

# DEPARTMENT OF PHYSICS

THE ACTIVITY REPORT



## GOVERNMENT GENERAL DEGREE COLLEGE, RANIBANDH

### DEPARTMENT OF PHYSICS

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**"Science is a way of thinking much more than it is a body of knowledge." - Carl Sagan**

In the realm of basic sciences, physics stands out as a cornerstone. It is fundamental in understanding the natural world, from the smallest particles to the vastness of the universe. In rural and remote areas, where higher education is often a distant dream and science education is considered a luxury, the need for physics becomes even more pronounced.

The Physics Department began its journey with an affiliation from Bankura University in 2017 and the first batch of students was welcomed. This marked the beginning of a mission to bridge the educational gap in the locality. Despite socioeconomic challenges, where most parents have education only up to class 10, the focus has been unwavering: to provide quality science education. However, from 2023-2024 academic session, the National Education Policy (NEP)-based Four Year Undergraduate Program was adopted in place of the Choice Based Credit System (CBCS) curriculum, as prescribed by the affiliating University.

To ensure a comprehensive education in physics, the department has collaborated with the Mathematics and Chemistry Departments. This interdisciplinary approach allows students to receive specialized instruction in areas where physics intersects with math and chemistry, enriching their understanding and expertise.

Despite having the smallest student strength in the college, the department consistently produces the best results. Every year, the top medal in the final exams is awarded to a student from the Physics Department. This success is a testament to the combined efforts of faculty and the determination of students.

Students are not only excelling academically but are also raising awareness about sustainability. They present innovative ideas such as piezoelectricity and solar cells at annual function stalls, which are visited by ministers, secretaries, local people, and other dignitaries. Additionally, they explore ultra-modern topics like "Advances in the Research of the Possibility of Time Traveling," showcasing their curiosity and advanced understanding.

Belief in the holistic development of students is strong in our college and the department. They are often encouraged to participate in cultural events, sports, and activities like tree plantation etc.. This all-round approach ensures well-rounded individuals.

Students not only achieve the highest marks in the college but also qualify in prestigious examinations like IIT-JAM and GATE. Some have even gone on to serve the nation in defense roles. However, the greatest reward came from a simple conversation. When a designated personality asked a student about their education in the Physics Department, the student confidently replied, "**The best physics is taught in our college.**" Obviously, to some, this could be a matter of discussion that isn't the student too unaware of the best universities of the world to make such a comment! Well, discussion is one part and may go on for a time, but, this confidence in their learning is invaluable, and means the world to us.

The journey of the Physics Department is a unique and inspiring one. Despite numerous challenges, significant strides have been made in providing quality education and fostering a spirit of excellence among students. The confidence and achievements of the students reflect the dedication and hard work of the faculty and the transformative power of education.

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**Head**  
**Department of Physics**  
**G.G.D.C. Ranibandh**

**A brief tour  
through  
the  
Department**



Mr. Kapil Mandal, Assistant Professor in the Department of Physics, leading a class on magnetism, guiding students through the fundamental reason why only moving charged particles create magnetic fields—a critical concept not typically found in standard textbooks.



Students, studying the photoelectric effect, Einstein's groundbreaking discovery that earned him the Nobel Prize.





Mr. Somnath Das, the premier student of our inaugural class, is being awarded the 2020 departmental honor by Dr. Anirban Chattopadhyay, Assistant Professor of Mathematics.



8.94, Somnath Das's CGPA in 2020, was the highest in the college, thereby securing him the title of college topper, conferred by the Officer-in-Charge, Sri Madhusudan Garain.





The Departmental Topper Medal for 2021 was awarded to Mr. Soumen Sahana, a student from a very poor economic and educational background. Soumen later joined defence to serve the nation, discontinuing his studies in physics due to some obligations. However, he continues to study current trends in physics and occasionally interacts with us.



Repeating the history, Mr. Soumen Sahana achieved the highest CGPA of his time, and was awarded the College Topper Award by Dr. Amar Hens, Assistant Professor of Chemistry.





Ms. Sangita Pal, the first female student of our department, was also the first female departmental topper. However, due to her master's exams, she couldn't attend the awarding ceremony in person. She continues to excel in her studies and has recently submitted a research paper to a prestigious journal.



The trend persisted: The 2022 departmental topper was also the college's highest achiever, earning a CGPA of 9.1 & distinguishing herself as the female college topper for the 2<sup>nd</sup> time.





Mr. Biswajit Kumar, honored the baton passed down by his seniors with utmost respect, achieved the highest CGPA in both the department and the college in 2023. However, the highest marks that year were attained by Mr. Dhruba Prasad Pal, the most obedient student in our department till now, also representing the highest marks in the college. Due to the credit system, the highest CGPA and accompanying awards were conferred upon Mr. Biswajit Kumar. Both are currently pursuing their master's degrees in Physics.





The Department of Physics received an award for raising awareness about using solar cells instead of conventional electricity at their departmental stall during the 2019 annual function.



In 2023, the departmental stall of the annual function showcased piezoelectricity, the one of the modern way of sustainable development, leading to the award by the College.





**Dweep Das, a student in the Department of Physics, took part as a member of a cricket team in the 2022 annual sports event.**

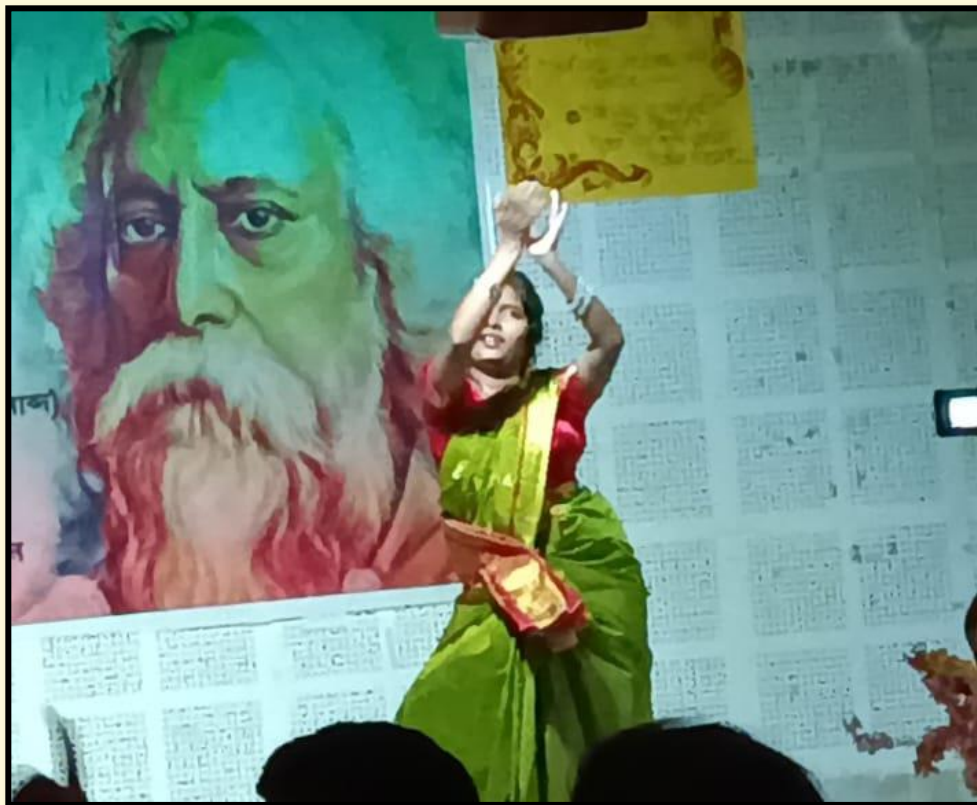


**Furgal Tudu, taking part in the Volleyball event of the annual sports of the year of the year 2022, fostering the all-round development of the soul.**





In 2022, Dweep Das's team emerged as the champions. Dweep's exceptional bowling, with figures of 2/7, was a key factor in securing the trophy. We extend our best wishes to him.

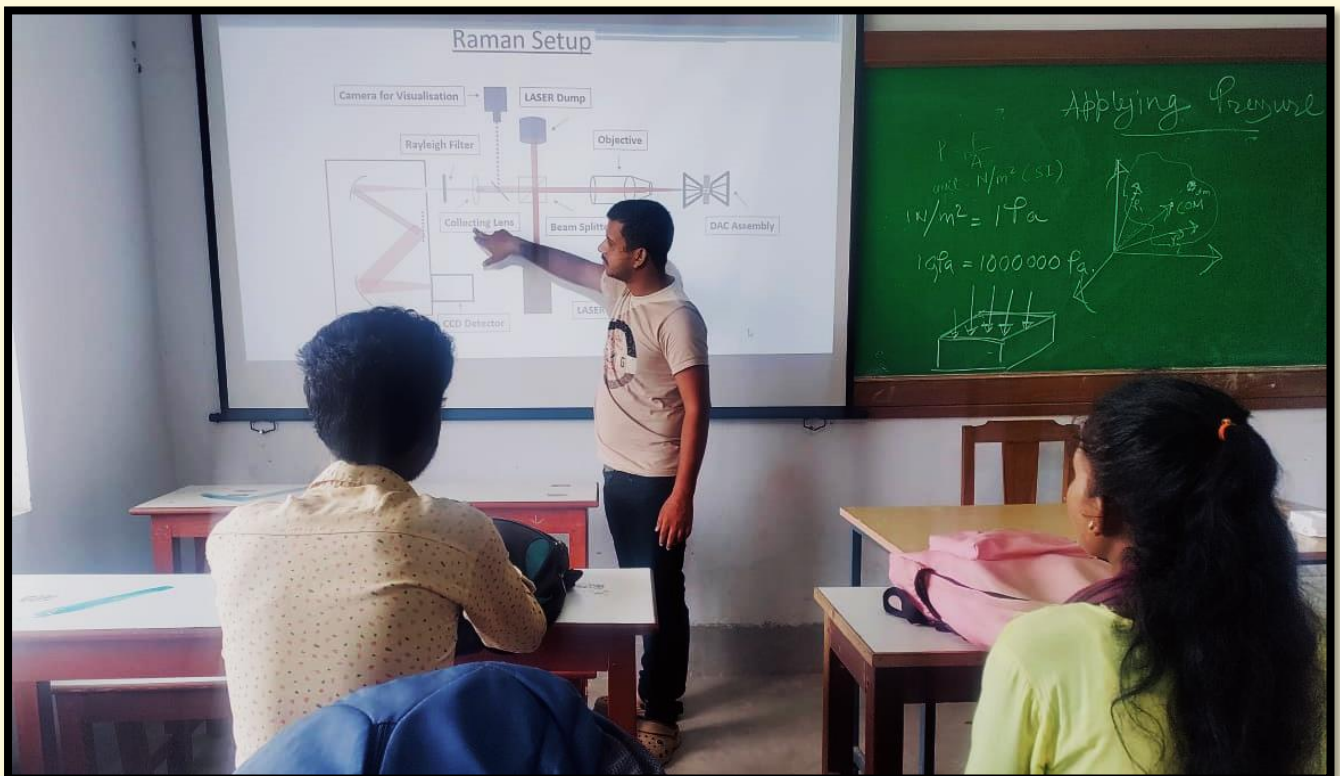


Sangita Pal, our 2022 topper, showcased her exquisite dance art in a tribute to Rabindranath Tagore in the Teachers' Day celebration of the Department.



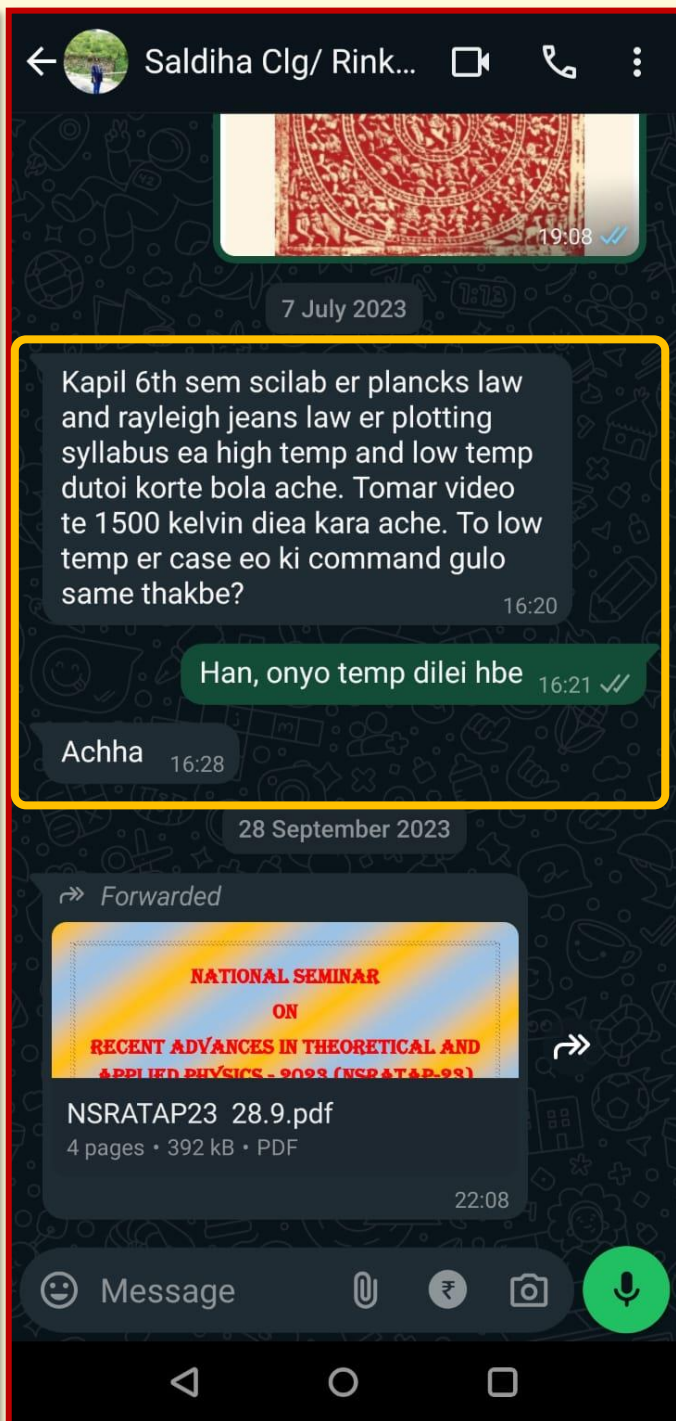
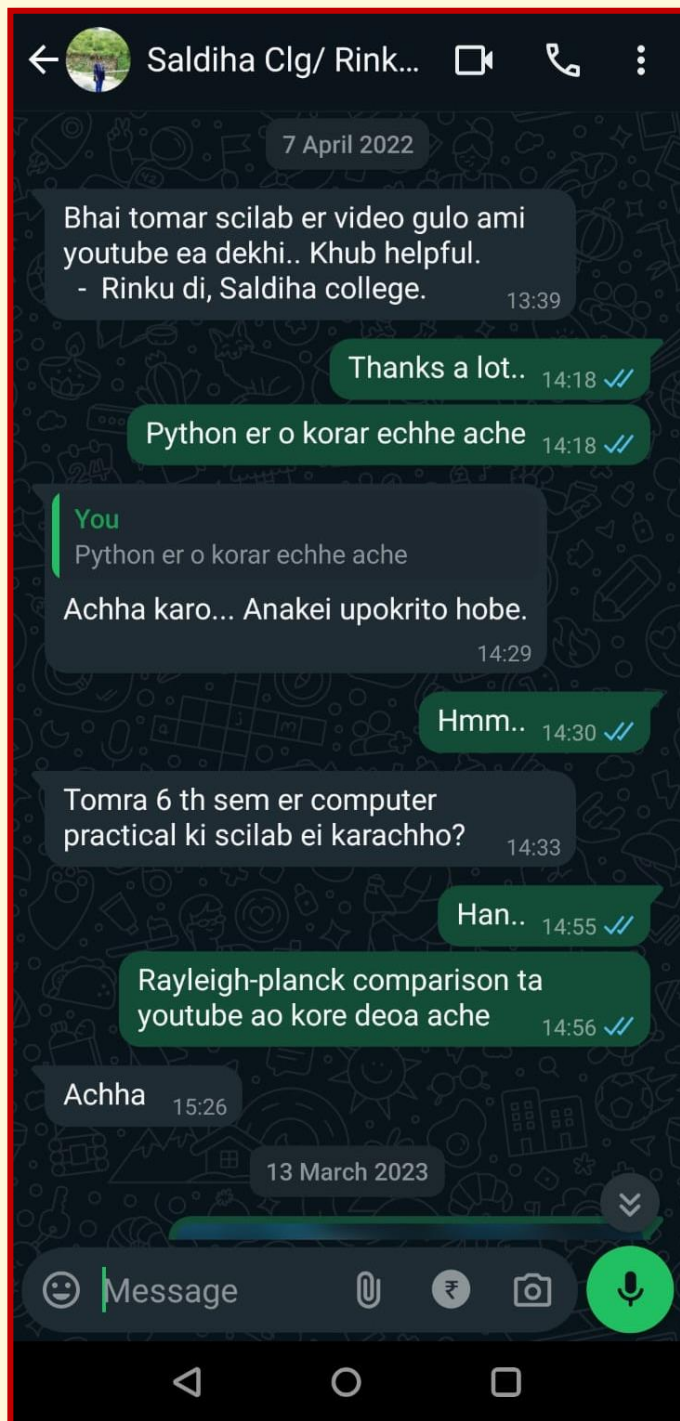


Hemanta Pal, in addition to advocating for sustainability through piezoelectricity, also promoting environmental stewardship by participating in the college's "Van-Mahotsav" program. A truly commendable human value.



The Physics Department fosters peer teaching, encouraging students to share knowledge, collaborate closely, and support each other's academic growth.





Even institutions that have been established for decades are soliciting suggestions and applauding the e-content developed by the faculty of the Physics Department at G.G.D.C. Ranibandh.







GGDCR PHYSICS...  
only admins can send me...

16 April 2021

**A Morning Refresher**  
What is the length of the hypotenuse of a right angled triangle whose base is 1 cm and the perpendicular is  $i$  (imaginary complex number) cm?

একটি সমকোণী ত্রিভুজের ভূমির দৈর্ঘ্য 1 cm, লম্বের দৈর্ঘ্য  $i$  cm হলে অতিভুজের দৈর্ঘ্য কতো??

Everyone try and send me the answer. Whatever might be the result, try to make a physical interpretation.. 04:51 ✓

You  
A Morning Refresher  
What is the length of the hypotenuse of a right angled triangle whose base is 1 cm...

If you fail to interpret physically, either you are making a mistake, or, there is a flaw in the theories you are using. Find out the exact case. Good morning.. Best wishes.. 05:21 ✓

Student/Bikash  
You  
A Morning Refresher

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only admins can send me...

7 September 2022

**MORNING REFRESHER AGAIN**

Let's say three friends; Dhruva, Biswajit & Hemanta are planning a tour in spacetime and the path to follow as suggested by each of them are indicated by the respective world lines in the picture. Only one (not two) of the line is forbidden according to STR. Tell me which plan is going to be cancelled & why? 05:54 ✓

Every problem, be it from BKU, JAM, JEST or Morning Refresher is a chance, a opportunity to learn physics in a more detailed manner. Never miss any such opportunity. Anywhere you see a problem, grab it without fear and then, the success will surely be yours. A very good morning dear students.

GGDCR PHYSICS...  
only admins can send me...

MORNING REFRESHER AGAIN  
(GGDCR Physics Department)

A helicopter is flying horizontally at a constant velocity. A perfectly flexible uniform cable is suspended beneath the helicopter; air friction on the cable is not negligible. Which of the following diagrams best shows the shape of the cable as the helicopter flies through the air to the right?

07:11 ✓

Student/Hemanta  
You  
Photo

Due to air friction all the points in the cable will not be uniform when the helicopter flying with constant velocity.

GGDCR PHYSICS...  
only admins can send me...

27 November 2021

**Morning Refresher Again:**  
If this is an ideal gas engine in ST diagram, draw the same engine in PV diagram. 08:16 ✓

Hint: entropy is an extensive variable, i.e, it depends on the size of the system. 08:19 ✓

Student/Sandip

GGDCR PHYSICS...  
only admins can send me...

Let's say, by doing Raja-yoga daily, you've got the power to alter any thermodynamic coordinate (P,V,T,S,U,...) as per your wish. Now, your mom came to know about this and asked, 'okay, if so, what can you do practically? Can you create an apple out of thin air?'

Now, you cannot say no as, saying so, will prove both the physics and your yogic practice wrong!!!

So, tell me, how, and which thermodynamic variables are to be altered to create an apple out of thin air ???

Solve this too. 19:14 ✓

Student/Hemanta  
As workdone is pathfunction hence non-zero, this increases the entropy of the process (Bad energy converted to entropy). We all know that entropy can't be negative, entropy can't be constant here thus it should increase by the help of

GGDCR PHYSICS...  
only admins can send me...

6 September 2022

**EVENING REFRESHER**

As we know, in a cyclic process, the path functions (work and heat) can't be zero. Imagine a machine in which the working substance(system) goes from A-B via an adiabatic process and then comes back (B-A) too via adiabatic process. Now, as this process is cyclic, change in internal energy is zero and as the process is adiabatic, change in heat is zero too. Therefore, according to the 1<sup>st</sup> law of thermodynamics, the work done must be zero but, this cannot happen as the work done cannot be zero in any cyclic process (this will violate the 2<sup>nd</sup> law + cyclic process must have non zero path functions). So, explain, what is happening here.

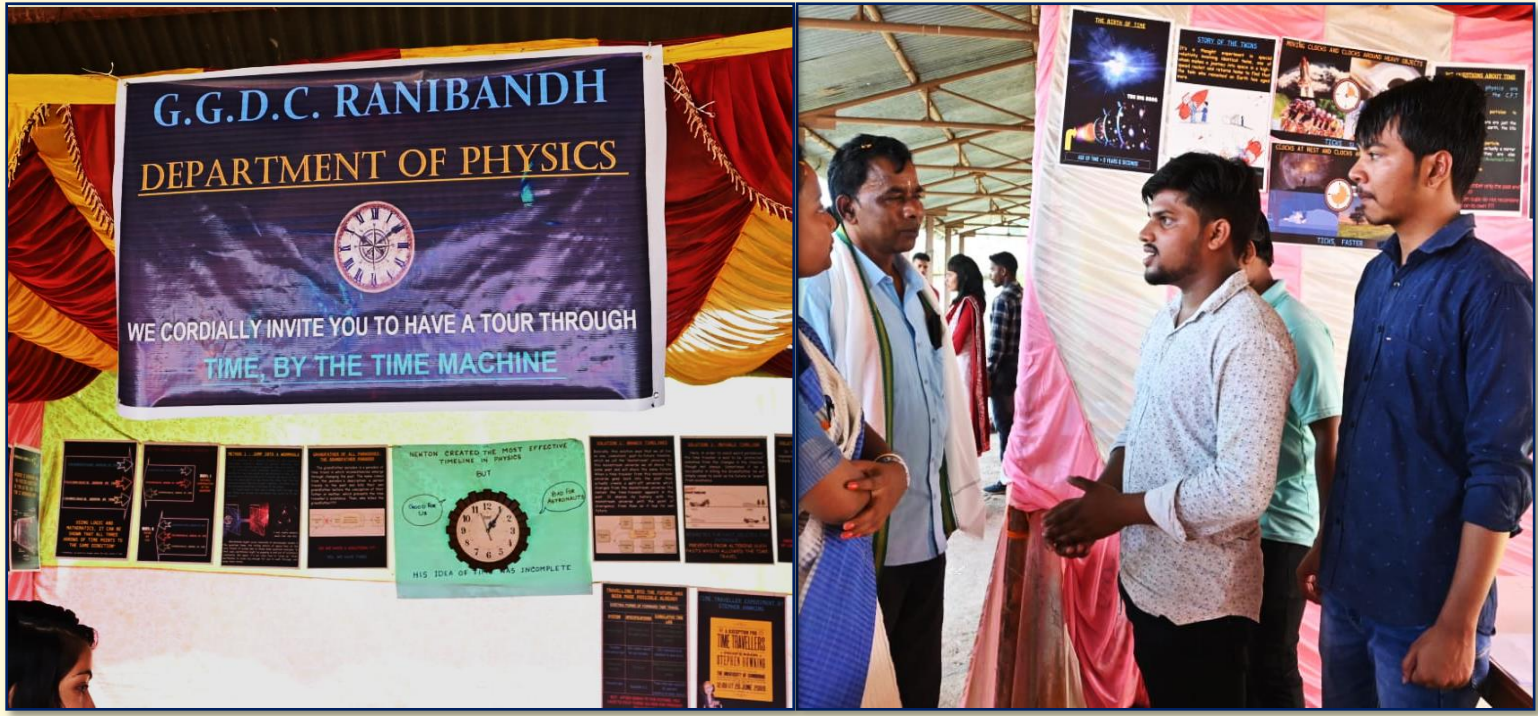
\* Consider the reversible processes to be practical.

Physics, your own subject is your identity. As long as the thrill of Physics is there within you, such conceptual problems will be adventurous. My students, should never be afraid of such problems. 18:42 ✓

Student/Sandip  
You  
Physics, your own subject is your identity. As long as the thrill of Physics i...

**Morning and Evening Refresher: An unconventional initiative by the Department of Physics at G.G.D.C. Ranibandh to keep students deeply immersed in physics even while at home. These sessions, conducted outside the class hours, were originally introduced to counteract the resistive effects of the local socioeconomic structure and the distractions of the internet.**





Students from the Department of Physics at this college are demystifying the ultra-modern concept of time for those outside the scientific community. At this particular event, they explained recent advancements in the research on the concept of time and the "possibilities" & "paradoxes" of time travel.



Our students; explaining the concepts of sustainability through piezoelectricity to the visitors.