

Report on AAPPS-DPP Sessions in APPC-14

The 14th Asia-Pacific Physics Conference 2019 (APPC14) was successfully organized from 17 – 21 November 2019 at Borneo Convention Centre Kuching (BCCK), Sarawak, Malaysia. The Institut Fizik Malaysia (Malaysian Institute of Physics) was the local host of APPC14. This is the 14th in the series of APPC organized by the AAPPS. For the first time this was organized together with various divisions of AAPPS which include the Division of Plasma Physics (DPP), the Division of Astrophysics, Cosmology and Gravity (DACG), and the Division of Nuclear Physics (DNP) and some other divisions who are taking shapes.

The scientific areas covered in the APPC14 included following broad areas:

1. Astrophysics, Cosmology, and Gravitation
2. Atomic, Molecular & Optical Physics
3. Condensed Matter, Semiconductor & Materials Physics
4. Particle Physics
5. Strongly Correlated Electron Systems
6. Optics & Laser
7. Synchrotron Radiation
8. Statistical Physics & Bioinformatics
9. Complex Systems, Mathematical Physics & Computational Physics
10. Biological and Medical Physics
11. Physics Education
12. Magnetism & High Magnetic Field
13. Nuclear Physics
14. Plasma Physics
15. Women in Physics
16. Quantum Information

The AAPPS-DPP took care of Plasma Physics area, which was further divided into three sub-sessions viz:

1. Applied and Basic Plasma – organized by Rajdeep Singh Rawat, Nanyang Technological University, Singapore
2. Astro Plasma – organized by Ryoji Matsumoto, Chiba University, Japan
3. Magnetic Fusion Plasma – Baonian Wan, Institute of Plasma Physics, Chinese Academy of Sciences, China

Overall coordination of these three area was done by Mitsuru Kikuchi, AAPPS-DPP Chair with support from Rajdeep Singh Rawat, APPC14 Vice Chair.

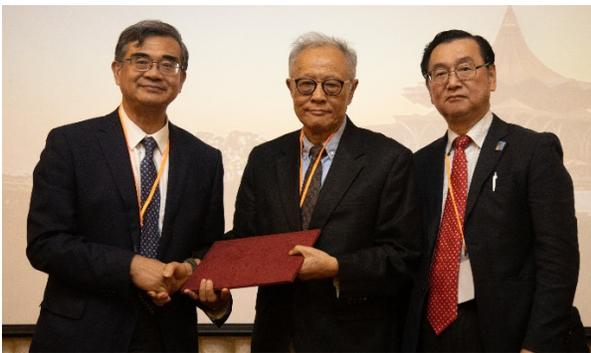
AAPPS-DPP also presented S. Chandrasekhar Prize of Plasma Physics for 2019 to Professor Liu Chen of Zhejiang University/University of California, Irvine and Professor Kanazuri Shibata of Kyoto University. Both S. Chandrasekhar Prize winners gave the plenary talks APPC14.



Prof K Shibata (left) with Prof A Sen (right)

Title of Plenary Talk - Extraordinary Activity of Magnetized Plasmas in the Sun, Stars, and Galaxies

Prof Kanazuri Shibata, Kyoto University, Japan



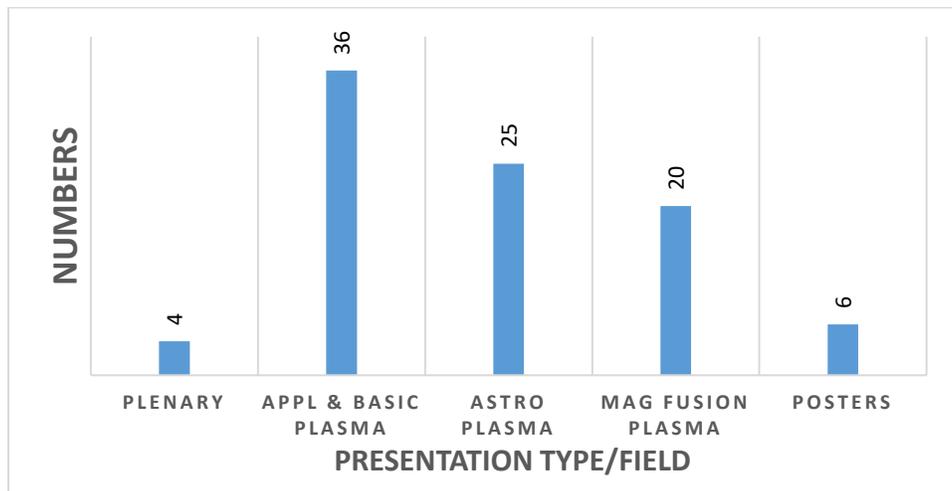
Prof Liu Chen (centre) with Prof Gui Lu-long (left) and Prof M Kikuchi (right)

Title of Plenary Talk - Physics of Kinetic Alfvén Waves: A Gyrokinetic Theory Approach

Professor Liu Chen, Zhejiang University, China and University of California, Irvine

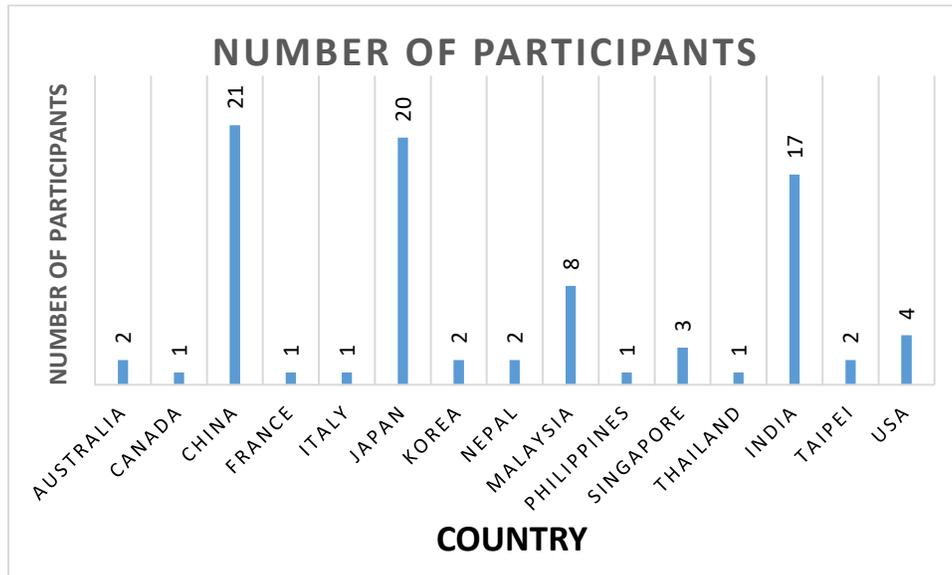
Other two Plenary Talks on Plasma were given by Prof Bertrand Lembège LATMOS-CNRS, France on “Analysis of Macro/Micro-Turbulence within Quasiperpendicular Supercritical Collisionless Shocks via Numerical Simulations” and by Prof Miran Mozetic, Institute Jozef Stefan, Slovenia on “Plasma Technologies in Industry 4.0 – Review and Challenges”.

A total of 527 participants from 24 countries participated in APPC-14. A total of 91 presentations were made under different plasma sessions whose distribution is shown below.



Out of the 85 oral presentations, there were 4 Plenary (45 minutes), 56 invited (30 minutes) and 25 contributory (15 minutes) presentations.

A total of 89 participants participated in plasma sessions with 2 participants giving 2 presentations, rest all gave only one presentation each. 89 plasma participants were from 15 different countries with their distribution shown below.



Some pictures from APPC-14 are shown below for record.



APPC14 Group Photo



S. Chandrasekhar Award Presentation at APPC14 Banquet



Some of Plasma Session Participants from India and Singapore with Prof Kikuchi

Report Prepared by –
Rajdeep Singh Rawat, Vice Chair APPC14

Appendix - Complete Plasma Program in Three Parallel Sessions

Day 1: Morning Parallel Sessions / 11:15 - 12:45				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.1a)		Chair: Matthew Hole
11:15	30	Tomohiro Morisaki	<i>NIFS, Japan</i>	Oveview of the Recent LHD Deuterium Epxeriment
11:45	30	Fulvio Auriemma	<i>Consorzio RFX, Italy</i>	TRANSP Predictive Modelling for ExB Studies in Pure D and T H-mode JET Plasmas
12:15	15	Dangtip Somsak	<i>TINT, Thailand</i>	Progress on Fusion Research in Thailand and Development Plan for Thailand Tokamak 1 (TT1) Facility
Room 2		Astro Plasma (AP.1a)		Chair: XH Deng/R. Prajapati
11:15	30	Abhijit Sen	<i>Institute for Plasma Research, India</i>	Characteristics and Applications of Nonlinear Fore-Wake Excitations from moving Charged Objects in Space Plasmas
11:45	30	Kunihiro Keika	<i>University of Tokyo</i>	Transport and Energization of Ionospheric Ions in Earth's Magnetotail: Recent Multi-spacecraft Observations
12:15	30	Nimardeep Kaur	<i>Guru Nanak Dev University</i>	Ion Acoustic Breathers and Freak Waves in a Magnetized Quantum Plasma with Density Effects of Spin of Degenerate Electrons
Room 3		Applied and Basic Plasma (AB.1a)		Chair: Miran Mozetic
11:15	30	Heping Li	<i>Tsinghua University</i>	Cold Atmospheric Plasmas: Physical Properties, Characteristics Modulations and Bio-Medical Applications
11:45	30	Masafumi Ito	<i>Meijo University</i>	Promotion of Bio-ethanol Production using Atmospheric-pressure Plasmas
12:15	15	Abhishek Sharma	<i>JECRC University</i>	Comparative Study Plasma Nitriding Process on AISI 1045 and AISI 4140 Steels
Day 1: Afternoon Parallel Sessions / 14:00 - 15:30				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.1b)		Chair: Tomohiro Morisaki
14:00	30	Matthew Hole	<i>Australian National University</i>	The Impact of Anisotropy on ITER Scenarios and ELMs
14:30	30	Baonian Wan	<i>Chinese Academy of Sciences</i>	Extension of High-performance Steady-state Plasma Regimes on EAST towards Future Fusion Rector
14:45	15	Wenfeng Guo	<i>IPP, Chinese Academy of Sciences</i>	Numerical Study of Double Tearing Mode in High Lundquist Number Regime with High Order Accuracy
Room 2		Astro Plasma (AP.1b)		Chair: T. Yokoyama
14:00	30	Bo Li	<i>Shandong University</i>	Seismological Applications of Magnetohydrodynamic Wave collectively supported by Solar Coronal Loops
14:30	30	Qingmin Zhang	<i>Chinese Academy of Sciences</i>	Fine Structures in Coronal Jets

Room 3		Applied and Basic Plasma (AB.1b)		Chair: Uros Cvelbar
14:00	30	Deepak Prasad Subedi	<i>Kathmandu University</i>	Surface Treatment Of Polypropylene By Dielectric Barrie Discharge Generated At Near Atmospheric Pressure
14:30	30	Nafarizal Nayan	<i>UTHO Malaysia</i>	Raman Spectroscopy of CZTS and ALN Thin film prepared by RF Magnetron Sputtering Plasma Deposition
15:00	15	Yen-Theng Lau	<i>University of Malaya</i>	Hydrophilization and Hydrophobic Recovery of Polymers and Borosilicate Glass Treated by 50 Hz Argon Plasma
15:15	15	Kulwant Singh	<i>Bhabha Atomic Res. Centre, India</i>	Prediction of Coating Composition using Composite-target Magnetron Sputtering and its Experimental Validation
Day 1: Afternoon Parallel Sessions / 16:00 - 17:30				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.1c)		Chair: Baonian Wan
16:00	30	Ahmed Diallo	<i>Princeton PPL</i>	Pedestal Dynamics and Onset Mechanism of ELMs
16:30	30	Guo Liang Xiao	<i>Southwestern Inst. of Physics</i>	Edge Localized Mode Mitigati with Different External Source Input on HL-2A Tokamak
17:00	30	Guo Liang Xiao (on behalf of W Zhong)	<i>Southwestern Inst. of Physics</i>	Enhancement of Nonlinear Regulation Dynamics by SMBI and Its Role in L-H Transition Tokamak Plasmas
Room 2		Astro Plasma (AP.1c)		Chair: R. Yamazaki
16:00	30	Zhen Cao	<i>Institute of High Energy Physics, China</i>	LHAASO Experiment and Its First Results
16:30	30	Albert K. H. Kong	<i>Nat. Tsing Hua University</i>	Millisecond Pulsars in the Multiwavelength Era
17:00	30	Kouchi Hirotani	<i>ASIAA</i>	Particle-in-Cell Simulations of Black Hole Magnetospheres
Room 3		Applied and Basic Plasma (AB.1c)		Chair: Heping Li
16:00	30	Uros Cvelbar	<i>Jožef Stefan Institute</i>	Plasma-grown Carbon Nanostructures and their Hybrids
16:30	30	Rajdeep Singh Rawat	<i>Nanyang Technol. Univ.</i>	Nitrogen RF Plasma Device based Synthesis of Porous Functionalized Nanostructure for Industrial Energy Applications
17:00	15	Thiam-Oun Teh	<i>Inti International Univ.</i>	An Investigation in the Concept of Producing Textured Cutting Tools by using a Plasma Focus Machine
17:15	15	Oi-Hoong Chin	<i>University of Malaya</i>	Activation of Deionized Water by Atmospheric Plasma Jets in Helium, Argon and Argon-Nitrogen Gas Flows

Day 2: Morning Parallel Sessions / 11:15 - 12:45				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.2a)		Chair: Rajesh Maingi
11:15	30	Sumin Yi	<i>Nat. Fusion Res. Inst. Korea</i>	Gyrokinetic Simulation Study of Zonal Flow Staircases in a KSTAR L-mode Plasma
11:45	30	Hogun Jhang	<i>Nat. Fusion Res. Inst. Korea</i>	Influence of Ion Flow and Fluctuations on Zonal Flow Formation in Magnetically Confined Plasmas

Room 2		Astro Plasma (AP.2a)		Chair: K. Shibata
11:15	30	Alexandre Lazarian	<i>Univ. of Wisconsin-Madison</i>	Intimate Connection of Astrophysical Magnetic Reconnection and Turbulence
11:45	30	Siyao Xu	<i>Univ. of Wisconsin-Madison</i>	Turbulent Dynamo in a Weakly Ionized Medium
12:15	30	Satoshi Okuzumi	<i>Tokyo Institute of Technology</i>	The Non-linear Ohm's Law: How Plasma Heating changes the Ionization Balance and MHD of Protoplanetary Disks
Room 3		Applied and Basic Plasma (AB.2a)		Chair: Nareshpal Saini
11:45	30	Amar Misra	<i>Visva-Bharati Univ.</i>	Stimulated Scattering in Relativistic Plasmas
12:15	15	Ramprasad Prajapati	<i>Guru Ghasidas Central Univ.</i>	Rayleigh-Taylor Instability and Internal Waves in Strongly Coupled Quantum Plasma
Day 2: Afternoon Parallel Sessions / 14:00 - 15:30				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.2b)		Chair: Somsak Dangtip
14:00	30	Hang Si	<i>ASIPP</i>	Advanced Power Exhaust Studies: from present EAST/DIII-D to future CFETR Tokamak Devices
15:00	15	Zhongshi Yang	<i>ASIPP</i>	Experiments and Simulations for Power Exhaust by Impurity Seeding on EAST
15:15	15	Yingfeng Xu	<i>ASIPP</i>	Simulations of NBI Fast Ion Losses in the Presence of Resonant Magnetic Perturbations in EAST Tokamak
Room 2		Astro Plasma (AP.2b)		Chair: S. Okuzumi
14:00	30	Ramprasad Prajapati	<i>Guru Ghasidas Central Univ.</i>	Waves and Instabilities in Dusty Space Plasma
Room 3		Applied and Basic Plasma (AB.2b)		Chair: Atsushi Okamoto
14:00	30	Smruti Ranjan Mohanty	<i>Institute for Plasma Res., Assam</i>	Basics of Inertial Electrostatic Confinement Fusion and its Applications
14:30	30	Hongbin Ding	<i>Dalian University of Technol.</i>	Development of Laser-based Wall Diagnostic Approach for Fusion Devices
15:15	15	Mayank Mishra	<i>Nayang Technol. University</i>	Diagnostics of Slow Focus Mode Dense Plasma Focus Device
Day 2: Afternoon Parallel Sessions / 16:00 - 17:30				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.2c)		Chair: GuoLiangXiao
16:00	30	Richard Sydora	<i>University of Alberta</i>	Stimulated Excitation of Thermal Waves in Magnetized Plasmas and Use in Thermal Conductivity Measurement

16:30	15	Zhongyong Chen	<i>HuaZhong Univ. of Sci. & Technol.</i>	Disruption Mitigation by Shattered Pellet Injection on J-TEXT
Room 2		Astro Plasma (AP.2c)		Chair: B. Lembege
16:00	30	Ryo Yamazaki	<i>Aoyama Gakuin University</i>	Shock Waves in Astrophysical and Laboratory Plasmas
16:30	30	Masahiro Hoshino	<i>University of Tokyo</i>	Ion and Electron Heating and their Energy Partition during Magnetic Reconnection
Room 3		Applied and Basic Plasma (AB.2c)		Chair: Smruti Ranjan Mohanty
16:00	30	Tsun-Hsu Chang	<i>National Tsing Hua University</i>	TM Waveguide Modes for Gyrotron Backward-Wave Oscillators
16:30	30	Modhuchandra Laishram	<i>Univ. of Sci. & Technol. China</i>	A Dusty Plasma Model for Characteristics of Vortices in Jupiter's Atmosphere
17:00	15	Jyotirmoy Goswami	<i>Jadavpur University</i>	Quantum Two Stream Instability in a Relativistically Degenerate Magnetised Plasma
17:15	30	Ding Li	<i>Chinese Academy of Sciences</i>	Influence of High Magnetic Field on Plasma Kinetics

Day 3: Morning Parallel Sessions / 11:15 - 12:45				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.3a)		Chair: Zhongyong Chen
11:45	30	Chen Lin	<i>Peking University</i>	Laser-accelerated Ion-beam Trace Probe (LITP): A New Diagnostics Method of 2D Profiles of Bp and Er in Tokomaks
Room 2		Astro Plasma (AP.3a)		Chair: S. Inutsuka
11:15	30	Tomoya Takiwaki	<i>Nat. Astronomical Observatory, Japan</i>	Characters and Roles of Hydrodynamic Instabilities that appear in Core-collapse Supernovae
11:45	30	Ke-Jung Chen	<i>Academia Sinica</i>	Magnetar-powered Supernovae
12:15	15	Archana Patidar	<i>Ujjain Engineering College, India</i>	Jeans Instability with Dissipative Effects in Neutrino Self-Gravitating Plasma
12:30	15	Hasan Abu Kassim	<i>University of Malaya</i>	Neutrino Energy Loss in Progenitors of Pair Instability Supernovae
Room 3		Applied and Basic Plasma (AB.3a)		Chair: Mohan Jacob
11:15	30	XinPei Lu	<i>HuaZhong Univ. of Sci. & Technol.</i>	Helix Streamers
11:45	30	Magdaleno Jr Vasquez	<i>University of the Philippines</i>	Development of Plasma Sources for Modification of Materials

12:15	15	Hom Bahadur Baniya	<i>Kathmandu University</i>	Diagnosics of Atmospheric Pressure Plasma Jet and Its Applications.
Day 3: Afternoon Parallel Sessions / 14:00 - 15:30				
Time	(min)	Speaker		Paper Title
Room 1		Magnetic Fusion Plasma (MF.3b)		Chair: Robin
14:00	30	Mitsuru Kikuchi	<i>ILE, Osaka University</i>	Advances in Physics Basis of L-mode Edge Negative Triangularity Tokamak Reactor
14:30	30	Rajesh Maingi	<i>Princeton PPL</i>	Impurity Injection for Improved Fusion Plasma Performance in Tokamaks
15:00	15	Pengjun Sun	<i>ASIPP</i>	Experimental Observation of the Effect of Electron-mode Microturbulence on Ohmic Energy Confinement Saturation and Degradation in EAST Plasmas
Room 2		Astro Plasma (AP.3b)		Chair: A. Kong
14:00	30	Kenji Toma	<i>Tohoku University</i>	Recent Topics in High Energy Astrophysics
14:30	30	Ken Ohsuga	<i>Tsukuba University</i>	Radiation Hydrodynamic/Magnetohydrodynamic Simulations of Super-Eddington Accretion Flows and Outflows
15:00	15	Mami Machida	<i>Kyushu University</i>	Magnetic Energy Dissipation by Small Scale Turbulence in Accretion Disks
15:15	15	Taichi Igarashi	<i>Chiba University</i>	Radiation Magnetohydrodynamic Simulations of Changing Look AGNs
Room 3		Applied and Basic Plasma (AB.3b)		Chair: XinPei Lu
14:00	30	Mineo Hiramatsu	<i>Meijo University</i>	Plasma Processing for Graphene-based Materials
14:30	30	Hiroshi Hashizume	<i>Nagoya University</i>	Effects of Plasma Treatment on Plant Cultivation
15:00	15	Hong-Chun Lee	<i>University of Malaya</i>	Study of a Side-fed, Tongue-flared Configured Pulsed Plasma Thruster
Day 3: Afternoon Parallel Sessions / 16:00 - 17:30				
Time	(min)	Speaker		Paper Title
Room 2		Astro Plasma (AP.3c)		Chair: R. Matsumoto and M. Hoshino
16:00	30	Takaaki Yokoyama	<i>University of Tokyo</i>	Magnetic Reconnection Model of Flares, Eruptions and Jets in the Solar Atmosphere
16:30	30	Shu-ichiro Inutsuka	<i>Nagoya University</i>	Star Formation and Magnetohydrodynamical Outflows and Jets
17:00	15	Ryoji Matsumoto	<i>Chiba University</i>	Radiation Magnetohydrodynamic Simulations of Intermittent Ejection of Jets during Hard-to-Soft State Transition in Black Hole Accretion Flows
Room 3		Applied and Basic Plasma (AB.3c)		Chair: Masafumi Ito
16:00	30	Mohan Jacob	<i>James Cook University</i>	Vertical Graphene grown using Plasma Enhanced Chemical Vapour Deposition: Methods and Applications

16:30	30	Janez Zavašnik	<i>Jožef Stefan Institute</i>	In-situ Observations of Nanoparticle Synthesis and Reactions with Ionic Liquids
17:00	15	Avinash Chaurasiya	<i>Nanyang Technol. University</i>	Plasma Modified Electrical and Magnetic Properties of Artificial Multiferroic Composite
17:15	15	Mamta Singh	<i>University of Delhi</i>	Second Harmonic Generation in Tunnel Ionizing Plasma in the Presence of Electron-Ion Recombination

Day 4: Morning Parallel Sessions / 11:15 - 12:45				
Time	(min)	Speaker		Paper Title
Room 3		Applied and Basic Plasma (AB.4a)		Chair: DN Gupta
11:15	30	Atsushi Okamoto	<i>Nagoya University</i>	Ion Collision Effect in Collisional Radiative Processes in Magnetized Plasma
11:45	30	Divya Singh	<i>University of Delhi</i>	Terahertz Radiation Generation via Laser Plasma Interaction: Overview
Day 4: Afternoon Parallel Sessions / 14:00 - 15:30				
Time	(min)	Speaker		Paper Title
Room 3		Applied and Basic Plasma (AB.4b)		Chair: Amar Misra
14:00	30	Devki Nandan Gupta	<i>University of Delhi</i>	Gas-Ionization Effects on Electron Acceleration by a Self-diverging Laser Pulse
Day 4: Afternoon Parallel Sessions / 16:00 - 17:30				
Time	(min)	Speaker		Paper Title
Room 3		Applied and Basic Plasma (AB.4c)		Chair: Tsun-Hsu Chang
16:00	30	Nareshpal Singh Saini	<i>Guru Nanak Dev University</i>	Multisolitons in a Polarized Non-Maxwellian Dusty Plasma
16:30	30	Ke Yao	<i>Fudan University</i>	Resonant Electron Ion Recombinations: Reliable Atomic Data for High Temperature Plasmas
17:00	15	Kuldeep Singh	<i>Guru Nanak Dev University</i>	Self Gravito-Acoustic Nonlinear Excitations In Self Gravitating Degenerate Quantum Plasma

Poster Presentations

Day 2: Poster Sessions / 15:30 - 17:30

Ahmad Najwan b. Zulkiplee	<i>Universiti Sains Malaysia</i>	The Effects of Electrode Configurations toward Plasma Current Sheath in Mather-type Plasma Focus by using Mathematical Modeling	Plasma
Jyotirmoy Goswami	<i>Jadavpur University</i>	Beam Instability in a Electron Positron Ion Quantum Plasma	Plasma
Kenji Nakamura	<i>Kyushu Sangyo University</i>	Numerical Study of the Effects of Thermal Conduction in Hard-to-Soft X-ray Transitions of Black Hole Candidates	Plasma

Khaizuran Akmal bin Kasman	<i>Universiti Sains Malaysia</i>	Comparative Study on the Inductance Evolution from Variant Discharge Electrode in a Dense Plasma Focus	Plasma
Sharma Praveen Kumar	<i>Barkatullah University</i>	Quantum Effect On The Rayleigh Taylor Instability In Strongly Coupled Rotating Magnetized Viscoelastic Fluids	Plasma
Sima Roy	<i>Visva Bharati University</i>	Stability of Electromagnetic Solitons and Relativistic Degenerate Plasmas	Plasma