

Session Program

31 October 2025 to 1 November 2025



SPARK 2025 (Symposium on Physics: Advances in Research and Knowledge)

Oral Presentations

North Lakhimpur University, Physics Gallery, Conference Hall, Digital Classroom, and Ranghar Auditorium
Khelmati, Lakhimpur, Assam-787031, India

Saturday 1 November

14:15

Oral Presentations: Track 01

Session | **Location:** Ranghar Auditorium, NLU | **Conveners:** Dr Prabwal Jyoti Phukon, Dr Abinash Das

14:15–14:28 **Neutrino Mass Matrix with unique Correlations**

Speaker

Mr Pralay Chakraborty

14:28–14:41

Effect of Inner Horizon in Hawking Temperature of 5D Myers Perry Black Hole

Speaker

Sraban Kumar Upadhyaya

14:41–14:54

A Minimal and Predictive Hybrid Seesaw Model for Majorana Neutrinos

Speaker

Sagar Tirtha Goswami

14:54–15:07

Bifurcation and Critical Phenomena in Black Hole Thermodynamics

Speaker

Bidyut Hazarika

15:07–15:20

Lyapunov Exponents, Phase Transitions, and Chaos Bound of ModMax AdS Black Holes

Speaker

Mozib Awal

15:20–15:33

Neutrinoless double beta decay in the framework of $D_4 \times Z_2$ Left-Right Symmetric Model

Speaker

Dr Happy Borgohain

15:33–15:46

Convergence properties of Mellin moments under sine-cosine PDF parametrizations

Speaker

Gyati Gyuth

15:46–15:59

Comparative Mellin moment evaluation using exponential and generalized polynomial parametrizations

Speaker

Hiinyo Antun

15:59–16:12

Realisation of Two-Zero Texture of Neutrino Mass Matrix Using Γ_3 Modular Group with Type II Seesaw Dominance in Left-Right Symmetric Model

Speaker

Bhabana Kumar

16:12-16:25

A modular symmetric approach to neutrino mixing with Froggatt-Nielsen mechanism**Speaker**

Gourab Pathak

16:25-16:38

Thermodynamics of Flat 4D Einstein-Gauss-Bonnet Black Hole with Rényi Entropy: An RPST-like formalism**Speaker**

Mr Amijit Bhattacharjee

16:38-16:51

Common Origin of Asymmetric Self-interacting Dark Matter and Dirac Leptogenesis**Speaker**

Dr Manoranjan Dutta

16:51-17:04

Reconstruction of $f(R)$ Gravity in Kaniadakis Holographic Dark Energy Model**Speaker**

Kalyan Malakar

17:04-17:15

Quantum Particle in a Parallelogram: Energy Spectrum and Eigenfunctions**Speaker**

Abinash Das

17:15

14:15

Oral Presentations: Track 02**Session** | **Location:** Conference Hall, NLU | **Conveners:** Dr Dipika Robidas, Prof. Pabitra Nath

14:15-14:30

Performance Analysis of Satellite-Based Classical and Quantum Communication with Adaptive Optics**Speaker**

Moushumi Barman

14:30-14:45

Optimizing circuit implementation and analyzing the parameter dependency for the FitzHugh-Nagumo model**Speaker**

Bandita Deka

14:45-15:00

Analysis, Modeling and Hardware Emulation of Indoor Power Line Channels for Power Line Communication**Speaker**

Kangkan Medhi

15:00-15:15

A Bio-inspired Dual-Parameter Sensor-Based Microstrip Patch Antenna for Soil Moisture and Salinity Detection**Speaker**

MUHIM KULI

15:15-15:30

Smartphone-Integrated Paper-based Fluorescence Optode for Point-of-Care Monitoring of Na⁺/K⁺ Ratio**Speaker**

Chunuranjan Dutta

15:30-15:45

An Integrated Modeling Framework for Ion Transport and Electrochemical Responses in Paper-Based Microfluidic Sensors**Speaker**

Rimjim Shibam

15:45-16:00

Ultra Thin Polarization Insensitive Band-Pass Frequency Selective Surface For Ku Band Applications**Speaker**

DEBASISH DAS

16:00-16:15

A DFT Study on influence of solvent media on electronic, optical and vibrational properties of TiO₂ Nanoparticle**Speaker**

PRAKASH NANDI

16:15-16:30

A Comparative Study of Hidden Layer Configurations in Multi-Layer Perceptrons (MLP) for Liver Cirrhosis Prediction**Speaker**

Mr Nyakum Nyayu

16:30-16:45

Backaction-Free Weak Force Sensing in a Quantum-Well Equipped Optomechanical System Beyond the Standard Quantum Limit**Speaker**

Alolika Roy

16:45-17:00

Portable Low-Cost Smartphone Microspectrophotometer for Simultaneous Imaging and Spectral Analysis**Speaker**

Mr Biprav Chetry

17:15

Oral Presentations: Track 03

Session | **Location:** Digital Classroom, NLU | **Conveners:** Prof. S. N. Pandey, Dr Kakali Bhuyan

14:15-14:30

Tuning the Neel Temperature of Antiferromagnetic Film: Thickness and Stoichiometry Dependence

Speaker

Jayanta Das

14:30-14:45

Berry Curvature Driven Anomalous and Spin Hall Effect in Ferromagnetic Janus Material

Speaker

Deepshekhar Roy

14:45-15:00

Momentum-Resolved Spin Splitting in 3D Altermagnets: Interplay of Ferromagnetic and Antiferromagnetic orders

Speaker

ROTISH SARKAR

15:00-15:15

An Analysis of Performance for n-Type Polycrystalline Silicon Cantilever-based Piezoresistive Pressure Sensors with Different Doping Concentrations

Speaker

Mr Lukram Bobinson Singha

15:15-15:30

Metal-Incorporated CdS Nanostructures for Improved UV Photodetection: A Study for Solar Energy Applications

Speaker

Dilip Saikia

15:30-15:45

Effect of Polyvinylpyrrolidone (PVP) concentration upon YBCO nanoparticles synthesized by sol-gel technique

Speaker

Dr Suparna Bhattacharjee

15:45-16:00

Ag-Au bimetallic nanoparticles deposited on filter paper as a simple SERS substrate for the quantitative analysis of Carbofuran and 2,4-dinitrophenol

Speaker

Nituraj changmai

16:00-16:15

Enhanced Blue Luminescence in $Y_2O_3:Ce^{3+}$, Eu^{2+} Phosphor Mediated by $Ce^{3+} \rightarrow Eu^{2+}$ Energy Transfer

Speaker

Manashree Dutta

16:15-16:30

Green Chemistry Principle Mediated Synthesis of Biocompatible ZnS Quantum Dots: Potential Antibacterial Agent and Photo Catalyst

Speaker

Dr Jejiron Maheswari Baruah

16:30–16:45

Revolutionizing Aqueous Aluminum-Ion Batteries: Manganese Carbonate as a Cathode Material.**Speaker**

Padmini Priyanka

17:15

14:15

Oral Presentations: Track 04**Session** | **Location:** Physics Gallery, NLU | **Convener:** Dr Litul Bokatial

14:15–14:35

Calibration of Organic Liquid Scintillator EJ-315 and Unfolding of Gamma Spectra**Speaker**

Mr Trinayan Saikia

14:35–14:55

Nonlinear structures in a plasma with charged debris and nonthermal electrons**Speaker**

Bikramjit Joardar

14:55–15:15

Estimation of refractivity turbulence structure constant (C_n^2) and atmospheric boundary layer height through ST Radar of Gauhati University**Speakers**

Nilotpal Nath, Pankaj Mili

15:15–15:35

Statistical Characterization of Flux Variability in X-ray Binaries**Speaker**

Dr Kabita Deka

15:35–15:55

Time delayed analysis of a firefly flash model**Speaker**

Dr Debashis Saikia

15:55–16:15

Evidence for collective radial flow in high-multiplicity pp collisions via long-range transverse momentum correlation at Run 3 LHC energy**Speaker**

Mr Rohit Agarwala

17:15