

Day 1 (17 December 2025, Wednesday)

Inaugural Session: 09:00 am - 10:00 am

Venue: Central Auditorium, Shahjalal University of Science and Technology

Time	Details
07:30 am to 09:00 am	Reporting and Reception
09:00 am to 09:05 am	Welcome Address by Dr. Jaseer Ahmed Member Secretary, Organizing Committee, ICAP-2025
09:05 am to 09:10 am	Speech from Special Guest Professor Md. Ahmed Kabir Chowdhury Dean, School of Physical Sciences, SUST, Sylhet, Bangladesh
09:10 am to 09:15 am	Speech from Special Guest Professor Dr. Md. Ismail Hossain Treasurer SUST, Sylhet, Bangladesh
09:15 am to 09:20 am	Speech from Special Guest Professor Dr. Md Shajedul Karim Pro Vice-Chancellor SUST, Sylhet, Bangladesh
09:20 am to 09:30 am	Speech from Chief Guest Professor Dr. A. M. Sarwaruddin Chowdhury Vice-Chancellor SUST, Sylhet, Bangladesh
09:30 am to 09:35 am	Address by Chair Professor Dr. Md. Shah Alam Convener, Organizing Committee, ICAP-2025
09:35 to 10:00 am	Photo Session
10:00 am to 10:30 am	Tea Break
10:30 am to 11:10 am	Speech from Plenary Speaker Professor Dr. Masashi Ohashi Kanazawa University, Japan Title: Correlation between magnetocaloric effect and crystal growth in manganese oxide ferromagnet $\text{La}_{1.4}\text{Ca}_{1.6}\text{Mn}_2\text{O}_7$

Technical Session-1

Condensed Matter Physics 11:10 am to 12:50 pm

Session Chair: Professor Dr. Shumsun Naher Begum
Department of Physics, SUST, Sylhet
Venue: Central Auditorium, SUST

Invited Speaker	Professor Dr. Abul Klam Azad Universiti Brunei Darussalam, Brunei
Title of the Invited Talk	Solid Oxide Fuel Cells (SOFCs): Technology, Challenges and Applications for Energy Sustainability
Time	11:10 pm to 11:35 pm

Contributory Talks

Abstract No	Abstract Title
119	Design and Realization of Plasmonic Solar Cell Platform
74	Tuning Charge Dynamics through La ³⁺ Substitution in CoFe ₂ O ₄ : Insight for Energy Storage Efficiency
26	Unveiling Crystal Structure and Properties of an Organic-Inorganic Hybrid Material
33	Low-Temperature Fabrication of CIGS Layers Exhibiting Superior Optoelectronic and Semiconductor Properties
178	Investigation of the Insulator to Metallic Phase Transition of LaCoO ₃
8	Structural and Flow Characteristics of Polycarbonate Microfiltration Membrane Synthesized Through the Phase Inversion Technique

**1:00 pm to 2:00 pm
Prayer and Lunch Break**

Technical Session-2

02:00 pm to 03:45 pm

Session Chair: Professor Dr. Masashi Ohashi, Kanazawa University, Japan
Co-chair: Professor Dr. Muhammad Omar Faruk, Department of Physics, SUST, Sylhet
Venue: Room 129, Academic Building-A, SUST

Invited Speaker	Professor Md. Wahadoszamen Department of Physics, University of Dhaka
Title of the Invited Talk	Engineering Light–Matter Interactions in Nanoscale Materials for Enhanced Raman and Nonlinear Optical Responses
Time	02:00 pm to 02:25 pm

Contributory Talks

02:25 pm to 03:45 pm

Room 129A	Nonlinear Optics and Nanoscience
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Session Chair: Professor Dr. Masashi Ohashi, Kanazawa University, Japan
Co-chair: Professor Dr. Muhammad Omar Faruk, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
167	FFT-Based Noise Filtering in Low-Power Z-Scan Measurements
181	Concentration-Driven Higher-Order Nonlinear Optical Responses in Triarylmethane Chromophore
116	Semiconducting and Self-Regulating Characteristics of BaTi0.80Mo0.20O3 Ceramics for heat sink application on microprocessor
183	Thermally Induced Nonlinear Optical Effects in Ni (II), Co (II), and Cu (II) Complexes of L-Phenylalanine: A CW Z-Scan Analysis
32	Synergistic Interplay of Ce-Doped g-C ₃ N ₄ and MXene for Enhanced Energy Storage
130	An Artificial Intelligence Approach Towards Noise Analysis In Electrical Circuits Using Neural Networks And Reinforcement Learning

Room 409 A	Experimental Condensed Matter Physics
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Session Chair: Professor Dr. Abdul Hannan, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
5	Phase stability, electronic, mechanical and thermoelectric properties of Zintl phases: XIn ₂ C ₂ (M= Mg, Sr and Ba)
19	Design of MoS ₂ /VS ₂ /PANI Hybrid Nanocomposites with Superior Electrochemical Capacitance
55	Synthesis and Study of Multifunctional Properties of a High-capacitance Supercapacitor Electrode Pr ₂ CoCrO ₆ Nanoparticles.
154	Theoretical investigation and experimental validation of ZnCr ₂ O ₄ for structural, mechanical, electronic and thermal property
93	Structural, morphological, magnetic and dielectric properties of Nd ³⁺ -doped zinc ferrites using conventional solid state reaction technique for high frequency applications
104	Structure based Electric Polarization in Mo and W Doped BaTiO ₃ Ceramics for Energy storage applications

Room 307 A	Atomic, Molecular and Plasma Physics
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Session Chair: Dr. Md. Khairul Islam, Bangladesh Atomic Energy Commission, Dhaka

Abstract No	Abstract Title
138	Photoelectric effect on dust acoustic mode in ionospheric dusty plasmas with dust charge fluctuation
61	Instability of plasma modes due to photoelectric effect in streaming and irradiated dusty plasmas
81	Comparative Study of Ion and Neutron Properties in Low-Energy Plasma Focus Devices
182	Excitation of Ion Acoustic Mode in Magnetized Dusty Plasma
82	Excitation of Electrostatic Dust Modes in Magnetized Dusty Plasma
77	Atomistic View of Molten Vanadium: Insights from Orbital-Free ab-initio Molecular Dynamics

03:45 pm to 04:00 pm
Tea Break

04:00 pm to 6:00 pm
Poster Session

06:30 pm to 9:00 pm
Online Session

Invited Speaker	Dr. Mohammad Belal Hossen Department of Physics, Chittagong University of Engineering and Technology, Chittagong, Bangladesh
Title of the Invited Talk	Nano-Manganites on a Sustainable Path: Enhancing Functional Properties While Preserving Intrinsic Structure for Sustainable Applications
Time	06:30 pm to 06:55 pm

Contributory Talks
06:55 pm to 09:00 pm

Room IICT Virtual Room	Physics: Mixed
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Session Chair: Dr. Md Enamul Hoque, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
115	Neutronic Assessment of SiC- and ZrC-Reinforced E110 Cladding for VVER-1200 Fuel Assembly Using OpenMC
118	Thermal Performance Improvement of Zr-1%Nb (E110) Cladding Reinforced with 2-15% SiC Nanoparticles for VVER-1200 Fuel Rods Using ANSYS

145	Wigner-based Monte Carlo Simulation of Three-Flavor Neutrino Oscillation in Vacuum
45	Multi-Task Machine Learning for Accelerated Prediction of Band Gap and Formation Energy
51	Bionic Design and Finite Element Analysis of an Elliptical Pressure Hull for Deep-Sea Applications
124	An Investigation on the Efficiency of CIGS solar cell by applying ZnSe buffer layer and Zn-MgO Electron Transport Layer: A Simulation Approach by SCAPS-1D
12	A Comparative Study of Molecular Transport to Identify the Lamellarity of Vesicle Using COMSOL Simulation
99	Comprehensive Analysis of Vertical Wind Shear on Intensity and Rainfall of Tropical Cyclones over the Bay of Bengal
103	Modeling Built-up Area through Atmospheric Pollutants in Bangladesh using Random Forest Algorithm
141	Assessment of Natural and Artificial Radioactivity Levels in Surface Water and Sediment Samples from Bhairab and Rupsha River in Khulna, Bangladesh
21	Evolution of Core Structure from Helium Burning to Oxygen-Neon Stages in a 15 M Star
135	AI-Based Inverse Design of Metamaterials for Electromagnetic Cloaking

Day-2 (18 December 2025, Thursday)**Plenary Speech: 9:00 am to 9:40 am****Session Chair:** Professor Dr. Md Shah Alam, Department of Physics, SUST, Sylhet

Plenary Speaker	Professor Emeritus Dr. A.K.M. Azharul Islam Department of Physics, University of Rajshahi, Rajshahi 6205, Bangladesh.
Title of the Invited Talk	Nanotech Wonders - Road from Fiction to Emerging Reality
Time	9:00 am to 9:40 am
Venue	Mini Auditorium, SUST, Sylhet

Technical Session-3

09:40 am to 11:20 am

Session Chair: Professor Dr. Md Shah Alam, Department of Physics, SUST, Sylhet

Venue: Mini Auditorium, SUST, Sylhet

Invited Speaker	Professor Dr. Khondkar Siddique-e Rabbani Honorary Professor and Founding Chairperson (2008–2015), Department of Biomedical Physics & Technology, University of Dhaka, Dhaka, Bangladesh
Title of the Invited Talk	Bioelectrical Frontiers in Medicine: Diagnostic and Therapeutic Potentials-Explored in Bangladesh
Time	09:40 am to 10:05 am

10:05 am to 10:20 am

Tea Break

Contributory Talks

10:20 am to 11:20 am

Room 129 A	Medical, Health and Bio-Physics
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Session Chair: Professor Dr. Md Shah Alam, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
158	Towards an EMI-Free Hospital Communication System in Bangladesh: A VLC-Based Approach
108	Optimized D-Shaped PCF-SPR Biosensor Using HfO ₂ Adhesive Layer for MDA-MB-231 and MCF-7 Biomarker Detection
163	Z-Scan Profiling of Sunlight-Exposed Cholecalciferol in Pharmaceutical Formulations
143	Impact of GPS Sensor Tracking on Astronauts' Retina to Outbreak of Unexpected Eye Disease
98	A Machine-Learning Framework for Non-Invasive SpO ₂ and Heart Rate Prediction from Photoplethysmography

Room 409A**Condensed Matter Physics: Experiment and Computation**

Session Chair: Professor Dr. Sharif Md. Sharafuddin, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
148	Synthesis and Structural Characterization of Mn Doped SrFeO ₃ as Perovskite
176	Optimizing Deposition of Platinum Nanoparticles on Functionalized Graphene Oxide
72	Exploring the Properties of Double Perovskite Pr ₂ CoCrO ₆ through DFT: An Analysis of Electronic and Optical Properties
85	Generalization and Efficiency of Graph Neural Networks for Crystal Formation Energy Prediction
91	Optimization of the superparamagnetic properties of Fe ²⁺ replacing by Al ³⁺ of Zn-Mn ferries for biomedical applications

Room 307 A**Optoelectronics**

Session Chair: Professor Dr. Nazia Chawdhury, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
34	Sustainable synthesis of Titania Nanoparticles with tunable crystallinity and optoelectronic properties
137	Structural, Optical, and Electrical Properties of FAPbI ₃ Perovskite Film and Simulation of the Perovskite Solar Cells
147	Investigation of Semiconducting and Optical Properties of Spray-Coated Ag-Sn Dual-Doped CdO Thin Films for Optoelectronic Applications
87	Band Gap Engineering and Lattice Distortion in Ce and Cu-Doped BaTiO ₃ Ceramics for advanced optoelectronic applications
134	Optoelectronic and Kinetic Properties of Pt-Bipyridine Complexes as Triplet Emitters in OLEDs: A Computational Study

Technical Session-4

11:30 am to 01:00 pm

Session Chair: Professor Dr. Abdul Hannan, Department of Physics, SUST, Sylhet
Venue: Room 129, Academic Building A, SUST

Invited Speaker	Professor Dr. Saleh Hasan Naqib Department of Physics, University of Rajshahi, Rajshahi 6205, Bangladesh
Title of the Invited Talk	Ca-substituted YBCO: a playground to explore magnetism, hole doping, and T_c degradation
Time	11:30 am to 11:55 am

Contributory Talks

11:55 am to 01:00 pm

Room 129A	Condensed Matter Physics: Theory and Computation
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Session Chair: Professor Dr. Abdul Hannan, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
72	Exploring the Properties of Double Perovskite $\text{Pr}_2\text{CoCrO}_6$ through DFT: An Analysis of Electronic and Optical Properties
80	Dynamic and Mechanical Stability of Ternary Semiconductor Na_2CuP : A Theoretical Insight
105	Electronic and optical properties of the ferromagnetic A_2CrWO_6 ($\text{A} = \text{Sr, Ba}$) for spintronic devices: A DFT insights
161	A comprehensive first-principles analysis of $\text{X}_2\text{AgIrBr}_6$ ($\text{X} = \text{Rb, Cs}$) halide double perovskites for advanced optoelectronic and energy conversion applications
146	Electronic and Charge Transport Properties of Metal Bathocuproine complexes utilizing Quantum Chemical Calculation

Room 409A	Earth, Atmospheric, and Environmental Physics
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Session Chair: Dr. Tanvir Ahmed, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
165	Investigating the relationship between Lightning Potential Index and Microphysical Volume of Hydrometeors using Weather Research and Forecasting Model over Bangladesh
113	Vertical Wind Shear Dominates Over Sea Surface Temperature in Controlling Tropical Cyclone Persistence: A WRF-Based Analysis of Cyclone Remal (2024)
30	Sensitivity of Weather Models to Initial Conditions in Long-Term Forecasts: A Comprehensive Analysis
58	Assessment of Groundwater Quality and its Suitability for Drinking and Irrigation Purposes in Sunamganj Sadar and Bishawamvarpur Upazila, Sunamganj, Bangladesh
22	Spatiotemporal Analysis of Poverty and Climatic Influences on Hospitalization Trends in Bangladesh (2019–2024): A Multivariate Public Health Perspective

Room 307A	Condensed Matter Physics: Experiment and Computation
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Session Chair: Professor Dr. Muhammad Omar Faruk, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
94	Sintering temperature dependent electromagnetic properties of gold (Au ³⁺) doped cobalt based ferrites for different potential applications
89	Sintering effect on electro-magnetic properties of Mn-Zn ferrites by green synthesis route
54	Coupled Influence of Surface Oxidation and Interlayer Structure on Proton Transport in Graphite Oxide
184	A Self-Consistent Computational Design of Fe-Doped CsGeCl ₃ for Flexible Perovskite Solar Cells
150	A Comparative DFT Study of Pb-Based and Pb-Free Ruddlesden-Popper Cs ₂ B ₂ I ₇ , (B = Pb, Ge) Perovskites for Next-Generation Optoelectronic and Solar Cell Applications

01:00 pm to 02:00 pm Prayer and Lunch Break
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Technical Session-5

02:00 – 03:30 pm

Session Chair: Professor Dr. Nazia Chawdhury, Department of Physics, SUST, Sylhet

Venue: Room 129, Academic Building A, SUST

Invited Speaker	Professor Dr. Ismail Rahman Institute of Environmental Radioactivity, Fukushima University, 1 Kanayagawa, Fukushima City, Fukushima 960-1296, Japan.
Title of the Invited Talk	The Fukushima Daiichi Water Challenge: Innovations in Radionuclide Separation and Containment
Time	02:00 pm to 02:25 pm

Contributory Talks

02:25 pm to 03:30 pm

Room 129A	Nuclear, Reactor and Particle Physics
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Session Chair: Professor Dr. Nazia Chawdhury, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
7	$^{191}\text{Ir}(n, \gamma)$ cross section and its impact on astrophysical network calculations
107	Selective Separation Of Radiostrontium From Aqueous Waste Using Porous Macroyclic Based Sorbent
47	An Integrated Remediation Framework for Radionuclide-Contaminated Lands: From Molecular Extraction to Landscape Stabilization
10	Natural radioactivity in sediments of the Jamuna River of Bangladesh: Concomitant radiological risk assessment with a statistical approach
71	Nuclear and Radioactive Waste Management in Bangladesh: Present Status and Future Challenges

Room 409A**Nanoscience and Material Physics**

Session Chair: Dr. Sarwat Binte Rafiq, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
127	Controlled Deposition of Photothermally Active Ag@TiO ₂ Coreshell onto Nano-cellulose Hydrogels Matrix for the Application of Wound Healing
169	Structural, Electronic, and Optical Properties of Copper Oxide Nanomaterials: A Comparative Study of DFT Predictions and UV-Vis Experimental Analysis
46	Sol-Gel-Derived NiO/ZnO Thin Films with Single and Heterostructure Layers for Electrochemical Energy Storage
25	Crystallographic Characterization Of Sol-gel Produced H-bn And Its Amino Functionalization: Resolving Functionalization Limitations
160	Impact of high sintering temperature on frequency dependent magnetic & dielectric properties of (Mg 0.25 Ni 0.25 Co 0.25 Zn 0.25) ₂ SiO ₄ high-entropy ceramics

Room 307A**Condensed Matter Physics: Computation**

Session Chair: Mr. Anock Somadder, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
171	A Quantum Espresso recipe for Z_2 invariant of 2D topological material 1T'WTe_2
65	A Comparative Study of Bilayer and Bulk Heterojunction Organic Photovoltaic Devices Employing Poly(3-hexylthiophene) and Polynaphthalene-bithiophene Polymers Through SCAPS Simulation
70	High-Pressure First-Principles Insights into BeCN ₂ : A Promising Ultra-Wide Band Gap Semiconductor for Next-Generation Electronics
139	Synthesis and Characterization of Sm Doped Cu-Zn Ferrite for High Frequency devices
142	The Investigation of the Cancer Cell's Fate by Integrating Agent-Based Modeling and Predictive Machine Learning

03:30 pm to 03:45 pm
Tea Break

Technical Session-6

03:45 – 05:15 pm

Session Chair: Professor Dr. Mohammad Delawar Hossain, Department of Physics,
SUST, Sylhet

Venue: Room 129, Academic Building A, SUST

Invited Speaker	Professor Dr. Syed Badiuzzaman Faruque Department of Physics, Shahjalal University of Science and Technology, Sylhet, Bangladesh
Title of the Invited Talk	Gravitomagnetism and Some of its Consequences
Time	03:45 pm to 04:10 pm

Contributory Talks

04:10 pm to 05:15 pm

Room 129A	Theoretical Physics, Mathematical and Computational Physics
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Session Chair: Professor Dr. Mohammad Delawar Hossain, Department of Physics,
SUST, Sylhet

Abstract No	Abstract Title
92	Doppler Lensing in Cosmic Voids: Relativistic-N Body Simulation Insights
125	Mathematical Modelling of Binary Stability: From Gravitational Binding to Evolutionary Disruption Show abstract
49	The VORTEX-MAJORANA Model: A Theoretical Framework for Neutrino Oscillations
129	Spectroscopy-Based Tracking and Timing Calorimetry for Enhanced Sensitivity in Muon-Electron Conversion Searches
28	Simulation-Based Investigation of Pulsed Electromagnetic Field (PEMF) Effects on Hemodynamics via Physics-Informed Modeling

Room 409A	Condensed Matter Physics: Computation
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Session Chair: Professor Dr. Khurshida Begum, Department of Physics, SUST, Sylhet

Abstract No	Abstract Title
114	Strain Engineering and Hybrid Functional Insights into IHV Compounds and the 2D InSe Monolayer for Advanced Electronic Applications
105	Electronic and optical properties of the ferromagnetic A2CrWO ₆ (A = Sr, Ba) for spintronic devices: A DFT insights
168	Optical and Electrical Properties of Methylammonium Tin Iodide Perovskite for the Application in Solar Cells: A Density Functional Theory Approach
3	Comparative First-Principles Study of M ₂ SnGeO ₆ (M = Ca, Sr, Ba) Double Perovskites: Electronic, Optical, Mechanical, and Thermoelectric Perspectives
109	Assessment of Free Layer Volume Influence on switching energy, current, and stability of Spin-Transfer Torque Devices.

Concluding Session

06:30 pm - 07:30 pm

Venue: Mini Auditorium, Shahjalal University of Science and Technology, Sylhet

Time	Details
6:30 pm to 6:40 pm	Vote of Thanks by Professor Dr. Abdul Hannan Treasurer, ICAP-2025
06:40 pm to 06:45 pm	Speech from Special Guest Professor Md. Ahmed Kabir Chowdhury Dean, School of Physical Sciences, SUST, Sylhet, Bangladesh
06:45 pm to 06:50 pm	Speech from Special Guest Professor Dr. Md. Ismail Hossain Treasure, SUST, Sylhet, Bangladesh
06:50 pm to 06:55 pm	Speech from Special Guest Professor Dr. Md Shajedul Karim Pro-Vice Chancellor, SUST, Sylhet, Bangladesh
06:55 am to 07:05 pm	Speech from Chief Guest Professor Dr. A. M. Sarwaruddin Chowdhury Vice-Chancellor, SUST, Sylhet, Bangladesh
07:05 pm to 07:25 pm	Best Poster Award
07:25 pm to 7:30 pm	Concluding Remarks by Chair Professor Dr. Md. Shah Alam Convenor, ICAP-2025

Conference Dinner: 7:30 pm