

Proceedings of  
3<sup>rd</sup> International Conference on

# THEORETICAL AND CONDENSED MATTER PHYSICS

October 19-21, 2017    New York, USA



# Opening Ceremony

## Keynote Forum

- 08:55-09:00 Introduction**
- 09:00-09:30 Title: Memristors – A new technology paradigm**  
Mehdi Anwar, University of Connecticut, USA
- 09:30-10:00 Title: Transport theory in condensed matter physics-metamaterial is phase transition**  
Woon Siong Gan, Acoustical Technologies Singapore Pte Ltd, Singapore
- 10:00-10:30 Title: Proposed link between the periodic table and the standard model**  
John O Roberts, University of Liverpool, UK
- 10:30-11:00 Title: The history of spin fluctuation theory in itinerant electron systems**  
Rikio Konno, Kindai University Technical College, Japan

## Panel Discussion

Networking & Refreshment Break 11:00-11:20

## Session: Condensed Matter Physics

Session Chair: Yshai Avishai, Ben Gurion University, Israel

Session Co-chair: Eliade Stefanescu, Advanced Studies in Physics Centre of the Romanian Academy, Romania

## Session Introduction

- 11:20-11:40 Title: Universal and system-specific charge density wave features in 2H-transition metal dichalcogenides**  
Utpal Chatterjee, University of Virginia, USA
- 11:40-12:00 Title: Spin-orbit interaction and topological states in spin 3/2 cold atomic gas**  
Yshai Avishai, Ben Gurion University, Israel
- 12:00-12:20 Title: Inspired by photonics - unconventional electron flow across 2-D P-N junctions**  
Avik Ghosh, University of Virginia, USA
- 12:20-12:40 Title: Structural and optical properties of the MoTe<sub>2</sub>-WTe<sub>2</sub> alloy system**  
Patrick M Vora, George Mason University, USA
- 12:40-13:00 Title: Model of classical thermodynamics based on partition theory, earth attraction and semi-classical asymptotics**  
V P Maslov, National Research University Higher School of Economics, Russia
- 13:00-13:20 Title: Absorption processes and their relationship with the transport processes in semiconductors**  
Ceballos Garzón Ricardo and Carrillo Guerrero Sergio, National University of Colombia, Colombia

## Panel Discussion

Lunch Break 13:20-14:20

- 14:20-14:40 Title: Phonon interference and emergence of energy wave packets**  
Anant Raj, North Carolina State University, USA
- 14:40-15:00 Title: Effect of phase transition on spin transport in quantum frustrated antiferromagnets**  
Leonardo dos Santos Lima, Centro Federal de Educação Tecnológica de Minas Gerais, Brazil
- 15:00-15:20 Title: Environmental heat conversion into usable energy as a quantum effect of the matter-field dynamics**  
Eliade Stefanescu, Advanced Studies in Physics Centre of the Romanian Academy, Romania

## Panel Discussion

## Session: Theoretical Physics

Session Chair: Loris Ferrari, University of Bologna, Italy

Session Co-chair: Holger Bech Nielsen, Niels Bohr Institute, Denmark

## Session Introduction

- 15:20-15:40 Title: Fundamental physics experiment reveals origin construct of DNA**  
Manuel S Morales, Independent Researcher, USA



15:40-16:00 **Title: Gap-less semiconductor model for relativistic particles**  
Holger Bech Nielsen, Niels Bohr Institute, Denmark

**Panel Discussion**

**Networking & Refreshment Break 16:00-16:20**

16:20-16:40 **Title: Pseudobosons and quasiphonons: The hidden side of bogoliubov collective excitations**  
Loris Ferrari, University of Bologna, Italy

16:40-17:00 **Title: Quantum physics as dynamic space-time differential calculus**  
Eugene Machusky, National Technical University of Ukraine, Ukraine

17:00-17:20 **Title: Synthesis of graphene-Fe magnetic nanofluid for enhancement of water thermal conductivity**  
Mohamed ibrahim , Süleyman Demirel University, Turkey

17:20-17:40 **Title: Efficient numerical integrator based on Fer expansion: Application to solid-state NMR experiments**  
Eugene Stephane Mananga, The City University of New York, USA

17:40-18:00 **Title: SnO<sub>2</sub>/TiO<sub>2</sub> nanohexagon arrays heterojunction photoanode based dye-sensitized solar cells with enhanced performance**  
Hafiz Muhammad Asif Javed, University of Agriculture Faisalabad, Pakistan

**Panel Discussion**

**Day 2      October 20, 2017**

**Conference Hall: Lexington**

**Keynote Forum**

09:00-09:30 **Title: Atomic dynamics in liquid in real space and time: Towards the liquid-state-physics**  
Takeshi Egami, University of Tennessee, USA

09:30-10:00 **Title: Unitary relativistic quantum theory**  
Eliade Stefanescu, Advanced Studies in Physics Centre of the Romanian Academy, Romania

10:00-10:30 **Title: Electronic structure of inverse opal- and nanoparticulate- TiO<sub>2</sub> electrodes**  
Taro Toyoda, The University of Electro-Communications, Japan

10:30-11:00 **Title: The interplay between off-stoichiometry and intrinsic point defects in quaternary compound semiconductors**  
Susan Schorr, Free University of Berlin, Germany

**Panel Discussion**

**Networking & Refreshment Break 11:00-11:20**

**Session: Condensed Matter Physics**

**Session Chair: Rikio Konno**, Kindai University Technical College, Japan

**Session Co-chair: Rita John**, University of Madras, India

**Session Introduction**

11:20-11:40 **Title: Strongly correlated electrons in two-dimensional quantum world**  
Sergey V Kravchenko, Northeastern University, USA

11:40-12:00 **Title: Density matrix in description of the collision of atomic particle with solid film**  
Gennadiy Filippov, Chuvash State Agricultural Academy, Russia

12:00-12:20 **Title: A diatomic chain with a mass impurity**  
Ming B Yu, 191 Waterton Lakes Ave. Las Vegas, Nevada, USA

12:20-12:40 **Title: Theory of thermal expansion of localized paramagnons**  
Rikio Konno, Kindai University Technical College, Japan

12:40-13:00 **Title: Influence of multiorbital and anisotropic coulomb interactions on isotope effect coefficient in doped Fe-based superconductors**  
Luxmi Rani, Physical Research Laboratory, India

13:00-13:20 **Title: First principle calculations on the effect of addition of X (Co, Rh, Ir) on TiPd**  
Rita John, University of Madras, India

**Panel Discussion**

**Lunch Break 13:20-14:20**

14:20-14:40 **Title: On the possibility of refining the gravitational constant and solving the task of integrating the gravitational and electromagnetic fields**  
Valentyn A Nastasenko, Kherson State Maritime Academy, Ukraine

14:40-15:00 **Title: Quantum simulation of (1+1) D U (1) lattice gauge-Higgs model by using cold atoms in one-dimensional optical lattice**  
Yoshihito Kuno, Kyoto University, Japan

Panel Discussion	
Sessions: Materials Science and Engineering   Meta Materials and Magnetic Materials   Nanotechnology and Mesoscopic Scale	
Session Chair: Jose Alberto Perez Benitez, Instituto Politécnico Nacional, Mexico	
Session Co-chair: Juan-Luis Domenech-Garret, Madrid Technical University, Spain	
Session Introduction	

- 15:00-15:20 **Title: Structural, optical and gas sensing properties of swift heavy ions irradiated metal oxide thin films**  
Azher M Siddiqui, Jamia Millia Islamia, India
- 15:20-15:40 **Title: Magnetic and transport properties in Mn doped III-V semiconductor: The cases of GaAs and InP**  
Georges Bouzerar, CNRS and Université Lyon 1, France
- 15:40-16:00 **Title: A non-equilibrium approach regarding hot metals**  
Juan-Luis Domenech-Garret, Madrid Technical University, Spain

Panel Discussion	
Networking & Refreshment Break 16:00-16:20	
16:20-16:40	<b>Title: Some progress concerning the use of magnetic barkhausen noise for magnetic materials characterization</b> Jose Alberto Perez Benitez, Instituto Politécnico Nacional, Mexico
16:40-17:00	<b>Title: Characterization and theranostics application of pluralistic ferrite nanoparticles</b> Yuko Ichiyanagi, Yokohama National University, Japan
17:00-17:20	<b>Title: Study of structural and magnetic properties of manganese doped cobalt ferrite nanoparticles for high frequency and sensor applications</b> Feroz A Khan, Bangladesh University of Engineering and Technology, Bangladesh
17:20-17:40	<b>Title: Ballistic transport of spin waves in ultrathin disordered <math>[\text{Fe}_{1-c}\text{Ni}_c]_n</math> alloy nanojunctions between Co leads using an EFT-PFMT formalism</b> Elie A Moujaes, Federal University of Rondônia, Brazil
Panel Discussion	

Day 3      October 21, 2017
Conference Hall: Madison

Keynote Forum	
09:30-10:00	<b>Title: On-chip plasmonic modulator</b> M A Swillam, The American University in Cairo, Egypt
10:00-10:30	<b>Title: Negative partial density of states in mesoscopic systems</b> P Singha Deo, S N Bose National Centre for Basic Sciences, India

Panel Discussion	
Networking & Refreshment Break 10:30-10:50	
Sessions: Quantum Physics and High Energy Physics   Superconductivity and Superfluidity   Theoretical and Experimental Study of Soft Matter	
Session Chair: I Chávez, Instituto de Investigaciones en Materiales, Mexico	
Session Co-chair: Ranjan Chaudhury, S N Bose National Centre For Basic Sciences, India	
Session Introduction	

- 10:50-11:10 **Title: BCS-Bose crossover extended with hole cooper pairs**  
I Chávez, Instituto de Investigaciones en Materiales, Mexico
- 11:10-11:30 **Title: Topological excitations in low dimensional magnetic systems**  
Ranjan Chaudhury, S N Bose National Centre For Basic Sciences, India
- 11:30-11:50 **Title: Initial model of ether describing electromagnetic phenomena, including gravity**  
Ioan Has, Land Forces Academy, Romania
- 11:50-12:10 **Title: Fast zero-point family of methods for computing phonon dispersion**  
Anant Raj, North Carolina State University, USA

Panel Discussion	
Lunch Break 12:10-13:00	
13:00-13:20	<b>Title: Weyl semimetals A S -matrix study</b> D Schmeltzer, The City University of New York, USA
13:20-13:40	<b>Title: Photoinduced interfacial electron transfer dynamics of CdSe quantum dots on single crystal rutile <math>\text{TiO}_2</math> (001), (110), and (111) surfaces</b> Taro Toyoda, The University of Electro-Communications, Japan

- 13:40-14:00 **Title: Surface and disorder novel effects on interlayer exchange coupling through magnetic tunnel junctions: Ab initio study**  
Ke Xia, Beijing Normal University, China
- 14:00-14:20 **Title: Condensed matter physics at the threshold of the extreme environments of temperature and magnetic fields**  
Kevin Storr, Prairie View A&M University, USA

#### Panel Discussion

#### Poster Presentations 14:20-15:00

- CMP 001 **Title: Equivalence between floquet-magnus and Fer expansions to investigate the dynamics of a spin system in the three-level system**  
Eugene Stephane Mananga, The City University of New York, USA
- CMP 002 **Title: Introduction in the band theory of liquid dielectrics**  
Alexander Shimkevich, NRC Kurchatov Institute, Russia
- CMP 003 **Title: Hybrid plasmonic electro-optical ring resonator based modulator based on electrically tuning the ITO's properties**  
M A Swillam, The American University in Cairo, Egypt
- CMP 004 **Title: Python Script in the processing of electrochemical impedance spectroscopy and current transient measurements for the determination of the chemical capacitance**  
Daniel Andres Triana Camacho, Industrial University of Santander, Colombia

#### Video Presentations

- 15:00-15:10 **Title: Treatment of the 'sing problem' by pair phase space pseudopotential**  
V S Filinov, Joint Institute for High Temperatures of the Russian Academy of Sciences, Russia
- 15:10-15:20 **Title: Scaling of thermocapillary molten pool shape during laser melting**  
Peng-Sheng Wei, National Sun Yat-Sen University, Taiwan
- 15:20-15:30 **Title: The decomposition of the solution during phase transition**  
Alex Guskov, Institute of Solid State Physics of RAS, Russia
- 15:30-15:40 **Title: New light-emitting materials for optical technologies based on complexes with europium**  
Peter P Pershukovich, The Institute of Physics of NAS Belarus, Belarus

#### Awards & Closing Ceremony

