



SWAMI VIVEKANANDA UNIVERSITY

NEWSLETTER

SCHOOL OF BASIC
SCIENCES

ISSUE 01

JANUARY - DECEMBER
2024

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MESSAGE FROM THE HOD

Education is not to be confined within the walls of a classroom, Covid- 19 has proved that. With the start of covid era which is still going on with its new effects we also started a new era of digital education. Our faculties and students have together proved that nothing can stop a teacher to teach and students to learn even in the pandemic like this. School of basic sciences always keep the students well aware about the various activities like webinars and conferences along with the productive activities.

Always keeping the same spirit, school has also printed new edition of its departmental Newsletter to enlighten the students and numerous activities that kept them going forward by bringing all details of numerous events and webinars.

I heartily congratulate the school, faculties and students for their efforts that never let us down and bringing yet another informative Newsletter.



Dr. SUBHABRATA
MONDAL
HOD and Assistant
Professor
School of Basic Sciences

MESSAGE FROM THE CONVENOR

It is my great pleasure to welcome another fruitful academic session in the Basic Science Department. This year we promises new opportunities for growth, exploration, and discovery in the foundational sciences that serve as the bedrock of all advanced fields of study. Basic science is more than just a collection of theoretical concepts—it is the foundation of innovation, the spark behind groundbreaking technologies, and a guiding light for evidence-based decision-making. Our department is committed to fostering a vibrant academic environment where curiosity is encouraged, critical thinking is honed, and collaborative learning thrives. This Newsletter consists of various events curated by our editorial team. We hope it will inspire you and enrich you with practical knowledge in the field of science. Once again, deepest gratitude to everyone for making the newsletter a great source of learning.



Dr. KAZI HASIBUR
RAHMAN
Assistant Professor
School of Basic Sciences

Editor's Note

TEACHER EDITOR'S

We would like to thanks to HOD Sir,
Senior Teachers, Members of
Editorial team and Contributors of
articles for their contribution for
second edition of Newsletter in 2024.

The content of this Newsletter
includes latest developments in
Science and interesting Articles.
It is proud moment for us to be part
of Editorial team. This Newsletter
provides a source of inspiration to
students to find absorbing interest in
Science.



Mr. Tanmoy Pal

Assistant Professor
School of Basic Sciences



Dr. Shilpa Maity

Assistant Professor
School of Basic Sciences

Faculty Details

Mathematics Department



Dr. Subhabrata Mondal

Assistant Professor and HOD
School of Basic Sciences



Dr. Tanmoy Pal

Assistant Professor
School of Basic Sciences



Dr. Arijit Das

Assistant Professor
School of Basic Sciences



Dr. Piu Samui

Assistant Professor
School of Basic Sciences



Dr. Najnin Islam

Assistant Professor
School of Basic Sciences



Dr. Moumita Ghosh

Assistant Professor
School of Basic Sciences



Ms. Aratrika Pal

Teaching Assistant
School of Basic Sciences



Dr. Sagar Chakraborty

Assistant Professor
School of Basic Sciences



Mr. Subhendu Maji

Assistant Professor
School of Basic Sciences



Mr. Mainak Chakraborty

Assistant Professor
School of Basic Sciences

Faculty Details

Physics Department



Dr. Subhrajyoti Dey

Assistant Professor
School of Basic Sciences



Dr. Kazi Hasibur Rahman

Assistant Professor
School of Basic Sciences



Dr. Shilpa Maity

Assistant Professor
School of Basic Sciences

Faculty Details

Chemistry Department



Dr. Arpita Sarkar

Associate Professor
School of Basic Sciences



Mr. Souvik Roy

Teaching Assistant
School of Basic Sciences

Events

Unified Approach

1st INTERNATIONAL CONFERENCE on SUSTAINABLE RESEARCH AND DEVELOPMENT (ICSRD)-2024

25th & 26th September, 2024

Inauguration By:



Prof. (Dr.) Subrata Kumar Dey
Vice-Chancellor, SVU



Prof. (Dr.) Shrotesimohan Dan
Mentor SVU



Prof. (Dr.) Deb Narayan Bandyopadhyay
Chief Executive Director(Academics), SVU



Dr. Ranjan Chakrabarti
Director, Research &
Academic Development, SVU



Prof. (Dr.) Pankaj Pasi Nath
Registrar, SVU

Keynote Speakers:



Prof. (Dr.) Vinayak Ranjan
Professor, Rowan University, New
Jersey, USA



Prof. (Dr.) Drazan Kozak
Professor, Slavonki Brod, Croatia



Dr. Santanu Das, Kalyani
Government Engineering College



Dr. Somendra Nath Roy
Ex: Chief Scientist,
CSIR-CGCRI



Prof. (Dr.) Biswajit Halder,
Professor, NIT Durgapur



Dr. Abhinandan De
Associate Professor,
IIEST Shibpur



Dr. Kaushik Kumar
Associate Professor, BIT
Mesra



Dr. Purushottam
Assistant Professor,
NIT Silchar



Dr. Pranibesh Mandal
Jadavpur University



Mr. Anandeshwar Bhattacharya
Deputy Manager, LMW



Dr. Vikas Kumar,
NIT CALICUT



Dr. Suvarjan
Bhattacharyya, BITS Pilani

The International Conference on Sustainable Research and Development (ICSRD) held at Swami Vivekananda University is a platform for academics, researchers, practitioners, and policymakers to convene and exchange ideas, findings, and innovations that address the challenges of sustainability. The conference typically focuses on multidisciplinary approaches to sustainable development, fostering collaboration across fields like engineering, environmental science, economics, and social sciences.

1st INTERNATIONAL CONFERENCE on SUSTAINABLE RESEARCH AND DEVELOPMENT (ICSRD)-2024

25th & 26th September, 2024



Objectives:

Promote Sustainable Development: Highlight cutting-edge research, technologies, and practices that advance sustainability across various sectors.

Encourage Collaboration: Foster international and interdisciplinary partnerships to tackle global challenges like climate change, resource depletion, and social inequality.

Disseminate Knowledge: Provide a forum for presenting research findings, sharing case studies, and exploring solutions.

Support Policy Formation: Offer insights and recommendations that can inform sustainable development policies and practices

MoU signed between Swami Vivekananda University and Sripat Singh College

18th July, 2024



The signing of a Memorandum of Understanding (MoU) between Swami Vivekananda University and Sripat Singh College is a significant step toward fostering academic and research development, particularly in the field of basic sciences. Key Highlights of the Collaboration: Focus Areas: Joint research projects in basic sciences. Enhancement of teaching methodologies and curriculum development. Capacity-building programs for students and faculty. Academic Exchange: Sharing of expertise and resources between the institutions. Faculty and student exchange programs. Organizing joint seminars, workshops, and conferences. Infrastructure and Resources: Access to each institution's laboratories, libraries, and other research facilities. Joint efforts to secure funding for research and development activities. Skill Development and Innovation: Promoting interdisciplinary research. Development of skills among students in cutting-edge areas of basic sciences. This partnership aims to strengthen the quality of education and research output, fostering innovation and contributing to societal development. It also emphasizes the growing need for collaborations between institutions to address challenges in science and technology.

MoU signed between Swami Vivekananda University and Sri Ramkrishna Vidya Mahapitha

15th March, 2024



The signing of a Memorandum of Understanding (MoU) between Swami Vivekananda University and Sri Ramkrishna Vidya Mahapitha is a significant step towards fostering academic and research development, particularly in the field of basic sciences. Objectives of the MoU: Collaboration in Research: Joint research initiatives in areas of fundamental sciences to enhance knowledge creation. Student Development: Opportunities for students to engage in collaborative projects, internships, and skill-enhancement programs. Resource Sharing: Mutual access to laboratory facilities, libraries, and other academic resources. Innovation and Problem-Solving: Joint efforts to address challenges in science education and research through innovative solutions. This partnership aligns with the vision of promoting higher education and research excellence inspired by the philosophies of Swami Vivekananda and Sri Ramkrishna, emphasizing scientific inquiry and holistic development.

MoU signed between Swami Vivekananda University and Mahadevananda Mahavidyalaya

4th April, 2024



Swami Vivekananda University and Mahadevananda Mahavidyalaya have signed a Memorandum of Understanding (MoU) to foster academic and research collaboration in the field of basic sciences. This agreement aims to strengthen ties between the institutions, encouraging joint initiatives such as:

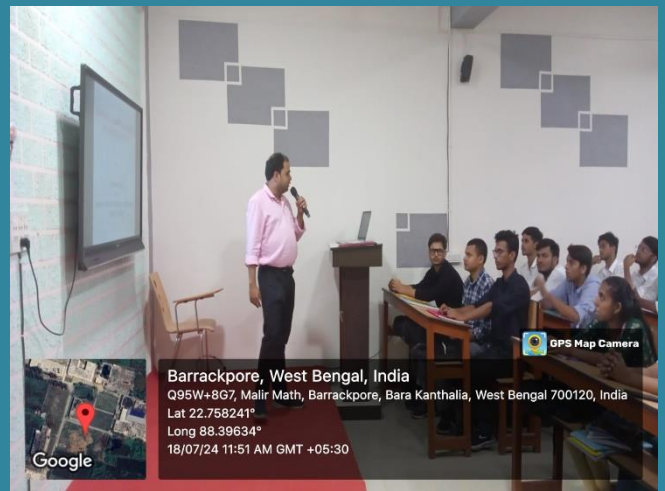
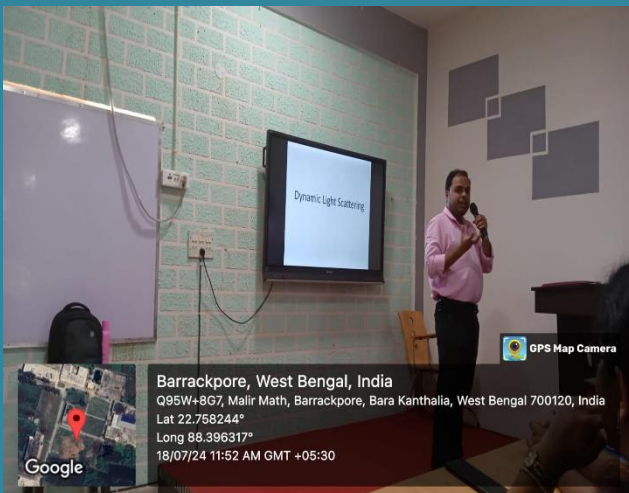
- Collaborative Research Projects: Focus on interdisciplinary research to address contemporary challenges in basic sciences.
- Workshops and Seminars: Jointly organized events to promote knowledge sharing and skill enhancement.
- Resource Sharing: Access to laboratory facilities, libraries, and other academic resources to boost productivity.
- Skill Development: Special training sessions for students and researchers to improve employability and innovation skills.

This partnership is expected to pave the way for significant advancements in basic sciences and contribute to the overall academic development of both institutions.

A Lecture on

Importance of Bio-Physics for Engineering Students

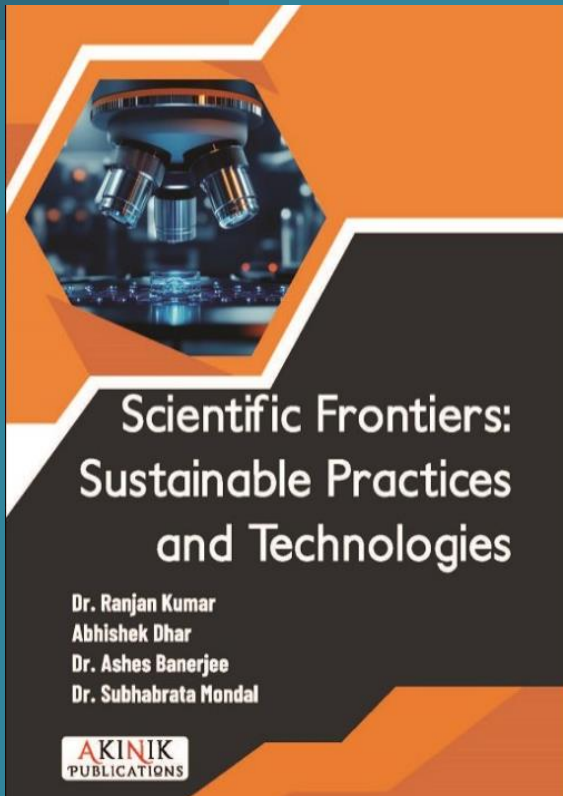
18th July, 2024



A lecture on Importance of Bio-Physics for Engineering Students) held at Swami Vivekananda University on 18th July, 2024. Biophysics is an interdisciplinary field that combines principles of physics and biology to study biological systems. For engineering students, especially those in biomedical engineering, biotechnology, or related fields, biophysics offers essential insights and tools to tackle challenges at the intersection of biology and technology.

Book Chapter

Scientific Frontiers: Sustainable Practices and Technologies



Editor(s) :Dr. Ranjan Kumar, Abhishek Dhar,
Dr. Ashes Banerjee and Dr. Subhabrata Mondal
Paperback ISBN :978-93-6135-429-8
Publisher : AkiNik Publications
Language : English
Pages : 297
Publication Year :2024
Binding : Paperback
DOI :<https://doi.org/10.22271/ed.book.2938>

DESCRIPTION

Scientific Frontiers: Sustainable Practices and Technologies explores mathematical theory and practical applications in sustainability. This volume highlights how advanced mathematical models, optimization techniques, and data-driven algorithms are being used to address critical global challenges such as climate change, resource management, and renewable energy. By showcasing the role of mathematics in developing sustainable technologies, from efficient energy grids to ecosystem modeling, the book emphasizes the importance of quantitative analysis in shaping a greener future. Ideal for researchers, academics, and practitioners, it offers insights into the evolving field of sustainability through the lens of mathematical innovation.

Book Chapter

Interdisciplinary Research in Science and Engineering

**Interdisciplinary Research
in
Science and Engineering**

Editors

Dr. Ranjan Kumar
Abhishek Dhar
Dr. Ashes Banerjee
Dr. Kazi Hasibur Rahman

Integrated Publications TM
New Delhi

Editor(s) :Dr. Ranjan Kumar, Abhishek Dhar,
Dr. Ashes Banerjee and Dr. Kazi Hasibur Rahman

Publisher : Integrated Publications
(New Delhi)

DESCRIPTION

Interdisciplinary research (IDR) refers to a collaborative approach to investigating complex questions, problems, or topics that span multiple disciplines. In science and engineering, IDR integrates methodologies, perspectives, tools, and knowledge from various fields to address challenges that cannot be effectively resolved within the boundaries of a single discipline.

Articles

Writeups That Inspire

Articles

Dr. Najnin Islam	A study on the interaction of waves with a submerged vertical elastic plate present in either layer of a two-layer fluid
Dr. Najnin Islam	Biological Applications of Differential Equations: A Study of Malaria Transmission
Dr. Najnin Islam	Examining Compartmental Models' effectiveness in building mathematical models of infectious diseases
Dr. Najnin Islam	A study on reproduction number for infectious diseases

Dr. Piu Samui	Modeling hepatocyte apoptosis in chronic HCV infection with impulsive drug control
Dr. Piu Samui	Impact of vaccination and awareness campaign in reducing Mpox transmission: A fractional mathematical study
Dr. Piu Samui	A delay differential equation model of SEIV in presence of media coverage
Dr. Piu Samui	Impact of awareness in self-monitoring of COVID-19: an optimal control approach with cost-effective strategy (Accepted)
Dr. Piu Samui	Determining pathogenic behaviors of chronic HCV infection in presence of incubation delay

Dr.Arijit Das	Dispersion Equation & It's Solution for Single Layer Fluid with Surface Tension Having an Inertial Surface
Dr.Arijit Das	A Study on Internal Wave Velocity in a Two-Layer Fluid Medium in Context of the Solution of Dispersion Equation
Dr.Arijit Das	A note on solution of the dispersion equation for small-amplitude internal waves in three-layer fluid
Dr.Arijit Das	A small note on the dispersion equation and it's roots for waves in mangrove forests in presence of surface tension
Dr.Arijit Das	Wave Scattering by an axisymmetric spheroid submerged Below a Free Surface
Dr.Arijit Das	Wave Scattering of non-axisymmetric spheroidal body Below a Free Surface
Dr.Arijit Das	A Study on Scattering of Water Waves by a Thin Inclined Plate in Finite-Depth Water Using the Galerkin Method

Articles

Ms. Aratrika Pal	RATIONAL POINTS ON ELLIPTIC CURVES OVER FINITE FIELDS
Ms.Aratrika Pal	HOMOTOPY THEORY AND ITS APPLICATIONS IN MODERN TOPOLOGY.
Ms.Aratrika Pal	RECENT DEVELOPMENTS IN THE STUDY OF AFFINE SPACE
Ms.Aratrika Pal	Enumerative Combinatorics and the Structure of Permutation Groups

Mr.Tanmoy Pal	Higher-Order Evolution Equation for Broader Bandwidth Capillary-Gravity Waves on Deep Water
Mr.Tanmoy Pal	Stability Analysis from Higher-order Evolution Equation for Broader Bandwidth Capillary-Gravity Waves in Finite Depth
Mr.Tanmoy Pal	Higher-order Schrödinger Equation of Broader Bandwidth Gravity Waves on Deep Water
Mr.Tanmoy Pal	Weakly Nonlinear Modulation of Broader Bandwidth Gravity Waves over Finite depth of Water
Mr.Tanmoy Pal	Current modified higher-order Schrödinger equation of broader bandwidth gravity waves
Mr.Tanmoy Pal	Linear-shear-current modified nonlinear Schrödinger equation for gravity-capillary waves on deep water.
Mr.Tanmoy Pal	Fourth-order nonlinear Schrödinger Equation for application to capillary-Gravity waves in deep water on flows of bulk vorticity

Mr.Tanmoy Pal	Higher-Order evolution equation for broader bandwidth capillary-gravity waves in the presence of depth uniform current
Mr.Tanmoy Pal	Current modified higher-Order Evolution Equation for Broader Bandwidth Capillary-Gravity Waves on Deep Water
Mr.Tanmoy Pal	Higher-order Schrödinger equation of broader bandwidth gravity waves in the presence of depth uniform current
Mr.Tanmoy Pal	Weakly Nonlinear Modulation for Broader Bandwidth Capillary-Gravity Waves
Mr.Tanmoy Pal	Weakly Nonlinear Modulation for Broader Bandwidth Capillary-Gravity Waves in Deep Water

Articles

Dr. Subhabrata Mondal	Plasticity and Free Swell Characteristics of Soil and Stone Dust
Dr. Subhabrata Mondal	Revisited Study on Advection Dominated Accretion Flow Around Black Hole
Dr. Subhabrata Mondal	Retailer's Inventory Decisions for Deteriorating Items with Exchange Scheme Under the Effort of Advertisement Efforts with Shortages
Dr. Subhabrata Mondal	Impact of Carbon Emission on EPQ Model in the Context of Rhino Bricks Production
Dr. Subhabrata Mondal	Impact of nonlinear dispersion and velocity in the aquifer close to the large water-bodies: Three-dimensional time-fractional model
Dr. Subhabrata Mondal	Solute transport through porous media: A Time dependent approach
Dr. Subhabrata Mondal	An ideal technique for solving linear and nonlinear Goursat problems
Dr. Subhabrata Mondal	The Emergence of Periodic and Chaotic Patterns in a Simple Predator -Prey System in Presence of Self-Diffusion
Dr. Subhabrata Mondal	Results and Discussion of Dengue Model with Temperature Effects in Interval Environment.
Dr. Subhabrata Mondal	Investigation of groundwater contamination in physical systems mathematically using differential transform method
Dr. Subhabrata Mondal	Results and Discussion of the Food Chain Model with Different Fear Effects under Uncertain Environment

Mr.Mainak Chakraborty	A Study on Scattering of Water Waves by a Thin Inclined Plate in Finite-Depth Water using the Galerkin Method
Mr.Mainak Chakraborty	Numerical Solution of Hypersingular Integral Equations using Galerkin Method with Chebyshev Polynomials
Mr.Mainak Chakraborty	Mathematical Modelling to Analyse the Energy Loss for Wind Flow at Costal Area
Mr.Mainak Chakraborty	Mathematical Modelling for Cyclone-Resistant Windmills
Mr.Mainak Chakraborty	Internal Energy of Non-Viscous Sea Wave
Mr.Mainak Chakraborty	Analysis of Scattering Water Waves on Submerged Ice Barges
Mr.Subhendu Maji	The Emergence of Periodic and Chaotic Patterns in a Simple Predator -Prey System in Presence of Self-Diffusion
Mr.Subhendu Maji	Numerical Solution of Hypersingular Integral Equations using Galerkin Method with Chebyshev Polynomials
Mr.Subhendu Maji	Mathematical Modelling to Analyse the Energy Loss for Wind Flow at Costal Area
Mr.Subhendu Maji	Mathematical Modelling for Cyclone-Resistant Windmills
Mr.Subhendu Maji	Internal Energy of Non-Viscous Sea Wave

Dr. Arpita Sarkar	In Situ NADH Regeneration Coupled to Enzymatic CO ₂ Reduction: From Fundamental Concepts to Recent Advances	Journal (Communicated)
Dr. Arpita Sarkar	Improved Photoinduced Charge Carrier Separation Through The Built-In Electric Field in A Rationally Designed Ag-ZnMn ₂ O ₄ /Exfoliated g-C ₃ N ₄ , A Plasmonic p-n Junction for Solar-Driven Synchronous Removal of Dissolved Cr(VI) and MB Dye	Journal (Communicated)

Articles

Dr. Najnin Islam	Wave Interactions with the submerged vertical porous elastic plate in Two Layered Fluid
Dr. Najnin Islam	Water wave scattering by an inclined flexible plate in a two-layer fluid
Dr. Najnin Islam	Artificial Intelligence Based Inventory Management
Dr. Najnin Islam	Water wave scattering by a poroelastic inclined flexible plate in a two-layer fluid
Dr. Najnin Islam	A Review on Mathematical Models of Enzyme Secretion and Glucose Metabolism
Dr. Najnin Islam	Mathematical study of the Urbach Energy of PANi-TiO ₂ at different molar concentration: A Theory
Dr. Najnin Islam	Examining Compartmental Models' effectiveness in building mathematical models of infectious diseases
Dr. Piu Samui	Determining impact of immunological memory in pathogenesis of Chronic Hepatitis C virus infection
Dr. Piu Samui	Predicting pharmaceutical control of Chickenpox transmission: A Caputo-fractional model analysis
Dr. Piu Samui	Quantifying global stability of a nonlinear Lassa Fever model: A mathematical approach
Dr. Piu Samui	Determining stability of deterministic model on spread of Typhoid fever with media awareness
Dr. Piu Samui	Modeling environmental contagion of Q Fever with therapeutic effect: A Caputo-fractional order prospect
Dr. Piu Samui	Determining global stability of Typhoid fever transmission model comprising media awareness
Dr. Piu Samui	Sensitivity analysis of a typhoid fever model predicting parameter uncertainty
Dr. Piu Samui	Impact of media awareness in curtailing of Typhoid fever contagion
Dr. Piu Samui	Analyzing global stability of Lassa Fever transmission model

Dr.Moumita Ghosh	A study on the prey-predator model under stochastic framework
Dr.Moumita Ghosh	A comparative investigation of the delayed and non-delayed optimization techniques on misinformation
Dr.Moumita Ghosh	Dynamics of Dengue Spread: A Mathematical Modelling Approach
Dr.Moumita Ghosh	A Mathematical Model on Malaria Transmission Dynamics
Dr.Moumita Ghosh	A Study on the Spread of SARS-CoV-2
Dr.Moumita Ghosh	A Comprehensive Overview of Control Algorithms
Dr.Moumita Ghosh	A Review of Mathematical Modelling and Analysis of Dengue Spread Dynamics

Articles

Dr. Shilpa Maity	Dye Sensitized Solar Cell Based On PEDOT-TOS Counter Electrode
Dr. Shilpa Maity	An Extensive Study of Photo thermoelectric materials For Device Applications
Dr. Shilpa Maity	Synthesis And Thermoelectric Characterization of Pedot-Tos/Tin Selenide Nanocomposite
Dr. Shilpa Maity	Enhanced Thermoelectric Properties of pTSA doped PEDOT/Bismuth Nanocomposite
Dr. Shilpa Maity	Thermoelectric Properties of Zinc-Incorporated Reduced Graphene Oxide-Polyaniline Composite
Dr. Kazi Hasibur Rahman	Highly active ZnO/Fe ³⁺ -TiO ₂ photocatalysts for visible-light photodegradation application and its colour change behaviour by d-d transition
Dr. Kazi Hasibur Rahman	A review on electrical properties, conduction mechanism of Polyaniline and its effect of doping on conductivity
Dr. Kazi Hasibur Rahman	Review on optical properties of MoS ₂ /TiO ₂ Nanocomposite
Dr. Kazi Hasibur Rahman	Recent developments in Graphene based nanomaterials for the application in Biosensors
Dr. Kazi Hasibur Rahman	Recent progress in metal oxides for biosensor application
Dr. Kazi Hasibur Rahman	Review on improvements of doping strategies on TiO ₂ and ZnO nanoparticles visible light photocatalytic applications
Dr. Subhrajyoti Dey	A review on synthesis technique and magnetic property of zinc ferrite nano and micro structures
Dr. Subhrajyoti Dey	A short review on magnetic property of nanosized cobalt – zinc ferrites
Dr. Subhrajyoti Dey	Entanglement Measures in Quantum Field Theory (QFT): A Comprehensive Review
Dr. Subhrajyoti Dey	Magnetic Characteristics of Nanosized Ni _{0.5} Zn _{0.5} Fe ₂ O ₄ : A Short Review
Dr. Subhrajyoti Dey	Application of Mössbauer Spectroscopy for Study of Hyperfine and Magnetic Properties of Ferrite Nanoparticles
Dr. Subhrajyoti Dey	Signature of 'Entanglement Transitions' in a Frustrated Spin Tetramer
Dr. Subhrajyoti Dey	Quantum Information Theoretic (QIT) Measures around the VBS point of an anisotropic spin-2 chain
Dr. Subhrajyoti Dey	Exploring electrical properties with the structural and morphological characteristics of MgFe ₂ O ₄ microspheres prepared by solvothermal method
Dr. Subhrajyoti Dey	Study of the structural, microstructural, electrochemical capacitive behavior of MnFe ₂ O ₄ hollow microspheres synthesized by solvothermal method

Dr. Shilpa Maity	Synthesis of Polyaniline and Its Enhanced Thermoelectric Performance
Dr. Shilpa Maity	Poly(3,4-ethylenedioxythiophene) functionalized with Selenium: It's synthesis and Thermoelectric characterization
Dr. Shilpa Maity	Poly(3,4-ethylenedioxythiophene) functionalized with Magnesium Silicide: It's synthesis and Structural and thermoelectric characterization.
Dr. Shilpa Maity	Synthesis Of Lead Tetraphenyl Porphyrin and Its Nanocomposites with Polyaniline-Carbon Nanotubes – Enhanced Dielectric Properties
Dr. Shilpa Maity	Synthesis and thermoelectric properties of Tellurium Nanotube
Dr. Kazi Hasibur Rahman	Analysis of the Fundamental propagation characteristics of circular Solid Core Photonic Crystal Fiber
Dr. Kazi Hasibur Rahman	Analysis of the Fundamental propagation characteristics of circular Hollow Core Photonic Crystal Fiber
Dr. Kazi Hasibur Rahman	A comprehensive synoptic review on synthesis method of MoS ₂
Dr. Kazi Hasibur Rahman	Comparative Study of MoS ₂ and Other 2D Materials in Photovoltaic Applications
Dr. Kazi Hasibur Rahman	A review study on optical properties of MoS ₂ and its applications on FET and optoelectronic devices