



**Joint NUST-NCP International College on Space & Astrophysical Plasmas**  
**Oct. 30 – Nov. 03, 2023, Islamabad, Pakistan**

**Academic Program**

**Monday October 30<sup>th</sup>, 2023 (SMME Seminar Hall, NUST Islamabad)**

**09:00 – 09:45 Registration**

**10:00-10:30 Inaugural Session**

**10:30 – 11:00 Tea Break**

**Chairman –Dr. Hamid Saleem**

**11:00 – 12:00 Dr. Peng- Fei Chen (China- Online Talk) Moreton waves and EIT waves on the Sun**

**12:00 – 12:45 Dr. Lina Hadid (France- Online Talk) The BepiColombo Mission to Mercury and Ion Composition**

**12:45 – 13:00 Shanza Arooj Fundamental Electrostatic Modes of PI and NPI Plasmas with and without electrons**

**13:00 – 14:30 Prayer/Lunch Break**

**Chairman – Dr. Shahid Ali**

**14:30 – 15:15 Dr. Bengt Eliasson (UK- Online Talk) Nonlinear effects during active space plasma experiments using large amplitude radio waves**

**15:15 – 16:00 Dr. Ioannis Kourakis (UAE) Electrostatic Solitary Waves in Space Plasmas- Theoretical Setting and Some Recent Results**

**16:00 – 16:30 Dr. Shahzad Mahmood Modulation Instability and Envelope Soliton of Electrostatic Waves In Magnetized Plasmas with Ion Pressure Anisotropy**

**16:30 – 17:00 Tea**

**Tuesday October 31<sup>st</sup>, 2023 (SMME Seminar Hall, NUST Islamabad)**

**Chairman – Dr. Shahzad Mahmood**

9:30 – 10:30 **Dr. Hamid Saleem** Thermal Energy as a Source for Seed Magnetic Fields and Plasma Jets

**10:30 – 11:00** **Tea Break**

**Chairman – Dr. G. Murtaza**

11:00 – 12:00 **Dr. Peng- Fei Chen (China- Online Talk)** Formation, oscillation, and eruptions of solar filaments

12:00 – 13:00 **Dr. Hassan A Shah** The Impact of Quantized Magnetic Pressure on the Stimulated Brillouin Scattering of Electromagnetic Waves

**13:00 – 14:30** **Prayer/Lunch Break**

**Chairman – Dr. Hassan A Shah**

14:30 – 15:15 **Dr. Stefaan Poedts (Belgium- Online Talk)** Challenges in Heliospheric Wind and CME Evolution Modelling

15:15 – 15:45 **Dr. Shahid Ali** Spacecraft Surface Charging at Geostationary Earth Orbit

15:45 – 16:30 **Dr. George Livadiotis (USA- Online Talk)** Kapa Distributions and non-extensive Statistical Mechanics in Space Science

16:30 – 17:00 **Tea**

Resource Persons: Dr. Shahid Ali, Dr. Shabbir Ahmad and Dr. Tajammal Hussain

**Wednesday November 1<sup>st</sup>, 2023 (SMME Seminar Hall, NUST Islamabad)**

**Chairman – Dr. Shabbir Ahmad**

9:30 – 10:15 **Dr. Fraz Bashir (USA- Online Talk)** Advancing Magnetospheric Research in Pakistan:  
Merging Local Theories with Global Data and Simulations

10:15 – 10:45 **Dr. Mushtaq Ahmad** Magneto rotational Instability in Accretion Disk Plasmas: Quantum  
Mechanical Approach

**10:45 – 11:15 Tea Break**

**Chairman – Dr. Nouman Sarwar**

11:15 – 12:15 **Dr. Ioannis Kourakis (UAE)** Optical-type Envelope Solitons and Freak  
Waves in Plasmas – The Modeling Principles

12:15 – 13:00 **Dr. Mohsin Siddique** TBD

**13:00 – 14:30 Prayer/Lunch Break**

**Chairman – Dr. Mushtaq Ahmad**

14:30 – 15:00 **Dr. Shabbir Ahmad** Full-Wave Modeling and Analysis of Non-Resonant Heating in  
Inhomogeneous Plasmas

15:00 – 15:20 **Dr. Zulfiqar Ahmad** Impact of Arbitrary Degeneracy on Two-Stream Instabilities in  
Quantum Semiconductor Plasmas

15:20 – 15:40 **Dr. Rabia Jahangir** Electron-Beam driven Interaction of Electron Acoustic Waves in  
Auroras

15:40 – 16:00 **Dr. Muhammad Shahid** Grad-B Drift Effects on Rayleigh Taylor Instability for Earth's  
Magnetospheric Plasmas

16:00 – 16:30 **Dr. Nazia Batool** Multi Soliton Interaction of Electrostatic Waves in Pair-ion-electron  
Plasma

**16:30 – 17:00 Tea**

Resource Persons: Dr. Shahid Ali, Dr. Shabbir Ahmad and Dr. Tajammal Hussain

**Thursday November 2<sup>nd</sup>, 2023 (SMME Seminar Hall, NUST Islamabad)**

**Chairman – Dr. Mohsin Siddique**

9:30 – 10:15 **Dr. David Hatch (USA- Online Talk)** New Strategies for Dramatically Increasing Confinement in Magnetic Fusion Energy

10:15 – 10:45 **Dr. Waqas Masood** Bäcklund Transformation for Analyzing a Cylindrical Korteweg–de Vries Equation and Investigating Multiple Soliton Solutions in a plasma

**10:45 – 11:15 Tea Break**

**Chairman – Dr. Waqas Masood**

11:15 – 12:00 **Dr. Faisal ur Rahaman** Clustering Statistics and Investigating the CMB Cold Spot with EMU-ASKAP and WALLABY-ASKAP Surveys

12:00 – 12:30 **Dr. Nouman Sarwar** Ion Velocity Distributions in Space Plasmas

12:30 – 13:00 **Dr. Saba Majeed** Relaxed Equilibrium Structures in Three-component Dusty Plasmas

**13:00 – 14:30 Prayer/Lunch Break**

**Chairman – Dr. Tajammal Hussain/Dr. Ali Ahmad**

14:30 – 14:50 **Dr. Mudassir Ali Shah** Electromagnetic Waves in fully Relativistic Electron Plasma

14:50 – 15:10 **Dr. Aamir Shahzad** Role of Electric Field on Diffusion Coefficients for Weakly Coupled Plasma

15:10 – 15:30 **Dr. Gohar Abbas** Dispersion Properties of the Waves with Temperature Anisotropy and Arbitrary Temperature Degeneracy

15:30 – 16:30 **Group Discussion**

**16:30 – 17:00 Tea**

Resource Persons: Dr. Shahid Ali, Dr. Shabbir Ahmad and Dr. Tajammal Hussain

**Friday November 3<sup>rd</sup>, 2023 (SMME Seminar Hall, NUST Islamabad)**

**Chairman – Dr. Gohar Abbas**

- 9:30 – 10:00 **Dr. Hamid Saleem** Criteria for Pure Pair Ion Plasma and Role of Electrons at Extremely Low Density
- 10:00 – 10:20 **Dr. Muhammad Shamir** Magnetospheric Multiscale Observations of Double Layers in the Earth's Bow Shock
- 10:20 – 10:40 **Usman Saeed** Nonlinear Structures in Terrestrial Ionospheric Plasma with Non-extensive Electrons
- 10:40 – 11:00 **Dr. Samia Gurmani** TBD

**Closing Ceremony: 11:00—12:00**  
**High Tea/ Departure**

- ❖ **We are thankful to National Centre for Physics (NCP), Pakistan Academy of Sciences (PAS) and National University of Sciences and Technology (NUST) for financial support.**

Resource Persons: Dr. Shahid Ali, Dr. Shabbir Ahmad and Dr. Tajammal Hussain