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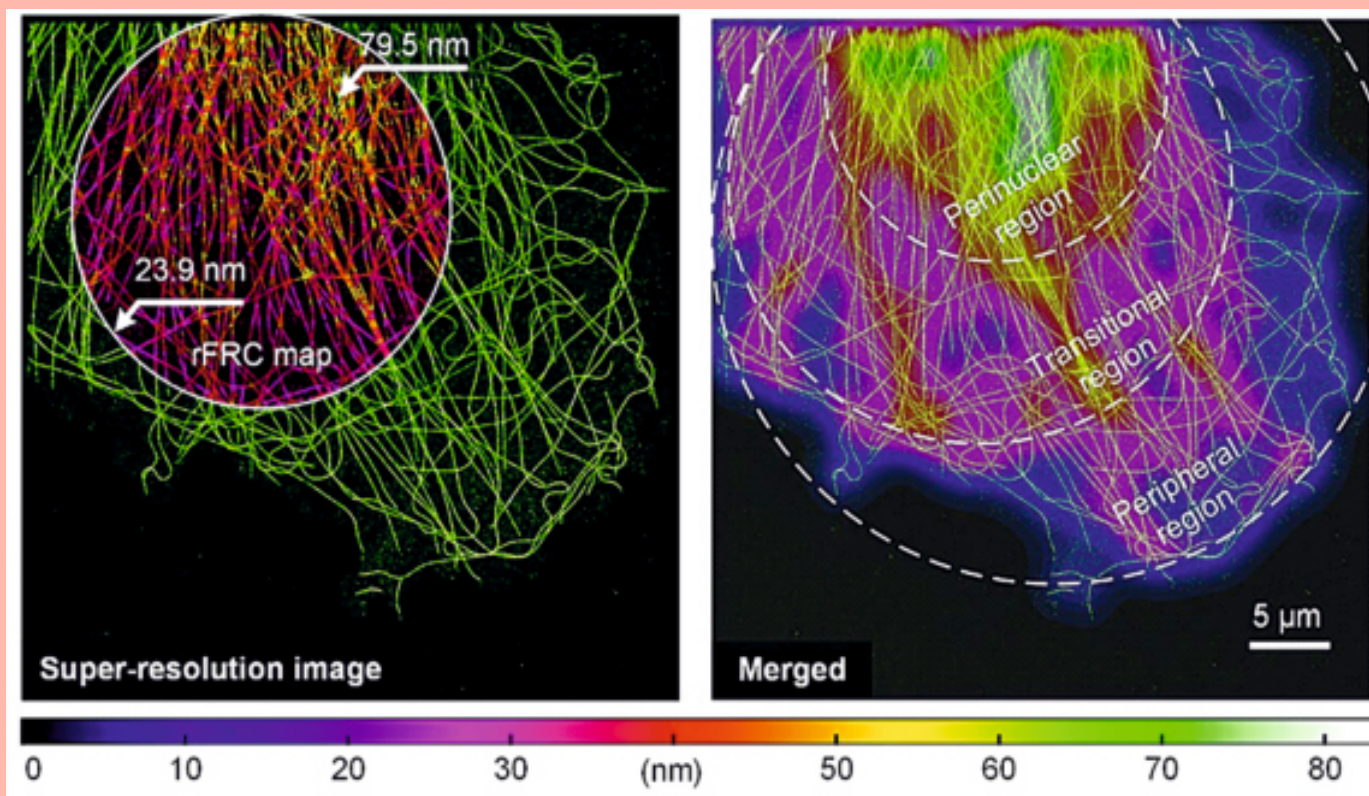
THE INDIAN ASSOCIATION OF PHYSICS TEACHERS

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Super-resolution (SR) fluorescence microscopy, through the use of fluorescent probes and specific excitation and emission procedures, surpasses the diffraction limit of resolution (200~300 nm) that was once a barrier. In a study published in *Light: Science & Applications*, a team of scientists have introduced a novel method known as the rolling Fourier ring correlation (rFRC). This method facilitates the representation of resolution heterogeneity directly in the Super Resolution (SR) domain, thereby enabling mapping at an unparalleled SR scale and an effortless correlation of the resolution map with the SR content. In addition, the team developed an improvement on the resolution scaled error map (RSM), resulting in more accurate systematic error estimation. This was used in tandem with the rFRC, creating a combined technique referred to as PANEL (Pixel-level Analysis of Error Locations), which focuses on pinpointing low-reliability regions from SR images. PANEL can be used to improve SR images. For instance, it has been effectively used to fuse SMLM images reconstructed by various algorithms, providing superior quality SR images.

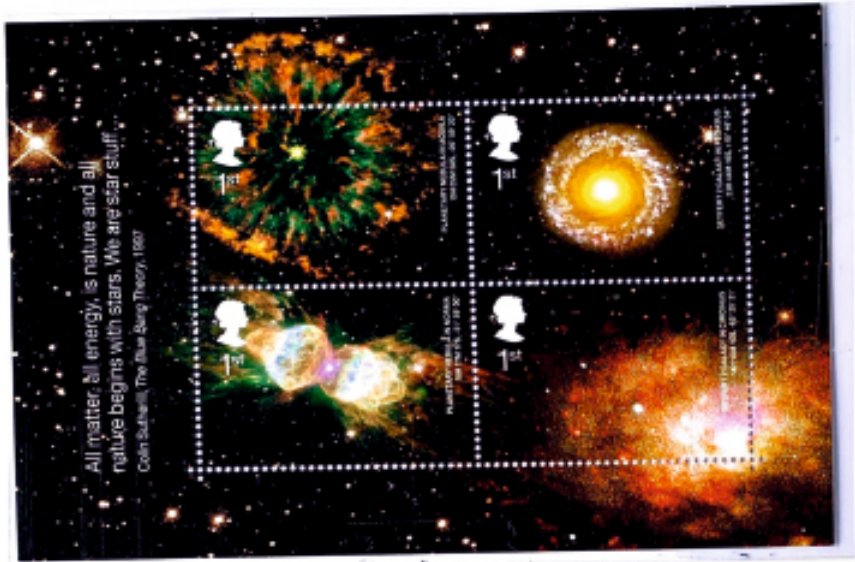
(Link: <https://phys.org/news/2024-01-fourier-method-local-quality-super.html>)

The Story of Cosmology Through Post Stamps 67

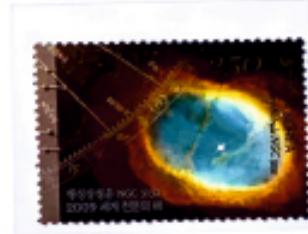
THE NEW ASTRONOMY

ETERNALISM- THE BLOCK UNIVERSE

This theory says that the universe is a giant block of all the things that ever happen at any time and at any place. On this view, the past, present and future all exist – and are equally real. *We can travel in time.* **Nebula-** A giant cloud of Stellar dust or gas exist in interstellar space, in fact provide lots of information about stellar evolution. Some nebula like Emission Nebula are nursery of stars where giant molecular clouds from supernova remnant, collapse under its own weight to form a new star system, while some other Planetary Nebula are cemetery of dying star as formed from material shed by star in its last stage



A souvenir sheet of four stamps depicting planetary nebula and Galaxies-
 -Glowing Eye Nebula in Aquila constellation
 -Ant Nebula, Menzel3 in Norma const. with binary system at centre.
 -Circinus Galaxy- at type of Seyfert galaxy with a Quasars in Nucleus
 -Fried Egg -Seyfert Galaxy in Pegasus, result of merger of a dwarf galaxy



Planetary Nebula- Ring nebula in constellation Lyra with star at its last stage of becoming white dwarf



Reflection Nebula-M78 in Orion; it is a stellar nursery of young stars



Stamp with laser hologram-depict Stylized image of supernova at centre lies a white dwarf or Neutron star shown as white dot



Collision of two massive Black holes- with apparent event horizon



Light Echo- produced by out burst of a variable star-Monocerotis



Pistol Star-blue hypergiant luminous star, ejecting enormous mass and radiation



Pleiades Star Cluster containing middle aged hot B type stars in taurus

PHYSICS NEWS

Unlocking the secrets of the universe through Neutrinoless double beta decay

The discovery that neutrinos have mass was groundbreaking. However, their absolute mass remains unknown. Neutrinoless double beta decay experiments aim to determine whether neutrinos are their own antiparticles and, if so, provide a means to determine the mass of the neutrino species involved. Germanium-based neutrinoless double beta decay experiments hold great promise for unraveling the mysteries surrounding neutrinos. The observation of this rare decay process not only offers the prospect of determining the nature of these enigmatic particles, but also the determination of their mass, provided the probability governing the decay is reliably known. This probability is not a direct experimental observable and thus can only be determined theoretically. Research on the structure of ^{76}Ge , led by physicists at the Triangle Universities Nuclear Laboratory (TUNL), has found that the ^{76}Ge (parent) and ^{76}Se (daughter) have different shapes. These conclusions are important for calculations aiming to determine the probability relevant for ^{76}Ge $0\nu\beta\beta$ decay.

Read more at: <https://phys.org/news/2024-01-secrets-universe-neutrinoless-beta-decay.html>

Original paper: Physical Review C (2023) DOI: 10.1103/PhysRevC.107.044314

New research sheds light on a phenomenon known as 'false vacuum decay'

An experiment conducted in Italy, with theory support from Newcastle University, has produced the first experimental evidence of vacuum decay. In quantum field theory, when a not-so-stable state transforms into the true stable state, it's called "false vacuum decay." This happens through the creation of small localized bubbles. The ultracold atoms lab of the Pitaevskii Center for Bose-Einstein Condensation in Trento reports for the first time the observation of phenomena related to the stability of our universe. The experiment uses a supercooled gas at a temperature of less than a microKelvin from absolute zero. At this temperature, bubbles are seen to emerge as the vacuum decays and the Newcastle University's Professor Ian Moss and Dr. Tom Billam were able to show conclusively that these bubbles are a result of thermally activated vacuum decay. This groundbreaking experiment is only the first step in exploring vacuum decay. The ultimate goal is to find vacuum decay at the temperature of absolute zero where the process is driven purely by quantum vacuum fluctuations.

Read more at: <https://phys.org/news/2024-01-phenomenon-false-vacuum-decay.html>

Original paper: Nature Physics (2024) DOI: 10.1038/s441567-023-02345-4

Astrophysicists offer theoretical proof of traversable wormholes in the expanding universe

The expansion of the universe at some stage of evolution is well described by the Friedmann model. RUDN University astrophysicists have now proven the theoretical possibility of the existence of traversable wormholes in the Friedmann universe. "A wormhole is a type of highly curved geometry. It resembles a tunnel either between distant regions of the same universe or between different universes. Such structures were first discussed in the framework of solutions to the gravitational field equations a hundred years ago. But the wormholes considered then turned out to be non-traversable even for photons. The astrophysicists investigated a generalized form of the famous Lemaître–Tolman–Bondi solution, which describes the evolution of spherically symmetric distributions of electrically neutral dust in general relativity. The researchers obtained numerical solutions that describe the movement of photons through wormholes connecting different Friedmann universes or different parts of the same universe. Possible observational signs of such objects, in particular, the properties of the cosmic microwave background and magnetic fields, may be the subject of further research.

Read more at: <https://phys.org/news/2024-01-astrophysicists-theoretical-proof-traversable-wormholes.html>

Original paper: Universe (2023). DOI: 10.3390/universe110465

Soumya Sarkar
IISER PUNE
INDIA

.....Cont. from Page No. 31

BOT: Certainly! Some AI tools for physics include online simulations that model physical systems, adaptive learning platforms that tailor content to your level, and intelligent tutoring systems that guide you through problems. How do you think AI could help you learn physics better?

PKA: I am President of Indian Association of Physics Teachers and there is lot of excitement among our member teachers to know more about it so that they may start implementing it.

BOT: That's fantastic! AI can greatly enhance the way physics is taught. For instance, AI can analyze data to identify learning gaps and provide customized resources. It can also enable virtual labs for hands-on experiments without the need for physical equipment. What are some challenges your members face that AI might address?

PKA:Where are the AI resources which they can use? I would like to curate such resources for them.

BOT: A great place to start is online educational platforms like Coursera or edX, which offer courses with AI elements. Additionally, PhET Interactive Simulations project provides free, interactive math and science simulations. For a more tailored experience, platforms like Socratic by Google use AI to help students with homework questions. Would you like to know how to integrate these into a curriculum?

PKA:Yes, please let me know.

BOT: Integrating AI resources can be done in steps. Start by incorporating AI-driven simulations into lectures to visualize concepts. Then, use AI tutor apps as supplemental homework aids. Finally, develop a feedback loop where AI assesses student performance and adapts teaching materials accordingly. Does that sound like a process your members could adopt?

PKA: Yes, where can I find AI driven simulations, which are more than mere simulations?

BOT: AI-driven simulations that go beyond basic models include platforms such as Labster, which offers virtual labs with a gamified experience, and Wolfram Alpha, which provides computational intelligence to solve complex physics problems. Also, platforms like SmartPhysics and MasteringPhysics use AI to create personalized learning experiences. Would these types of resources be of interest to your association?

PKA: Yes definitively.

BOT: Excellent! These resources can bring a new dimension to physics education. I recommend reaching out to these platforms to explore collaboration opportunities. They often provide educator discounts or special access for institutional use. How soon do you plan to introduce these to your members?

PKA: We are planning a six-hour awareness program in the month of February 2024. Can you suggest a program for that, so that mystery around artificial intelligence may go away.

BOT: For a six-hour program, consider the following outline:

1. Introduction to AI (1 hour): Overview of AI, its history, and its role in education.
2. AI in Physics Education (1 hour): Specific examples of AI applications in physics.
3. Hands-on Session (2 hours): Interactive demonstrations with AI tools like simulations.
4. Implementation Strategies (1 hour): How to integrate AI resources into teaching.
5. Open Discussion (1 hour): Address misconceptions and answer questions.

Does this structure align with your goals for the program?

PKA: Tell me some bullet points about history of AI, its overview and its role in learning and teaching.

BOT: Absolutely, here are some bullet points:

- AI History: Emerged in the 1950s, with early work on problem-solving and symbolic methods.

- AI Overview: Involves machine learning, natural language processing, robotics, and more.
- Role in Education: Personalizes learning, provides simulations, automates grading, and offers tutoring.

Would you like more detail on any of these points?

PKA: Yes

BOT: Here's a more detailed breakdown:

- AI History:
 - 1950s: Alan Turing's work on the concept of machine intelligence.
 - 1956: John McCarthy coins the term "Artificial Intelligence" at Dartmouth Conference.
 - 1960s-70s: AI research focused on logic and reasoning.
 - 1980s: Expert systems developed to mimic the decision-making of a human expert.
 - 1990s-2000s: Internet growth and increased computational power boost AI research.
 - 2010s-present: AI becomes integral to consumer technology, business, and research.
- AI Overview:
 - Machine Learning: Algorithms improve through experience, used in data analysis and pattern recognition.
 - Natural Language Processing (NLP): Enables machines to understand and respond to human language.
 - Robotics: Combines AI with mechanical engineering to create intelligent machines.
 - Neural Networks: Systems modeled after the human brain that can learn and make decisions.
- Role in Education:
 - Personalized Learning: AI adapts to individual student's learning pace and style.
 - Simulations and Virtual Labs: Allow students to conduct experiments in a virtual environment.
 - Automated Grading: Saves time by grading assignments and providing feedback.
 - Intelligent Tutoring Systems: Offer one-on-one tutoring to students by simulating human tutors.

Would you like to explore how to present these points in your awareness program?

PKA: Yes

BOT: For presenting these points in your awareness program:

1. Start with a timeline of AI, highlighting key milestones.
2. Use visuals to depict the evolution of AI technologies.
3. Discuss current AI trends in tech and education through case studies.
4. Break down complex AI concepts using simple analogies and interactive elements.
5. Include live demos of AI in education, like a chatbot or grading algorithm.
6. Facilitate hands-on workshops where participants use AI tools.
7. End with a Q&A session to address specific queries and concerns.

Would these suggestions help in demystifying AI for your audience?

PKA: Yes. Now some specific examples of AI in Physics, please let me know, so that they may see innards of its usage in physics.

BOT: Certainly! Here are some specific AI applications in physics:

- Smart Physics: Interactive textbooks with AI support for learning concepts.
- Wolfram Alpha: Uses AI to solve complex physical equations and visualize results.
- Modelling Software: AI algorithms help simulate physical phenomena, like fluid dynamics.
- Data Analysis: AI assists in analyzing large datasets from experiments like particle physics research.
- Robotics: AI-driven robots are used to conduct experiments in hazardous environments.

Would you like to delve into how these examples can be incorporated into physics teaching?

PKA: Yes, I am really enjoying it.

BOT: I'm glad to hear that! To incorporate these AI applications:

1. Use interactive textbooks in the classroom to enhance traditional learning.
2. Employ Wolfram Alpha during problem-solving sessions for instant analysis.
3. Integrate modelling software into labs to allow students to run virtual experiments.
4. Teach students to use AI for data analysis, preparing them for research roles.
5. Demonstrate robotics applications to show AI's potential in experimental physics.

Would you like guidance on any specific tool or how to align these with your current curriculum?

PKA: I would like to have more information on 4 the bullet point.

BOT: Absolutely, data analysis using AI in physics:

- AI can sift through vast amounts of experimental data to identify patterns and anomalies.
- Machine learning models are trained to recognize signals in noisy datasets, such as those from particle accelerators or telescopic observations.
- AI helps in predicting physical properties and outcomes of experiments that have not yet been conducted.
- It's also used in optimizing experimental setups, such as adjusting parameters of a particle collider for better results.

How might your teachers use AI for data analysis in their physics classes?

PKA: Example for a K12 teacher teaching Gravity?

BOT: For a K12 teacher, AI in teaching gravity could involve:

- Using simulations to visualize gravitational pull between different masses.
- Employing AI quizzes that adapt to a student's learning pace to teach gravity concepts.
- Analyzing students' answers to improve the teaching of gravity-related problems.

Would your teachers be interested in specific platforms that offer these AI tools?

PKA: Yes, please let me know about one of the platforms which you mentioned earlier.

BOT: One platform that stands out is PhET Interactive Simulations, developed by the University of Colorado Boulder. It offers free educational simulations, including ones for gravity. Students can visualize and manipulate gravity forces between different objects, enhancing their understanding of gravitational concepts. Would you like more information on how to use PhET in your classes?

PKA: I have an exposure on that, teachers specifically ask what has gone into these so that intelligence is built into these.

BOT: The intelligence in platforms like PhET stems from several layers:

1. **Physics Engines:** Accurate simulations rely on algorithms that mirror real-world physics laws.

2. **User Interaction:** Machine learning tailors the simulation based on user interactions, adapting to their learning style.
3. **Data Analytics:** Collects data on how students use the simulation, providing insights into common misconceptions or difficulties.
4. **Feedback Mechanisms:** Offer hints or change scenarios dynamically to challenge students appropriately.

BOT: Would you like to explore the backend of such a platform to better understand the AI components?

PKA: Yes

BOT: To explore the backend:

1. You can often access developer tools or documentation provided by the platform to see the algorithms at work.
2. Some platforms may offer educator workshops or webinars that go into detail about the technology.
3. Engage with the community forums where developers and users discuss the simulations and their AI elements.

Would your teachers be interested in attending a workshop or webinar on this topic?

PKA: Yes, we can direct them to these workshop/webinar

BOT: That's a great idea. Workshops and webinars can provide valuable insights into the AI technologies used in educational platforms. They can also offer practical tips on effectively integrating these tools into the classroom. I recommend checking the websites of platforms like PhET or other educational AI tools for any upcoming events. Shall I assist with anything else related to AI in physics education?

PKA: Also, some links to smart physics?

BOT: I'm sorry for any misunderstanding, but as an AI, I'm unable to provide direct links. However, SmartPhysics is often part of the services provided by educational content providers like McGraw-Hill's Connect or Pearson's MasteringPhysics. You can find these by searching for their respective websites or contacting their customer service for information on SmartPhysics and similar AI-integrated educational tools. Does this help guide you on where to look?

PKA: Yes. What about these physics' engines?

BOT: Physics engines are software that simulate physical systems according to the laws of physics. They are used in video games, animation, and simulations like those from PhET. In educational AI, these engines allow for realistic, interactive environments where students can experiment with and observe physical phenomena. Understanding physics engines' role in AI can help teachers explain the realistic behaviors seen in simulations. Would your teachers be interested in a primer on how these engines work?

PKA: Yes, please help with such a primer.

BOT: A primer on physics engines might include:

- **Basic Principles:** Physics engines simulate Newtonian mechanics, handling motion, collisions, and other physical processes.
- **Computational Models:** They use mathematical models to predict and simulate the behavior of physical systems.
- **Realism vs. Performance:** Engines balance accuracy with computational load to run smoothly on various devices.

- Application in Education: They allow students to see immediate consequences of physical changes in simulations, enhancing comprehension.

Would a more detailed breakdown of these points be useful for your teachers?

PKA:This is very well established in physics under the title computational physics. We try to run test cases and adopt what if approach, does that make it Artificially intelligent?

BOT:Running test cases and adopting a "what if" approach in computational physics is an excellent way to explore physical phenomena, but it doesn't inherently make a system artificially intelligent. AI involves the ability to learn from data, make decisions, or perform tasks that would typically require human intelligence. For a system to be considered AI, it would need to have elements such as machine learning, where it can improve its performance over time without being explicitly programmed for each scenario. Would an example of an AI application in computational physics be helpful?

PKA: Yes definitely. Its great interacting with you.

PKA:I'm glad you're finding this interaction helpful! An example of AI in computational physics is the use of machine learning algorithms to predict the properties of materials or the outcome of physical experiments based on previous data. Another example is the use of neural networks to detect patterns in large datasets from astronomical observations or particle physics experiments. These AI systems can learn and improve their predictive accuracy over time, which is a key feature of artificial intelligence.

Would you like to know how these AI applications could be used in a classroom setting?

PKA:Yes, please let me know and also tell me can we take up these at K12 level or will these be better in an undergraduate physics major program.

BOT:In a K12 setting, AI applications could be introduced as concepts and demonstrated through interactive tools. For example, showing how AI can predict the motion of planets or analyze weather patterns. In an undergraduate physics program, students could engage more deeply, using AI to conduct research and analyze complex data.

AI at the K12 level is more about exposure and sparking interest, while at the undergraduate level, it's about practical application and skill development. Would your K12 teachers be interested in training that prepares them to introduce these concepts in age-appropriate ways?

PKA:Yes, I feel that is the right way to proceed further.

BOT:Perfect! Training for K12 teachers can focus on:

- Understanding AI basics and its implications in physics.
- Learning to use AI-powered educational tools.
- Developing lesson plans that incorporate AI concepts.
- Strategies for explaining AI to students in an engaging way.

This approach ensures that teachers are comfortable with the material and can effectively inspire their students. Would you be interested in resources for teacher training programs on AI in physics education?

PKA:Yes, please.

BOT:For teacher training, you might explore:

- Online courses focused on AI in education, like those offered by Coursera or edX.
- Workshops provided by educational AI tool developers, often found on their official websites.

- Professional development webinars hosted by educational technology organizations.
- Collaborative forums and communities where educators share AI teaching strategies.

These resources can provide a solid foundation for teachers to bring AI into their physics classrooms. How would you like to proceed with organizing such training?

PKA:Suggest some course from coursera and Edx.

BOT:I apologize for the inconvenience, but as an AI, I'm unable to directly access or recommend specific current courses on platforms like Coursera or edX. However, I can guide you on how to find them:

1. Visit the Coursera or edX website.
2. Search for keywords like "AI in education", "AI for teachers", "Physics education technology".
3. Look for courses that match your interest in AI and physics, and check their syllabi and reviews.

These searches will help you find courses tailored to teaching physics with AI. Would this method be useful for finding the right course for your needs?

PKA:Okay I will explore. What about at undergraduate level. For example, from where can we take dataset for the motion of a planet and predict say motion of another planet say mercury?

BOT:For undergraduate-level projects, NASA provides a wealth of planetary motion data through their various missions and the Planetary Data System (PDS). Students can access datasets related to the motion of planets, including Mercury, and use machine learning algorithms to make predictions or analyze orbital mechanics. To predict the motion of another planet, students would use this historical data to train their models.

Would your undergraduates be interested in a project that involves accessing and using NASA datasets for such predictions?

PKA:Yes definitely. My aim is that this kind of work can be taken up by teachers at K12 also. Taking them towards machine learning basics.

BOT: That's an ambitious and forward-thinking goal! Here are steps to introduce machine learning at K12:

1. Start with basic statistics and data analysis concepts.
2. Introduce simple machine learning concepts with visual aids.
3. Use age-appropriate software tools that teach machine learning principles.
4. Gradually build up to projects using real datasets, like predicting planetary motion.

This approach can help K12 students grasp the basics of machine learning in an engaging way. Would you like to know about specific educational tools that can facilitate this learning?

PKA:Yes please.

BOT:For K12 education in machine learning, consider these tools:

- Google's Teachable Machine: Intuitive tool to create simple machine learning models.
- Scratch: A visual programming language that can introduce logic used in machine learning.
- TinkerPlots or Fathom: Data analysis software that helps students understand statistical concepts.

These tools are user-friendly and can make the introduction to machine learning fun and accessible. Would you like assistance in developing lesson plans using these tools?

PKA:I think that would really take us forward in a big way.

BOT:Fantastic! To develop lesson plans:

1. Identify clear learning objectives for machine learning basics.
2. Choose the appropriate tool for each objective based on the students' age and skill level.
3. Design interactive activities that allow hands-on experience with the concepts.
4. Include assessments that measure understanding of machine learning principles.

With these steps, teachers can create a structured and effective machine learning curriculum for K12 students. Would you like to discuss the first steps to kickstart this program?

PKA: Yes, I think you are giving me lot of food for thought to brainstorm on these with our IAPT for AI group.

BOT: I'm delighted to hear that! To kickstart the program, consider the following steps:

1. Form a small focus group within IAPT to spearhead the AI initiative.
2. Organize a brainstorming session to outline goals and resources needed.
3. Plan a pilot project using one of the educational tools to gauge effectiveness.
4. Gather feedback from both teachers and students to refine the approach.

This initial phase will set the foundation for a successful integration of AI into your K12 physics curriculum. Would you like any specific guidance on forming the focus group or organizing the brainstorming session?

PKA: Yes please

BOT: For forming a focus group:

1. Select a diverse group of teachers interested in AI and physics education.
2. Include members with varying levels of experience to provide different perspectives.
3. Ensure the group has access to the necessary technological resources.

For organizing a brainstorming session:

1. Set a clear agenda with objectives for the AI initiative.
2. Encourage open communication and the sharing of ideas without judgment.
3. Document all suggestions and use them to create a roadmap for the pilot project.

This structured approach can help create a cohesive plan for integrating AI into physics education. Would these strategies work for the IAPT AI group?

PKA: I think so. I think it is enough for today. I will come back to you in a weeks' time. Thanks for very enlightening chat.

BOT: You're very welcome! I'm pleased to have been part of your journey into AI and physics education. Feel free to return anytime for further discussion or assistance. Good luck with your planning, and I look forward to our next enlightening chat. Farewell for now!

Acknowledgement: This dialogue was generated using classroom AI app.

With human intelligence alone can you estimate the time I would have taken to generate this script? With BOT I completed it in one sitting of an hour.

Any comments, do share.

P K Ahluwalia

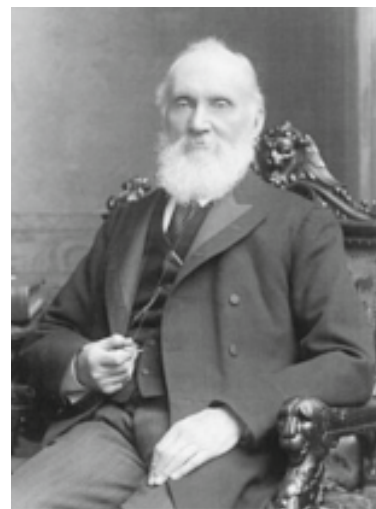
UNIT KELVIN TURNS SEVENTY IN THE BICENTENARY YEAR OF LORD KELVIN

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It is a river in Scotland close to the city of Glasgow and is only about 35 km long. Glasgow is located by the river Clyde and the River Kelvin is a tributary to River Clyde. But in 1892 a physicist William Thomson was made Baron of Kelvin when he was about 68 years of age. Of course, he was also known as Sir William Thomson from 1866 before turning into Lord Kelvin. He became the first British scientist to be inducted in the House of Lords. The name came from that of the river that was flowing not far from Glasgow University where William Thomson was a professor of Natural Philosophy for 53 years. Yes, it was the end of nineteenth century yet Lord Kelvin was neither a professor of physics, nor of any branch of engineering or even mathematics. It was Natural Philosophy. This goes to show the place of philosophy in the academic pyramid even when science was knocking at the door of twentieth century.



Lord Kelvin was not only a physicist or scientist but an engineer, mathematician all rolled into one. He was born when Michael Faraday was doing his great experiments and widening the field of electromagnetism. New horizons of physics were opening and he could meet and could have academic discussion with one of his contemporaries James Clarke Maxwell. It was a great period in physics in British Isles and Lord Kelvin had the company of William Crookes, David Brewster, George Gabriel Stokes, John Kerr and many more whose work we study as students of physics. Moreover, he did significant amount of work with the nineteenth century scientists and his contributions are associated with the names like James Prescott Joule, Max Planck, Hermann Helmholtz are just to name a few.



So, from 1892 William Thomson came to be known as Lord Kelvin, but with his scientific legacy began 40 years before his induction to Lordship. He had already presented us with the discovery of number of scientific phenomena and their scientific explanations bearing the name of William Thomson. For example, if we study different aspects of thermoelectricity, we talk about three effects viz., Seebeck effect, Peltier effect and Thomson effect. And this third one is a contribution of Lord Kelvin when he was still William Thomson. In different materials used in a thermoelectric circuit, the Seebeck coefficient changes with temperature. So, if there is a spatial gradient in temperature that would give rise to the gradient in the Seebeck coefficient. Now when a current is driven through this gradient, then Peltier

effect will not be observed only at the junctions but a continuous variation of it will be observed. This came to be known as Thomson effect as it was first predicted and later observed in 1851 by Lord Kelvin who was William Thomson at that time. There is no need for the junction of dissimilar materials as in the cases of Seebeck and Peltier effects.

The well-known Joule-Thomson effect is now also referred to a Joule-Kelvin process or even Kelvin-Joule process. In an adiabatic expansion of a real gas through a porous plug a process of cooling taking place when the gas under pressure gets throttled. It was a contribution of William Thomson and his fellow British scientist James Joule. Owing to Lord Kelvin the name of the small river found a big place in science when one of the seven base SI units was named as kelvin with the symbol K. However, the credit goes not to the river but to Lord Kelvin for his immense contribution in science and engineering, mathematics particularly in physics.

William was born in Belfast in 1824 and it was a time when the British scientific community was under the strong influence of Newton and his approaches towards science. His father was a teacher of mathematics in Belfast and later became a professor of mathematics in the University of Glasgow when William was nine years old. His father had a special outlook and wanted his children to get exposed to for a broad-based education and cosmopolitan culture. That took William and his brother to France, where he came to know about the work of three mathematicians of France often referred to as three L's (Lagrange, Legendre, and Laplace). He also went to Holland when he was a teenager. That provided him with great exposure to the scientific work done and the prevailing culture along with some familiarity of the languages spoken in the parts of continental Europe. This had helped him to shape up as a scientist.

A young William Thomson became interested in the idea of so called "infinite cold" or in the ultimate limit of coldness and made attempts to figure it out. Since the number of temperature scales were using some standard melting and boiling points as reference points and the same temperature was getting different values in different thermometric scales it drew the attention of William. In 1848, when he was barely 24 years old, he published a paper, 'On an Absolute Thermometric Scale', that stated that this absolute zero was, in fact, -273 degrees Celsius. (It is now set at -273.16 degrees Celsius.) and no temperature below this would be possible. The scale that bears his name uses sizes of the steps as of same magnitude as the Celsius scale's degrees. But instead of setting 'zero' arbitrarily at the freezing point of water, the Kelvin scale sets 'zero' at the coldest point possible for matter.

The scientific community always looks for the uniformity of units in their work as that helps one to understand any other's work much comfortably. That way the kelvin has been the preferred scale for the scientific transactions since 1954, when the General Conference on Weights and Measures (CGPM) — an international organization that makes decisions about measurement standards — adopted the kelvin (symbol 'K') as the base unit for thermodynamic temperature. The CGPM set a reference point of 273.16 K as the triple point of water, at which water exists as a solid, liquid and gas simultaneously in thermal equilibrium. This no doubt has given a very special place to Lord Kelvin in the scientific world. That way the acceptance of kelvin as SI unit of temperature is 70 years old.

Why was Lord Kelvin quite different from the fellow-scientists during his time? He has various discoveries, principles and laws associated with his name. Apart from Newton no other physicist from Great Britain had so

many concepts, laws and principles named after him or her. His originality of thinking was evident even when he was in his late teens. This has been presented by a very nice writing by Prof Jayant V Narlikar. It has been included in the book 'One hundred Reasons to be a Scientist' published by the Abdus Salam International Centre for Theoretical Physics (ICTP, Trieste, Italy). Prof Narlikar here has talked about the young William Thomson who appeared in a difficult and challenging test in the form of the Cambridge Examination of Mathematical Tripos in early 1840s. Thomson was quite bright but he was competing for the top spot with another young man called Parkinson also was very well-known as a brilliant student. While evaluating the answer scripts for a particular question one professor got stuck up with the answer scripts of the two one of whom was of William Thomson while the other was Parkinson. The professor observed that this particular question, he considered to be a very special one and an; out of the box type has been answered correctly by only these two students and there were striking similarities in the answers. The professor knew that the competition for the top spot was restricted to these two students and he possibly was not surprised that only these two students could attempt a difficult question. He himself set this question and his efforts were not based on any standard material available in the books. He consulted a research-paper published around that time in a well-known research journal and the question was based on a problem discussed in that research paper. And the professor was confident that this would be the clinching question. But looking at the answers of these two he felt some malpractices might have crept in these answers. Maybe one boy has copied it from the other, he felt. So, he decided to interact with these students personally but separately to probe what has actually transpired.

Parkinson was called first. When he was asked how he could answer that question he politely replied that he was in the habit of reading the research journals and this particular problem is based on a recently published paper where it has been solved. So that way Parkinson admitted that he knew the answer beforehand and could handle the question with his knowledge gathered by reading the concerned research paper. Professor was quite satisfied with this answer and he became very appreciative of Parkinson for his thirst of knowledge that led him to grasp the contents of a research journal. In fact, Parkinson went on to provide the reference of the journal and the paper and that immensely satisfied the professor. Parkinson was sent back with an appreciative pat on his back.

Next William Thomson was called up by the professor. While asking him about that particular question and how he could solve that, the professor mentioned that Parkinson saw a paper in a journal where the problem was solved and that helped him to answer the question correctly. The professor went on to add "I hope you are not going to tell me that you also saw it there." "No sir, I didn't see it there" replied Thomson and he added "I wrote the paper." Well, the professor was apparently not satisfied with this reply and Parkinson emerged as the topper of the examination with Thomson occupying the second position. In fact, William Thomson published his first paper when he was barely 14 years old. This paper and a few more were published under the pseudonym "PQR." This was a style in vogue around that period. William Thomson was really the author of the paper as during the first half of nineteenth century this system of using the pen-name for research papers and Thomson exactly did that. Prof Narlikar points out that the concerned professor as an evaluator did not recognize the originality of Thomson as the author of a paper but focused his attention on Parkinson who could glean the materials from the paper efficiently. In the process Parkinson came first in the examination and won the prize

but Thomson has remained the cornerstone of modern physical science. Parkinson never could become the part of the scientific community leave aside contributing significantly.

Lord Kelvin following the trend of the nineteenth century science did good number of experiments involving very critical measurements. That was a time for the determination of various physical quantities and constants with higher and higher degree of precision. In the process scientists used to look for the deviation from the expected value and used to try to find out the reasons behind these results. Kelvin's strong conviction in this type of work has been reflected in his very well-known saying that he told before a gathering of scientific personnel in a function organized by the British Association for the Advancement of Science in late nineteenth century. The fact that he could consider the precise measurements are the very important aspect of science, possibly the most important activity. He said "When you can measure what you are speaking about, and express it in numbers, you know something about it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts advanced to the stage of science."

His keenness for accurate measurements has not only been appreciated by the scientists in modern times but have surprized many. Lord Kelvin in 1871 developed an equation now known as Kelvin equation that gives us the change in vapour pressure on a curved liquid-vapour interface, e.g., a droplet. In 2020 the researchers have conducted very careful measurements to discover that the equation provides the results that are correct to the 1 nm scale!

However, his conviction towards more accurate measurement to the most important key to science prompted him to declare in late nineteenth century "There is nothing new to be discovered in physics now. All that remain more and more precise measurements." We need to remember that it was a time when electron and x-rays were discovered along with the radioactivity. The quantum theory of light was proposed. The Annus Mirabilis in the life of Albert Einstein dawned as the year 1905. Einstein came up with a few pathbreaking papers, explaining the photoelectric effect, putting forward the special theory of relativity, and coming up with the equation giving us the mass energy equivalence. Lord Kelvin by that time had entered in his eighties.

Nobel Prize was instituted based on the Will of Alfred Nobel. Nobel made this Will in 1895 one year before his demise and the first Nobel Prizes were awarded in 1901. The conditions of the will stipulated that the Prizes are to be awarded to living persons only with no provision for a posthumous award. It is a much-discussed topic why the two stalwarts, one from chemistry and the other from physics who were quite senior in the beginning of the twentieth century and had great contributions in their respective fields, were not awarded the Nobel Prize. Both received a few nominations for the Prize. The two concerned scientists were Dimitri Mendeleev (1834-1907) of Russia and Lord Kelvin (1824-1907) from Great Britain. Mendeleev received nomination for chemistry Nobel in 1905, 1906 and in 1907 and Lord Kelvin was nominated for the Physics Prize in 1901, 1903 and in 1907. Both received nominations for 1907 the year they passed away. Interestingly, Kelvin was nominated for 1901 Physics Prize by none other than Wilhelm Roentgen who went on to win the first Physics Nobel Prize.

Lord Kelvin also acted as a nominator during the initial years of the Nobel Prize. He sent his first nomination in 1902 favoring the British physicist, John Kerr. Kerr was exactly of same age of that of Lord Kelvin and belonged

to Glasgow. He and was his close friend. Kerr discovered the double-refraction in solid and liquids kept in electrostatic fields and the phenomenon came to be known as Kerr effect. The same scientist received nomination from Kelvin also in 1903. Kerr however, never had won a Nobel Prize. Kelvin became successful as a nominator in 1904 when Lord Rayleigh received the physics Nobel prize. Some in the scientific community feel that Lord Kelvin himself was an institution and the fact that he has not become another Nobel Laureate has underlined his special position in science and technology in general and in Physics in particular. Yet another section feels that Nobel Prize would have been even more glorious had the prize been awarded to Lord Kelvin and Dimitri Mendeleev. Lord Kelvin sent his last nomination for physics Nobel in 1905 favoring Sir J J Thomson. Thomson went on to win the Prize in the next year i.e., 1906.

The fact that he was a nineteenth century Scottish scientist of Victorian period is also evident from some of his sayings that look a bit surprising today. He could declare in the similar light to underline the all-pervading role of physics with respect to the other branches of science. He could say "In science all is physics and the rest is stamp collection" with distinct tangential observations for the subjects like zoology or botany where the classifications were stressed upon be it in the animal world or in the world of plants at that point of time. He was a physicist to the core. He became the President of the Royal Society in 1890, a position he held till 1895.

Yet he was also found to be seriously wrong about the future of physics. It is attributed to him that he observed in 1900 "Now there is nothing new that can be discovered in physics. All that remains is more and more accurate measurements." Unfortunately, he could not see the revolution in physics that was going to come in the twentieth century though the hints in this regard had started pouring in last few years of his life.

Moreover, in 21st century we can see with the integration of physics and mathematics with chemistry, statistics, computer science or biology and many more has made the modern-day life-science a different area altogether. It appears he possibly was not comfortable with the signs of deviation in the field of physics from classical physics of nineteenth century. These began to emerge in the beginning of twentieth century when he made an observation "heavier than air flying machines are impossible." It was said at a time when the Wright brothers could develop preliminary versions of aeroplanes that could fly a few miles when Lord Kelvin was alive in the first decade of twentieth century.

Lord Kelvin got engaged into a debate related to the age of the earth through a paper that he published in 1863. It was an area where the geologists were working and British Geologist Lyell was among its leaders. Kelvin published a calculation where he "demonstrated" that the earth is about 100 million years old and certainly not more than 200 million years old. At that time in England the physicist had a special position in scientific community and they were considered as belonging to the upper strata of the scientific hierarchy. Geologists under the leadership of Lyell were not comfortable with that calculation of earth's age as that could not explain number of their observations. The biologists also joined soon in the debate as Darwin had published his famous book by that time. Moreover, in a way it was a fight between the scientific views with those expressed in religious texts and was quite important in the contemporary society. Kelvin did have a quite reasonable approach in this work and he used his ideas from thermodynamics for the prediction. He felt that the Earth was not an infinite source of energy, and heat was observed flowing out of Earth which meant that the earth was cooling. Geologists began to consider a finite-age Earth and soon were able to reconcile their observations with

an Earth age of the order of one hundred million years. But Kelvin went on revising his calculations. With the discovery of radioactivity at the fag-end of the nineteenth century, it was understood that the earth does have a source of energy in the form of radiation from the radioactive elements. However, Kelvin did not want to accept the idea immediately.

Why was Lord Kelvin also considered to have contributed significantly in the branch of engineering? In mid-nineteenth century England had colonies in different parts of the world and had a great relationship with America across the Atlantic. The need for the telegraphic communication through cables was greatly felt both by the USA and British Isles. And the cable lying across the Atlantic was a big challenge. Kelvin did some laboratory experiments to assess the possibility of connecting the two shores of Atlantic with a cable for carrying message signals. Then based on his laboratory work he did take up a voyage across the Atlantic in a cable-lying expedition in 1854. It was not successful but it provided a very useful experience from scientific and technological point of view. Later, the efforts were fruitful and the two continents could exchange message through cables laid under the Atlantic. Kelvin continued to show interest in engineering problems coming up with innovative solutions in many cases.

Lord Kelvin at the end of the nineteenth century was considered as one of the greatest scientists. His contributions not only in physics but in the areas like engineering, mathematics, geology etc. were mind-boggling. Interestingly, at the end of the 20th century when some physics journals (Physics World, Physics Web News, Top 10) conducted one survey and in 1999, took polls from over 500 scientists to identify the great physicists of all time; Lord Kelvin did not even get nominated. The event has been interpreted as an effect of more and more specialized approaches towards science that possibly have compartmentalized the scientific community too much. Also, the present-day physicists possibly do not much delve with classical physics. Some felt that the three names by which Lord Kelvin has contributed in physics, engineering and mathematics might have taken away the focus from real person. Engineers considered him a mathematician when the mathematicians considered him a physicist and this went on. However, many feel that Lord Kelvin has remained a topmost scientist who have contributed significantly in so diverse fields that has possibly not been achieved by any other scientist. May be, he has not been recognized by more awards that he rightly deserved but his contributions have made science in general and physics in particular very rich. And the River Kelvin still flows quietly, temperatures in scientific work continues to be measured in kelvin and Lord kelvin remains a father-figure of physics, nay modern science.

References

1. The Excitement of Doing Science by Jayant V s, p 175 In the collection of articles in 'One Hundred Reasons to be a Scientist' Published by Abdus Salam ICTP, Trieste, Italy
https://en.wikipedia.org/wiki/Lord_Kelvin
2. [http://eqseis.geosc.psu.edu/cammon/HTML/Classes/PhysicalGeology/Notes/SciUniversality/P07.html#:~:text=In%201863%2C%20Lord%20Kelvin%20\(William,200%20million%20years%20in%20age](http://eqseis.geosc.psu.edu/cammon/HTML/Classes/PhysicalGeology/Notes/SciUniversality/P07.html#:~:text=In%201863%2C%20Lord%20Kelvin%20(William,200%20million%20years%20in%20age)
3. . Age of the Earth, Pennsylvania State University
4. <https://atlantic-cable.com/CablePioneers/Kelvin/>

MINUTES OF IAPT EXECUTIVE COUNCIL MEETING

A meeting of Executive Council members of Indian Association of Physics Teachers was held on October 07, 2023 from 3:00 pm onwards at Jaipur during IAPT 37th Annual Convention.

Following members attended the meeting

1	Prof P.K. Ahluwalia	President
2	Prof. Mrs. Rekha Ghorpade	General Secretary
3	Dr. Ranjita Deka	Vice President East Zone
4	Prof. P. Nagaraju	Vice President South Zone
5.	Prof. H C Verma	Vice President
6	Prof. Meenakshi Sayal	RC-02 Punjab & Jammu Kashmir
7.	Dr. Pawan Kumar	RC-03 Chandigarh & Himachal Pradesh
8	Dr. Sundar Singh	RC -04 Uttar Pradesh
9	Prof. R. K. Khanna	RC-06 Rajasthan
10	Prof. S.B. Mane	RC 08 Maharashtra
11	Prof. Pradeep Kumar Dubey	RC-09 Madhya Pradesh
12	Prof M.S. Jogad	RC-12 Karnataka
13	Prof. Kalipada Adhikari	RC-18 Tripura, Meghalaya, Mizoram, Manipur
14.	Prof. V. Rajeshwar Rao	RC-22 Telangana
15	Prof. Vijay A Singh	Past President
16	Prof. K. N. Joshipura	Past General Secretary
17	Prof. B.P. Tyagi	Chief Coordinator Examination
18	Prof. Sanjay Kumar Sharma	Secretary
19	Prof. D.C. Gupta	Treasurer
20	Prof. Bhupati Chakrabarti	Coopted Member
21	Prof. G. Venkatesh	Coopted Member
22	Dr. S.K. Joshi	Co- Ordinator NCEWP
23	Dr. R. M. Shewale	RC-08 President
24	Dr. Sunil Ranjan Biswal	RC-16 Secretary
25	Prof. D.K. Tyagi	RC-04 President
26	Dr. CH Madhusudan	RC-22 Secretary
27	Dr. Akhilesh Tiwari	RC-04 Secretary
28	Dr. R. S. GeethaSub	RC-12 A Member
29.	Dr. R. Anandakumari	Sub RC- 12A President
30	Dr. Lata D Jadhav	RC-08 Secretary
31	Dr. Sarmistha Sahu	Sub RC-12 A Secretary
32	Dr. D. Uttra	RC-13 Secretary
33	Dr. Runima Baishya	RC- 17 President
34.	Dr. Reshma Raut	RC-21 Secretary
35	Vinod Kr. Prajapati	Office Assistant Kanpur Office

Prof. Rekha Ghorpade, General Secretary of IAPT, requested Professor P. K. Ahluwalia to Chair the meeting. She welcomed the members and thanked RC-06 members for organizing the 37th Annual convention of IAPT at Jaipur and making all arrangements for the smooth conduct of EC Meeting.

Mourning the passing away of honorable members of IAPT:

At the outset a two-minute silence was observed to mourn the death of following very active members of IAPT who left us for their heavenly abode:

- i. Prof. Y. R. Waghmare, Former President, IAPT.
- ii. Prof. Anil Singh, coordinator, NGPE
- iii. Prof. SVM Satyanarayan, Physics Department, Puducherry University
- iv. Prof. S. Ravi Prasad Rao, Secretary RC 22,
- v. Prof. Samer Bagchi, Famous Science Communicator

Rich tributes were paid to all the members. Prof. Ahluwalia recalled their contributions to IAPT and said that we will miss them for their guidance and dedication to vision and Mission of IAPT. Thereafter, agenda items were taken up one by one.

1. To read and confirm the minutes of the earlier EC meeting.

The minutes of last meeting were read by GS and were confirmed with one correction. The correction was sent by Prof. Ravi Bhattacharjee in the APhO report. It was mentioned that the Indian delegation for APHO-23 was accompanied by Dr. Vijay Kumar, Coordinator-APhO cell. However, at that time Prof. Ravi Bhattacharjee was the coordinator. This was accepted.

2. Report on activities by Central IAPT (May – September 2023) by GS:

Rekha Ghorpade, GS, IAPT updated on the following activities of Central IAPT:

- Dynamic Website
- Purchase of Zoom Platform
- Lecture by Dr. K. K. Mashood, HBCSE (March 4, 2023) - From Physics Derivations to Computational & Interdisciplinary Modelling.

- Panel Discussion on 'Women in Science'
 - Workshop on National Curriculum Framework (NCF)
Guest of honour – Prof. K. N. Joshipura
Speakers – 1) Prof. Meenakshi Sayal, Jalandhar
2) Prof. P. K. Joshi, HBCSE
 - Zoom Platform used by:
 1. RC 08: 3-Days Lecture Series on Fascinating Areas Of Physics.
 2. RC 03: 6- Days National workshop on Nano Materials.
 3. RC 12 A: 12 Days summer school in Computational Physics.
 - IAPT Women's Cell
 - i) A Talk by Prof. Prajwal Shastri (May 7, 2023)
Topic: My Journey Through Space-Time.
 - ii) Celebrating Independence Day with Woman Scientist: Prof. P. K. Ahluwalia in Conversation With Prof. Manjit Kaur. (August 13, 2023).
 - iii) Interview with Dr. Uthra D., IAPT DSM Awardee-2023 By Prof. P. K. Ahluwalia (September 16, 2023)
 - IAPT Series on NEP-2020/NCF Initiated by Prof. K. N. Joshipura
 - i) NEP2020 And Curriculum Frameworks: IMPLICATIONS FOR PHYSICS EDUCATION AT SENIOR SECONDARY AND UG LEVELS. by Prof. C. K. Ghosh (June 11, 2023). This lecture provided a launching pad for further discussion.
 - ii) PANEL DISCUSSION: Role Of IAPT In Designing Physics Curriculum In The Light Of Recommendations Of NEP-2020. (June 22, 29, 2023)
- After this a series of brainstorming sessions/ discussions were conducted under the auspices of RC 15. A submission on NCF document of IAPT was prepared and submitted to NCERT, CBSE and Secretary Ministry of Education, Govt. of India, New Delhi (Appendix-1). RC-15's role for taking this initiative was duly acknowledged.

- **IAPT PER LECTURE SERIES**

Coordinator, Dr. Sapna Sharma

- i) From Physics Derivations to Computational and Interdisciplinary Modelling By Dr. K. K. Mashood, faculty at HBCSE (March 4, 2023)
 - ii) Facilitating Thinking and Learning and Beyond Physics Classrooms using Research based Approaches By Dr. Chandrekha Singh (May 14, 2023)
 - iii) Implications of Pedogogy and its Relevance in Advanced Physics Learning By Dr. B. N. Meera.(June 10, 2023)
 - iv) Science Education: Science or Art? By Prof. Vijay Singh, Former President IAPT(July 223, 2023)
 - v) Facilitating Scientific Practices and Actionable Feedback through next Generation Assessments. By Dr. Amogh Sirnoorkar, Dept. Of Physics, Kansas State University. (August 20, 2023)
 - vi) From Classroom to Laboratory and Exam: Physics Questions Powered by Smart phones By Dr. Praveen Pathak, Faculty at HBCSE.(September 24, 2023)
- A Book Talk by Prof. P. C. Deshmukh on his book “FUNDAMENTALS OF CLASSICAL MECHANICS” was hosted. Host: Prof. P. K. Ahluwalia.
 - IYPT: International Young Physicists Tournament
 - i) Curtain Raiser by Mr. Shashikant Pandey, School Teacher, Mumbai.
 - ii) Webinar on INYPT: Mr. Gyaneshwaran, School teacher, Dehradun and Akshat Gaur, Student.
 - IAPT RC EXEMPLAR AWARD - 2023
Incentivization of RCs: Results
 - SHRESHTHA – RC 01, Delhi
 - UTTAMA – Sub-RC 12A, Bengaluru
 - ANANYA – Sub-RC 08B, Mumbai

Poor Attendance in online Programs: Prof. Jogad mentioned the poor attendance during the IAPT online programs. GS informed that we need not worry, some times the attendance is more than 70. Also, the recordings of the programs will be made available on

the website.

Non-attendance of EC members in EC meetings: GS raised a concern for some of the EC members who do not attend meetings. Some inform and some do not. Being an important link between Central IAPT and RC, their attendance is expected. Prof Sudam Mane suggested, that those EC members who do not attend three meetings consecutively, they can be removed as per the constitution and a new nominee from the RC may be sought.

Prof. B. Chakraborty suggested, if a member does not attend 2 meetings, he/she can be given the notice, and the action can be taken if there is no response. Prof. Ahluwalia expressed, this is an acceptable solution.

Prof. Chakraborty also told that some of the members are not relieved for attending convention and other offline programs by their institutions.

President assured that they can be given further help in the form of communication to their respective colleges to facilitate their leave.

Programs by RC's and Sub-RCs: Prof. Ahluwalia suggested that each RC must organize/facilitate Lecture Series on different themes on Physics by President/Secretary/other members of the respective RCs. He said, at least all the RC members should be present in these lectures.

Conveyance to attend IAPT programs: Prof. Nagaraju, Vice President North informed, some of the RC members don't attend programs if they are not paid the conveyance. GS suggested that RCs can organize these programs in mixed mode. President requested EC members to assist Central Office to organize programs and further informed that it is beyond the means of IAPT to provide conveyance to every member.

Appreciation of Efforts: GS appreciated the efforts by Prof. Ranjita Deka, VP, East Zone in reaching out to RCs in her Zone.

3. Latest Updates:

i) On accounts and Budget (2023-24):

Prof. Sanjay Sharma, Secretary, Central IAPT office and Prof. D. C. Gupta, treasurer presented the statement of Income-Expenditure which was approved by the members.

Prof. B. Chakraborty suggested, if any RC has collected money from their own efforts, the break up should be mentioned in the budget.

Prof. Sanjay Sharma informed, if RC receives any donation, Aadhar and PAN card of the donor is required. The amount may be taken as sponsorship, so that Aadhar or PAN card is not required.

ii) Status of e-mail addresses for IAPT website.

Prof. Ahluwalia informed that the lists of members from respective regions in the form of excel sheets whose emails are not available in the IAPT database have been sent to RC presidents/Secretaries/EC representatives to get emails of the members for profile updating, however, only few RCs have responded. A printed copy of the same is also being handed over to EC members, President requested members to take up this matter on top priority and help IAPT central office to update and reach out to each member via e-mails which are being sent regularly.

Opening of the website www.indapt.org.in: Prof. Mane expressed the difficulties in reaching out to the website. He felt some modifications are needed, so that even non-members can open and access the website.

Prof. Ahluwalia told the members that there are two areas on the website, one which is accessible to the registered members and the other for any one on the internet. Members can login with their registered email and edit the profile as required. He also requested, RCs must start using their page. They can write in the IAPT Feed about their upcoming events, reports, etc, upload the photos in the gallery, and so on. He stressed the point that each RC has a dedicated page which they should own and use to show case their activities.

iii) Single website for IAPT. Winding up other websites other than www.indapt.org.in

Prof. Ahluwalia informed that there are two old websites, one was created for the exams by Prof. Dharkar and the other is general one with static content. To avoid the confusion we need to close the two websites.

Prof Mane pointed out that on exam posters of NSE and NGPE the address of old website is given. If you close that one, how the students will get the information.

Prof. Ahluwalia told, from next year we will integrate

all the websites into single one. We have decided to end this task by end of March 2024 and work is in progress.

iv) Status of online Publications: Physics Education Journal, IAPT Bulletin and Students' journal of Physics.

Members were informed that sub committees are working hard on finding a solution and is likely to be in place by 31st March 2024

v) Examinations: Prof. B. P. Tyagi, Chief coordinator, IAPT Exams.

- **Status of Enrolment in NSE:** Prof. Tyagi informed, the enrolment scenario has improved against the enrolment in last three years. It was 62 thousand in 2020, 63 thousand in 2021, 1,37,000 in 2022 and 1,72,496 in 2023(current year). He also updated on enrolment process and the schedule of current NSE cycle.
- **Court Case for the conduct of NSE in all Indian Languages:** He informed about the court case filed in Delhi court, demanding NSE question papers in all the Indian languages, as large number of students are studying in vernacular medium schools. The decision is pending. Hence we are going ahead with our guidelines. He further informed that currently, we provide question papers in English and Hindi. However, if there are 300 (or 1% of the total enrolment in a subject) for any other language, the QP is made available in that language.
- **Appeal:** He appealed to the members to help him in the forthcoming National Standard Examinations 2023, scheduled in the month of November.
- **Efforts to reach out to KV's and JNV's:** He informed about his efforts to reach out Kendriya Vidyalaya , Jwahr Navodya Vidyalaya Head Quarters to allow the NSE centres and also allow outside students to appear in the NSE without any additional charges. He was successful in getting the KVs, JNVs to do the task, and to motivate the students to appear for NSEs. KV and JNV HQ's issued notification to all the KV and JNV schools to allow outside students to appear in respective centers. He appreciated the support by the respective officers in both the HQs.

- **Invitation to Support Exam Cell:** He requested the members to come forward and help Exam Cell in QP setting, Vetting, proof reading, etc. Prof. Mane assured all the support needed would be provided.
- **Mentoring of State Toppers:** Mentoring of top 30 students from among the state toppers list. Prof. Jogad suggested, there should be an orientation program for top 30 students from state topper list (Top 1% of national toppers already go for INO conducted by HBCSE). He said that this proposal should be taken up by IAPT exam cell and implemented for all the states. The necessary funding (approx. 13.5Lakh) should be provided by central IAPT. GS expressed inability of IAPT to raise such a huge funds for a single program. She suggested, RCs can plan such programs for the students in their respective states. President said, RCs can innovate on such programs and help students in many possible ways. Teachers can be encouraged to make videos for problem solutions in regional languages (e.g. Dr. Uthra is doing in Tamil), students can join the face book page of IAPT LUSI and get solutions to their problems.

vi) Status of IAPT-APhO cell and the activities under it: Dr. Vijay Kumar (Invitee)

Prof. Vijay Kumar, APHO Coordinator could not attend the meeting, however, he sent a report in the form of a ppt, which was presented by the General Secretary. Some of the highlights were:

- Starting of the video lectures on YouTube by APHO Coordinator, along with a WhatsApp group.
- In the videos previous years NSEP problems are being discussed. Students also join his Google Classroom to get solutions for the problems.
- It is proposed to start the discussion of INO problems for the next cycle of APHO/IPHO.
- APhO lab is set up at Graphic Era Hill University, Dehradun and is functional. Further lab activities have been initiated. Students of B Sc are working on the set ups of APHO equipment available from the past years, they are preparing ppts and presentations, which they propose to use for peer training of the shortlisted APHO group for final

selection.

- Future Plans: Prof. Vijay Kumar intends to start a program “Eklavya”, a collaborative effort by IAPT APhO cell and GEHU to train students from across the country in an online mode by solving problems at APhO level.
- Prof. Vijay Singh added the following point which were not included in the above presentation:

A 2 day POLLEX IX workshop was conducted in Patna from August 5-5 2023 at Shoshit Samadhan Kendra, a school for the severely underprivileged. Over 300 students from the school and surrounding areas attended. It was decided to convey this to the coordinator APHO cell for including in the presentation.

- The EC reiterated its deep appreciation for Dr Ravi Bhattacharjee for providing a long and outstanding stewardship of the APHO-IAPT program in India as its Coordinator since inception of this program It was suggested by Dr Mane that Dr Ravi Bhattacharjee be invited to share his experiences in online/off linemode.

vii) Status of IAPT-JSO cell and report of activities: Prof. Gadre (Invitee)

Prof. Rekha Ghorpade presented the report on behalf of Prof. Gadre, as he was unable to attend the meeting.

She informed the members, that after NSE, the second level exams, Indian National Olympiad (INO) are conducted by HBCSE. Last year HBCSE approached IAPT to take over the Junior Science Olympiad program second stage onwards. it is indeed an opportunity for IAPT to grow academically and help create resources as a byproduct. Therefore, IAPT accepted the request. HBCSE Director and National Coordinator, science Olympiad promised that it would be a smooth handover and there will be a handholding from HBCSE for the next cycle and for raising the JSO lab.

HBCSE has helped us at all the stages till the team went for International event in the last cycle of 2023. Now the new cycle has started and the entire responsibility is with IAPT. JSO team is now working independently, of course, HBCSE has promised IAPT to help whenever required. We started searching for the place to set up the IAPT JSO Cell. We received few proposals. We have visited the places to see the infrastructure and the

resources available. The Proposal given by Dr. Achutha and Dr. Raghavendra from Bangalore was found to meet most of the requirements, so it was decided to set up the IAPT JSO cell at VVS First Grade college, Bangalore. The center will work in collaboration with IISc Challakere campus. The IAPT JSO cell will have the responsibilities of conducting Resource Generation Camps for INJSO and OCSC, QP setting, vetting and Grading, OCSC(18-days), PDC and sending the team to IJSO.

Prof. Ghorpade explained all the processes and the schedule of entire Junior Science Olympiad Program.

She informed that, last year after taking over this program the team of 6 students was sent to IJSO-22 held at Bogota, Colombia. The Indian team won 6 Gold Medals, making a Hatrick and placing India at the top rank.

This year the IJSO-23 will be held at Bangkok, Thailand during December 1-9, 2023. The formalities are over. The Pre-departure camp will be held at VVS Bangalore between November 24-29, 2023.

viii) Competitions:

a) **NCEWP** – Report by Coordinator, Prof. S. K. Joshi (Invitee)

1. Announcement of NCEWP-2023 appeared in Bulletin of IAPT Jan.2023 issue with last date of submission as July 30,2023

(Bulletin Pages 21-22). It was also uploaded on the IAPT website on January 25.

2. Date extended for Essay submission to 15th Aug. 2023 (Bulletin of IAPT Aug. 2023 P.234) Published on IAPT website, July 30, 2023

3. June 21, 2023, all RCs (office bearers- President, Secretary and their EC members) from RC-1 to RC-22 were sent an e-mail requesting them to take necessary steps in organizing Essay Competition in their respective regions.

4. In students' category, 71 entries were received, which was maximum since starting of the competition in2012. The judges **Dr. Swapan Majumdar (Agartala, Tripura), Dr. A. P. Deshpande (Nagpur) and Dr. Usha Singh (Indore)** were profusely thanked for their voluntary services in this competition.

5. In Teachers' category, 22 entries were received. The judges **Dr. D. A. Deshpande (Nagpur), Dr. Sapna Sharma (Shimla) and Dr. Mihir Pal (Tripura)** were profusely thanked for their voluntary services in this competition.

6. All the essays received were checked for the plagiarism.

7. The results were announced and the prize winners will be awarded the prizes during the inaugural function of 37th annual convention of IAPT at Jaipur. Prof. Joshi thanked the members from different regions who helped him getting the entries.

b) **NCIEP** – Report by Prof. Geetha R. S. (Invitee), Coordinator.

Prof. Geeta informed, there are three categories;

Category A (Teachers): 14 entries received, out of which 10 have confirmed their participation.

Category B (Students: +2, UG, PG): 18 entries received and 13 have confirmed their participation.

Category C (School level): 15 entries received and 11 have confirmed their participation.

Student participants (category B & C) will get Rs1000/- incentive.

She thanked Prof. Y. K. Vijay and Prof. Y. C. Sharma who agreed to waive the registration fee for student participants.

She requested honorable members to give suggestions. She thanked office bearers of RCs and teachers for encouraging the participants. She also thanked Prof. Ahluwalia, President, Prof. Rekha G, GS, Prof. Y. K. Vijay and his team, Prof Nagaraju, VP South zone and Dr. G. Venkatesh for their inputs and suggestions and all the encouragement.

c) **NCICP** - Prof. Pradipta Panchadhyayee (Invitee), Coordinator.

Prof. P. Panchadhyayee could not attend the meeting. The report was not available

d) **NSSP** – Prof. C. N. Kumar (Invitee), Coordinator

Prof. C. N. Kumar informed, National Students Symposium on Physics will be held during October (27-29), 2023 at Chandigarh. The arrangements are being

done. B. Sc.(3rd year) and M. Sc.(I & II) Students will participate and present their papers.

He requested the institutes having good research facilities should come forward to organize this three days workshop in future, so that students get exposure to some interesting research areas in Physics.

4. NANI: Updates on Anveshika activities and NAEST

Prof. H. C. Verma, Coordinator, NANI presented a report.

- a) He informed the members, there are two new Anveshikas are set up this year,
 - 1) STA-IAPT Anveshika, Srinagar. Coordinator- Mr. Ishtiyah Ahmed.
 - 2) KMV-IAPT Anveshika, Jalandhar. Coordinator- Ms. Neetu Verma.
- b) A meeting of Anveshika coordinators was organized during June (18-20), 2023 at Anand Engineering College, Agra.

Prof. Ahluwalia, President talked to Anveshika Coordinators, online and gave suggestions to coordinators to harness Anveshika potentials further more effectively. He asked them to make a collection of experimental videos and create virtual labs, which will be the resource for others.

The work has been initiated as listed below:

- Ms. Smita Fungaria is leading, Prof. Verma informed.
- Ms. Pragya Nopany to lead the International Conference on Physics Experiments: NANI/ Anveshika, The Journey and new models during Pandemic.
- Resource Generation Camps, NWUPT-2023 were organized.
- Specific coordinators are appointed:

NAEST Online - Smita Fungaria and Amit Bajpeyee

NAEST Offline - Rakesh Awasthi and Rohit Sharma

Calendar Monitoring – Pragya Nopany and Mineesh Gulati

Web, Communication and documentation – Dinesh

Sharma and Debmalya Sen

- **Anveshika Buzz**, a monthly magazine has started, where Anveshika coordinators write reports, articles, experiences, etc. Two issues are published. Dinesh Kumar, Coord. HIM-Anveshika is managing the publication.

- **Schedule and Statistics of NAEST 2023** is reported as follows

- NAEST-2023: Registration- April 01 to May 25, 2023.
- Total Registration: College level – 2300, School level – 18500
- Appeared for screening: College level – 1885, School level – 5037
- Selected for Prelims: College level – 187, School level – 821
- Semi-final & Final: At Sopan Ashram Kanpur, September 22-24, 2023
- Final Results: September 25, 2023. 5 winners(2-school, 3-college) will be awarded prizes at annual convention, Jaipur.
- Finance for lodging, boarding, food for students, parents was by I. I. T. Kanpur.
- **Future Plan:** Surya Rath Darshan on Science Day by 1M students splitting white light into colours with zero cost.
- **Appeal:** Need more evaluators, Tachers from IAPT network to join Physics Par Charcha (PIPASA), Registration campaign.

4. **Drafting a model curriculum for Under Graduate Physics (3/4 years)** after deliberating on the current status with UGC and with State and central universities.

Prof Ahluwalia underlined the important role of IAPT in this regard. He suggested, an online brain-storming session can be organized for drafting model curriculum for UG programs. He also requested that some RC to take up this as a program in mission mode and should come out with a model document taking care of implementation issues in various state as part of NEP

2020.

5. Initiating endowments for IAPT and top-up to existing ones.

President underlined the fact that in going ahead with the mission and vision of IAPT money matters. We need to think about generating programs based financial resources in the form of endowments, grants under CSR and having MOU's with HEI and leading schools with facilities such as Atal Tinkering lab etc. This proposal was given approval to go ahead.

6. Criteria to evaluate reports: approved to initiate further action.

7. Updates by IAPT Sub-committee for the appointments of non-elective posts in IAPT.

As per the proposal submitted by Prof. G. Venkatesh, IAPT President has constituted a committee to work on this proposal. The members of the committee are:

Prof. Bhupati Chakraborty(convenor), Prof. P. D. Lele and Prof. S. K. Joshi.

Prof Bhupati Chakraborty informed that, the committee met online to discuss the proposal and draft guidelines. He promised that committee would soon complete the drafting work on guidelines for appointments of coordinators of various non-elective posts(Examinations, NANI, Competitions, etc.) and they will be circulated among the EC members for suggestions before placing it in the next meeting for approval.

8. Ruby Jubilee celebration of IAPT.

President informed, that IAPT is completing 40 years of its work across the length and breadth of the country On 31st December 2023. He further said that this milestone is worth celebrating and reminding ourselves the hard work which has been put into it by all the members and office bearers from time to time. So it is proposed to celebrate 2024 as Ruby Jubilee of IAPT. He requested the members to organize programs in their regions as a part of this celebration, he invited suggestions from the members to make it a memorable event.

9. Any other item with the permission of the chair:

i) IAPT Students' Ambassadors Proposal: A draft for this has been received from Prof. Mahesh Shetti,

this is being worked out further and soon it will in place for implementation.

ii) Rearrangement of RC/SRC:

a) RC 08 Proposal was received to form a new Sub-RC (Vidarbha) and restructuring of Sub-RC 08 B(Mumbai)

b) RC 03 Proposal received to have New RC For Himachal Pradesh

Both the proposals were deliberated; however, the decision was pending. It was decided that it will be taken up further in the next part of the EC meeting for final decision

iii) INYPT:

Different Rounds of INYPT have been started to finally select the teams to shortlist candidates for INYPT.

iv) 38th Annual Convention of 2024:

GS informed; we have received two proposals for hosting the 38th Annual convention of IAPT in 2024. One from Chandigarh & Himachal Pradesh (RC 03) and Goa(RC 22). Since the proposal for RC 03 was received first and they already have started working on it, it was approved.

38th Annual Convention will be at Dharamshala, (H. P.), informed Dr. Pawan, an EC representative of RC 03.

10. Remarks by the President:

President Prof. Ahluwalia made his remarks during/ after every agenda point. Since it was almost 11:00 pm he appreciated the valuable inputs by all the members during deliberations on various agenda items and thanked them for coming to this offline meeting in which RC/Sub-RC presidents and secretaries were also invited.

Meeting adjourned with vote of thanks by Gen. Secretary Rekha Ghorpade till the extending part of this meeting to take up remaining agenda online.

Minutes of An Extended Meeting.

An Extended meeting of Executive council members was held in an online mode on December 10, 2-23 from 10:00 am onwards.

Following members were present.

1	Prof P.K. Ahluwalia	President
2	Prof. Mrs. Rekha Ghorpade	General Secretary
3	Dr. Ranjita Deka	Vice President East Zone
4	Prof. P. Nagaraju	Vice President South Zone
5	Prof. Jaswinder Singh	RC-02 Punjab & Jammu Kashmir
6	Dr. Pawan Kumar	RC-03 Chandigarh & Himachal Pradesh
7	Dr. Sundar Singh	RC -04 Uttar Pradesh
8	Prof. Y. K. Vijay	RC-06 Rajasthan
9	Prof. Limbachia	RC-07 Gujrat, Daman, Diu
10	Prof. S.B. Mane	RC 08 Maharashtra
11	Prof. Uttam Sharma	RC-09 Madhya Pradesh
12	Prof M.S. Jogad	RC-12 Karnataka
13	Prof. Anandavadivel	RC-13 Tamil Nadu
14	Mrs. Benazera	RC-14 Kerala, Lakshadweep
15	Prof. Makhanlal Nanda	RC-15 W.B, Andaman, Nicobar, Sikkim
16	Prof. Kalipada Adhikari	RC-18 Tripura, Meghalaya, Mizoram, Manipur
17	Prof. B. P. Tyagi	RC-22 Telangana
18	Prof. V. Rajeshwar Rao	Chief Coordinator Exams
19	Prof. Sanjay Kumar Sharma	Secretary
20	Prof. D.C. Gupta	Treasurer
21	Prof. Bhupati Chakrabarti	Coopted Member
22	Vinod Kr. Prajapati	Office Assistant Kanpur Office

On request from GS, President, Prof. P. K. Ahluwalia accepted the chair.

GS proposed to pay homage to Prof. G. Venkatesh, an EC member and senior IAPTian who left us for heavenly abode on November 08, 2023.

President Prof. Ahluwalia read the obituary and 2-minutes silence was observed thereafter.

Discussion on Agenda followed.

- **Formation of New RC/Sub-RC:**

Discussion for this agenda point was done at length in the last meeting. Prof. Jogad, Prof. B. Chakraborty, Prof. Mane raised few queries. GS clarified those to their satisfaction. She informed; she has received the modified proposals from

respective RCs. This includes the resolutions from respective RCs and the ad-hoc committee members list. After a little discussion, the members approved the following decisions:

- Himachal Pradesh being a separate state, it should be awarded the status of **Regional Council** and it will be recognized as **RC 23(Himachal Pradesh)**.

It was suggested that the joint meeting of EC members from RC 03 and RC 23 should be organized as a good will gesture and the minutes be shared with central office as well for record.

- Proposal was received from RC 08(Maharashtra) for the formation of new Sub-RC of Vidarbha. Prof. Ahluwalia appreciated the proposal for SRC and

said we must approve it without any discussion. Prof. Mane and Prof. Nagaraju supported it.

It was also approved unanimously.

iii) RC 08 also sent a proposal for restructuring the Sub-RCs 08B & 08D.

Currently, the districts Raigad, Ratnagiri and Sindhudurg, which are in Sub-RC 08D(Kolhapur) may be included in Sub-RC 08B(Mumbai). Institutions from said district are affiliated to university of Mumbai and it will be convenient to organize academic programs.

This was also approved by the members.

President, Prof. Ahluwalia thanked the members for approving the new RC and SRC.

International Junior Science Olympiad (IJSO-23): GS shared the good news that IAPT has sent an Indian team for International Junior Science Olympiad (IJSO-23) at Bangkok, Thailand on its own efforts with handholding from HBCSE. The team won 5-Gold and 1-Silver medals. President congratulated the young scientists, their mentors, trainers and HBCSE. He shared his experiences while interacting with them when he was at HBCSE during the training.

Prof. Rekha G. added, Pre Departure Camp(PDC) was organized at Vidya Vardhaka Sangh, Bangalore. She appreciated their excellent efforts in a very short time.

Report Presentations by Regional Councils:

Following RCs presented their reports.

- I. RC 02 (Punjab, J & K)
- II. RC 03 (Chandigarh, H. P.)
- III. RC 04 (Uttar Pradesh)
- IV. RC 06 (Rajasthan)
- V. RC 07 (Gujrat, Daman Diu)
- VI. RC 08 (Maharashtra)

VII. RC 09 (Madhya Pradesh)

VIII. RC 12 (Karnataka)

IX. RC 14 (Kerala & Lakshadweep)

X. RC 15 (W.B. Andaman, Nicobar Islands, Sikkim)

XI. RC 18 (Tripura, Meghalaya, Mizoram, Manipur, Nagaland)

XII. RC 22 (Telangana)

Rekha Ghorpade, GS informed; Presidents/ Secretaries/EC representatives of RCs were requested to mail their reports before this meeting. However, only one RC sent the report. She also raised her concern over non-attendance of RC representatives of EC and not sending the report.

Prof. B. Chakraborty suggested, RCs can send video recording of their reports, in case EC member/President/Secretary is unable to join the meeting. These recordings can be posted on the website.

Prof. Ahluwalia gave his remarks during/after each presentation. He appreciated the activities by the RCs within their regions, sharing resources with other RCs and helping central IAPT to carry out their activities.

He suggested, each RC must create a scatter diagram of their activities and the active members from the regions.

He said, as a part of Ruby Jubilee Celebration of IAPT, each RC must generate 40 outreach programs under the banner **IAPT@40**.

Prof. Rekha Ghorpade thanked all the honorable members who joined the extended EC meeting.

Rekha Ghorpade
General Secretary, IAPT

WORKSHOP ON QUANTUM PHYSICS SIMULATIONS USING NUMERIC SHEETS

Date: 09/12/2023, **Time:** 10:30 pm to 4:30 pm

Venue: Government Degree College, Rajgarh, District Sirmaur, H.P.

Organized by: RC-03 **Beneficiaries:** UG students (40)

Resource Person: Prof OSKS Sastri, Central University of Himachal Pradesh.

This workshop was divided into three sessions. In the first session students were given basic theory of quantum simulations including the mathematical background starting from Taylor series, matrix formulation of quantum mechanics etc.

In the second session a practical demonstration of the methodology was given by Prof. Sastri on Gnumeric sheets. In the last session, students performed the simulations themselves on the Gnumeric sheets themselves. Prof Sastri and Dr Pawan Kumar supervised the students and helped them while working on the problem.



Prof.OSKS Sastri with the students

Pawan Kumar

INTER-COLLEGE WORKING MODEL COMPETITION

(December 2, 2023)

On the occasion of Birth centenary year celebration of Prof. Babulal Saraf

The Department of Physics, Kanoria PG Mahila Mahavidyalaya, Jaipur, in collaboration with the Regional Council-6, and sponsored by Electronics India, organized a Working Model Competition on December 2, 2023 on the occasion of Birth centenary year celebration of the great experimentalist Prof. Babulal Saraf. The purpose of this event was to encourage young physicists and science enthusiasts to be creative, innovative, and scientifically minded. The event served as a platform to showcase novel ideas, technical expertise, and practical applications of theoretical concepts in physics. The event saw an enthusiastic turnout of 80 undergraduate and postgraduate students from various educational institutions.

The competition spanned a full day, commencing with an inaugural ceremony. Prof. Y K Vijay Director CIST and President, RC-6 was the keynote speaker. He threw light on the legacy of Prof. Saraf and shared his experiences with him. By citing Prof. Saraf's work on the coupled oscillator experiments and the beta ray spectrometer, which are housed in UG and PG laboratories, Prof. Vijay inspired students to think like entrepreneurs while pursuing





physics breakthroughs.

After Keynote address Dr. Vipin Kumar Jain, Associate Professor and Head, Department of Physics, Chaudhary Bansi Lal University, Bhiwani (HR) delivered Invited talk on “Fun in exploring science through hands-on experimentations” and judged, as one of jury member in the

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king model competition. Prominent academic specialists and physicists, including, Dr. Usha Bhatia, the former head of the department of physics at Kanoria PG Mahila Mahavidyalaya and Dr. Narendra Jakhar, Assistant Professor, department of physics, university of Rajasthan were also on the jury for the inter- college working model competition



Participants presented an array of working models, each demonstrating a unique application of physics principles. The entries encompassed a broad spectrum of topics, ranging from Hydrogen fuel, River cleaning, IOT based smart home, Smart Institute, generation of electricity and fuel using waste material, accident prevention, RADAR sensor, Plasma globe etc.

Judges evaluated the models based on innovation, scientific accuracy, presentation, and practical utility.

After rigorous evaluation and deliberation, the panel of judges identified and recognized the most outstanding working models. The top three models were awarded prizes of 5000/-, 3000/- and 2000/- respectively by RC-6 (IAPT) and a certificate of excellence, and accolades from the organizers and dignitaries present at the event.

Additionally, all participants received certificates of participation, acknowledging their dedication and contribution to the competition. Mrs. Vimla Saraf, wife of Prof Babulal Saraf and his son was the guest of honor in the valedictory and award ceremony of the inter-college working model competition.

List of winners

S.No.	Name of Student	Name of Institute	Class	Position
1.	Vanshika Mishra	Kanoria PG Mahila Mahavidyalaya, Jaipur	M.Sc. III	I
	Kratika Sharma		M.Sc. III	
	Ashwini Singh		M.Sc. III	
	Vinita Kumari		M.Sc. III	
2.	Divyanshi Sharma	Suresh Gyan Vihar University	B.Sc. B.Ed.	II
	Khushbu Pohiya			
	Khushboo Dudawat			
	Arzoo Choudhary			
3.	Kalpesh Jangid	S.S. Jain Subodh College	M.Sc. Previous	III
	Mithlesh Yadav		M.Sc. Previous	
	Khushi Sharma		M.Sc. Previous	
	Manisha Meena		B.Sc. II	
	Naman Khandelwal		M.Sc. Previous	

The success of this event would not have been possible without the collaborative efforts of the Department of Physics, IAPT, and the generous sponsorship provided by Electronics India. Special thanks to the judges, participants, volunteers, and attendees whose enthusiastic participation and support contributed to making this competition a resounding success.

Sarla Sharma
Head - Physics Dept.

REPORT-SRC08B

SEMINAR ON GUIDANCE AND CAREER COUNSELLING

Venue: Patuck Technical High School and Junior College, Santacruz, Mumbai

Organized by: IAPT SRC08B and Patuck Technical High School and Junior College Mumbai.

No. of Participants/beneficiaries: 80 students of ninth and tenth class and 6 teachers.

Date: 20th Dec. 2023.

Schedule: 10.30 am to 4.30 pm

Resource person: Prof. Rekha Ghorpade,

Dr. Raosaheb Raut, Dr. Yasmin Lodge, Ms. Namra Mirza

Coordinator: Mrs. Susmita Meta

Program started with prayer followed by lighting of lamp by dignitaries. Mrs. Sushmita Meta welcomed the guests with bouquets. Treasurer of SRC08B, Prof. Shyamla madam gave a brief introduction of guest speakers. The Chairman, Patuck school, Shri Adil J Patuck expressed his happiness on the conduct of such programs which are beneficial for the students and conveyed his best wishes and support for future endeavors. Mrs. Rekha Ghorpade, General Secretary, Indian Association of Physics Teachers discussed various career options for science students

with the aid of effective ppt. The secretary of SRC08B, Dr. Krishna Bhole explained the objectives and working of IAPT.

Dr. Raosaheb Raut, Psychologist – Counsellor of the college talked on the topic “People's suggestion, My choice”. He encouraged students to make wise and bold decisions at the right time. He addressed the queries of students regarding various factors to be taken care of while choosing a career, overcoming fear and depression, increasing confidence and self-esteem etc.

Mrs. Yasmin Logde, senior faculty for skill development and Miss Namra Mirza -Faculty from Maharashtra institute of Medical Science Technology, talked about scopes of various paramedical courses. They gave guidelines on how and when to apply for the courses with specified criteria.

Faculties from Pravin Patil College briefed the courses available at their campus. They explained the admission procedure, facilities and fee structure during the next academic year.

Program gave a positive vibe for students.

Program ended with a vote of thanks.

K. G. Bhole
Secretary -SRC08B

REPORT-SRC 08B

PLANETARY SCIENCE LECTURE SERIES

Venue: Online and YouTube channel

Organized by: Physics Department of John Wilson Education Society's Wilson College, Mumbai, in collaboration with IAPT, Mumbai Sub-Regional council 08B

No. of Participants/beneficiaries: Registered 200, Average attendance 60 but many will see it on YouTube channel.

Date: 22nd Dec. to 27th Dec. 2023.

Coordinator: Mr. Mahesh Shetty

Physics Department of John Wilson Education Society's Wilson College, Mumbai, in collaboration with IAPT, Mumbai Sub-Regional council organised an online lecture series on Planetary Science. The series was conducted on Zoom meeting platform on 22nd, 23rd, 26th and 27th December 2023. The main objective of the lecture series was to provide exposure to undergraduate students about the new trends in planetary sciences and to motivate them to take up higher studies in this growing field.

Resource persons were diverse from the geology, geophysics, and astronomy and ranged from being academicians, scientists to amateurs working in the field.

The topics of 12 lectures were:

- 1) Earth's interior and rock cycle by Prof. Raymond Duraiswamy, Savitribai Phule Pune University
- 2) Earth and Space Exploration: Mars Analogue, Ladakh, India – Ms Rujal Pachhigar, graduate student in geology
- 3) Journey through air: Unravelling Planetary Atmosphere – Mr Lot Ram, Research scholar, IIT Roorkee
- 4) Guardians of Planets: Magnetic fields – Dr. Virendra Yadav, ARIES, Nainital
- 5) Gravity anomaly, its measurement techniques and interpretations – Dr. Dinesh Kumar, Associate Prof, Kurukshetra University
- 6) Citizen Science Project: Asteroid mapping using occultation technique – Mr. Shishir Deshmukh, amateur

astronomer, Akash Mitra Mandal

- 7) Study of Gems – Mr. Hemant Sane, Professional gemmologist, Universal Diamond Grading
- 8) Exoplanet detection – Mr. Anwesh Mazumdar, HBCSE (TIFR)
- 9) Age of Rocks – Mr. Deepak Kumar Sahu, Asst Prof, Geology Department, K J Somaiya College
- 10) Magnetic mapping of the Earth – Mr Deepak Kumar Sahu, Asst Prof, Geology Department, K J Somaiya College
- 11) Plate Tectonics and dynamics of mountain formation – Dr Ramech Chandra Patel, Associate Professor, Banaras Hindu University
- 12) Modelling meteoritic impacts – Mr. Mahesh Patil, citizen scientist

More than 200 participants registered though the actual numbers present during sessions were around 50-60 for each lecture. All the lectures were recorded and are uploaded on

Wilson College YouTube channel:

https://www.youtube.com/playlist?list=PLQUzryAOIOH1ex3vAhFyEJWGE9c_iZZ_g

and IAPT Mumbai Sub-RC YouTube channel:

<https://youtube.com/playlist?list=PLN7tyQ36o5VN-mEDW0JoNi1vMnJr-Lo7L&si=ns1biaszfZP8yXhd>

Participants have been asked to submit an essay of their learning throughout the series. The best essays will be given prizes.

The activity is sponsored by Wilson College, under the DBT Star Strengthening Scheme.

Lecture series was inaugurated on 22nd December 2023 by Wilson College IQAC coordinator Dr Radhika Birmole, on behalf of Principal Anna Pratima Nikalje, Wilson College. Mr. Michael D'Souza of Physics Department welcomed dignitaries, Mr Mahesh Shetti explained the objective of lecture series. Prof. Ahluwalia, President, IAPT addressed and praised the efforts of Mumbai Sub-RC to bring in innovative programmes. Dr. K G Bhole, secretary of IAPT, Mumbai Sub-RC talked about IAPT activities.

Lecture sessions were hosted and coordinated by following teachers: Mr. Shekhar Deodhar, Mr. Michael D'Souza, Dr. Kapil Bhatt, Mr. Mahesh Shetti (all from Wilson College) and Dr. K. G. Bhole, Dr. Shyamala Bodhane, Dr. Hemlata Deshpande, Dr. Kiran Kolwankar, Mr. A. M. Shaker (all from Mumbai Sub-Regional Council). Mr. Shubham Mourya worked as technical host for all sessions and help record them.

The series concluded on 27th December 2023. Mr. Michael D'Souza and Dr. Shyamala Bodhane, treasurer of IAPT, Mumbai Sub-RC proposed vote of thanks.

Mahesh Shetti
Coordinator

REPORT (RC-17)

INVITED GUEST TALK AT THE DEPARTMENT OF APPLIED SCIENCES, TEZPUR UNIVERSITY

Date: 20-11-2023

A guest talk was organized on 20-11-2023 by the Department of Applied Sciences, Tezpur University (TU), to benefit students, research scholars, and faculty members of TU. Dr. InduKalpaDhingia, a postdoctoral fellow at the Tsung-Dao Lee Institute, Shanghai Jiai-Tong University, delivered the talk. His areas of interest are high-

energy astrophysics and relativistic astrophysics. Dr. Dihingia visited Tezpur University from November 18-20, 2023, and the title of his talk was “**Understanding Physics around Black Holes with General Relativistic Magnetohydrodynamics (GRMHD).**”

The workshop began with a brief inaugural ceremony. Dr. Biplob Sarkar, coordinator of the event, welcomed the audience and introduced the resource person, Dr. Dihingia. Afterward, Prof. ParthaPratimSahu, Dean of the School of Engineering, TU, delivered the inaugural address and welcomed the event's resource person. Dr. DhruvajyotiHaloi, Associate Professor, Department of Applied Sciences, TU, addressed the Session, briefly overviewing the Department of Applied Sciences and elaborating on the Department's various activities.

The faculty members, research scholars, and the B. Tech students of the University attended the talk. During his talk, Dr. Dihingia elaborated on the general-relativistic magnetohydrodynamic (GRMHD) simulations performed around the Kerr black hole. He mentioned that the goal of the simulations is to understand the physics around the Kerr black holes and extract physical information from astrophysical observations. As a result, the modelling aims to reconcile data with astrophysical theories. Dr. Dihingia highlighted that the focus of the recent simulation results in the context of black hole X-ray binaries and active galactic nuclei. In the talk, Dr. Dihingia explained the properties of the accretion flow around black holes in the single-temperature and two-temperature paradigms. He also explained the formation of relativistic jets and disc-wind driven by the Blandford & Znajek and Blandford & Payne mechanisms from the thin accretion disc.

After the talk, there was a lively interaction between the speaker and the audience.



Indu Kalpa Dhingia delivering talk.

Dr. Biplob Sarkar
Coordinator

REPORT (RC-07)

THE PHYSICIST IN 21ST CENTURY : APPLYING FUNDAMENTAL KNOWLEDGE TO ADDRESS GLOBAL CHALLENGES

6th PRL-IAPT Dr. Vikram Sarabhai Lecture

January 5th, 2024

The annual PRL-IAPT Dr. Vikram Sarabhai Lecture is a flagship activity of RC-07 (Gujarat, DD-DN). On the evening of Friday January 5th 2024, the sixth lecture of the series was organized at K. R. Ramnathan auditorium, Physical Research Laboratory Ahmedabad. The invited speaker was Prof. Nigel Mason OBE, a molecular physicist at the University of Kent UK. He is very actively involved in frontline researches on astrochemistry and astrobiology and has close links with electron scattering physics community in India. His research has led Prof. Nigel to leadership roles in various international programs of scientific development. He was the President,

Europlanet Society, and is the coordinator of Europlanet-2024 Research Infrastructure. Earlier too, Prof. Mason has visited PRL and SPU Vallabh Vidyanagar (Gujarat) for atomic-molecular physics conferences.

Welcoming one and all, Prof. Anil Bhardwaj, Director PRL lauded the lecture activity jointly organized with IAPT every year since 2019. Prof. Mason gave an insightful lecture on *the physicist in 21st century; Applying fundamental knowledge to address global challenges*. The invited speaker said he had chosen this topic as he was going to address physics teachers who would be nurturing the future physicists. The lecture theme was quite befitting in view of Prof. Mason's 3-dimensional endeavors in teaching, research and public outreach all these years. Physics is the one of the oldest sciences, and it deals with the structure of matter, and the interactions between the fundamental constituents of the observable universe. This may sound a rather abstract and theoretical discipline, whereas physics and physicists today are addressing some of the greatest scientific and technological challenges facing humanity and the world today. The subject is truly multidisciplinary, said Prof. Mason as he introduced the lecture theme in his own appealing style. Most branches of engineering are examples of applied physics, and chemistry is rooted in atomic and molecular physics. Medical and biological applications of physics are also well-known. The speaker discussed how physics and physicists of the 21st century will be at the forefront of the greatest scientific challenges. The issues that he brought to focus were, global warming and climate change, clean energy, and medical therapies, together with outer-space explorations and habitation across our solar system. The speaker was loud and clear as he engaged the audience very effectively. In the recent past the times were better, but now we are in the post-covid era with climate change looming large. Challenges are posed also by energy supply problems, diseases and health issues. "Who is going to solve the crisis?" he asked, and pointed to science and scientists. Prof. Mason gave the example of the covid vaccine developed around 2021.

Turning to physics, he said, "This is the subject that opens the doors for an exciting knowledge to begin with. And that is because the skills and ways of thinking it teaches." Physics shapes our future as it offers ways to tackle from climate change to cancer treatment and from gaming and robotics to artificial intelligence. However, in terms of job opportunities for physicists, we must know that the employers need not just knowledge, but also problem solving skills and critical, creative thinking ability. They also look for people with analytical and mathematical skills. We also need good presenting abilities as the attention span of students or receivers is just about a few minutes. The speaker highlighted a canvas of physical science from classical physics to quantum mechanics, with potential applications. Striking a surprise, he asked, "can you think of laser produced from a jelly fish...?!" The answer is yes; physicists have produced a new laser using a green fluorescent protein obtained from jelly fish. Mentioning about semiconductors and materials science, he quoted several examples of physics behind the modern technologies. The speaker then switched to everyday life. In the morning, you wake up as the alarm rings in the clock. If you wonder as to how accurate the time keeping could be, physics has the answer in the form of atomic clocks. You go to the microwave oven to prepare your breakfast, and you wonder how the microwaves play with the polar molecule H_2O .

When you are driving to your work-place the GPS shows the way. Back home, when you relax after dinner you switch on the TV with the remote, and you ask; how does it work? And think of the transistors and ICs behind the devices you are using daily. You would then like to switch off the TV, and perhaps go out to watch the beautiful star-studded night sky. Physics which originated from astronomy has brought to us the wonders of astrophysics and cosmology, and we now explore even for life on exoplanets. On a broader perspective, think of the green-



house effect which keeps the earth warm enough. What is the role of IR absorption? Prof. Nigel then returned to global warming and climate change. We have to first understand the underpinning science and then think of mitigation. Physics has a role to play in this 21st century challenge. He emphasised that the world needs physicists, and therefore physics teachers. We have to attract student to the all- important *STEM* (Science Technology Engineering and Mathematics) theme, and physics is at the core. What is the best age to attract students to physics and Science? It is before 10, he said, and asked, “Who can do it...?!” His answer was.... *Teachers...!* Prof. Mason concluded his lecture with a touching message to physicists and physics teachers,

.....*The future of the world and the mankind lies in your hands...!*

In the beginning of the program Prof. K. N. Joshipura introduced the speaker. The lecture was followed by a Q-A session in which IAPT President Prof. Ahluwalia gave his remarks. The program was anchored by Dr. Bhushit Vaishnav (PRL).

Now, an article based on this lecture, to be written by the speaker, will be published in the annual physics magazine **PragaamiTarang** 2024.

K. N. Joshipura



INDIAN ASSOCIATION OF PHYSICS TEACHERS

National Standard Examination - 2023

Held on November 25 & 26, 2023 and Astronomy in Rajasthan held on December 10, 2023

SUMMARY												
Exam	Enrolment	Present	Average of Top Ten Scores	MAS	MI	Students above MAS	Students above MI	Students shortlisted for INO - 2023	Male	Female	Other	Percentage of Present Students
NSEP	49460	36739	199.8	99	159	912	72	305	35507	13944	9	74.28%
NSEC	44363	33221	198.4	99	158	3695	388	531	29406	14951	6	74.88%
NSEB	29795	20682	141.2	70	112	1740	139	345	12138	17653	4	74.14%
NSEA Excluding Rajasthan	16869	12507	A - 174.5	87	139	910	72	Group - A 258	12976	3890	3	74.14%
			B - 152.3	76	121	445	38					
Only Rajasthan held on 10.12.23			A - 169.8	84	135	109	20	Group - B 256				
			B - 140.1	70	112	85	23					
NSEJS	32629	24605	172.2	86	137	455	119	426	19633	12994	2	75.40%
Total	173116	127754				8351	871	1607	109660	63432	24	

MAS : Minimum Admissible Score, MI : Merit Index, INO : Indian National Olympiad

Prof B P Tyagi

Chief Coordinator (Examination)

Indian Association of Physics Teachers



INDIAN ASSOCIATION OF PHYSICS TEACHERS
State - wise Enrolment of National Standard Examination - 2023

The number of students shortlisted for the Indian National Olympiad - 2024 in respective subjects

Sr. No.	State	No. of Centre	NSEP - 2023			NSEC - 2023			NSEB - 2023			NSEA - 2023			NSEJS - 2023		
			Enl	Appeared	Short listed for INO	Enl	Appeared	Short listed for INO	Enl	Appeared	Short listed for INO	Enl	Appeared	Short listed for INO	Enl	Appeared	Short listed for INO
1	ANDAMAN & NICOBAR	4	46	45	36	36	77	73	1	4	4	39	37				
2	ANDHRA PRADESH	40	1798	1555	11	1847	1602	31	105	98	634	534	8	2157	1603	45	
3	ARUNACHAL PRADESH	10	121	107	4	105	98	131	120	3	28	26	145	130			
4	ASSAM	34	745	492	4	632	424	8	582	424	8	175	128	5	330	272	
5	BIHAR	38	1657	1145	10	1351	968	26	875	601	17	611	415	13	1040	712	
6	CHHATTISGARH	34	543	444	3	451	374	7	475	360	8	234	178	5	465	389	
7	CHANDIGARH	7	632	478	5	598	443	10	230	144	6	304	252	5	124	109	
8	DADRA & NAGAR HAVELI	3	103	63	63	108	66	137	79	1	13	13	56	49			
9	DELHI	15	3236	2098	23	2894	1874	51	1466	888	22	1227	812	13	1048	685	
10	GOA	6	137	99	1	127	96	1	97	73	5	31	25	50	38		
11	GUJRAT	55	2475	1968	13	2400	1864	27	1844	1253	13	960	763	11	1127	900	
12	HIMACHAL PRADESH	23	399	308	2	360	298	5	275	220	5	117	90	1	300	256	
13	HARYANA	56	2182	1596	7	2028	1490	19	1290	848	7	674	510	8	1768	1343	
14	JHARKHAND	40	1164	820	6	857	629	6	528	353	6	413	304	5	851	641	
15	JAMMU & KASHMIR	23	348	214	1	314	215	5	243	161	5	97	67	442	334		
16	KARNATAKA	60	3134	2454	15	2882	2263	34	1936	1464	15	971	745	13	2174	1696	
17	KERALA	39	1275	848	8	1093	688	8	882	596	8	413	250	7	653	423	
18	LADDAKH	2	8	2	13	2	2	10	2	2	7	1	23	18			
19	LAKSHADWEEP	1	3	3	3	3	3	5	5	5	3	3	6	5			
20	MAHARASHTRA	122	6559	5065	28	6076	4736	54	4321	3112	29	2036	1585	24	3009	2300	
21	MEGHALAYA	7	54	32	1	51	34	1	59	38	28	24	104	90			
22	MANIPUR	6	36	31	33	33	30	66	63	63	66	63	69	67			
23	MADHYA PRADESH	72	2074	1590	19	1857	1450	19	1667	1179	19	663	508	16	1127	828	
24	MIZORAM	4	12	11	8	9	8	19	18	18	1	1	36	27			
25	NAGALAND	6	10	10	23	22	22	41	39	39	1	1	101	88			
26	ODISHA	49	1240	1017	10	911	754	10	870	703	10	524	417	8	1027	799	
27	OVERSEAS	3	19	17	18	18	18	22	21	21	2	2	16	15			
28	PUNJAB	36	1272	933	7	1218	919	12	753	512	7	442	319	6	488	356	
29	PUDUCHERRY	4	94	72	97	97	82	5	130	103	5	37	30	2	104	81	
30	RAJASTHAN	89	4004	2786	37	3551	2517	36	2695	1667	18	1381	16	32	2366	1815	
31	SIKKIM	4	47	40	50	42	42	1	80	64	21	19	63	56			
32	TELANGANA	39	3700	3039	29	3723	3053	58	838	519	10	1468	1269	11	3751	3058	
33	TAMIL NADU	76	3641	2662	17	3212	2324	17	2565	1870	17	925	680	14	3361	2517	
34	TRIPURA	11	127	105	97	97	81	3	139	115	6	39	28	1	128	100	
35	UTTARAKHAND	24	638	461	2	603	428	5	410	287	5	228	162	5	325	233	
36	UTTAR PRADESH	107	4083	2796	27	3413	2373	51	2511	1556	54	1488	996	44	2771	1849	
37	WEST BENGAL	42	1844	1333	21	1322	917	21	891	619	24	670	487	17	985	686	
Total		1191	49460	36739	305	44363	33221	531	29795	20682	345	16869	11663	258	32629	24605	

MI - Merit index is 80% of the average of Top Ten Scores in the respective NSE - 2023. All students scoring equal to and above MI are shortlisted for INO - 2024
MAS - Minimum Admissible Score is 50% of the average of Top Ten Scores. No students below MAS is shortlisted for INO - 2024. However students between MAS and MI may and may not be shortlisted. Depending on the State/UT

Prof B P Tyagi
Chief Coordinator (Examination)



Indian Association Of Physics Teachers

(Registered under Section 30G of Societies Act 1960, Reg. No. K-1448)

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NATIONAL COMPETITION FOR INNOVATIVE EXPERIMENTS IN PHYSICS (NCIEP) – 16-18th October 2024, Dharamshala, HP

Announcement

National competition for innovative experiments in Physics (NCIEP) is being held since 2003, to encourage Physics Teachers, students and Physics educators to conceive and set up original innovative experiments in Physics. The Competition is held every year at the venue of the Annual Convention of IAPT. Innovation rather than sophistication is the main theme and therefore the use of computers for data acquisition and display is not allowed.

1. The following categories are included:

(A) The participant can be a teacher at any level or M. Phil. / Ph. D. awarded /Ph.D. pursuing student or a Scientist from national laboratories or a science communicator working in science centres, etc. He/she need not be an IAPT member.

(B) The participant can be a student pursuing UG/PG course

(C) The participant can be a High School student Studying in 9-12 standard.

For all categories participants themselves have to demonstrate the experiment.

2. The experiment should be an original one, designed by the participant himself/ herself. It can be even a demonstration type experiment.

For category B and C students can work under the guidance of a **mentor**.

3. Top 3 experiments from each category A, B and C are awarded cash prizes.

4. More Details will be provided in the coming months.

Selected entries from each category will be invited for demonstration at the 38th IAPT convention is to be held from 16th to 18th October 2024 at Dharmshala, Himachal Pradesh.. The invited participants will be paid railway fare from the workplace to the convention place as per IAPT rules. In case of joint authors, only one of the participants is eligible to receive TA (as per IAPT rules). Top ten student participant entries (for category B and C) may be given an amount of Rs 1000/- each towards expenditure incurred in setting up the experiment. The selected participant must come with his/her own setup for final demonstration.. Decision of the judges will be final..

Closing date to receive the entries is 31st August, 2024.

Please feel free for any query at e- mail: nciepiapt03@gmail.com or WhatsApp number 8088812890

Dr Geetha R S, Coordinator, NCIEP 2024



National Photo Essay Competition in Physics

(National Science Day 2024 Celebration)

Organised by

Bajaj College of Science, Wardha (Autonomous)

In Association with

Indian Association of Physics Teachers (IAPT)

RC-08E (Vidarbha)

Who can Participate

Undergraduate and Post Graduate Student of Physics
from Indian Universities and Colleges

Theme: The Wonders of the Universe

- Showcase the awe-inspiring images of celestial bodies, astronomical events, and cosmic phenomena that physics helps us understand.

INCENTIVES

- Top three photo essay participants will be given cash prizes of Rs. 3000/-, Rs.2000/- and Rs. 1000/- respectively.
- Top 10 essays will be showcased on the youtube channel of IAPT.
- Top 10 participants will be given an opportunity to present their essays in the Annual IAPT convention.
- Each participant will get the e-certificate duly signed by the organizer.

No Registration Fee

Registration Begins

15th January 2024

Last Date of Submission

20th February 2024

Event Convener

Dr. Sanjay Bagade,
HOD, Physics
Bajaj College of Science, Wardha

Scan Here to Know

- What is photo essay ?
- How to make photo essays?
- Registration process
- Helplines
<https://tinyurl.com/n63w3e38>



Event Patrons

Prof. PK Ahluwalia, President, IAPT
Prof. Pradeep Tekade, Principal
Bajaj College of Science, Wardha

Event Coordinator

Dr. Govinda Lakhotiya
Bajaj College of Science, Wardha
Whats App: 9579194076

About the Organisers

IAPT: <https://www.indapt.org> , BCS: www.jbsw.shikshamandal.org

FESTIVE ASTRONOMY

INDIAN FESTIVALS AND ASTRONOMY

Rituals and festivals were seen as a mean of securing divine approval, support or forgiveness for worldly action. To be efficacious, they must be elaborate and well timed their timing must be well defined so it must be linked with celestial movement of the sun, moon or planet. Which are well rhythmic



Sonepur cattle fair-Kartik
Poornima

Goa Carnival -Fat
Saturday, day of
lent season

Pushkar Fair-
ends on Kartik
Poornima

Baul Mela-Makar Sankranti-
Summer Solstice



Dussehra-tenth day month Kartik



Deepawali- New moon
day of Kartik



Kumbh Mela- every 12th year when Jupiter
appear in constellation Aquarius



Buddha Jayanti-first Full moon day of Vaisakha



Pongal- day of summer Solstices

BULLETIN OF INDIAN ASSOCIATION OF PHYSICS TEACHERS

FOUNDED BY (LATE) DR. D.P. KHANDELWAL

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