THE PHYSICS BEATS

Department of Physics, Bijni College, Bijni, Chirang, Assam

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FROM THE DESK OF HOD



Welcome to the first volume of our Department Newsletter 'The Physics Beats'. I am proud to introduce this. Our departmental faculty are dedicated to improve the quality of students. They engage themselves to nourishing student's technical skills and holistic development through different events. They encourage the students to enhance academic and personal development for being a responsible human being. It is also expected that the students will serve the society with the knowledge and skills that they have developed during the time at the department. One can go through the pages and see the teachers – students' relationship to fulfill the moto keep shining. I am also thankful to Mrs. Jayshri Narzary for preparing such an excellent work.

Sanjita Ray,

HOD, Physics

Editor's Note



It gives me immense pleasure to present 'The Physics Beats', the departmental newsletter of the Department of Physics. This newsletter is a reflection of the enthusiasm, creativity, and academic spirit of our students and faculty members. It serves as a platform to share scientific ideas, departmental activities, achievements, and developments in the fascinating world of physics. The publication of this newsletter marks another step towards encouraging scientific temperament, innovative thinking, and active participation among students. I sincerely appreciate the efforts of all contributors, editors, faculty members, and students whose dedication and cooperation made this issue possible. I hope The Physics Beats will continue to inspire curiosity, promote academic excellence, and strengthen the bond within our departmental community. I extend my best wishes for the success of this publication and look forward to many more enriching editions in the future.

Editor,
Jayshri Narzary

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DEPARTMENTAL ACTIVITY CORNER

INDUCTION PROGRAMME





An induction programme was held on 02/08/2024 for the newly admitted Major students of the department. S. J. Hussain and Sanjita Ray, faculty members of the department, in their welcome address highlighted the various facilities of the department, along with opportunities for placement and progression to higher education.

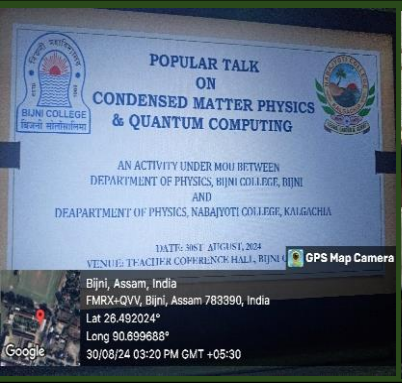
SESSION 2024:2025

DEPARTMENTAL FRESHERS'



Department Freshers for the newly admitted students of session 2024–25 was held on 27/08/2024 at B.G. Basumatary Auditorium. Birhash Giri Basumatary, Principal of the college, attended the programme along with the faculty members of the department and addressed the students with encouraging words for their academic journey.

FACULTY EXCHANGE PROGRAMME





A faculty exchange programme was held on 30/08/2024 as an activity under the MoU between the Department of Physics, Bijni College and Nabajyoti College. A talk on Condensed Matter Physics and Quantum Computing was delivered by Pradyut Rajkumar, faculty member of the Department of Physics, Nabajyoti College. About 40 students from both institutions, along with faculty members, were present in the programme.

EXTENSION ACTIVITY PROGRAMME





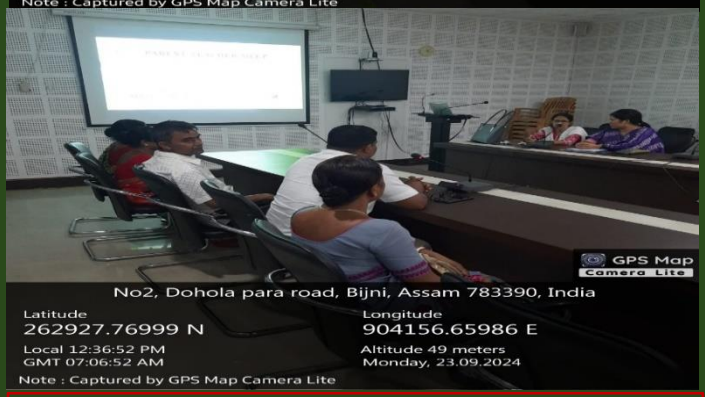
An extension activity was organised by the department along with the Major students in collaboration with NSS Bijni College Unit on 06/08/2024 at Khujurapguri M.E. School, located at Khujurapguri Village. A group of departmental Major students participated in the activity and conducted classes at the school for sharing knowledge with the students. A total of 58 students were benefitted through the activity.

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PARENT –TEACHER MEET





The department organised a parent-teacher meeting on 23/09/2024 at the Conference Hall of the college. A total of seven parents participated in the programme along with the faculty members of the department. The meeting focused on discussing the academic progress, attendance, and overall development of the students, along with suggestions for further improvement.

Department Level Workshop on Research Methodology





A departmental-level workshop on Research Methodology was organised for the Major students of the department on 13/09/2024 at Conference Hall, Bijni College. Dr. Anindita Chakravarty, Assistant Professor, Department of Zoology, and Dr. Prasanta Das, Assistant Professor, Department of Mathematics, participated as the resource persons in the said programme and delivered informative lectures on research methodology, data interpretation, report writing, and the importance of ethical practices in research. The workshop provided valuable guidance to the students regarding the fundamentals of academic research and project preparation. At totalof 35 students took part in the program. The program was ended with the vote of thanks from the HOD, Physics.

INAUGURATION OF WALL MAGAZINE AND DEPARTMENTAL SEMINAR









The inauguration of the Wall Magazine "The Image" and a departmental seminar on the theme "Semiconductor and Semiconductor Devices" were held on 24/09/2024 at Birendragiri Auditorium at 10:00 AM. The Wall Magazine was inaugurated by Birhash Giri Basumatary, Principal of Bijni College, while the seminar presentation session was inaugurated by Sabita Ray, Vice-Principal of the college. A total of seven groups of Major students presented papers on different sub-themes related to semiconductors and semiconductor devices. The programme provided a valuable platform for students to enhance their presentation skills, scientific knowledge, and academic participation.

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SCIENCE DAY CELEBRATION, 2025





National Science Day is celebrated on 28/02/2025 and this celebration implies the share of logical knowledge. It inspire the young minds, promote scientific temper. The program was inaugurated by the Principal, Bijnicollege. Resource person was Dr. Das from Rajib Gandhi University ,Arunachal Pradesh. He gave a lecture on "NEP 2020 and The current Trends in Research" It was a nice and interesting lecture .Many teachers and students took part in

INAUGURATION OF ADD-ON COURSE AND DEPARTMENTAL MAGAZINE





The inauguration of Add on Course on Numerical Methods and Their Implementations in Physics using C++ Programming Language held on 22/03/2025 at Physics Computer Laboratory, Bijni College at 12:30 PM. The program was inaugurated by the Principal, Bijni College. The vice principal and IQAC coordinator blessed the program. The 9th edition of our departmental annual magazine "QUANTA" was also inaguratet by our respected Principal in the program.

CLOSING OF ADD-ON COURSE AND DISTRIBUTION OF CERTIFICATE







The closing and certificate of completion of Add on Course on Numerical Methods and Their Implementations in Physics using C++ Programming Language, started from 22/03/2025 to 03/05/2025, was held at Physics Computer Laboratory, Bijni College at 12:30 PM. The program was attended by the Principal, Bijni College. .

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DEPARTMENTAL ACTIVITY CORNER

FAREWELL CEREMONY PROGRAMME







The Department of Physics, Bijni College, organised a Farewell Ceremony on 10- 05- 2025 at the Departmental computer Lab. for the outgoing students of U, G, 6th Semester students (2022-23 batch). The programme was chaired by Sanjita Ray, HoD, Department of Physics and was graced by all faculty members. The programme was featured with speeches from the teachers, outgoing students. Junior students also share their sweet memories of the days they spent with their seniors. Participants are entertained with a beautiful song by B.Sc. 4th & 2nd. Semester student with Syed Jawahar Hussain (Faculty). The programme was anchored by Suma Saha, a 4th semester student. Vote of thanks was given by Syed Jawahar Hussain (Faculty) of the Department.

FACULTY EXCHANGE PROGRAMME







The Department of Physics, Bijni College, organised a Faculty exchange programme on 21/05/2025 at the Departmental computer Lab. The programme was chaired by Sanjita Ray, HoD, Department of Physics and was graced by all faculty members. The faculty from Basugoan College, Mr. Mahanta Chouhan delivered a lecture on Magnetic Material. It was a very interesting subject related lecture. The programme was featured with speeches from the department teachers. Students of different semesters interacted with Mr. Chouhan. The programme was concluded with Vote of thanks given bySyed Jawahar Hussain (Faculty) , of the Department

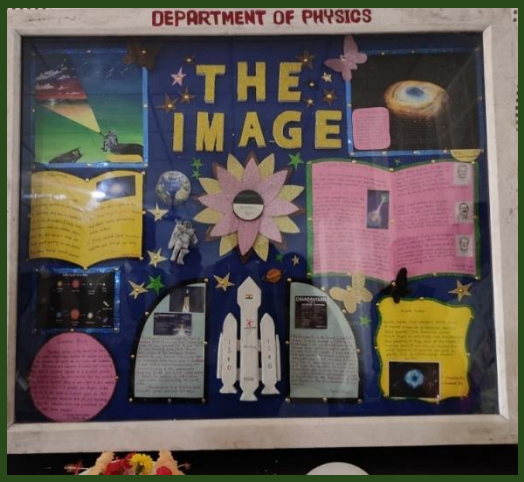
SOFT SKILL PROGRAMME



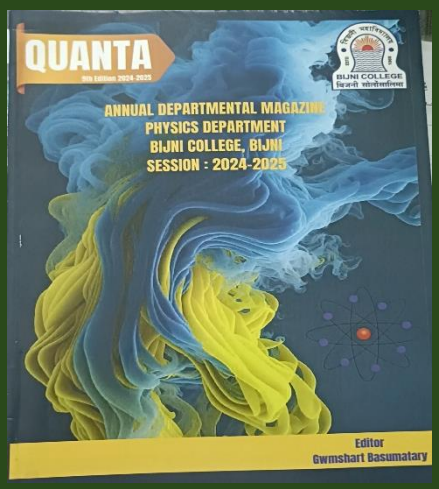


Soft skill program for Major students was arranged on 04.042025 to develop programming language skill among the students. The program was inaugurated with the speech from HOD, Sanjita Ray. She explained the importance of C++ language in physics. Jayshri Narzary, faculty of the department, showed them how by writing a programming code could solve problems. The program was concluded with a photo session with the students.

DEPARTMENTAL PUBLICATIONS/ ACHIEVMENT/RESULT



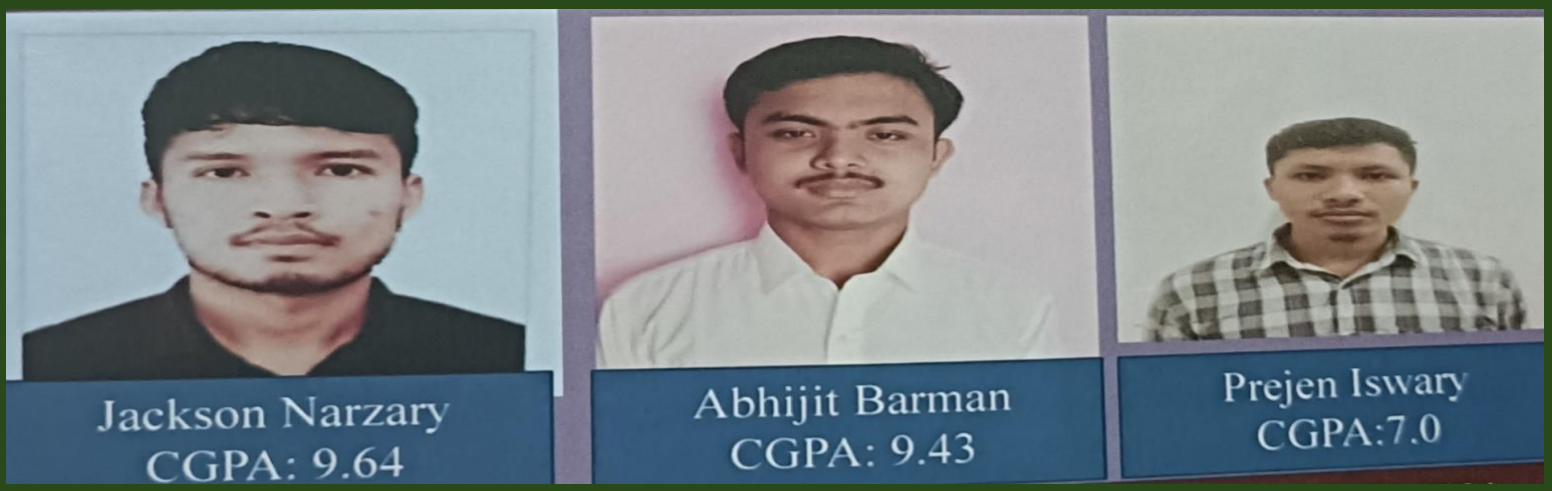
WALL MAGAZINE "THE IMAGE"



ANNUAL MAGAZINE "QUANTA"



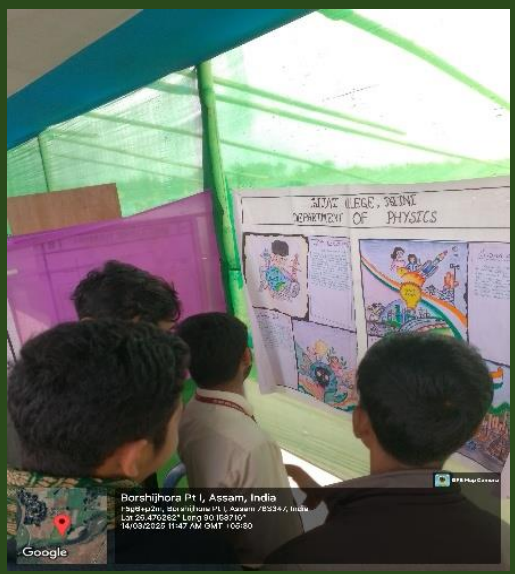
2nd PRIZE FOR DEPARTMENTAL WALL MAGAZINE COMPETITION



PARTICIPATION OF STUDENTS IN OUT REACH PROGRAMME







Students Participated in Science Exhibition in the Conference, 2025 organised by All Bodo Students Union at Dotoma

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1

Physics & Indian Knowledge System

-Sanjita Ray, HOD, Physics, Bijni College

Physics is the basic of understanding the universe with all its visible, invisible matter, different forces, energies etc. and these concepts can be gathered from different Vedas, Upanishads or some ancient times documents i.e. we can say that there was a practice of understanding the mystery of universe at that time also. Surya Siddhanta described the gravitational force as a force that holds the objects in earth, Yajurveda explained the heat as energy and gave its relationship with the motion. We get the concepts of resonance also in ancient Text. Aryabhata, the ancient mathematician, gave a significant contribution to Astronomy which is the foundation of understanding the planetary motion, concepts of space and time. Vaisheshika school founded by saga Kanada (around 300 BC), proposed an atomic theory with two types of atoms, atomic nature of matter, non-atomic nature of time and space. This school is basically known for atomic theory, which give that matters in the universe are composed of tiny eternal, individual atoms (anu) and its Meta physical system that categorizes reality into six or seven categories called padarthas. These are: substance (dravya), qua lity (Guna), action (karma), generality (samanya), particularity (vishesha), inherence (samavaya), non-existence (abhava). The concepts of zero and decimal system originated in India. India. IKS allows fusion of traditional Indian wisdom with modern science to address contemporary problems. This approach can lead to innovative solutions for sustainable development. IKS integrates spirituality with the knowledge of science. Recognizing and applying the IKS in present day research will enable us for more advancement

2

Dielectric Materials: The Hidden Backbone of Modern Electronics

-Jayshri Narzary, Assistant Professor, Physics Department of Physics, Bijni College

Dielectric materials are special insulating substances that do not conduct electricity but can store electrical energy when placed in an electric field. They are widely used in devices like capacitors, which are essential components in almost all electronic circuits. These materials help control and manage electric signals, making devices more efficient and reliable. From mobile phones and computers to advanced communication systems, dielectric materials play a crucial role in modern technology. Even though they are not visible, they silently support the functioning of everyday electronic devices, making them an important part of our digital world.



3

Motion of Life

-Nazma Sultana, Student
FYUGP 2nd Semester

Life itself is motion and flow,
Like rivers that forever go.
Some rise high, some slowly fall,
Yet time continues through it all.
Just like planets move in space,
We each travel at our own pace.
Physics reminds us every day,

Nothing in this world truly stays.

4

The Language of the Universe

-Sanghamitra Ray, Student
FYUGP 2nd Semester

Physics is the silent song,
That guides the world and moves along.
In every star, in every sea,
It writes the laws of destiny.
From falling rain to shining light,
From darkest day to clearest night,
It teaches us the hidden way,
Of how the universe works each day

5

Black Holes and the Mysteries of Space

-Rupam Marak, Student, FYUGP 3rd Semester

Space has always fascinated human beings with its endless mysteries and unknown wonders. Among the most mysterious objects in the universe are black holes. A black hole is a region in space where gravity is so strong that nothing, not even light, can escape from it. Scientists believe black holes are formed when very massive stars collapse after exhausting their energy. Black holes cannot be seen directly because they do not emit light. However, scientists detect them by observing the movement of nearby stars and gases. At the centre of every black hole lies a point called a singularity, where matter is compressed into an extremely small space. Surrounding it is the event horizon, often called the "point of no return." The study of black holes has helped scientists understand many secrets of the universe. They play an important role in the formation and movement of galaxies. In 2019, scientists captured the first image of a black hole, which became a historic achievement in space science.

Space itself is full of mysteries beyond black holes. Questions about dark matter, dark energy, alien life, and the origin of the universe still remain unanswered. Scientists continue to explore space using powerful telescopes and satellites to discover new information about the cosmos. The mysteries of space inspire curiosity and imagination in people around the world. As technology advances, humans may uncover more secrets of the universe in the future. Black holes and space exploration remind us that there is still much to learn beyond our planet Earth.

6

The Science Behind Nuclear Energy

-Kripananda Ray, Student, FYUGP 2nd Semester

Nuclear energy is one of the most powerful sources of energy used in the modern world. It is produced from the nucleus, or center, of an atom. Atoms are extremely tiny particles that make up everything around us. In certain heavy elements such as uranium, the nucleus can split into smaller parts, releasing a huge amount of energy. This process is called nuclear fission.

E= mc2

During nuclear fission, a neutron strikes the nucleus of a uranium atom, causing it to split into two smaller nuclei along with additional neutrons and heat energy. The released neutrons then strike other uranium atoms, creating a chain reaction. This continuous reaction produces an enormous amount of heat.In a nuclear power plant, this heat is used to boil water and produce steam. The steam spins large turbines connected to generators, which then produce electricity. The overall process is similar to thermal power plants, but instead of burning coal or gas, nuclear plants use the energy released from atomic reactions.

One of the greatest advantages of nuclear energy is that it can generate a large amount of electricity from a very small amount of fuel. Nuclear power plants also produce very low greenhouse gas emissions compared to fossil fuels, making them an important option for reducing air pollution and combating climate change.