

REFLECTIONS

A Department of Physics
Annual Newsletter

2021-2022

ICFAI Science School
ICFAI University Tripura

DESK OF VICE CHANCELLOR



I, on behalf of “The ICFAI University Tripura” take this opportunity to welcome all readers’ community for reading ‘Reflections’, the Newsletter of Department of Physics of the ICFAI University Tripura. It is my immense pleasure to inform you that the issue is full of information regarding the academic achievements, extra-curricular activities of the students & faculty members of the department. I would like to appreciate and congratulate each and every member of the physics department for their respective roles in this inventive enterprise. It is indeed a creditable effort by the entire department of Physics to come up with this Newsletter in such short span.

I am delighted to acknowledge that our University is providing a powerful platform to Icfains to succeed in their endeavor. Our commitment to high quality and engaged classroom teaching and learning along with imparting required professional skill, soft skill and life skill oriented programs have been proved beyond doubt since the inception of the University. We are committed to provide a rewarding educational experience to our students and developing relevant knowledge on the frontiers of best practices.

I hope this dynamic effort of the physics department for publishing the ‘Reflections’ Newsletter is setting bars and putting the hands for the wellbeing of society.

I wish every success of this News letter!

Dr. Prof. Biplab Halder
Vice Chancellor
ICFAI University Tripura

DESK OF REGISTRAR



With immense happiness, I want to express my hearty congratulations to the Department of Physics, The ICFAI University Tripura for their endeavors in coming up with the Physics Newsletter Reflections. The Department of Physics is getting developed and shaped to become one of the finest Departments in the ICFAI University Tripura. Their Newsletter consists of the information regarding the departmental activity and different achievements.

Apart from imparting quality education and outstanding research, the holistic development of students is attempted by this department. They are regularly trying to enhance the quality of their service towards society by their scientific approach which is utterly needed in the present scenario across the globe for the wellbeing of mankind.

The current issue of 'Reflections' are bringing the change in all the sections. I am eagerly waiting to see it in published form. Congratulations to the editors and the faculty members for their untiring endeavor.

A handwritten signature in black ink, consisting of a stylized 'R' followed by '75'.

Dr. A. Ranganath

Registrar

ICFAI University Tripura

DESK OF DEAN, FST



I am very much delighted to know that the Department of Physics, ICFAI Science School is going to publish its second Newsletter on 28 th February, 2023, on the occasion of the observation of National Science day. The department will also launch its own web page and wall magazine on this day. Number of Research papers published by the department's faculty members in the national/international journals, seminars, guest lecturers conducted, presentations by its faculty members on various research topics, student's activities held in the departments etc., makes this department a happening place in our University.

This department has floated various value added courses. Students of the University apart from learning prescribed courses can enhance their knowledge in the subject of their interest through these value added courses.

Lastly, I would like to congratulate the editorial team of this Newsletter, for taking the pain in compiling two years' activities. I express my deep sense of gratitude to all of them.

A handwritten signature in black ink, appearing to read 'Priyangshu Rana Borthakur'.

Dr. Priyangshu Rana Borthakur
Dean, FST
ICFAI University Tripura

DESK OF HOD, PHYSICS



'Reflection', the newsletter of the Department of Physics, ICFAI University Tripura is a way of gauging the departmental activities, excitement energy of the budding Physicists and the nurturing creativity of the enthusiastic faculty members. After the beginning of the journey 'Reflection' was paused due to some unavoidable situation caused by the Covid-19 pandemic. But with hard toil of Dr. Sourav Chattopadhyay and Dr. Dipayan Chattopadhyay the newsletter is back to present the spectrum of the department in front of all.

I do hope that very shortly every upcoming issue would be circulated at large to play a role of the torch-bearer of society.

Dr. Sovan Ghosh
HOD, Physics
ICFAI University Tripura

ABOUT THE ICFAI UNIVERSITY TRIPURA

The ICFAI University, Tripura (referred to hereafter as the University) was established in 2004 through an Act of State Legislature (Tripura Act 8 of 2004). The University has been approved by the University Grants Commission, under Section 2(f) of the UGC Act, 1956. The University has been approved by the University Grants Commission, under Section 2(f) of the UGC Act, 1956. The Visitor of the University is H.E, the Governor of Tripura. The University is administered as per the Act, Statutes, and Rules. The Board of Governors is headed by the Chancellor and has Vice-Chancellor and others as members. The Board of Management is headed by the Vice-Chancellor. The Academic Council is responsible for all academic matters.

The University offers Bachelor, Master, and Doctoral programs in management, finance, science and technology, information technology, education, law, and other areas. The University campus based at Agartala is a lush green campus spread over 32 acres at Kamalghat Sadar, Tripura. It has over 6 lakhs sq. ft. of built-up area with academic blocks, workshops, laboratories, faculty rooms, auditorium, seminar halls, computer labs with the latest computing facility, well-equipped library, canteen, sports and recreation facilities. The campus also provides the latest teaching aids and is Wi-Fi enabled. The University is being widely recognized as an institution devoted to quality research and teaching. The University gives utmost importance to the Industry-University interface.

FACULTY OF SCIENCE & TECHNOLOGY (FST)

Faculty of Science & Technology (FST), a constituent unit of the ICFAI University, Tripura (IUT). FST is committed to providing quality education in the field of science and technology. It helps the students develop professional competence through their exposure to labs and workshops and industry exposure through internships/projects in the industry. with the objective of promoting new areas of Science & Technology and to play the role of a nodal department for organizing, coordinating, and promoting S&T activities in the country.

ABOUT THE ICFAI UNIVERSITY TRIPURA

About the Department of Physics

The Department of Physics was established as a separate department under ICFAI Science School in August of 2018, it has never looked back. Ever since its inception, the Department has not only been overcoming hurdles through its sincere perseverance and hard work but has also been committed to endorsing and nurturing young scientific minds towards the beauty of physics. Department currently consists of highly qualified faculty members who have been actively involved in cutting-edge research in various emerging fields, and in developing state of art technologies. The dynamic faculty members with their dedication and painstaking care have been involved in breeding a genre of students who will be able to independently think and excel in their area of choice. Presently we are offering Bachelors (B.Sc-Honors), Masters (M.Sc), and Doctorate (Ph.D.) courses. Students have been encouraged to join various esteemed institutions for their internship projects. Masters Projects are being conducted in numerous active research areas utilizing the Departmental facilities. To keep the students well informed about the recent trends in research and to enhance their presentation/academic skills as well as to inculcate the ability of entrepreneurship, numerous seminars are being conducted by the department throughout the year. We aim to impart a quality education and research environment to the students that would lead to their overall development in next coming years. The Department of Physics envisages itself becoming a Center of Excellence in the near future under the hood of ICFAI University Tripura.

Issue Editors: **Dr. Sourav Chattopadhyay**
& **Dr. Dipayan Chattopadhyay,**

Assistant Professor (Department of Physics)

Editorial Board:

Dr. Sovan Ghosh

Dr. Ganesh Adhikary

Dr. Camelia Das

Dr. Tuhin Subhra Mukherjee

Dr. Arunabha Saha

Prof. Bibhabasu De

Dr. Gobinda Pradhan

Courses Offered:

♦ **B.Sc. (Honours) Physics:** The B.Sc. (Physics) program is designed for six semesters (three years) to provide a systematic understanding of core physical concepts, principles, and theories along with their applications. The first batch of B.Sc. had 24 students, the second batch had 47 students, while the current batch of B.Sc. third year has 56, B.Sc. second year has 53, and the first year batch has 33 students.

♦ **M.Sc. Physics:** The M.Sc. (Physics) program is designed for four semesters (two years) in a way that a good basic foundation of subjects is laid and applications along with recent developments are covered. The M.Sc. program aims to train the students such that they can make careers in R&D, industries, and academic institutions. The first batch of M.Sc. had 27 students while the second batch M.Sc. batch has 41 students. The student strength of the current M.Sc. first year is 31 and that of the second year batch is 44.

♦ **Ph.D. (Physics):** The Ph.D. program in Physics has been the newest addition to the Department. It has been designed for individuals who want to seek greater depth of knowledge of Physics and want to contribute towards the overall enhancement of science and technology. It would empower them with the ability to work in research and would enable them to create fresh knowledge, discover new things and develop new skills. By obtaining a Ph.D. in Physics, the candidates would acquire the education, skills, and hands-on experience necessary to access several careers within the field of physics.

Highlights of the Department

- ▶ Undergraduate, Postgraduate, and Doctorate of Philosophy degrees are offered.
- ▶ Highly qualified faculty members.
- ▶ Well-equipped Laboratory facility
- ▶ Research and publications in emerging research areas.
- ▶ Seminars by highly qualified experts from all over India and abroad.
- ▶ Preparatory classes for competitive examinations (NET, JEST, GATE, JAM, etc.)

ABOUT THE DEPARTMENT OF PHYSICS

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Prof. Bibhabasu De

Dr. Gobinda Pradhan

Areas of Research:

- Experimental Nuclear Astrophysics
- Nuclear Reactions involving weakly bound nuclei
- Fluorescence Spectroscopy
- Condensed Matter Physics
- Experimental Condensed Matter Physics
- Time and Angle-Resolved Photon Spectroscopy
- Quantum Field Theory
- Mathematical Physics
- Particle Physics
- Cavity quantum optomechanics
- Cavity QED
- Parity-time symmetry and CV quantum information
- Experimental Nuclear Structure Physics
- Nanomaterials and Nanostructures
- Thin films and experimental material science
- Solar energy applications
- Monte Carlo simulations
- Ultracold atoms in optical lattices
- Bose-Einstein Condensates and Many-body localization
- General Relativity and Gravitation
- Gravitational Lensing

ICFAI FAMILY



Prof. Bibhabasu De
Assistant Professor (Physics),
Faculty of ICFAI Science School,
ICFAI University Tripura

The union of **Prof. Bibhabasu De** with ICFAI University Tripura came into action when he joined as an Assistant Professor in the Department of Physics, Faculty of ICFAI Science School, ICFAI University Tripura on 26th August 2021.

He is currently pursuing his doctoral research from the Institute of Physics, Bhubaneswar (HBNI). In 2016 he cleared NET-JRF with all India ranking 116.

After a Delhi University B.Sc degree (2015), he did his M.Sc (2017) from the Indian Institute of Technology Guwahati. He completed his master's with the first rank and bagged the prestigious "InstituteSilverMedal."

High Energy Physics (Phenomenology) is the domain of research of Prof. Bibhabasu. Tao of his research is designed with Supersymmetric and Non-Supersymmetric Dark Matter models, Leptoquarks and production mechanisms of Higgs boson, Anomalous magnetic moment, and charged lepton flavor violation.

The first duo of his research outcome is published in esteemed journals Physical Review D and Physics Letters B. One more very recent work by him is currently under review.

Till date, the digit suitable for research presentations in international conferences is five.

Besides professional and educational credentials, Prof. Bibhabasu is an eminent author who penned stories in frontline magazines, including 'Desh' (Bengali magazine published by Aanandabazar Publication House).



Dr. Gobinda Pradhan
Assistant Professor (Physics),
Faculty of ICFAI Science School,
ICFAI University Tripura

Dr. Gobinda Pradhan got united with IUT as an Assistant Professor in the Department of Physics, Faculty of ICFAI Science School, ICFAI University Tripura on 27th September 2021.

His doctoral degree is achieved from the Department of Physics of the Indian Institute of Technology Guwahati, an institute of a global reputation for excellence in teaching and research at the current juncture.

His primary research interest is to study two-dimensional materials, quantum dots, semiconductor materials, and their photonics and optoelectronics, sensing, and energy applications.

Six of his articles are published in high-impact, leading International Journals during the doctoral program. Being an active and keen researcher, he continues with the fragrance of his elegant touch in some of his recent works.

The presentation of a research article at an International Conference named 'ICMAT-2019', Marina Bay Sands, Singapore, is one of his notable contributions.



Dr. Sourav Chattopadhyay
Assistant Professor (Physics),
Faculty of ICFAI Science School,
ICFAI University Tripura

Dr. Sourav Chattopadhyay got associated with ICFAI University Tripura as an Assistant Professor in the Department of Physics, Faculty of ICFAI Science School, ICFAI University Tripura on 27th January 2022. He was awarded a Ph.D. degree in Physics from the Indian Institute of Technology Guwahati (IIT Guwahati) in 2021. He did his M.Sc. in Physics from IIT Guwahati following B.Sc. (Physics Honours) from Scottish Church College of the University of Calcutta. He cleared the National Eligibility text (CSIR-NET) and GATE in 2012.

The domain of research work of Dr. Sourav includes equilibrium and out-of-equilibrium statistical mechanics and condensed matter physics. His research works involve heavy computation on HPC (Linux environment). His research collaborators belong to eminent institutes of India (e.g., IITs, etc.). He is a significant asset to the research team, including collaborators from Germany and Israel. He has peer-reviewed articles in leading international journals. Also, a few of his articles are under review at this juncture. A book on 'condensed matter physics' authored by Dr. Sourav is going to be published shortly by the American Institute of Physics (AIP).

His active participation in many conferences and symposiums are impactful, out of which national DAE SSPS, Statphys, ICC as national level, and CCP2021 of international status are noteworthy. As secretary, organizing successfully the international conference CCP2015 (IIT Guwahati) brought another glorious feather to his cap. August audiences from many institutions experienced his effortless and gracious invited talks in the recent past.



Dr. Sovan Ghosh
Assistant Professor (Physics),
Faculty of ICFAI Science School,
ICFAI University Tripura

Dr. Sovan Ghosh became an integral part of the Department of Physics, Faculty of ICFAI Science School, ICFAI University Tripura, joining the university on 14th February 2022.

Ph.D. degree in Physics was conferred upon Sovan in 2013 by Tezpur University. He did his M.Sc in Physics from Tezpur University after his B.Sc. (Physics Honours) from Surendranath College of the University of Calcutta.

His doctoral work includes studying basic parameters of electron and positronium mass spectra based on various models. Currently, he is involved in research work on the fine structure constant, cosmological constant, and quintessence fields.

A stint of 11 years that he served as a teaching professional featured him as an active member of the board of examiners of five universities and a few autonomous colleges. His contributions in the research domain are published in national and international journals.

His dossier got enriched with the Indian Science Congress Association Best Poster award in Physical Sciences in the 99th ISC 2012 and 2nd rank in Poster in the 8th Physics Academy of North East 2012.

XXII DAE-BRNS HEP Symposium, XXIII DAE-BRNS HEP Symposium, Fifth DAE-BRNS Workshop, and PANDA Discussion meeting are noteworthy from the numerous conferences and workshops he attended. He has successfully organized one national level and one international conference as a convener on the online mode.



Dr. Dipayan Chattopadhyay
Assistant Professor (Physics),
Faculty of ICFAI Science School,
ICFAI University Tripura

Dr. Dipayan Chattopadhyay joined the Department in the Mid of August, 2022 directly from the United States of America after completing the post-doctoral research from Indiana University, Bloomington. Dr. Chattopadhyay's journey into the world of physics began after he completed his master's(2013) from West Bengal State University and went on to do his PhD from the Bhabha Atomic Research Centre, Mumbai(2019) after clearing JEST-2013 with AIR-88th Rank and OCES. The next stop was Saha Institute of Nuclear Physics in Kolkata, where he did his first post-doctoral studies. After completing his first post-doc he moved into Tata Institute of Fundamental Research, Mumbai followed by final post-doc to Indiana University, Bloomington, USA.

He has his expertises in the domain of experimental Nuclear Physics and Nuclear Astrophysics. During his PhD he is involved in the development of large area segmented silicon strip detector array which is commissioned at BARC-TIFR pelletron facility, Mumbai. He has developed the simulation code for analyzing the breakup data of loosely bound nuclei. His thesis entitled “Measurement of projectile breakup cross-sections in $6,7\text{Li}+112\text{Sn}$ reactions”, selected as top three best thesis by Department of Atomic Energy-BRNS international symposium in Mumbai. During his post-doc in India he was involved in the development of a digital data acquisition system for signal processing of Radiation detectors. During his post-doc period in the United States of America he was engaged with experimental activities as well as development of particle detector simulations.

He is also awarded three times as best poster awardee by the Department of Atomic Energy, Government of India. He has published 23 research articles in Internationally reputed journals and more than 70 publications in DAE-conference proceedings so far. He is giving invited talks at the prestigious NN-collisions conference, conducted by RIKEN Japan in 2018, DAE-BRNS theme-meeting in 2019 conducted by Bhabha Atomic Research Centre, Mumbai and DAE-BRNS symposium in Nuclear Physics, Cotton University, Guwahati in 2022.

EVENTS

Celebration of National Science Day 2021

The ICFAI Science School celebrated National Science Day on 16th March of 2021. National Science Day is being celebrated on 28th February throughout India since 1987 to commemorate the invention of the Raman Effect by Dr. C.V. Raman. This year 28th February being a holiday, it was decided to celebrate the day on our campus on 16.03.2021 to increase access to information, providing a simple scientific outlook to citizens in all aspects of their daily life. The theme for the event this year was “Future of STI (Science, Technology, and Innovations): Impacts on Education, Skills, and Work”. At this event, we organized a Quiz competition, Poster competition, Science Model competition, Best out of the Waste competition for undergraduate and postgraduate students and Sit and Draw competition for school, college, and university level students. To spread awareness and popularize science, we also organized several popular science talks by students and faculty. The response from the students and participants were overwhelming. The session was started by welcoming our chief guest Sri Animesh Das, IAS, Director of Science, Technology & Environment, Govt. of Tripura. Dr. A. Ranganath, Registrar, ICFAI University Tripura delivered the welcome speech. He also explained why scientific temperament is necessary for the growth of society.

In his speech, Chief Guest Sri Animesh Das said that science must be used for the sustainable development of society. And he said development must be something that doesn't harm the environment. On this occasion, the first volume of the newsletter of the Department of Physics namely ‘Reflection’ was revealed by our chief guest Sri Animesh Das, IAS, Director of Science, Technology & Environment, Govt. of Tripura, Dr. A. Ranganath, Registrar, ICFAI University Tripura and Prof. (Dr.) P. R. Barthakur, Dean, FST, ICFAI University. The inaugural session ended with a vote of thanks from Prof. (Dr.) P. R. Barthakur, Dean, FST, ICFAI University Tripura. In his speech, he explained why we need to celebrate National Science Day. In the Lecture cum Cultural Session, Dr. Beauty Pandey delivered a speech on the topic “Inventions, Innovations and Beyond...”, followed by a group dance by IUT students. Mr. Bilash Chandra Roy, Research scholar, Chemistry Department, nicely discussed “Progress and Challenges in the development of COVID-19 vaccines”, in his speech. The next speaker was Debodeep Deb, Student, Chemistry Department. His topic was “Assessment of ambient air Quality”. A poem ‘Tuni’ written by Pranab Ghosh was recited by Susmita Modak, student, B.Ed., second semester, IUT. Aditi Malakar and Ankan Chanda, Students of the Physics Department discussed “Theory of Special Relativity” and “Dark Matter” respectively. A drama named ‘Rat Pohale e Corona’ was presented by IUT students which depicted the fight between science and superstition in the corona period. The session ended with the presentation of Susham Baran Debbarma, Student, Department of Mathematics. His topic of explanation was “Fibonacci Series”. After the end of the cultural cum lecture session five events started in parallel sessions. From nearby schools (Mohanpur Girl's H/S School, Mohanpur H/S School, Jagatpur High School, Fatickcherra High school), more than 180 students and some teachers joined in this event. The occasion was nicely concluded with a prize distribution ceremony among the participants.





Physics of Smart Materials

Manickam MAHENDRAN, Ph.D. FASCh
 First-Year UG Engg Coordinator
 Professor & Head, Dept of Physics
 Thiagarajar College of Engg. Madurai
 manickam-mahendran@tce.edu



...in memory of Prof. Robert C. O'Handley, MIT, USA

Webinar on "Physics of Smart Materials"

The Department of Physics successfully organized a webinar entitled "Physics of Smart Materials" on 9th April 2021. Dr. Makinram Mahendran, Professor and Head of the Department of Physics, Thiagarajar College of Engineering, Anna University, Chennai, was the esteemed speaker of the webinar.

The webinar was aimed at B.tech/B.Sc/M.Sc. students as well as faculty members to make them familiar with the very interesting field of Smart Materials. The objective of the webinar was to make the audience familiar with the Ferromagnetic Shape Memory Alloys and their key physics principles. Professor Mahendran explained about Smart Materials, various classes of Smart Materials viz., Piezoelectric materials, Electrostrictive materials, Magnetostrictive materials, Ferromagnetic Shape Memory Alloys, etc. In the course of his presentation, he explained the underlying physics principles, the concept of field-induced strain, actuators and polymer composites, etc. in a very lucid and easily understandable manner.

understandable manner.

Physics of Smart Materials

Manickam MAHENDRAN, Ph.D. FASCh
 First-Year UG Engg Coordinator
 Professor & Head, Dept of Physics
 Thiagarajar College of Engg. Madurai
 manickam-mahendran@tce.edu



...in memory of Prof. Robert C. O'Handley, MIT, USA

Smart Materials

The materials based on the association of sensors, so that they have their own nervous systems, able to both sense and communicate with all outside intelligence.

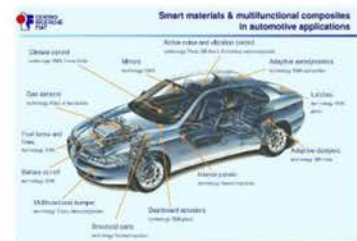
Sensors: Intrinsic sensors that recognize and measure the intensity of the stimulus - stress, strain, thermal, electric, magnetic
 Actuators: Respond to the stimulus
 Processor: It controls the response to the stimulus.

-Senses a stimulus (eyes)
 -Takes an intelligent decision (brain).
 -Through electronic feedback it takes corrective/preventive measures to avoid catastrophic situations (arms).

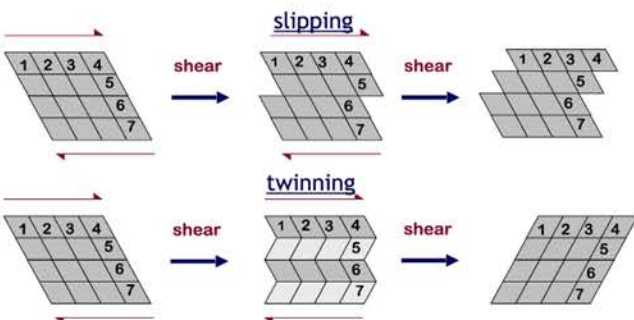


Conclusions

- Twin boundary motion/pinning is responsible for hysteresis.
- Piezo assist can significantly enhance output stress and strain per unit field, thus less magnetic "gear" for "soft" actuators.
- Mechanical absorption up to acoustic range recommends FSMA composites for damping, noise reduction.
- Appropriately chosen matrices might be useful as acoustic and vibration energy absorptive materials



Deformation Mechanisms for Actuators



Webinar on “Quantum world – a fascinating, but ‘spooky’ story”

The Department of Physics organized a webinar entitled “Quantum world – a fascinating, but ‘spooky’ story” on 2nd July 2021. Dr. Bobby Antony, Professor, Department of Physics, Indian Institute of Technology (Indian School of Mines) Dhanbad discussed the historical timeline and the events which led to the development of Quantum World. Professor Antony gave an extensive description of the Quantum world considering a large number of graduate and undergraduate students, faculties, and learned scholars from a variety of fields gathered in the audience. Quantum mechanics was developed over many decades, beginning as a set of controversial mathematical explanations of experiments that the math of classical mechanics could not explain. It began at the turn of the 20th century, around the same time that Albert Einstein published his theory of relativity, a separate mathematical revolution in physics that describes the motion of things at high speeds. Unlike relativity, however, the origins of quantum mechanics cannot be attributed to any one scientist. Rather, multiple scientists contributed to a foundation of revolutionary principles that gradually gained acceptance and experimental verification. The speaker presented a historical timeline as to how quantized properties, particle nature of light, and waves of matter served as the basic theories around which the quantum world was developed. The speaker discussed the principles of quantization, wave-particle duality, and the uncertainty principle that ushered in a new era for the quantum world. Paul Dirac applied a quantum understanding of electric and magnetic fields to give rise to the study of “quantum field theory” (QFT), which treated particles (such as photons and electrons) as excited states of an underlying physical field. The historical background of such an important theory of physics, as described to us by the speaker was very interesting. The speaker also explained to the audience, what exactly is the quantum world and also introduced to us the strange properties of the quantum world that have many possible applications in future technologies.



Copenhagen Interpretation (Schrödinger's cat)

What if somebody else do the measurement for you?

Probability	State
50 %	$ \text{eye cat}\rangle$
50 %	$ \text{eye dog}\rangle$

Probability	State
50 %	$ \text{eye eye}\rangle$
50 %	$ \text{eye dog}\rangle$

Webinar on “Lightning: The facts and safety Measures”

The Department of Physics organized a webinar entitled “Lightning: The facts and safety Measures” on 1st September 2021. Dr. Anirban Guha, Assistant Professor, Department of Physics, Tripura University, Agartala was the esteemed resource person for this talk. More than ninety participants including students and faculty members attended this webinar. Natural lightning kills around 20,000 people all over the globe, with around 4,000 people in India every year. It is also a major cause of livestock death. Lightning also destroys natural vegetation, properties, commercial infrastructure and poses threats to the increasing aviation sector and space ventures. Lightning ranks first among all the accidental deaths caused by natural factors in India, despite multiple measures from the Government. One of the main reasons behind this is the lack of basic education and awareness. This speaker nicely summarized the basic facts of lightning phenomena with easy-to-understand details. The webinar was primarily focused on educating common people with simple measures to minimize the loss of life and property, thus bringing us a safe and healthy livelihood for a better future.

The Quantum World
...a fascinating, but spooky story...

Bobby Antony
Professor of Physics, IIT(ISM) Dhanbad
bobby@iitism.ac.in

ONLINE NATIONAL CONFERENCE
ON
EMERGING TRENDS IN PHYSICAL SCIENCES (ETPS-2021)
Date: 27th September to 1st October 2021

Stalwarts Of the Conference

 Dr. Kamalnayan Joshipura Professor and General Secretary, IAPPT (Formerly Professor & Head, Dept. of Physics, SPU, Gujarat, Ex Hon. Dir., C. C. Patel Community Science Centre)	 Dr. Raghunath Bhattacharya Professor and Adviser, DOT-IIEST, Salt Lake, Kolkata [Formerly Scientist/ Emeritus Scientist, NPL, New Delhi]	 Dr. Sunil Mukhi Professor, Dept. of Physics, IISER Pune	 Dr. Suman Chakraborty Institute Chair Professor & Sir J C Bose National Fellow, Dean, SIC, IIT Kharagpur Fellow, American Physical Society, Royal Society of Chemistry (UK), ASME, INSA, INAE, INAS, IAS
 Dr. Sreerup Raychaudhuri Professor, Dept. of Theoretical Physics, TIFR, Mumbai	 Dr. Ranjeev Misra Professor, IUCAA, Pune	 Dr. Rahul Mitra Professor (HAG), Dept. of Metallurgical and Materials Engineering, IIT Kharagpur	 Dr. Perumal Alagarasamy Professor & Head, Dept. of Physics, IIT Guwahati
 Dr. Pravat Kumar Giri Professor, Dept. of Physics, IIT Guwahati	 Dr. Tarak Nath Dey Professor, Dept. of Physics, IIT Guwahati	 Dr. Somnath Chandra Roy Professor, Dept. of Physics, IIT Madras	 Dr. Tumpa Bhattacharjee Scientific Officer (G), VEC & Associate Professor, HBN
 Dr. Asit Kumar Kar Associate Professor, Dept. of Applied Physics, IIT-BM Dhanbad	 Dr. Sujit Tandel Associate Professor, Centre for Excellence in Basic Sciences (CEBS), Mumbai	 Dr. Shankhadeep Chakraborty Professor, Dept. of Physics, IIT Roper	 Dr. Rahul Srivastava Assistant Professor, Dept. of Physics, IISER Bhopal
 Dr. Arnab Pal Assistant Professor, Dept. of Physics, IIT Kanpur	 Dr. Ranjan Modak Assistant Professor, Dept. of Physics, BHU	 Dr. Manik Banik Assistant Professor, Dept. of Physics, IISER Thiruvananthapuram	

Dates to Remember:
Last Date of Registration : 26th September 2021,
Last Date of Abstract Submission : 27th September 2021

Registration Link: https://docs.google.com/forms/d/e/1FAIpQLSR_C7ZF97W86Adn3EELko2vfBhXwvF6a1pMtH1g8Bn3Zbw/viewform

Organized By: Department of Physics, ICFAI Science School, ICFAI University Tripura



National Conference on “Emerging Trends in Physical Sciences (ETPS-2021)”

The Department of Physics organized a national conference entitled “Emerging Trends in Physical Sciences (ETPS-2021)” from 27th September to 1st October of 2021. The conference was attended by more than a hundred participants every day (51 Students, 28 Research Scholars, 15 Assistant Professors, 1 Associate Professor, and 2 Professors). The conference aimed to bring together leading as well as budding academic scientists, researchers, and research scholars to exchange and share their experiences and research results on all aspects of Physical Sciences and its allied branches. It also desired to provide them a premier interdisciplinary platform to present and discuss the most recent innovations, emerging trends, and concerns as well as practical challenges encountered and solutions adopted in the diverse field of Sciences, Engineering, and Applied Physics.

At the conference invited lectures were delivered by:

Prof. (Dr.) Kamalnayan Joshipura, Retd. Prof., Department of Physics, Sardar Patel University, Vallabh Vidyanagar (Gujarat); General Secretary, Indian Association of Physics Teachers. He enlightened the audience with a nice discussion on “A golden decade of Science in India 1921-1930; Saha, Bose, Raman era”. In this talk, the memorable works of Saha, Bose, and Raman, both as outstanding physicists and as mentors of the next generation scientists, who in turn were the institution builders of independent India, were highlighted.

Prof. Sunil Mukhi, Professor, Department of Physics, Indian Institute of Science Education and Research (IISER), Pune. His lecture was aimed towards “Remarkable outcomes of Mathematical Physics”. Mathematical Physics is sometimes thought of as a realm of abstruse speculation disconnected from experimental reality. But using history as a guide, Prof. Mukhi showed that the opposite is true -- considerations of theoretical and mathematical consistency have explained and even predicted many important experimentally observed phenomena over the past century. These include objects like elementary particles and black holes, as well as phenomena like phase- transitions and novel transport properties.

Prof. Raghunath Bhattacharya, Adviser, DST-IEST Solar PV Hub, Kolkata. The title of his talk was “Some Nanomaterial based devices for Renewal Energy & Sensing applications”. In this talk, a brief account of the Plasmonic Solar cell and other nanostructured materials have been presented which have been exploited to enhance the efficiency of silicon-based solar cells. The plasmonic-based idea for sensor development has helped SPR to emerge as a versatile technology platform. DST has funded this research in the country.

Prof. (Dr.) Pravat Kumar Giri, Professor, Dept. of Physics, IIT Guwahati, delivered a lecture on “Two Dimensional Layered Materials and Their Heterostructures: Optoelectronics and Energy Applications”. In this talk, first, a brief overview was given about the ongoing research on large-area CVD growth of monolayer graphene, MoS₂, WS₂, Bi₂O₂Se, graphene-ZnO nanowire, and MoS₂-TiO₂ nanorod, Bi₂O₂Se-Perovskite heterostructures, and chemically derived graphene quantum dots and their applications in optoelectronics, energy, environment, biosensing, etc.

Next, the mechanism behind the superior photoluminescence (PL) and photodetection performance of MoS₂-TiO₂ heterostructures was elaborated.

Dr. Sujit Tandel, Associate Professor, Centre for Excellence in Basic Sciences (CEBS), Mumbai. His lecture was focused on “Quantum shell effects and their role in the stability of the heaviest atomic nuclei”. The stability of the atomic nucleus is a topic that continues to provide fascinating insights into this strongly interacting, quantum many-body system. The increased stability for nuclei with a magic number of nucleons was understood in terms of a shell structure for the nucleus analogous to that in an atom, and the crucial role of the spin-orbit interaction was identified. In this talk, representative results of many experimental campaigns were presented along with their implications for the location of the super heavy island of nuclear stability.

Dr. Tumpa Bhattacharjee, Associate Professor (HBNI, Mumbai) & Scientific Officer G, Variable Energy Cyclotron Centre, Kolkata. The title of her talk was “Nuclear excitations in exotic degrees of freedom --- probing through gamma-ray spectroscopy”. In the lecture, different aspects of nuclear excitations were discussed that have been unfolded through the recent experiments carried out with the newly developed facilities and light ion beam from K-130 cyclotron at VECC, Kolkata. These new facilities have been developed and some are under development to open up new dimensions of nuclear structure research at VECC, Kolkata. These facilities are aimed at performing experiments to understand the exotic nuclear structure phenomena through measurements on nuclear level lifetimes and transition moments as well as nuclear beta decay.

Prof. (Dr.) Perumal Alagarsamy, Professor and Head, Dept. of Physics, Indian Institute of Technology Guwahati. His topic of discussion was “Spintronics: Playing With GMR Stack for Future Technology”. In this presentation, the speaker mainly emphasized on obtaining the linear and reversible MR curves using asymmetric structured CIP-GMR device with metastable body-centered-cubic (bcc)-Cu spacer and auxiliary biquadratic coupling through Rh spacer in the film stack of CoFe/ Rh/ CoFe(-sensing layer)/ bcc-Cu/ CoFe. The details on how to tune and achieve the large linear sensitive GMR sensors were

Dr. Asit Kumar Kar, Associate Professor, Dept. of Applied Physics, Indian Institute of Technology (IIT-ISM), Dhanbad. The title for his talk was “Metal-oxide based polymer nanocomposites for PLED application”. Polymer-inorganic nanocomposites become an important topic of research due to the synergic effect of both the polymer and inorganic counterparts in the same material. For flexible display electronics, like polymer light-emitting diodes (PLED), the development of emissive polymer-inorganic composites is essential since they can offer both flexibilities as well as high emission efficiency. Different aspects of such nanocomposites were elaborately discussed in his talk.

Prof. (Dr.) Tarak Nath Dey, Professor, Dept. of Physics, Indian Institute of Technology Guwahati. Prof. Dey’s talk was aimed at “Singular beam in Quantum optics”. The speaker and his group explored how electromagnetic radiation with phase singularities can make an opaque medium transparent. A transverse magnetic field (TMF) and a suitable spatially inhomogeneous control field can be used to create a spatial transparency modulation for the probe field at the desired location. Such transparency modulation is the principle behind the shaping of the light.

Prof. (Dr.) Rahul Mitra, Professor (HAG), Dept. of Metallurgical and Materials Engineering, Indian Institute of Technology (IIT), Kharagpur. The title of his talk was “Evolution of microstructure and its effect on mechanical behavior, scratch and corrosion resistance of magnetron sputtered in-situ nanocomposite thin films”. Nanocomposite thin films produced by reactive magnetron sputtering or co-sputtering of metal targets are of interest for protective applications due to their superior hardness and corrosion resistance. The speaker, in his presentation, nicely discussed different aspects of nanocomposite thin films.

Prof. (Dr.) Sreerup Raychoudhari, Professor, Dept. of Theoretical Physics, Tata Institute of Fundamental Research (TIFR), Mumbai. The title of his talk was “Fundamental Building Blocks of Matter: Developing the Standard Model”. The Standard Model of strong and electroweak interactions is the reigning theory of the interactions of elementary particles. In this talk, the development of the Standard Model, starting from the discovery of the electron in 1897 to the discovery of the Higgs boson in 2012 was explained in simple, non-technical

terms, with a minimum of mathematics. Reasons for expecting more physics beyond the Standard Model, especially hints from cosmology, were also touched upon.

Dr. Arnab Pal, Assistant Professor, Dept. of Physics, IIT Kanpur. His topic of the presentation was “No turning back: irreversibility and complexity in life”. Sir Arthur Eddington famously remarked that the Second Law of Thermodynamics holds “the supreme position among the laws of Nature.” Half a century earlier, Ludwig Boltzmann had already noted that thermodynamics constrains the activity of living systems, in such a way that the Darwinian “struggle for existence” could be framed in terms of entropy. This leads to the concept of ‘irreversibility’ or the arrow of time in our life. All these concepts were nicely presented and discussed in his talk.

Dr. Rahul Srivastava, Assistant Professor, Dept. of Physics, IISER Bhopal. The title of his talk was “Neutrino, Dark Matter, Higgs and Gravitational Wave-portals for new physics”. Neutrinos and dark matter both are of fundamental importance to the complete understanding of our universe. Despite the tremendous amount of theoretical as well as experimental research over several decades, they are still poorly understood. In this talk, the speaker discussed some of his recent works aimed at constructing, analyzing, and looking for experimental signatures of new physics models, trying to explain neutrino properties while also accounting for the cosmological dark matter.

Prof. (Dr.) Ranjeev Misra, Professor, IUCAA, Pune. The talk was entitled “The Nobel road to observing black hole systems”. For the last fifty years, humankind has been on this epic journey, where we looked for and found the most exotic objects in the Universe, black holes. In this talk, the speaker highlighted some arguments and observational proofs that convinced us that black holes do exist.

Dr. Ranjan Modak, Assistant Professor, Dept. of Physics, Banaras Hindu University. In his lecture, the speaker mainly focused on “Absence of Thermalization in Isolated Quantum systems”. In his talk, he first gave a brief introduction to Integrable quantum systems and Many-body localization. Then he talked about some of the recent techniques which can be used to understand the far-from-equilibrium dynamics of integrable systems. More specifically, he talked about two new tools, i) quasi-particle approach and ii) emergent eigenstate solution. Next, he focused on disordered systems and discussed the fate of the Many-body localized phase in presence of the correlated disorder.

Dr. Manik Banik, Assistant Professor, Dept. of Physics, IISER, Thiruvananthapuram. The title of his talk was “Story of communication-from Claude E. Shannon to Charles H. Bennett and what more”. Successful implementation of any modern means of information transmission -- cellular, internet, and satellite communications-- depends crucially on the active steps taken to mitigate and correct the undesirable but unavoidable noise introduced during information transfer from one space-time point to another. In this talk, the speaker tried to present a pedagogical review of classical information theory and its quantum generalization.

Prof. (Dr.) Suman Chakraborty, Professor, Dept. of Physics, IIT Kharagpur. The lecture was aimed at “Diagnostic Technologies for Affordable Healthcare”. The recent pandemic has exposed the challenges due to the non-availability of diagnostic technologies that are accurate yet low cost, accessible, user-friendly, and amenable to massive manufacturing scale-up and parallelization. The availability of such an easy-to-use and reasonably sensitive detection method for community-level testing holds the potential of capturing the commonly missed cases of early infection and asymptomatic disease presentation and reducing the opportunity for community-level transmission. In his talk, the speaker had nicely elaborated on all these aspects and possibilities of our present healthcare system.



Dr. Shankhadeep Chakraborty, Assistant Professor, Dept. of Physics, IIT Ropar. The title of his talk was “Tensionless string theory: A fairy tale on the worldsheet”. The speaker considered the tensionless limit on bosonic closed string theory as an ultra-relativistic limit on the worldsheet, where the 3D Bondi-Metzner-Sachs (BMS) algebra appears as the residual gauge symmetry algebra on the tensionless worldsheet. He showed that the tensionless string also emerges in the limit of infinite acceleration of a worldsheet observer when the Rindler horizon is hit. He discovered a null string complementarity, which gives two distinct observer-dependent pictures of the emergence of open string physics from closed strings in the tensionless limit.




Shweta Raychaudhuri is presenting

The Higgs Boson

The search for the Higgs boson took 48 years...

1 GeV 125 GeV 100 GeV



Large Hadron Collider

Shweta Raychaudhuri, IT Physics, Ganesh Adhikari, Shweta Raychaudhuri, JYOTSNA KUMAR, IT Physics, Beauty Parulekar, 33 others, You

Adit Kar is presenting

Metal-Oxide Based Polymer Nanocomposites for PLED Application

Adit Kumar Kar
Department of Physics
IIT (ISM) Dhanbad

Adit Kar, Beauty Parulekar, JYOTSNA KUMAR, IT Physics, Suman Saha, Sankar Paul, 33 others, You

Tarak Dey is presenting

Singular Beam in Quantum Optics

Tarak Dey
Indian Institute of Technology Guwahati, Assam, India

We explore how electromagnetic radiation with phase singularities can make an opaque medium transparent. A transverse magnetic field (TMF) and a subtle spatially inhomogeneous control field can be used to create a spatial transparency modulation for the probe field at the desired location. Such transparency modulation is the principle behind the shaping of the light. Further the propagation of vector beams through a four-level tripod atomic system is investigated. We theoretically study a scheme to fully control the rotation of the transverse polarization structure of a vector beam at any given position inside the medium by manipulating the medium susceptibility. Hence this controlled light shaping and polarization rotation control paves a new way for high contrast imaging, laser microstructuring, creation of optical lattices and optical tweezers. Our work may also have applications in optical communication and information processing.

Department of Physics, ICFAI Science School
ICFAI University Tripura

Tarak Dey, Beauty Parulekar, Shweta Raychaudhuri, JYOTSNA KUMAR, Dr. Prasanta Sahoo, Dr. Arunabha Saha, 33 others, You

Manik Banik is presenting

Story of Communication: from Shannon to Bennett & What More?

Department of Physics
ICFAI SCIENCE SCHOOL
THE ICFAI UNIVERSITY, TRIPURA
TRIPURA 799210, INDIA

IISER
THIRUVANANTHAPURAM

Dr. Manik Banik
Assistant Professor
School of Physics

Manik Banik, Tuhin Subhra M., Sankar Paul, BASIR AHMED, Ganesh Adhikari, IT Physics, Magdhu Paul, 13 others, You

P.K. Giri is presenting

Two Dimensional Layered Materials and Their Heterostructures: Optoelectronics and Energy Applications

Dr. Pravat K. Giri
Department of Physics & Centre for Nanotechnology
Indian Institute of Technology Guwahati
Email: giri@itg.ac.in

H Index: 41, I index: 118, Citations: 5484

Dr. Pravat K. Giri, prityangshu borah, Sujit Tandi, vikas kumar, vikas kumar, Debanshu Saha, Beauty Parulekar, 14 others, You

Shankhadev Chakraborty is presenting

Tensionless string theory: A fairy tale on the worldsheet.

Shankhadev Chakraborty
Department of Physics
IIT-Roorkee

Emerging Trends in Physical Science
Department of Physics, ICFAI University Tripura

Shankhadev Chakraborty, Dr. Arunabha Saha, Subhankar Panigrahi, Tuhin Subhra M., Sankar Paul, pankaj kalia, Swara Singh, 13 others, You

Rahul Mitra is presenting

Effect of Temperature on Microstructure

Mukesh Kumar and R. Mitra, Thin Solid Films, 624, 70-82 (2017)



Film density increases on applying -60 V substrate bias.

300 °C, 0 V Bias, 300 °C, -60 V Bias, 700 °C, 0 V Bias, 500 °C, 0 V Bias, 500 °C, -60 V Bias, 700 °C, -60 V Bias

Beauty Parulekar, Ganesh Adhikari, Rahul Mitra, Shweta Raychaudhuri, JYOTSNA KUMAR, Dr. Arunabha Saha, BIPLOJ SARKAR, 17 others, You

Along with these enlightening lectures, the conference was tightly packed with 29 technical talks, presented by research scholars and faculties from various institutes of India. The five-day program of ETPS-2021 was concluded with a valedictory session by Dr. Arunabha Saha.

TREE PLANTATION AT MOHANPUR IN 2022



ORIENTATION DAY IN 2022

Career counseling session in 2022



TREE PLANTATION AT UNIVERSITY CAMPUS IN 2022

A tree plantation drive was organized by the Department of Physics, ICFAI University Tripura on 16th June, 2022 within the University campus. A number of useful plants were arranged for the purpose and planted by the students. Both the students and faculty members of the department actively participated in the event. For looking after each of the plants a group of a few students was formed and assigned with the responsibility.



TEACHERS DAY CELEBRATION BY STUDENTS IN 2022



SCIENTIFIC PUBLICATIONS

All the faculty members from the Department of Physics are devoted to Research related activities and from 2021 to 2022, the faculty members published a total of 8 research articles in reputed international journals and three paper in conference proceedings.

In the span of the last year, all the faculty members have been dedicated to high-quality research and have resulted in the publication of a majority of articles in journals of international repute. Additionally, the dynamic faculty of the department has been also successful in establishing and strengthening wide collaborations nationally as well as internationally.

Dr. Arunabha Saha, Assistant Professor, Department of Physics has published two research articles in SCI-indexed international journals. He has productive collaborations with Variable Energy Cyclotron Centre (Kolkata), Saha Institute of Nuclear Physics (Kolkata), etc.

Dr. Suvankar Paul has published two research articles in a highly recognized international journal.

Dr. Subhadeep Chakraborty has published one review paper in an international journal.

Dr. Sourav Chattopadhyay has published one paper in an American Physical Society based journal Physical Review B and one paper in conference proceedings.

Dr. Dipayan Chattopadhyay has published one paper in an American Physical Society based journal Physical Review C and two papers in conference proceedings. He has strong collaboration with Bhabha Atomic Research Centre, Mumbai, Tata Institute of Fundamental Research, Mumbai and Indiana University, Bloomington, The United States of America.

Dr. Gobinda Pradhan has published one paper in an Prestigious International Journal Ceramics International.

A brief summary of these outstanding scientific achievements is glimpsed here for the budding enthusiasts in the department.

YOGA SESSION 2022



SCIENTIFIC PUBLICATIONS

A hand-on session on Yoga was organized by the Department of Physics, ICFAI University Tripura on 16th June, 2022 for the students of B.Sc Physics and M.Sc Physics. The session was conducted under the guidance of Prof. Prasenjit Majumder, Assistant Professor, Department of Physical Education and Yoga, ICFAI University Tripura. Both the students and faculty members of the Department of Physics actively participated in the event. The students performed various simple but useful Yoga postures as demonstrated by Prof. Majumder. During the Yoga session Prof. Majumder briefly summarized the applicability of Yoga in daily life to maintain a healthy body and mind. Dr. Sovan Ghosh, HOD, Department of Physics ICFAI University Tripura and Dr. Gobinda Pradhan, Assistant Professor, Department of Physics ICFAI University Tripura played an active role to motivate the students for participating in the session.



FACULTY SEMINAR 2022

The Department of Physics has started a Faculty Seminar from the year 2022. The seminar was delivered by Dr. Dipayan Chattopadhyay on "Study of breakup reaction of radioactive nuclei of 7Be ". He has demonstrated a novel method which is proven to be an alternative way to study the characteristics of Radioactive Nuclei like 7Be . Dean of FST Prof Dr. Priyangshu Rana Borthakur and all the Faculty members of Department of Physics were present in the seminar.



WITH THE STUDENTS OF UNDERGRADUATE AND POSTGRADUATE BATCHES OF AY:2022-23



WITH THE STUDENTS OF UNDERGRADUATE AND POSTGRADUATE BATCHES OF AY:2022-23

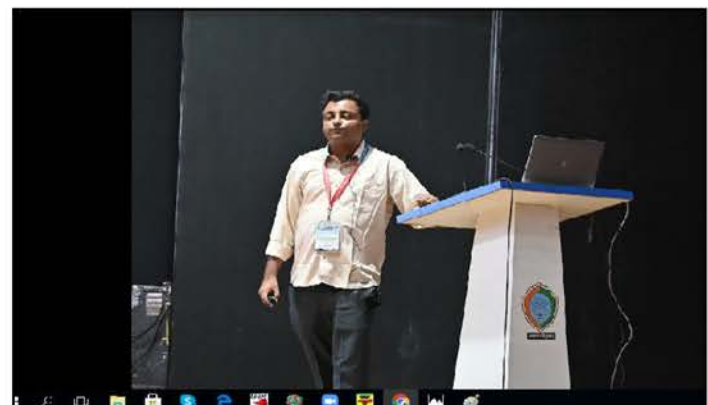


INVITED TALKS DELIVERED IN SEMINARS/WORKSHOP/SYMPOSIUM:

Dr. Dipayan Chattopadhyay delivered an invited talk at DAE-BRNS symposium on Nuclear Physics, Cotton University, Guwahati on “Study of breakup reactions of weakly bound stable and radioactive nuclei” in 2022.



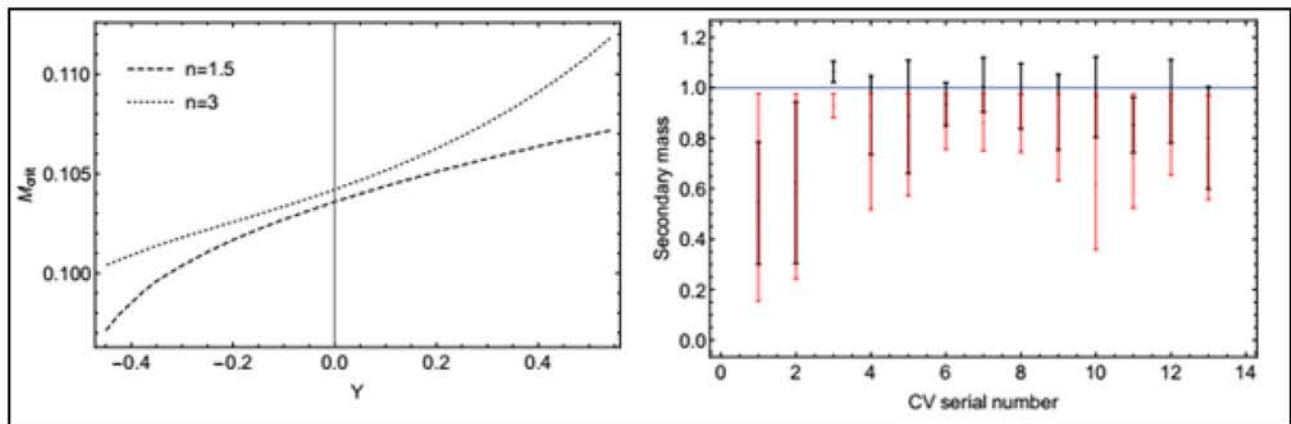
Dr. Arunabha Saha demonstrating the efficacy of the CsI(Tl) and NaI(Tl) in the Orientation course at DAE-BRNS symposium on Nuclear Physics, Cotton University, Guwahati in 2022.



RESEARCH ARTICLE PUBLICATIONS IN INTERNATIONAL JOURNAL

- (1) “Constraining Modified Gravity from Tidal Phenomena in Binary Stars”, Pritam Banerjee, Debojyoti Garrain, [Suvankar Paul](#), Rajibul Shaikh, and Tapobrata Sarkar, , The Astrophysical Journal, 910, 1 (2021)

In beyond-Horndeski theories of gravity, the Vainshtein screening mechanism might only be partially effective inside stellar objects. This results in a modification of the

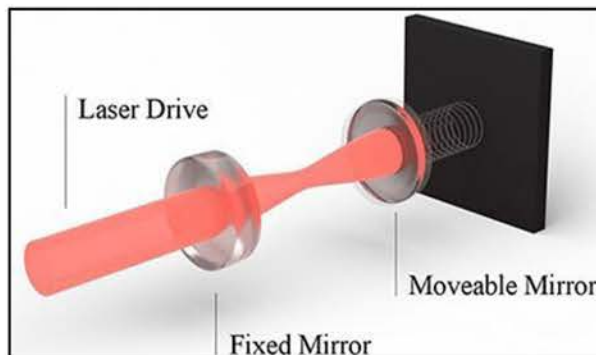


pressure balance equation inside stars, often characterized by a single parameter (γ) in isotropic systems. We show how to constrain such theories of modified gravity, using tidal effects. We study such effects in cataclysmic variable star binaries and numerically obtain limits on the critical masses of the donor stars, below which they are tidally disrupted, by modeling them in beyond-Horndeski theories. This is contrasted with values of the donor masses, obtained using existing observational data, by a Monte Carlo error progression method. A best-fit scenario of the two yields a parametric constraint in the theories that we consider, within the approximations used. Here, we obtain the allowed range $0 \leq \gamma \leq 0.50$.

- (2) “Continuous variable quantum entanglement in optomechanical systems”, Amarendra Sarma, [Subhadeep Chakraborty](#), and Sampreet Kalita; A short review, AVS Quantum Science, 3, 015901 (2021)

Cavity optomechanics deals with the radiation pressure-induced interaction between photons and mechanical motion in a cavity. It has promising applications in quantum information

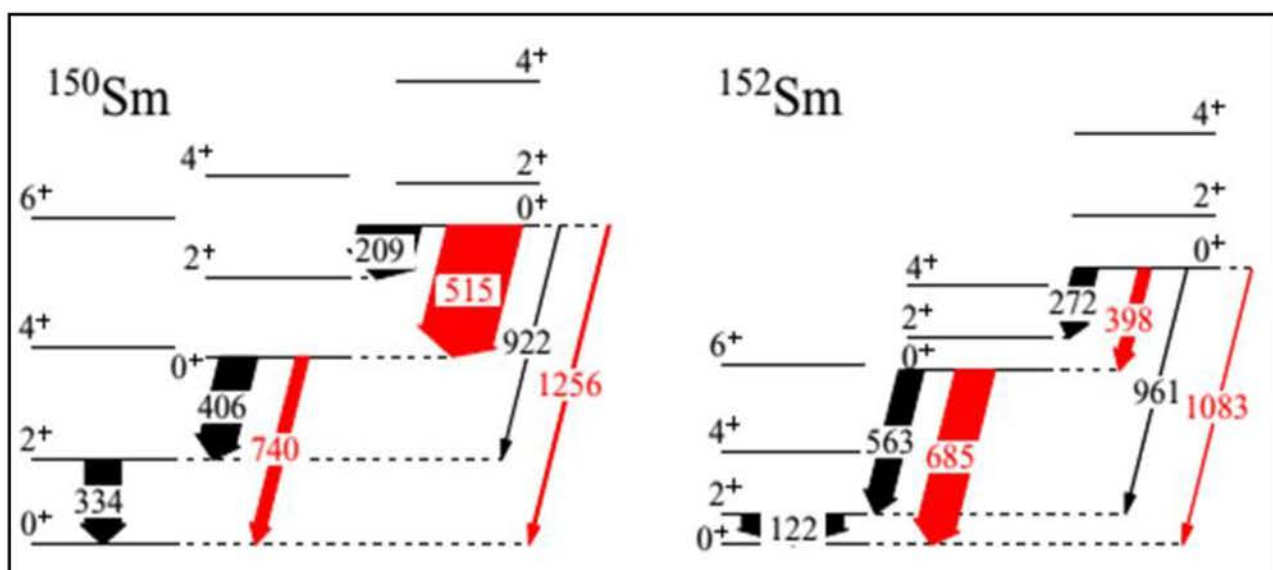
science. In this review, the authors discuss quantum entanglement in this emerging area of research. After giving a brief historical background on the topic of entanglement and cavity optomechanics, measures of continuous-variable entanglement are discussed somewhat in great detail. This is followed by a short discussion on cavity quantum optomechanics, relevant to the topic of entanglement. Then the authors discuss most of the prominent ideas and proposals pertaining to entanglement research in cavity optomechanics up until now. The authors have emphasized the key theoretical concepts without too much rigor and provided relevant experimental details whenever deemed appropriate. Finally, the authors conclude by giving a perspective on other quantum correlations such as quantum discord and quantum synchronization.



- (3) “Shape coexistence scenario in ^{150}Sm from a γ - γ fast-timing measurement”, S. Basak, S. S. Alam, D. Kumar, [A. Saha](#),¹ and T. Bhattacharjee, *Phys. Rev. C* 104, 024320 (2021).

Lifetimes are measured for low lying states of ^{150}Sm , populated from β -decay of ^{150}Pm produced through (p, n) reactions with a ^{150}Nd target. The VENTURE array

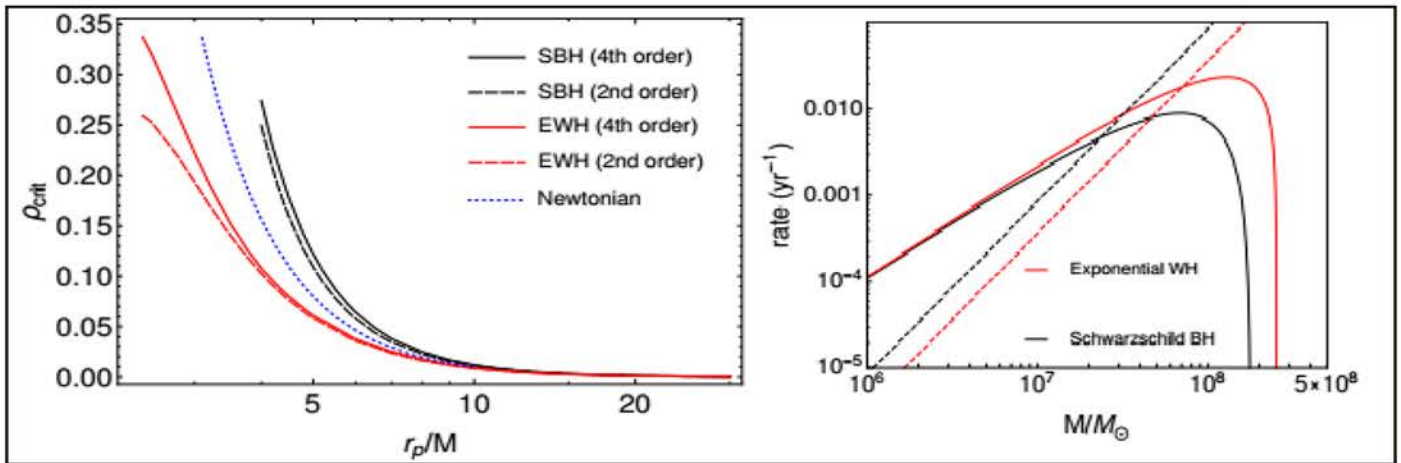
comprising of eight fast CEBR3 detectors is



used for lifetime measurement with γ - γ fast timing technique. The lifetime of 0^+_3 level of ^{150}Sm is measured for the first time to be 36(10) ps. The 0^+_3 level is found to have enhanced decay strengths to the $K^\pi=0^+_2$ structure compared with $K^\pi=0^+_1$. A high $\rho^2(E0)$ strength for the $0^+_3 \rightarrow 0^+_2$ decay confirms shape coexistence and shape mixing in $N=88$ ^{150}Sm .

“Tidal disruption near black holes and their mimickers”, Pritam Banerjee, [Suvankar Paul](#), Rajibul Shaikh, and Tapobrata Sarkar; *Journal of Cosmology and Astroparticle Physics*, **03,042(2021)**

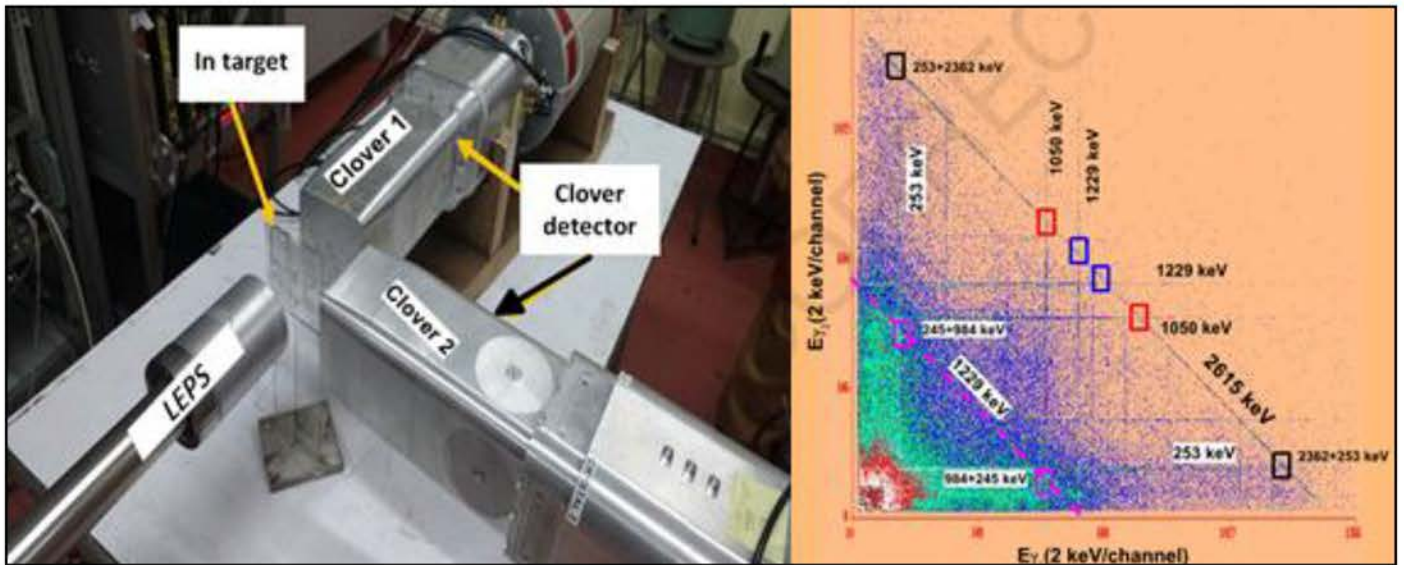
Black holes and wormholes are solutions of Einstein's field equations, both of which, from afar, can look like a central mass. We show here that although at large distances both behave



like Newtonian objects, close to the event horizon or to the throat, black holes and wormholes have different tidal effects on stars, due to their respective geometries. We quantify this difference by a numerical procedure in the Schwarzschild black hole and the exponential wormhole backgrounds and compare the peak fallback rates of tidal debris in these geometries. The tidal disruption rates in these backgrounds are also computed. It is shown that these quantities are a few times higher for wormholes, compared to the black hole cases.

“Decay spectroscopy of $^{117,118}\text{Sn}$ ”, S. Das, A. Adhikari, S. S. Alam, S. Sharma, S. Aich, A. Gupta, Y. Sapkota, A. Das, [A. Saha](#), S. K. Dey, D. Pramanik, A. Bisoi, I. Ray, T. Bhattacharjee, C. C. Dey, S. Sarkar, M. Saha Sarkara; *Nuclear Physics A*, 1006, 122079, (2021).

The low-lying states of $^{117,118}\text{Sn}$ have been studied from the decay of $^{117g,118m}\text{Sb}$, and ^{117m}Sn . These long-lived species were populated through the reaction $^4\text{He} + ^{\text{nat}}\text{In}$ at $E_{\text{lab}} = 32$ MeV. Singles, as well as γ - γ coincidence data, were acquired. The uncertainties in the placement of some of the γ -rays in the excitation spectra of ^{118}Sn observed by previous workers have been removed. A γ -ray (984 keV) previously assigned to ^{118}Sn has been eliminated from the level scheme, based on the present analysis. The decay half-lives of $^{117g,118m}\text{Sb}$ have been remeasured. The slope method and deconvolution technique have been used to determine the half-lives of a few isomeric states in $^{117,118}\text{Sn}$. The results are interpreted in the framework of large-scale shell-model calculations performed in the 50 - 82 valence shell using truncations. Although the excitation energies were not reproduced well, the theoretical calculations could reasonably reproduce the isomers' transition probabilities due to their nearly pure configuration.

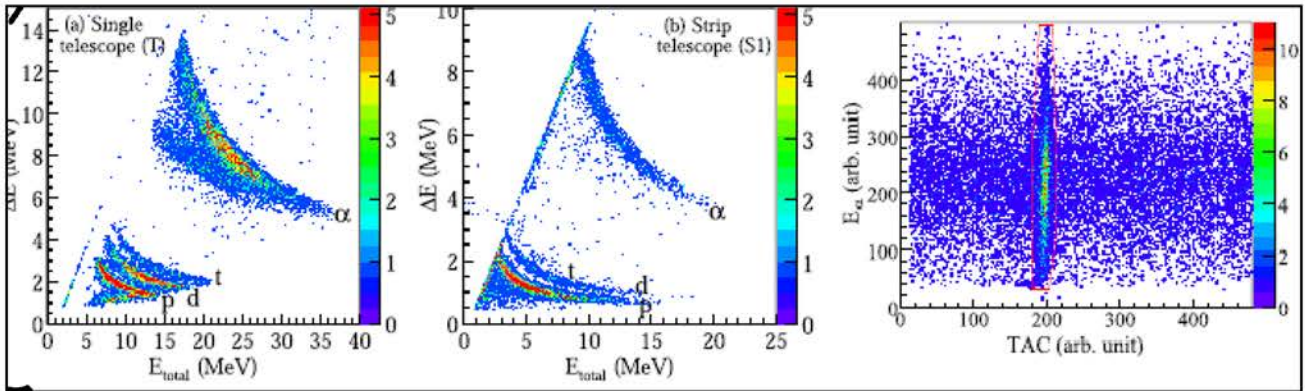


- (6) “Critical analysis of the reentrant localization transition in a one-dimensional dimerized quasiperiodic lattice”, Shilpi Roy, [Sourav Chattopadhyay](#), Tapan Mishra, and Saurabh Basu, *Phys. Rev. B* 105, 214203 (2022).

A reentrant localization transition was predicted recently in a one-dimensional quasiperiodic lattice with dimerized hopping between the nearest-neighbor sites. It was shown that the interplay between the hopping dimerization and a staggered quasiperiodic disorder manifests two localization transitions through two intermediate phases, resulting in four critical points as a function of the quasiperiodic potential. In this paper, we study the critical nature of the states across the localization transitions by computing the mass exponents and the corresponding fractal dimensions of the states through a multifractal analysis. Moreover, we analyze the phenomenon of this reentrant localization transition by examining the spectral properties of the eigenstates. By performing a systematic finite-size scaling analysis for a fixed value of the hopping dimerization, we obtain accurate critical disorder strengths for different transitions and the associated critical exponents. Further, we complement the critical nature of the energy spectrum by computing the Hausdorff dimensions.

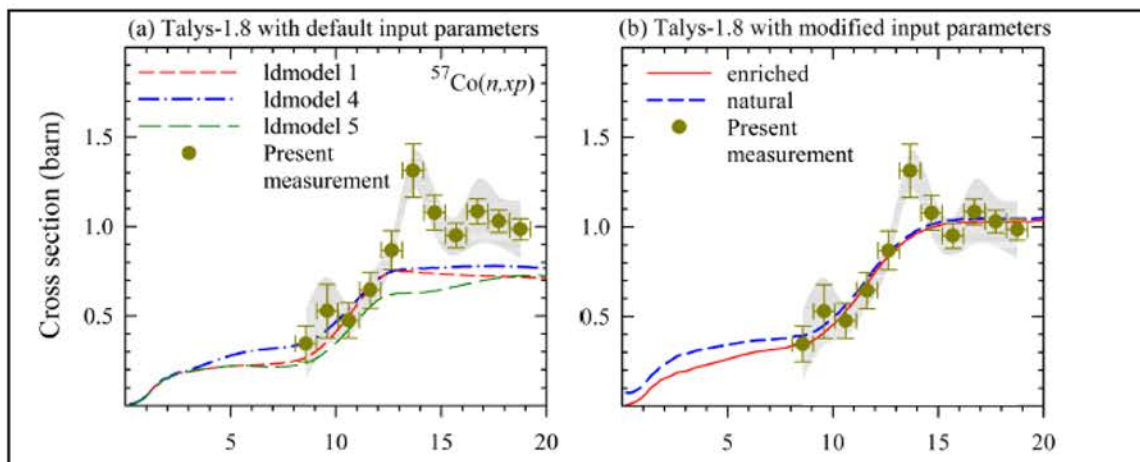
- (7) “Determination of $^{57}\text{Co}(n, xp)$ cross sections using the surrogate reaction ratio method” Ramandeep Gandhi, S. Santra, A. Pal, B. K. Nayak, P. C. Rout, [D. Chattopadhyay](#), A. Kundu, A. Baishya, T. Santhosh, S. K. Pandit, G. Mohanto, and A. Diaz-Torres, *Phys. Rev. C* 106, 034609 (2022)

The compound nuclei $^{58}\text{Co}^*$ and $^{61}\text{Ni}^*$ have been populated at overlapping excitation energies by transfer reactions $^{56}\text{Fe}(^6\text{Li}, \alpha)^{58}\text{Co}^*$ (surrogate of $n + ^{57}\text{Co}$) at $E_{\text{lab}} = 35.9$ MeV and $^{59}\text{Co}(^6\text{Li}, \alpha)^{61}\text{Ni}^*$ (surrogate of $n + ^{60}\text{Ni}$) at $E_{\text{lab}} = 40.5$ MeV, respectively. The $^{57}\text{Co}(n, xp)$ cross sections in the equivalent neutron energy range of 8.6–18.8 MeV have been



within the framework of the surrogate reaction ratio method using $^{60}\text{Ni}(n, xp)$ cross section values from the literature as reference.

The proton decay probabilities of the compound systems have been determined by measuring evaporated protons at backward angles in coincidence with projectile-like fragments detected around the grazing angle. The measured $^{57}\text{Co}(n, xp)$ cross sections are in good agreement with both the predictions of TALYS-1.8 statistical model code with default parameters using different microscopic level densities and data evaluation library JEFF-3.3 up to equivalent neutron energy ≈ 12.6 MeV, while for higher energies the measured $^{57}\text{Co}(n, xp)$ cross sections are found to be consistently higher than the predictions. However, the TALYS-1.8 calculations with modified values of input potential parameters provide a reasonable reproduction of the measured $^{57}\text{Co}(n, xp)$ cross sections for the entire neutron energy range. The observed discrepancies at higher energies between the experimental data and the predictions of both the JEFF-3.3 library and the TALYS-1.8 calculations with default



parameters indicate the need of new evaluations for this reaction.

- (8) “Nonlinear optical properties of Bi_{0.5}Na_{0.5}TiO₃ thin films grown by PLD”, Srinivas Pattipaka, Pamu Dobbidi, Pundareekam Goud J, Gyan Prakash Bharti, **Gobinda Pradhan**, S. Shraavan Kumar Reddy, K.C.James Raju, Alike Khare, *Ceramics International*, 48, 29533, 2022

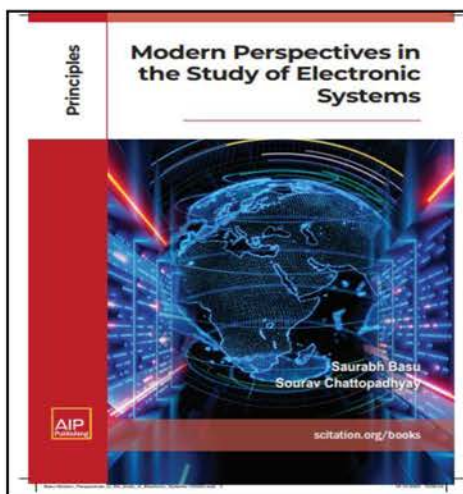
The present work investigates the role of oxygen partial pressure (PO_2) during the thin film growth in obtaining phase and controlling the crystallinity and optical responses in the thin films. Rietveld refinement of X-ray diffraction confirmed a rhombohedral structure of BNT as a major phase with secondary phase of Bi₂Ti₂O₇ and Bi₄Ti₃O₁₂. The diminutions of the secondary phase are observed with an increase in PO_2 , which signifies the crystal structure closely related to the partial oxygen pressure. The refractive index of films was found to be improved and optical bandgap energy was reduced with PO_2 due to the increase in crystallinity as well as decrease in oxygen vacancies. Nonlinear optical properties show a strong PO_2 dependency, self-focusing behaviour with a positive, large optical nonlinearity ($n_2 = 4.62 \times 10^{-6} \text{ cm}^2/\text{W}$) and strong absorbance ($\beta = 0.755 \text{ cm/W}$) for the film deposited at 10 Pa, which makes a potential candidate for the nonlinear photonic device applications.

RESEARCH ARTICLE PUBLICATIONS IN CONFERENCE PROCEEDINGS

- (1) “Study of diluted kinetic Ising model under sinusoidal external field”, **Sourav Chattopadhyay**, S. B. Santra, *Journal of Physics: Conference Series* 2207 (2022) 012005.
- (2) “Determination of $^{58}\text{Co}(n, xp)$ cross sections using surrogate reaction ratio method”, *Ramandeep Gandhi, S. Santra, P. C. Rout, A. Pal, A. Baishya, T. Santhosh, D. Chattopadhyay, K. Ramachandran, G. Mohanto, J. Pandey, Rudrajyoti Palit, Proceedings of the DAE Symp. on Nucl. Phys. 66, 397 (2022)*
- (3) “R-matrix analysis for the $^2\text{H}(\alpha, \gamma)^6\text{Li}$ reaction cross sections”, *Tanya Singh, D. Chattopadhyay, S. Santra, A. Baishya, Proceedings of the DAE Symp. on Nucl. Phys. 66, 740 (2022).*

BOOK/Chapter Publications

- (1) “Modern Perspectives in the Study of Electronic Systems”, Sourabh Basu and **Sourav Chattopadhyay**, AIP Publishing Books, 2022



Activities

Summer Internship Programme

Summer internship projects are an integral part of our B.Sc. and M.Sc. curriculum. Students of the Department of Physics are doing their IP during the summer holidays and the tenure is 45 days. Students can bag an internship through various means since our University gives ample opportunities to the students to interact with some prestigious institutes of India. During their internship, the students have to submit a weekly report to their respective mentor and after the completion of their internship project students have to submit a final report. Internship project presentation is also conducted for the students. This year as a pandemic situation is going on, online internship projects have been arranged. Some of our students have done their internship projects from ICFAI University Tripura and some of the students have completed their internship at The Inter-University Centre for Astronomy and Astrophysics (Introductory Summer School in Astronomy and Astrophysics) and Tata Institute of Fundamental Research & Homi Bhabha Research for Science Education (Vigyan Vidushi 2021). The Department of Physics floated various Summer IP Projects to keep the students occupied during the summer break. Most of the M.Sc students have solved various physics problems using C programming. The projects were useful in enhancing skill, team spirit, and knowledge amongst the students. Students have successfully completed the projects and were awarded certificates.

Sl. No	Project Title	Program	Faculty Supervisor
01.	Groups and their representations	B.Sc (Physics) 1 st year	Dr. Tuhin Subhra Mukherjee
02.	Complex functions	B.Sc (Physics) 1 st year	Dr. Tuhin Subhra Mukherjee
03.	Magnetoresistance in pseudo spin valve thin films	B.Sc (Physics) 1 st year	Dr. Camelia Das
04.	Basics of waveguide	B.Sc (Physics) 1 st year	Dr. Camelia Das
05.	Plotting data and fitting curve in smartphones	B.Sc (Physics) 1 st year	Dr. Ganesh Adhikary
06.	Determination of muon lifetime	B.Sc (Physics) 1 st year	Dr. Ganesh Adhikary
07.	Emissivity and demonstration of the effect of colors on the emissivity	B.Sc (Physics) 1 st year	Dr. Beauty Pandey
08.	Black holes and determination of the effects of the temperature of the universe on black holes	B.Sc (Physics) 1 st year	Dr. Beauty Pandey
09.	Science of Aeroplanes Flight	B.Sc (Physics) 1 st year	Dr. Arunabha Saha
10.	Physics behind nuclear fusion and fission	B.Sc (Physics) 1 st year	Dr. Arunabha Saha
11.	Diffusion equation and its solution	B.Sc (Physics) 2 nd year	Dr. Tuhin Subhra Mukherjee

Sl. No	Project Title	Program	Faculty Supervisor
12.	Green's function	B.Sc (Physics) 2 nd year	Dr. Tuhin Subhra Mukherjee
13.	Magnetoresistance in pseudo spin valve thin films	B.Sc (Physics) 2 nd year	Dr. Camelia Das
14.	Propagation of Electromagnetic waves in matter	B.Sc (Physics) 2 nd year	Dr. Camelia Das
15.	Maxwell's equation and properties of light	B.Sc (Physics) 2 nd year	Dr. Ganesh Adhikary
16.	Theory of Hall effect	B.Sc (Physics) 2 nd year	Dr. Ganesh Adhikary
17.	Mapping solar performance for its beneficial utilization	B.Sc (Physics) 2 nd year	Dr. Beauty Pandey
18.	Construction, execution and analysis of a floating MAGLEV train	B.Sc (Physics) 2 nd year	Dr. Beauty Pandey
19.	Four fundamental forces of physics	B.Sc (Physics) 2 nd year	Dr. Arunabha Saha
20.	Interaction of Nuclear Radiation with Matter	B.Sc (Physics) 2 nd year	Dr. Arunabha Saha
21.	C programming	M.Sc (Physics) 1 st year	Dr. Suvankar Paul
22.	Introductory Summer School in Astronomy and Astrophysics	M.Sc (Physics) 1 st year	The Inter-University Centre for Astronomy and Astrophysics
23.	Vigyan Vidushi 2021	M.Sc (Physics) 1 st year	Tata Institute of Fundamental Research & Homi Bhabha Research for Science Education

Extracurricular Activity(AY:2020-21):

Students of Department of Physics, ICFAI University are very much active in extracurricular activities. For the overall development of a student, the curriculum is not only the criteria. The holistic growth and as well as to develop the various facts of personality develops by these kinds of activity. This year, during the critical situation of pandemic our students have participated in many competitions and got success. Students of B.Sc and M.Sc of the Department of Physics have actively participated in various extracurricular activities.

No.	Name of the student	Course	Participated in	Position Secured
1.	Astha Paul Chowdhuri	B.Sc	Participated in Sit and Draw competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 1st position

2.	Mamun Acharjee	B. Sc.	Participated in Science Model Competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 2 nd position
3.	Mamun Acharjee	B. Sc	Participated in Poster Competition in National Science Day-2021 conducted by ICFAI University Tripura	-
4.	Mamun Acharjee	B. Sc	Participated in singing competition in Annual Techno-Cultural Fest ICARIA-2021 organized by ICFAI University Tripura	-
5.	Anwasha Bhowmik	B.Sc	Participated in Science Model Competition in National Science Day -2021 conducted by ICFAI University Tripura	Secured 2 nd position
6.	Anwasha Bhowmik	B.Sc	Participated in Poster Competition in National Science Day-2021 conducted by ICFAI University Tripura	-
7.	Debmita Chakraborty	B.Sc	Participated in Science Model Competition in National Science Day -2021 conducted by ICFAI University Tripura	Secured 2 nd position
8.	Debmita Chakraborty	B.Sc	Participated in Poster Competition in National Science Day -2021 conducted by ICFAI University Tripura	-
9.	Shaheb Choudhury	B.Sc	Participated in Science Model Competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 1st position
10.	Shaheb Choudhury	B.Sc	Participated in Poster Competition in National Science Day-2021 conducted by ICFAI University Tripura	-

11.	Shaheb Choudhury	B.Sc	Participated in Treasure Hunt game and in Poetry Session in Annual Techno-Cultural Fest ICARIA-2021 organized by ICFAI University Tripura	-
12.	Shaheb Choudhury	B.Sc	Shouldered various responsibilities in organizing variety of cultural and competitive events in Annual Techno-Cultural Fest ICARIA-2021 organized by ICFAI University Tripura	-
13.	Manidwipa Shil	B.Sc	Participated in Science Model Competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 1st position
14.	Manidwipa Shil	B.Sc	Participated in Poster Competition in National Science Day-2021 conducted by ICFAI University Tripura	-
15.	Akash Dhar	B.Sc	Participated in Science Model Competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 1st position
16.	Tamajit Dey	B.Sc	Participated in Science Model Competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 1st position
17.	Souravi Acharjee	B.Sc	Participated in Poster Competition in National Science Day-2021 conducted by ICFAI University Tripura	-
18.	Prantanu Sarkar	B.Sc	Participated in Poster Competition in National Science Day -2021 conducted by ICFAI University Tripura	-
19.	Abhishek Choudhury	B.Sc	Participated in Poster Competition in National Science Day -2021 conducted by ICFAI University Tripura	-

19.	Tanmoy Deb	B.Sc	Participated in Poster Competition in National Science Day -2021 conducted by ICFAI University Tripura	-
21.	Aishwarya Chowdhuri	B.Sc	Participated in singing competition in Annual Techno-Cultural Fest ICARIA-2021 organized by ICFAI University Tripura	Secured 1st position
22.	Antarika Banik	B.Sc	Participated in various dance forms in Annual Techno-Cultural Fest ICARIA-2021 organized by ICFAI University Tripura	Secured 1st position
23.	Rajesh Sarkar	B.Sc	Participated in Sit and Draw competition in National Science Day-2021 conducted by ICFAI University Tripura	Secured 3rd position
24.	Pujita Chakraborty	M.Sc	Participated in Poster Competition in National Science -2021 conducted by ICFAI University Tripura	Secured 3rd position
25.	Sreejit Kar	M.Sc	Participated in Poster Competition in National Science -2021 conducted by ICFAI University Tripura	Secured 3rd position
26.	Arpita Bhuiya	M.Sc	Participated in Sit and Draw competition in National Science -2021 conducted by ICFAI University Tripura	Secured 1st position
27.	Sanchita Karmakar	B.Sc	Participated in an online course on "Geospatial Technology for Hydrological Modelling, organized by Department of Space, Indian Space research Organisation and Indian Institute of Remote Sensing, DEHRADUN, Govt. Of India, from 19-07-2021 to 30-07-2021	-

28.	Debarpit Chakraborty	B.Sc	Attended and represented Tripura in National theatre conference summit 2021-2022 at Hyderabad.	-
29.	Debarpit Chakraborty	B.Sc	participated and Hosted the Biggest techno-cultural fest of North-East ICARIA 2021 organized by ICFAI University Tripura	-
30.	Debarpit Chakraborty	B.Sc	Performed Drama “CORONA COLLAGE” and “DESHER NAME” on 10 th March 2021	Received best actor Award from well renowned Tollywood actor Rwitobroto Mukherjee
31.	Debarpit Chakraborty	B.Sc	Acted on a drama “Raat Pohalei Corona” which Tells us the different aspects of COVID-19 on human life in National Science -2021 conducted by ICFAI University Tripura	-
32.	Debarpit Chakraborty	B.Sc	Received uprising actor award 2020 of Tripura on the auspicious occasion of World theatre day 2021	-
33.	Debarpit Chakraborty	B.Sc	Attended online workshop on “mime and its co-circulance” organized by National Mime Institute Pune on 7 th May 2021	-
34.	Debarpit Chakraborty	B.Sc	Attended Six days Acting workshop from 10 th August 2021 to 15 th August 2021 at Rabindra Bharati University, Santiniketan, and performed Drama with well renowned Tollywood actor Anirban Bhattacharjee and Rudranil Sen	-

35.	Debarpit Chakraborty	B.Sc	Released a New short film named “COMATE” which was praised and admired all over the state as well as country	-
36.	Debarpit Chakraborty	B.Sc	Hosted Biggest freshers welcome program NOVATOS 2021 organized by ICFAI University Tripura.	-
37.	Debarpit Chakraborty	B.Sc	Hosted a cultural evening for UGC NAAC visit 2021 at ICFAI University Tripura on 7 th December 2021	-

Summer Internship (AY:2021-2022) Project Details :

Group	ID	Name	Project Name
Group 1	21IUT0080016	PRITAM SAHA	Projectile motion
Group 1	21IUT0080021	SOUVIK SARKAR	Projectile motion
Group 1	21IUT0080029	SANJUKTA MAJUMDER	Projectile motion
Group 1	21IUT0080038	DEBAJIT DAS	Projectile motion
Group 1	21IUT0080045	SUCHITA SAHA	Projectile motion
Group 2	21IUT0080004	NILABRO DEB	Solution of simple differential equation
Group 2	21IUT0080011	BIPLAB GHOSH	Solution of simple differential equation
Group 2	21IUT0080012	SUSANTA MAJUMDER	Solution of simple differential equation

Group 2	21IUT0080018	KULDEEP DEBNATH	Solution of simple differential equation
Group 2	21IUT0080019	SOUVIK BHATTACHARJEE	Solution of simple differential equation
Group 3	21IUT0080001	NABANITA DAS GUPTA	Harmonic oscillator
Group 3	21IUT0080008	SAYANIKA DATTA	Harmonic oscillator
Group 3	21IUT0080023	DEBASREE MAJUMDER	Harmonic oscillator
Group 3	21IUT0080025	RAJASHREE MAJUMDER	Harmonic oscillator
Group 3	21IUT0080027	RASMITA GHOSH	Harmonic oscillator
Group 3	21IUT0080028	JAYASHREE PAUL	Harmonic oscillator
Group 4	21IUT0080005	TAMAL DATTA	Curve fitting
Group 4	21IUT0080006	PUJA DAS	Curve fitting
Group 4	21IUT0080017	SUBHAM BANIK	Curve fitting
Group 4	21IUT0080022	DIPTANU SARKAR	Curve fitting
Group 4	21IUT0080024	SAYAN BHOWMIK	Curve fitting
Group 5	21IUT0080013	SUPRATIM DAS	LC oscillation
Group 5	21IUT0080026	SHIBASREE ROY	LC oscillation
Group 5	21IUT0080030	SHYAMASREE SAHA	LC oscillation
Group 5	21IUT0080032	DEBALINA BANIK	LC oscillation

Group 5	21IUT0080033	CHIRASREE GOPE	LC oscillation
Group 5	21IUT0080036	PRAJESH ROY	LC oscillation
Group 6	21IUT0080014	DWIPJYOTI DEBNATH	Solution of differential equation
Group 6	21IUT0080020	NACHREEN SULTANA	Solution of differential equation
Group 6	21IUT0080039	ANAMIKA DEB	Solution of differential equation
Group 6	21IUT0080042	PRATYUSHA GHOSH	Solution of differential equation
Group 6	21IUT0080043	KAKALI PAUL	Solution of differential equation
Group 6	21IUT0080044	LIPA CHOWDHURY	Solution of differential equation
Group 7	21IUT0080010	SUJAN DEBNATH	Lissajous figure
Group 7	21IUT0080015	SANKARSAN DATTA	Lissajous figure
Group 7	21IUT0080031	SHAYAN BHOWMIK	Lissajous figure
Group 7	21IUT0080040	SHREYASI DEY	Lissajous figure
Group 7	21IUT0080041	PRIYANKA DAS	Lissajous figure
Group 8	21IUT0080002	ARKADEEP SAHA	Eigenvalue and eigenvector
Group 8	21IUT0080003	RAHUL SHIL	Eigenvalue and eigenvector
Group 8	21IUT0080007	SWARNALI KARMAKAR	Eigenvalue and eigenvector
Group 8	21IUT0080009	PRASENJIT DEBNATH	Eigenvalue and eigenvector
Group 8	21IUT0080034	AKASH DHAR	Eigenvalue and eigenvector
Group 8	21IUT0080035	RINKI DEBNATH	Eigenvalue and eigenvector

Student Name	ID No.	Branch	Project Topic	Project Supervisor
Nayan Sinha	20IUT008003	M.Sc 2 nd Year	Experimental Techniques for Nuclear Structure Studies	Dr. Arunabha Saha
Subhra Shankar Bhowmick	20IUT0080021	M.Sc 2 nd Year	Experimental Techniques for Nuclear Structure Studies	Dr. Arunabha Saha
Mousumi Pal	20IUT0080039	M.Sc 2 nd Year	Experimental Techniques for Nuclear Structure Studies	Dr. Arunabha Saha
Uddesh Bhowmick	20IUT0080040	M.Sc 2 nd Year	Experimental Techniques for Nuclear Structure Studies	Dr. Arunabha Saha
Nirnay Bhowmick	20IUT0080028	M.Sc 2 nd Year	Pervoskite Solar Cells: Poentials, Challenges and opportunities	Dr. Ganesh Adhikary
Satashree Deb	20IUT0080032	M.Sc 2 nd Year	Pervoskite Solar Cells: Poentials, Challenges and opportunities	Dr. Ganesh Adhikary
Imran Chowdhury	20IUT0080058	M.Sc 2 nd Year	Pervoskite Solar Cells: Poentials, Challenges and opportunities	Dr. Ganesh Adhikary
Taniya Debnath	20IUT0080042	M.Sc 2 nd Year	Pervoskite Solar Cells: Poentials, Challenges and opportunities	Dr. Ganesh Adhikary
Pujita Chakraborty	20IUT0080064	M.Sc 2 nd Year	Characterization of LaBr ₃ and clover HPGe detectors	Dr. Arunabha Saha

Arindam Paul	20IUT0080046	M.Sc 2 nd Year	Characterization of LaBr ₃ and clover HPGe detectors	Dr. Arunabha Saha
Faria Sultana	20IUT0080055	M.Sc 2 nd Year	Characterization of LaBr ₃ and clover HPGe detectors	Dr. Arunabha Saha
Ria Acharjee	20IUT0080017	M.Sc 2 nd Year	Study on the electronic states and quantum confined system	Dr. Ganesh Adhikary
Rabi Bhowmick	20IUT0080044	M.Sc 2 nd Year	Study on the electronic states and quantum confined system	Dr. Ganesh Adhikary
Bijoy Debnath	20IUT0080057	M.Sc 2 nd Year	Study on the electronic states and quantum confined system	Dr. Ganesh Adhikary
Shayon Majumdar	20IUT0080004	M.Sc 2 nd Year	Study of the solving Kepler Problem using Numerical Methods	Prof. Bibhabasu De
Chitra Chowdhury	20IUT0080015	M.Sc 2 nd Year	Study of the solving Kepler Problem using Numerical Methods	Prof. Bibhabasu De
Dipjoy Datta	20IUT0080059	M.Sc 2 nd Year	Study of the solving Kepler Problem using Numerical Methods	Prof. Bibhabasu De
Soujanita Dey	20IUT0080024	M.Sc 2 nd Year	Study of the Dynamics of a Heavy Symmetric Top Using Numerical Methods	Prof. Bibhabasu De

Aratrika Banik	20IUT0080031	M.Sc 2 nd Year	Study of the Dynamics of a Heavy Symmetric Top Using Numerical Methods	Prof. Bibhabasu De
Rakhal Das	20IUT0080062	M.Sc 2 nd Year	Study of the Dynamics of a Heavy Symmetric Top Using Numerical Methods	Prof. Bibhabasu De
Aniket Das	20IUT0080019	M.Sc 2 nd Year	Study of Complex Quintessence Theory and Dark Energy	Dr. Sovan Ghosh
Sreejit Kaur	20IUT0080052	M.Sc 2 nd Year	Study of Complex Quintessence Theory and Dark Energy	Dr. Sovan Ghosh
Sarbani Das	20IUT0080053	M.Sc 2 nd Year	Study of Complex Quintessence Theory and Dark Energy	Dr. Sovan Ghosh
Swagata Debnath	20IUT0080038	M.Sc 2 nd Year	Study of Complex Quintessence Theory and Dark Energy	Dr. Sovan Ghosh
Suman Debnath	20IUT0080061	M.Sc 2 nd Year	Study of Complex Quintessence Theory and Dark Energy	Dr. Sovan Ghosh
Manoj Debnath	20IUT0080009	M.Sc 2 nd Year	Study of Complex Quintessence Theory and Dark Energy	Dr. Sovan Ghosh
Nikita Rudrapaul	20IUT0080070	M.Sc 2 nd Year	Study of a Random walk in a plane	Dr. Sourav Chattopadhyay
Mistu Bhattacharjee	20IUT0080037	M.Sc 2 nd Year	Study of a Random walk in a plane	Dr. Sourav Chattopadhyay

Rima Chakraborty	20IUT0080043	M.Sc 2 nd Year	Study of a Random walk in a plane	Dr. Sourav Chattopadhyay
Sangita Datta	20IUT0080047	M.Sc 2 nd Year	Study of a Random walk in a plane	Dr. Sourav Chattopadhyay
Pranjal Goswami	20IUT0080051	M.Sc 2 nd Year	Determination of the value of pi using a stochastic method.	Dr. Sourav Chattopadhyay
Ripan Sarkar	20IUT0080002	M.Sc 2 nd Year	Determination of the value of pi using a stochastic method.	Dr. Sourav Chattopadhyay
Tushar Das	20IUT0080048	M.Sc 2 nd Year	Determination of the value of pi using a stochastic method.	Dr. Sourav Chattopadhyay
Asmita Datta	20IUT0080010	M.Sc 2 nd Year	Modulation of Optical Properties of WS2 Quantum Dots by Varying the Size of Quantum Dots	Dr. Gobinda Pradhan
Tirthankar Debnath	20IUT0080011	M.Sc 2 nd Year	Modulation of Optical Properties of WS2 Quantum Dots by Varying the Size of Quantum Dots	Dr. Gobinda Pradhan
Mampi Mitra	20IUT0080012	M.Sc 2 nd Year	Modulation of Optical Properties of WS2 Quantum Dots by Varying the Size of Quantum Dots	Dr. Gobinda Pradhan
Barsha Majumdar	20IUT0080013	M.Sc 2 nd Year	Modulation of Optical Properties of WS2 Quantum Dots by Varying the Size of Quantum Dots	Dr. Gobinda Pradhan
Sanjoy Paul	20IUT0080016	M.Sc 2 nd Year	Nonlinear Optical Characterization of MoS2	Dr. Gobinda Pradhan

Dipankar Datta	20IUT0080050	M.Sc 2 nd Year	Nonlinear Optical Characterization of MoS ₂	Dr. Gobinda Pradhan
Shupankar Debnath	20IUT0080020	M.Sc 2 nd Year	Nonlinear Optical Characterization of MoS ₂	Dr. Gobinda Pradhan
Sharmin Akhter	20IUT0080036	M.Sc 2 nd Year	Determination of crystallite(Grain) size and strain in different powder samples by Williamson-Hall plot method	Dr. Camelia Das
Arpita Bhuiya	20IUT0080033	M.Sc 2 nd Year	Determination of crystallite(Grain) size and strain in different powder samples by Williamson-Hall plot method	Dr. Camelia Das
Pratima Sarkar	20IUT0080034	M.Sc 2 nd Year	Determination of crystallite(Grain) size and strain in different powder samples by Williamson-Hall plot method	Dr. Camelia Das
Nabanita Baidya	20IUT0080006	M.Sc 2 nd Year	Thickness Dependent Magnetic Anisotropy of Co ₄₀ Fe ₄₀ B ₂₀ Films	Dr. Camelia Das
Sanchita Karmakar	20IUT0080007	M.Sc 2 nd Year	Thickness Dependent Magnetic Anisotropy of Co ₄₀ Fe ₄₀ B ₂₀ Films	Dr. Camelia Das
Debajyoti Banik	20IUT0080029	M.Sc 2 nd Year	Thickness Dependent Magnetic Anisotropy of Co ₄₀ Fe ₄₀ B ₂₀ Films	Dr. Camelia Das
Argha Swarup Paul	20IUT0080067	M.Sc 2 nd Year	Thickness Dependent Magnetic Anisotropy of Co ₄₀ Fe ₄₀ B ₂₀ Films	Dr. Camelia Das

Bishal Nath Sarma	20IUT0080001	M.Sc 2 nd Year	The Transverse Field Ising Model	Dr. Tuhin Subhra Mukherjee
Sanjoy Debnath	20IUT0080014	M.Sc 2 nd Year	Simulation of 1D Ising model using Python	Dr. Tuhin Subhra Mukherjee
Dipankar Saha	20IUT0080023	M.Sc 2 nd Year	Simulation of 1D Ising model using Python	Dr. Tuhin Subhra Mukherjee

STUDENT PLACEMENT OFF CAMPUS PLACEMENT

Name Of Student	Program	Batch	Name Of Company/Organization	Offered Post
Chinmay Debnath	B.Sc Physics	2020-2023	Department of Post. Govt. of India	ABPM
Shwetashubhra Karmakar	B.Sc Physics	2020-2023	Department of Post. Govt. of India	GDS BPM
Abhijit Debnath	B.Sc Physics	2020-2023	Department of Post. Govt. of India	GDS BPM
Suchita Saha	M.Sc Physics	2020-2022	Directorate of Elementary Education, Govt. of Tripura	Graduate Teacher
Biplab Ghosh	M.Sc Physics	2020-2022	Directorate of Elementary Education, Govt. of Tripura	Graduate Teacher



Student's Speak

“ICFAI University is the place which provides me a stage to bring out all the things from inside me. The faculty members are very much helpful and they help us in every aspect of learning. I met with different people from different areas which helped me to gain knowledge about many things. The environment is also very pleasant. Students get so many opportunities in various fields to participate in different events which were organized by the university. I am really very much thankful to ICFAI University – to create what we are today. It was the best time of my life”.proud.”

Astha Paul Choudhury,
B.Sc. Physics
(Passed out student)



“After studying for three semesters at ICFAI University, I can proudly say that it fosters multi-dimensional skills in students, enriching their overall personality. It is a global launchpad providing a myriad of opportunities to students coming from different walks of life. The faculties of the Physics Department have always been helpful in terms of career guidance and for letting me showcase my potential. The various activities organized by the department helped me to explore my skills, besides academics.”

Arpita Pal,
B.Sc. Physics
(3rd Year)



“I am a student of ICFAI University Tripura and I am pursuing my B.Sc. Physics Honours. I am really thankful to this university as it provides me with a better learning environment. It welcomes the young students, educational quality and to explore the best. Apart from academic excellence, various other curriculum activities take place. We have well-experienced educators, admirable administrators, well-equipped lab technicians, a vast library, well-furnished infrastructure, and many more. Besides educational qualifications, I got the chance to acknowledge many more things in the field of sports, cultural activities, and technical fields. So, I am very glad to be a part of the ICFAI Family. ”

Shyamashree Roy,
B.Sc. Physics
(3rd Year)



“I am pursuing B.Sc. Physics at ICFAI University Tripura. The faculty members of ICFAI University are highly knowledgeable in their field and they also impart the knowledge to students in a very easy manner. I am very thankful to the university. Our university also gives exposure to us in various extra-curricular activities. It is really one of the best phases of my life.”

Shwetashubhra Karmakar
B.Sc. Physics
(3rd Year)



“This is undoubtedly a wonderful institution to pursue higher education with accomplished professors; they are always very helpful and nurturing us with great academics. Not only our university provides great educational infrastructure it also focuses on extracurricular activities to develop critical thinking, reasoning skills, and leadership capability and arranges different quizzes, competitions among students to develop their activeness. And moreover, our institution also arranges wonderful opportunities to interact with accomplished scientists of our country thus giving us great exposure to recent scientific developments. So it’s really a great opportunity to study in this glorious institute, and I really feel proud to be a part of this university”.

Debasmita Saha,
B.Sc. Physics
(3rd Year)



A warm welcome to all of the readers, presenting myself as one of the alumni of the University. I was amongst the students of the first batch in the program (B.Sc. Hons.) which started in the university in 2018. Recently passed out in the year 2021 holding a Bachelor's degree in PHYSICS and pursuing my M.Sc. at NIT Agartala presently.

When I joined this university, I was in a big dilemma, whether I might get the right guide on the way of my Higher Education as this was our first batch, but gradually over the years, with the help of faculties from prestigious institutions (mostly IITians), sharing their knowledge and experience in their respective field of intelligence with us helps the students to grow to their potential, by the side also develops the laboratory facilities by collaborating with good companies having the best instruments for the betterment of the students.

Our faculties guide us in preparing different competitive exams for higher education, besides teaching only bookish knowledge, and by their support, I cleared JAM in the year 2021 and got admitted to NIT Agartala.

Goutam Debnath,
B.Sc. physics (Alumni)

PICNIC MOMENTS AT “KHUMULWNG PARK”

