled states in the vicinity of exceptional points

15:25 – 15.45 J. Wójcik
Quantum Walks - Advantage of Heisenberg Reset

15:45 – 16.05 K. Ślipko
Spectral properties of particles in quantum waveguides

Coffee Break

Session VII *Chair: S. Mudry*

16.35 – 16.55 K. Urbanowski
Critical look at some sum uncertainty relations

16.55 – 17.15 M. Przybylska
Non-integrability of charged three-body problem

17.15 – 17.35 R. Basu
Uncovering the features of Partially screened Gap in Pulsars from radio observations

17.35 – 17.55 P. Lubiński
Insights on the black hole spin in the Cyg X-1 system from X-ray spectral studies

Thursday, October 24, 2024

Building A-29, Lecture room 106

Session VIII (RID Session) — *Chair: M. Dudek*

9.00 – 9.40 Y. Yaremko (Keynote speaker)
Semi-classical description of a diatomic molecule in the polar trap

9.40 – 10.00 S. Kłos
Prediction of failure states in low-pressure metal processing furnaces

10.00 – 10.20 S. Hajdasz
High-temperature superconducting tapes for Superconducting Fault Current Limiters – microstructural studies

Coffee Break

Session IX (RID Session) — *Chair: A. Drzewiński*

10.50 – 11.20 S. Mudry (Keynote speaker)
3D Printing of Amorphous Alloys

11.20 – 11.40 G. Bhatta
Multi-wavelength properties of radio-loud active galactic nuclei

11.40 – 12.00 M. Marć
Effect of Temperature on the Stability of Nanoparticle Suspensions

12.00 – 12.20 K. Dudek
Control over static and dynamic properties of magneto-mechanical metamaterials