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Former NASA astronaut Jack Fischer captured this photograph of Lagoa dos Barros and crescent-shaped barchan dunes on the Atlantic coastline of southern Brazil on July 9, 2017, while aboard the International Space Station.

Barchan dunes are sand dunes that form in areas with one wind direction and little vegetation. In this case, fierce winds from the Western Atlantic sculpt the sand along the coast into distinctive crescent shapes. The tips of barchan dunes point downwind, showing the prevailing wind direction. These fragile formations act as barriers keeping the wind and waves from penetrating inland, blunting the effect of storms and minimizing coastal erosion.

Link: https://www.nasa.gov/image-feature/the-barchan-dunes-of-brazil

The Story Of Cosmology Through Post Stamps 55

SOLAR ACTIVITY

SPACE WEATHER

Space Weather define biological, technological and cosmic system of the Sun, interplanetary or planetary environment. The heighten magnetic activity associated with 11-year cycle of the Sunspots can lead solar flares, coronal mass ejection solar and other far reaching electromagnetic phenomenon that can endanger the space weather

Meter cancellation-Slogan postmark "-Sunlight for Life Insurance" 24.4.1949, Delhi

Solar prominence-and creation of Adam

Set of Se-Tenant Self-Adhesive Pair-showing Aurora

Aurora Borealis and Aurora Australis – are only visible manifestation of *space weather*. Energy from ever present solar wind or from coronal mass ejection, is transported in the earth's strong magnetic system near polar region and leads to excitation of oxygen and nitrogen molecules, present in upper atmosphere. This result in emission of light.

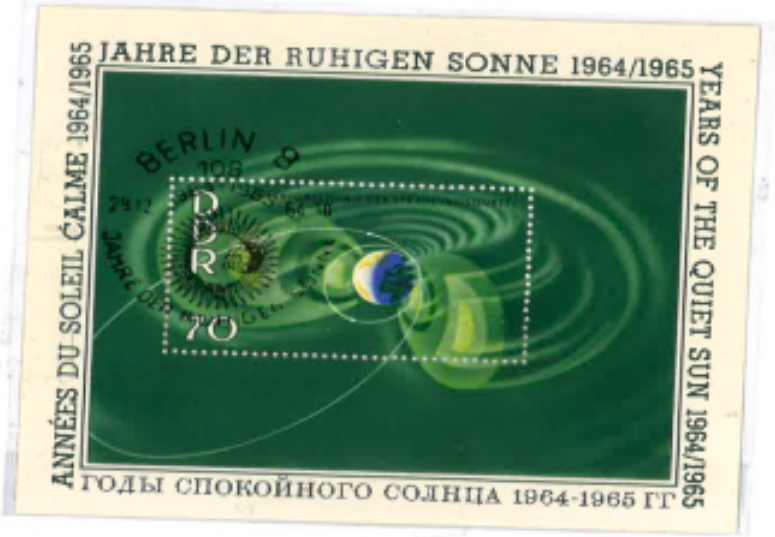
Sun and Solar Flares

Total Solar Eclipse and Coronal Glow

Earth's Magnetosphere

Souvenir Sheet - commemorating International Year of Quiet Sun 1964-65,

Illustrate ***Van Allen Radiation Belt*** -which is a Zone of charged particle due to solar wind. These particles are captured and held around the Earth by Earth's magnetic field



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MANAGING EDITOR:
Sanjay Kr. Sharma
Email: sksharma777@gmail.com
Ph.: 9415404969

All communication regarding the contents of the Bulletin should be addressed to:
Chief Editor (IAPT Bulletin)
Indian Association of Physics Teachers
Dept. of Physics, P.U., Chandigarh - 160014
Email: iapt@pu.ac.in
Ph.: 7696515596 (USK), 9464683959 (MK)

The Bulletin is the official organ of the IAPT. It is a monthly journal devoted to upgrading physics education at all levels through dissemination of didactical information on physics and related areas. Further, the Bulletin also highlights information about the activities of IAPT.

INDIAN ASSOCIATION OF PHYSICS TEACHERS

REGISTERED OFFICE:
Indian Association of Physics Teachers
Flat No. 206, Adarsh Complex,
Awas Vikas-1 Keshavpuram,
Kalyanpur, Kanpur-208017
Ph. : 09935432990 • Email: iaptknp@rediffmail.com

EXAMINATION OFFICE:
Indian Association of Physics Teachers
15, Block 2, Rispana Road,
Near DBS (Post Graduate) College
Dehradun - 248001 (Uttarakhand)
Ph. : 9632221945
Email: iapt.nse@gmail.com, http://www.iapt.org.in

PRESIDENT:
P. K. Ahluwalia
Shimla (Himachal Pradesh)
Email : pkahluwalia071254@gmail.com
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GENERAL SECRETARY:
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Ph. : 9833569505
Email: gensecretary.iapt22@gmail.com

CHIEF COORDINATOR (EXAMS):
B. P. Tyagi
23, Adarsh Vihar, Raipur Road,
Dehradun-248001
Ph.: +91 135 2971255, 9837123716
Email: bptyagi@gmail.com

TYPESET: Gurbaksh Singh, singhgurbaksh119@gmail.com

Let Us Participate in the Change Knocking at Our Doors

We are amidst a change of great opportunities and challenges on the horizons of Education in India. We have a responsibility to respond and be its part for a positive output. As a foremost community of Physics Education in the country we must participate in this change actively. Lately, IAPT made a submission [1] to NCERT and CBSE two apex bodies of School Education in the country, regarding curricula at class 11 and 12 stage after lot of deliberations through a series of Lectures on Curricular Design of School Science Courses, panel discussion and subsequent effort to write a comprehensive document.

Thanks to virtual meets, we could discuss at length what should be the curriculum at this stage which is a threshold for deciding whether a perspective student of higher education is going to make a move to study science or not. Paramount question is whether in the name of load shedding we are curtailing the curriculum, sacrificing coherence of the exposure which will deprive students of a world view of today's Physics which is already into second quantum revolution. We cannot afford to miss this opportunity. One of the very important submissions made in this document is to integrate theory and experiments at the text book level itself, so that once again experiments start getting the attention which they deserve and without which study of physics or any natural science has no meaning. Also, a rationale has been provided in this document why certain topics are a must in the curriculum within the envisaged time frame of 180 working days comfortably.

Curricular framework of Schools 2023 envisages four core courses at this level, and two subject based electives. Submitted document has also suggested a list of 10 elective courses which are relevant for the 21st century student studying Physics. These courses are a mix of courses which can help students decide different tracks to them to make a move towards entrepreneurship or academics as they move out of school and look forward to make choices beyond this level. As a member of this subject society, we take this opportunity to invite you to read this submission and start work on the content for each of these papers of appropriate level and learning outcomes. Two Regional Councils can come together to take such a desired responsibility.

We at IAPT are in the process of starting looking closely at recently released UGC curricular framework at UG and PG

levels and National Higher education Qualification Framework. Implementation of NEP has already started creating ripples by decline in students opting for Physics at UG level. It does not bode good for the future of Basic Sciences in the country, which are known for bringing paradigm shift in technology and quality of human life by its new discoveries. India can ill afford such a scenario; we need to do a lot of churning at the IAPT level itself to provide optimum paths to not let that happen. We would like you to participate in our online NEP lecture series where we are discussing such issues in depth and defining IAPT's role, and letting its voice heard in the concerned quarters at the highest level besides sensitising physics community to become participants in this change.

Asian Physics Olympiad and International Physics Olympiads for the year 2023 are over. It was satisfying to see all the participants of the Indian teams on the podium. This speaks highly of the mentorship provided to them during their preparation. IAPT congratulates the students and team of mentors for this success. Collaboration between HBCSE and IAPT has been the cornerstone of this effort, which we need to strengthen further by exposing more and more students to the expectations which that level of international competition desires. IAPT is working on a plan a yearlong engagement with the students more actively for meeting their aspirations.

In the last one year we have seen new shoots of activities at the Regional Councils, which is an encouraging sign for each one of us in the IAPT, especially for our biggest stakeholders, our students. Also new and young members are coming out with their programmes both individually and collectively. Collaborations among RCs are also emerging. New website www.indapt.org.in offers dedicated pages to each RC and sub-RC. We invite you to populate the pages designated for you. Create albums in the IAPT Photo Gallery of various activities. Admins are there to approve and post. At IAPT we are only a call away/post away/email away. Your feed-back is crucial for us. This is the only way by which resources can be generated and documented to bring the with in the reach of our students and teachers.

On the eve of our Independence Day, I wish you all a very happy Independence Day. Here is a quote from Our own Nobel Laureate Bharat Ratan CV Raman particularly targeted to the youth of the country [2], which is worth pondering.

> If there is one fact more than any other which stands out in history of science, it is the remarkable extent to which great discoveries and youthful genius stand associated together. Scores of instances can be quoted in support of this proposition. Indeed, if one were to attempt to write a treatise on any branch of science in which all discoveries made by youthful workers were left out, there would be very little left to write about. The fact of the matter appears to be that, other things being the same, the principal requisite for success in scientific research is not the maturity of knowledge associated with age and experience, but the freshness of outlook which is the natural attribute of youth. The conservatism which develops with increasing age is thus revealed as a factor which militates against great achievements in science.

Jai Hind.

PK Ahluwalia

1. https://www.indapt.org.in/f/IAPT-Submission-Regarding-School-Curriculum-for-11and-12-under-NEP-23134?source=view
2. Quoted in Journey into Light, Life and Science of CV Raman, Chapter 13, p 493, Penguin Books India, 1994.

ANNOUNCMENT

Date Extended For Essay Submission (NCEWP-2023)

It has now been decided to extend the essay submission deadline to 15th August 2023. It is applicable to both 'Teachers' and 'Students' categories. Rest of the details/information for NCEWP-2023, that appeared earlier in the IAPT bulletin January issue (Pages 21 and 22) and was also published on the IAPT website, remains unchanged.

S.K.JOSHI
Coordinator NCEWP-2023
E-mail:joshisantoshk@yahoo.com

PHYSICS NEWS

Novel Raman technique breaks through 50 years of frustration

Raman spectroscopy, a chemical analysis method that shines monochromatic light onto a sample and records the scattered light that emerges, has caused frustration among biomedical researchers for more than half a century. Due to the heat generated by the light, live proteins are nearly destroyed during the optical measurements, leading to diminishing and non-reproducible results. thermostable-Raman-interaction-profiling (TRIP), this new approach is a paradigm-shifting answer to a long-standing problem that provides label-free, highly reproducible Raman spectroscopy measurements. Due to TRIP's ability to detect protein-ligand interactions in real time, the timeline for drug and vaccine testing may be shortened. Another application could be clinical, turning lengthy tests to detect a virus into same-day turnaround with accurate results.

Despite the breakthrough, the team is looking for other aspects in which the TRIP method could be useful.

Read more at: https://phys.org/news/2023-07-raman-technique-years-frustration.html

Original paper: Proceedings of the National Academy of Sciences (2023) DOI: 10.1073/pnas.2218826120

Study proposes combining continuum mechanics with Einstein field equations

Albert Einstein's general theory of relativity is a landmark in our understanding of the universe. It gave rise to the notion of a spacetime continuum against which all physical phenomena play out. But over the decades, it has inspired many questions that have yet to be answered. In a new article, author Piotr Ogonowski offers a seemingly simple solution—the theories of spacetime and electromagnetism are describing the same things. Spacetime, it appears, may simply be the way we perceive electromagnetic fields. The conclusions drawn could be far-reaching. If further research confirms these findings, it would mean that Einstein was right from the beginning and that General Relativity explains much more than just gravity.

Read more at: https://phys.org/news/2023-07-combining-continuum-mechanics-einstein-field.html

Original paper: International Journal of Modern Physics D(2022). DOI: 10.1142/S0218271823500104

Investigating the Ising model with magnetization

Researchers have explored the evolution of systems of interacting spins, as they transition from random to orderly alignments. Through new simulations, they show that this evolution can be investigated by measuring the changing strength of the system's magnetism. The Ising model describes systems of interacting atomic spins relaxing from a "paramagnetic" state. So far, the nonequilibrium dynamics of this transition has been studied by measuring the growth of regions, or "domains" of aligned spins.

As a system evolves from a paramagnetic to a ferromagnetic state, it is driven to minimize its energy to reach a stable state of thermodynamic equilibrium. This occurs through a reduction in area of domain walls, where the alignment direction of the spins abruptly changes. This outcome held both for nearest-neighbor interactions between spins, and long-range interactions which haven't been widely studied thus far. As a result, Janke and colleagues now hope their new approach could lead to new discoveries in the many areas of nature where long-range spin interactions can be found

Read more at: https://phys.org/news/2023-07-ising-magnetization.html

Original paper: The European Journal of special topics (2023). DOI:10.11. DOI:10.1140/epjs/s11734-023-00882-w

Soumya Sarkar
IISER PUNE
INDIA

Galactic Magnetic Fields – A Brief

R, Balakrishnan, Bangalore
Email: balakilatha@gmail.com

1. Introduction

We all know that Earth has a magnetic field. How about the planets, stars, galaxies and the universe? Yes, the whole Universe is magnetised. Although the universe is electrically neutral, it is filled with magnetic fields. Natural magnetic fields are seen everywhere in the universe. Like the gravitational field, the magnetic field is invisible, omnipresent and vital for life in the universe. In this article an attempt is made to give an overview of the galactic fields and their characteristics.

2. Planetary magnetic fields

The origin of the first magnetic fields in the Universe is still a mystery. The discovery of magnetic field in an external galaxy is due to Öhman (1942) who used first a Felspar polarimeter and later a Wollaston prism to observe the polarized emission in Andromeda nebula (M31).

The planets in the solar system generate and maintain magnetospheres [2]. It is difficult to image and study planetary magnetospheres directly. Jupiter has the largest and mercury has the smallest magnetosphere. Solar wind can destroy the magnetospheres. When solar wind hits the magnetosphere, it transfers mass, energy, and momentum into this layer. The magnetosphere can absorb most of the energy from the everyday level of solar wind. But during strong storms, it can get overloaded and transfer excess energy to the upper layers of Earth's atmosphere near the poles. Venus has no magnetosphere but what is known as an induced magnetic field. This weak magnetic field is created by the interaction of the Sun's magnetic field and the planet's outer atmosphere. NASA has done extensive research on the magnetospheres. A comparison of the planetary magnetic fields is given below:

Probes found that Mars and Venus do not have a significant magnetic field. Jupiter, Saturn, Uranus, and Neptune all have magnetic fields much stronger than that of the Earth. Jupiter is the champion- having the largest magnetic field. Earth's magnetic field is categorized as moderately strong, the gas giants and ice giants have extremely strong magnetic fields, and Mercury has a weak magnetic field, while Mars and Venus have no measurable magnetic fields. Jupiter is the largest planet in the Solar System and therefore has the strongest magnetic field. In Fig.1, a comparison is made about the strength of planetary magnetic field and in Fig.2, the rotation and magnetic axis of the planets, Saturn, Jupiter Uranus and Neptune (they have stronger magnetic field than earth) are shown.

3. Detection of galactic magnetic fields

Intergalactic magnetic fields (IGMFs) are produced by a number of mechanisms, but are weak and are billions of

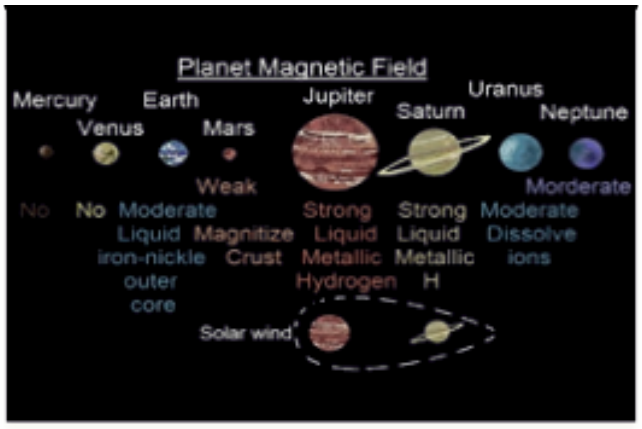


Fig1. Strength of planetary magnetic fields
http://earthsci.org/space/space/mag/mag.html

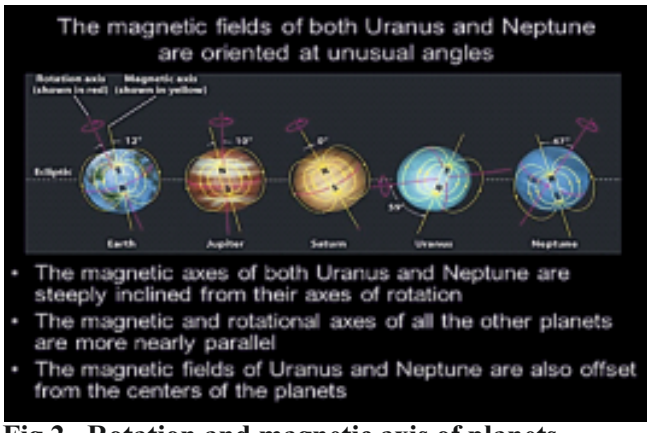
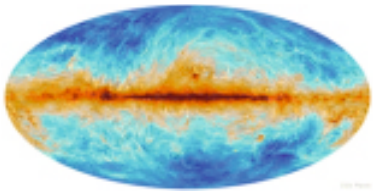


Fig 2. Rotation and magnetic axis of planets
https://slideplayer.com/slide/2411201/

light-years away. But we observe them because of their influence on charged particles. When electrons and other particles spiral along magnetic field lines, they emit electromagnetic emission. By displaying this radio signal, astronomers map galactic magnetic fields. These radio emissions have certain directivity. The presence of magnetic fields in nearby galaxies was inferred in 1958, based on observations of the polarization of stars in the Andromeda galaxy, M31. The first report of a cosmic magnetic field outside the Earth was the result of a direct measurement of the Zeeman Effect in the magnetic fields in sunspots in 1908. Galactic magnetic fields can be observed in the optical range via starlight which is polarized by interstellar dust grains in the foreground. These grains are elongated and can be aligned by magnetic fields, where the major axis becomes perpendicular to the field lines. Measurements of many stars revealed a general picture of the magnetic field in the Milky Way near the Sun. Aligned dust grains also emit polarized *infrared emission*, which is very useful to show magnetic fields in dust clouds in the Milky Way. *Zeeman splitting* of radio spectral lines allows measurement of relatively strong fields in nearby, dense gas clouds in the Milky Way. Observations in external galaxies another technique, measuring *synchrotron emission*, is the most powerful one and can be applied over the whole Milky Way, to nearby galaxies, and also to distant galaxies.



Magnetic Map of Milky Way

Human Magnetic Field

4. Interesting facts

The Universe is magnetic. From stars to galaxies to intergalactic space, magnetic fields thread the cosmos. These magnetic fields are invisible, mysterious and marvelous.

- Whether and how magnetic fields influence the formation and evolution of galaxies is still unknown. Building up magnetic fields in galaxies is a three-stage process: i) seeding, ii) amplifying and iii) ordering and sustaining.
- Milky Way contains an ordered, large-scale magnetic field. The field configuration has been explored mostly by modeling pulsar (Faraday) rotation and dispersion measures. It is extremely weak compared to Earth's; thousands of times weaker. The magnetic field of the Milky Way is an invisible agent controlling many physical processes. It organizes gas clouds into filaments, delay star formation, accelerate and guide cosmic rays, shape supernova remnants, and inflates the galactic halo. According to radio synchrotron, optical polarization and Zeeman splitting data, the average strength of the total magnetic field in the Milky Way is about 6 μG near the Sun and increases to 20-40 μG in the Galactic center region
- Each galaxy does have a natural magnetic field, but it is weak. The magnetic field of our galaxy is about 100 times weaker than the magnetic field of the earth. The magnetic field of a galaxy has two basic components: a large-scale ordered pattern that imitates the shape of the galaxy, and a small-scale random pattern.
- Are stars magnetic? Yes. About 10% of stars with more than ~1.5 solar mass have strong, large-scale surface magnetic fields. When they explode in supernovae, they probably forge the strongest magnets in the Universe, highly-magnetised neutron stars known as *magnetars.* More than 90% of the stars of our Galaxy end their lives as white dwarfs. Although many have a magnetic field, it's still unknown when it appears on the surface, whether it evolves during the cooling phase of the white dwarf and, above all, the mechanisms for their generation.

The dynamo mechanism needs fast rotation, but this is not generally observed in white dwarfs. So a new approach/theory is needed for magnetism observed in white dwarfs.

- Neutron stars generate the strongest magnetic fields in the universe. It is generally believed that there is a very strong magnetic field, ($B > 10^8$ T), associated with most neutron stars. These magnetic fields, close to a neutron star's surface, can only be

measured accurately and directly by looking for cyclotron resonance scattering features.

- It is widely believed that Sun is a giant magnetic star. The Sun's magnetic field is generated by electrical currents acting as a magnetic dynamo inside the Sun. These electrical currents are generated by the flow of hot, ionized gases in the Sun's convection zone. We know a lot about the Sun's magnetic dynamo. It has a 22 year cycle. The strength of the solar magnetic field is about 0.0001 tesla. (Your fridge magnet is about 0.01 tesla!)
- Mars and Venus do not have a significant magnetic field. Jupiter, Saturn, Uranus, and Neptune all have magnetic fields much stronger than that of the Earth. Jupiter is the champion- having the largest magnetic field. Jupiter's magnetic field is about 20,000 times stronger than Earth's magnetic field. It creates a magnetosphere so large that it can avert the solar wind almost 3 million kilometers before it reaches Jupiter.
- According to the proposed dynamo mechanism, the magnetic field is generated by electric currents caused by convective motion in the core of the celestial bodies. These convective currents are caused by heat escaping from the solidifying core.
- Einstein proposed that a star bends space-time just as a ball bends down a rubber sheet. By reanalyzing the basic equations of general relativity, it is being said that magnetic fields tend to flatten and stiffen the fabric of space-time. This finding may make astronomers and cosmologists to reexamine how magnetic fields have shaped the evolution of the cosmos.
- A magnetar is a type of neutron star with an extremely powerful magnetic field ($\sim 10^9$ to 10^{11} T, ($\sim 10^{13}$ to 10^{15} G). The magnetic-field decay powers the emission of high-energy electromagnetic radiation, particularly X-rays and gamma rays.

The existence of magnetars was proposed in 1992 by Robert Duncan and Christopher Thompson. The active life of a magnetar is short, compared to other celestial bodies. Their strong magnetic fields decay after about 10,000 years, after which activity and strong X-ray emission cease. The magnetic fields made by a magnetar are about 1,000 trillion times that of the Earth's magnetic field. They can attain surface temperatures of 9 million degrees Celsius (Wikipedia)

Over the following decade, the magnetar hypothesis became widely accepted, and was extended to explain anomalous X-ray pulsars (AXPs). As of July 2021, 24 confirmed magnetars were known, with six more candidates awaiting confirmation [6]. A full listing is given in the McGill SGR/AXP Online Catalog. It has been suggested that magnetars are the source of fast radio bursts (FRB), in particular as a result of findings in 2020 by scientists using the Australian Square Kilometer Array Pathfinder (ASKAP) radio telescope.

- IMAGINE, a consortium(*Interstellar MAGnetic field INtference Engine*)as well as a software package has been developed to further the knowledge of the strength and structure of the Galactic magnetic field.. The purpose is to coordinate and facilitate efforts of diverse groups of researchers in the broad areas of the interstellar medium, Galactic magnetic fields and cosmic rays, The goal is to develop more comprehensive insights into the structures and roles of interstellar magnetic fields and their interactions with cosmic rays [3].

5. Uses of galactic magnetic fields

Galactic magnetic fields are sufficiently strong to be dynamically important. They drive mass into the centers of galaxies. These magnetic fields, based on their strength and orientation, can channelize material from one area to another. We all know how the Earth's magnetic field (Van Allen Belts) protects us from electrically charged cosmic rays. The magnetosphere is a strong magnetic field that surrounds our planets. Acting as a shield, it deflects most solar energetic particle radiations that emanates from the Sun. It prevents the dust and gas that make up the densest regions from collapsing under gravity. These processes slow down star formation; without them, night sky may be much brighter than what we see today. They modify the formation of spiral arms and they can affect the rotation of gas in the outer regions of galaxies. The Milky Way's magnetic field is thousands of times weaker than Earth's. But it is significant enough to trace the paths of cosmic rays, star formation, and many other astrophysical processes. Astronomers say that cosmic magnetism is primordial and permeate much of

the cosmos. If these fields date back to the Big Bang, they could solve a major cosmological mystery.

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2. Astrophysical Magnetic Fields - Magnetic Universe, Basics of MHD, Detecting magnetic fields and more = IIA Summer Programme 2022 = Sharanya Sur (sharanya.sur@iiap.res.in)
3. Magnetic Universe – You Tube- Gresham College – 01 March 2022 – 1/02/43 hr
4. PLANETARY MAGNETICFIELDS – http://lasp.colorado.edu/~bagenal/3750/ClassNotes/Class13/Class13.html
5. https://slideplayer.com/slide/4572048/ – good introduction on all planetary magnetic fields

You tube videos:

1. Magnetic fields in nearby galaxies and the Milky Way – Rainer Beck https://www.youtube.com/watch?v=8ZNipAOteWg
2. The Milky way Galaxy Facts | How do we know our Galaxy is spiral https://www.youtube.com/watch?v=w5LEtILN8vI - Kloonusste - Susan Beck.
3. How Magnetism shapes the Universe - PBS Space Time site – 19 min
4. Galaxies are Cosmic Magnets - Gina Panopoulou - 01/31/2020 Galaxies are Cosmic Magnets - Gina Panopoulo, Caltech video - 1 hr 40 min (in author's opinion simple and good)
5. Understanding the Magnetic Sun – You Tube – NASA- Goddard – 7 yrs ago , 2 min. https://www.youtube.com/watch?v=2g1epPppIOM&t=17s

Erratum

This article is reprinted due to crucial information missing in the diagram-prints in the previous issue. However, the e-version on the website is complete.

Common Clock: A study of the angle between the Hour and Minute hands and its times of occurrences

Nitin Ghatpande, Ex Group Director, U.R Rao Satellite Centre (URSC), Bangalore.
email: nitin.ghatpande239@gmail.com

A close observation of the Common Wall Clock generates lot of interest in the relative motion of the Hour and Minute hands. Particularly, one wants to know the relative angle between the Hour and Minute hands, for a given time from 00:00 to 12:00 hours. Conversely, one also wants to know at what instants of time during the 12 hours period, a given angle between the Hour and Minute hands occurs. The following paragraphs, with the help of the rate of revolution of the hands and the relative rate of motion between the Hour and Minute hands, address the above observations.

It is well known that the Minute Hand makes one complete revolution of 360° in 1 hour. In other words, we can say that the Minute hand's rate of revolution is 1 rev/hour. Similarly, the Hour hand's rate of revolution is 1/12 rev/hour. **Fig-1** explains the above angular motions on a Clock. **Fig-1(a)** shows the position at 12:00. **Fig-1(b)** shows the position of the Hands after 1 hour at 01:00. It can be seen that the Minute hand has made one revolution and the Hour hand has made (1/12) revolution. Both of them are with reference to the 12:00 fixed position of the Clock. But the Clock is always viewed as a relative position between the two hands. The Minute hand can be viewed as revolving at (1-1/12) or 11/12 rev/hour with respect to the Hour hand. **Fig-1(c)** shows that the Hour and Minute hand coincide, like at 12:00 position after one relative revolution of 360°. This happens after 12/11 hours (1h 05m 27.2727s), considering the relative rate of revolution of 11/12 rev/hour.

For a given time, the relative angle **θr** of the Hour hand, measured in the clockwise direction from the Minute hand is shown in **Fig-2**. Since the relative rate is 11/12 rev/hour, we can find the angle **θr** for a given time, using this information. The given time is converted to time in hours (Tg). The number of revolutions in this time is given by Tg*(11/12). The decimal part of this, representing the fractional revolution, when multiplied by 360° gives the angle in degrees. Fig-2, also illustrates this for an example time of 07:30. The acute angle being 45°, **θr** is 315° with the assumed +ve direction.

It is also possible to work out the time instants during the 12 hours, where a given angle **θr** occurs. Starting from 12:00, the first time of occurrence of **θr** is given by (12/11) * (**θr**/360). (12/11) hours is the time of one relative rev, and (**θr**/360) is the fraction of the revolution required to revolve **θr**°. After this time, the same angle will be achieved after every (12/11) hours of repetition time. **Table-1** shows this computation of the 11 times occurrences in the 12 hours, for different common angles. **Fig-3** shows the pictorial clock-view of the 4 time occurrences out of the 11, for the angles θr given in Table-1. This gives a visual feel of the time occurrences at the chosen angles.

This Article has tried to cover the different angular positions of the Hour and Minute hand through simple calculations based on the relative rate of motion between the Hour and Minute hand. The methodology used, may be applied to some similar observation in other related areas

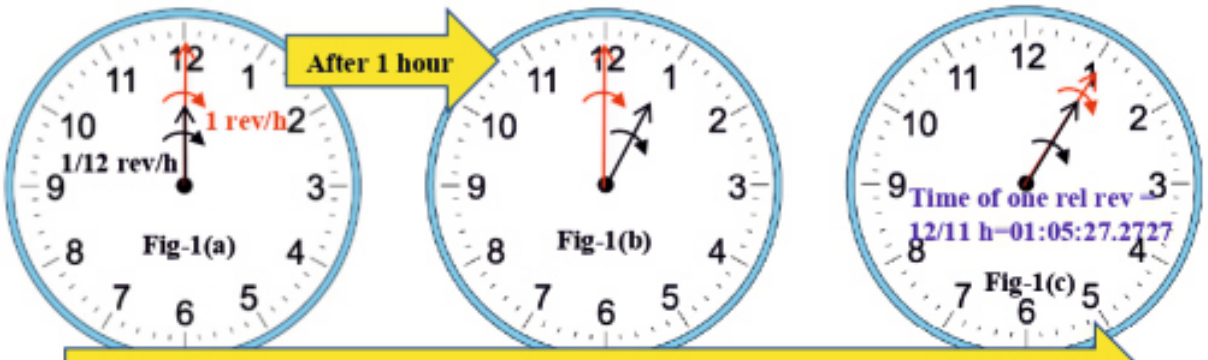


Fig-1: Relative motion of Minute hand with respect to Hour hand

To find θr for a given Time; θr = {Fraction[(Time in hrs)*11/12]}*360};
Example, 7:30, θr = {Fraction[7.5*11/12]}*360} = 0.875*360= 315°

θr = Lead angle of Minute hand with respect to Hour hand in Clockwise direction

Fig-2: θr definition and time of occurrence

Occurrence Time of Rel Angle θr = (12/11)*θr/360 + N*12/11; N=0,11.
(11 relative revolutions in 12 hours)

Relative Angle θr	0°	45°	90°	135°	180°	270°
(N) 0	12:00:00	12:08:10.9	12:16:21.8	12:24:32.7	12:32:43.6	12:49:05.4
1	01:05:27.3	01:13:38.2	01:21:49.1	**01:30:00**	01:38:10.9	01:54:32.7
2	02:10:54.6	02:19:05.4	02:27:16.4	02:35:27.3	02:43:38.2	**03:00:00**
3	03:16:21.8	03:24:32.7	03:32:43.6	03:40:54.5	03:49:5.4	04:05:27.3
4	04:21:49.1	**04:30:00**	04:38:10.9	04:46:21.8	04:54:32.7	05:10:54.5
5	05:27:16.4	05:35:27.3	05:43:38.2	05:51:49.1	**06:00:00**	06:16:21.8
6	06:32:43.6	06:40:54.5	06:49:05.4	06:57:16.4	07:05:27.3	07:21:49.1
7	07:38:10.9	07:46:21.8	07:54:32.7	08:02:43.6	08:10:54.5	08:27:16.4
8	08:43:38.2	08:51:49.0	**09:00:00**	09:08:10.9	09:16:21.8	09:32:43.6
9	09:49:05.4	09:57:16.4	10:05:27.3	10:13:38.2	10:21:49.1	10:38:10.9
10	10:54:32.7	11:02:43.6	11:10:54.5	11:19:5.4	11:27:16.4	11:43:38.2
11	12:00:00	12:08:10.9	12:16:21.8	12:24:32.7	12:32:43.6	12:49:05.4

Table-1: Time of occurrences in 12 hours for a given **θr**

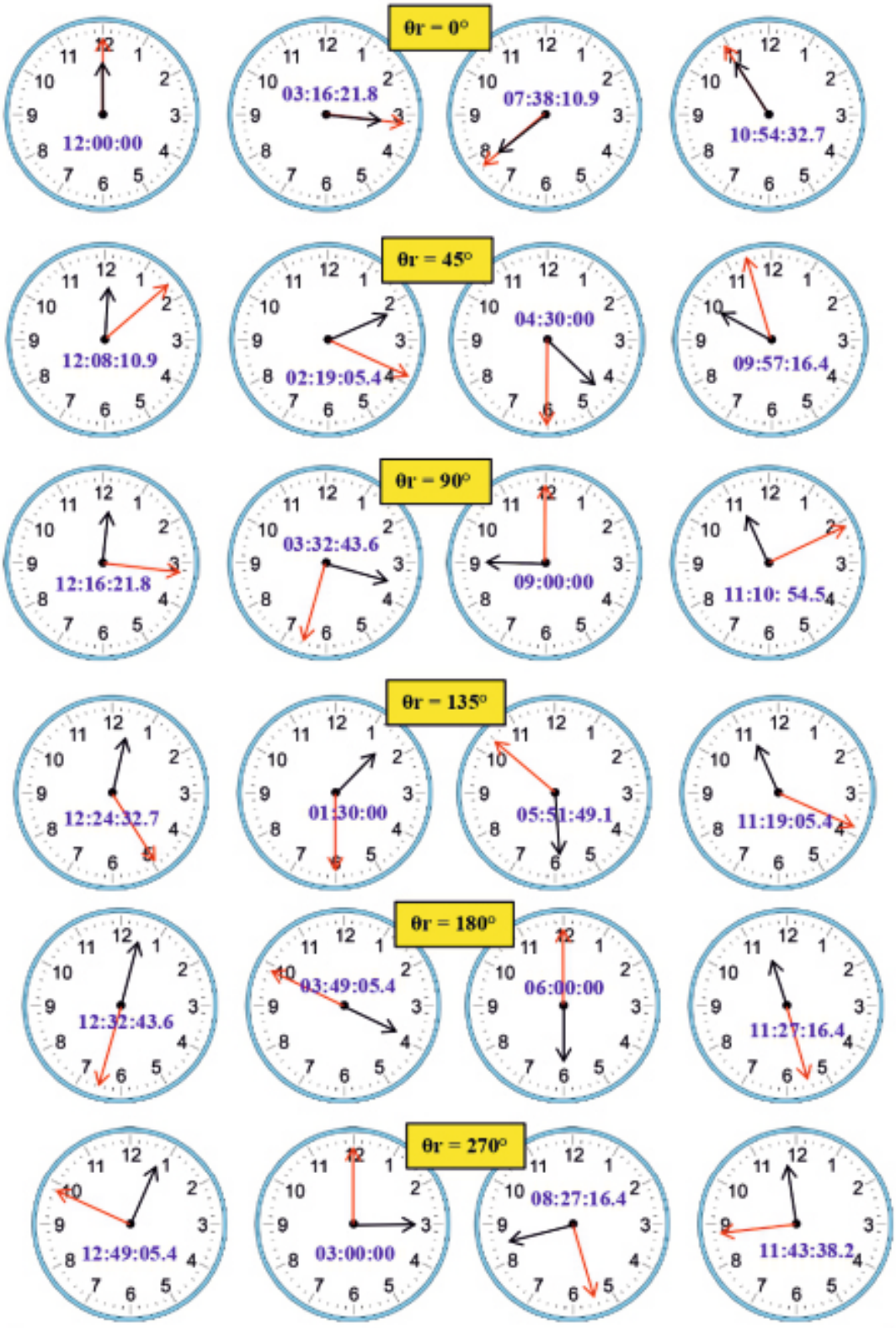


Fig-3: Clock view of the Time of occurrences in 12 hours for a **θr** = 0°,45°,90°,135°,180°,270°

Activities

1. Workshop on 'Learning Physics through Simple Experiments (LPSE-2023)

A two-day Student Workshop on "Learning Physics through Simple Experiments [LPSE-2023]" was organized by Department of Physics, Swami Keshvanand Institute of Technology, Management and Gramothan, Jaipur in collaboration with RC-06 on January 24-25, 2023. About 300 students attended the workshop and got benefited from the experience of eminent speakers.

On the first day of the workshop, following Resource Persons graced the occasion.

1. Prof.Y. K. Vijay, President RC-06, Rajasthan as Chief Guest
2. Dr. Vipin Kumar Jain, Ass. Prof. in Physics at JK Lakshmipat University, Jaipur as Guest of Honor

A gracious floral welcome and a memento were presented to Prof. Y. K. Vijay by the honorable Surja Ram Meel, Chairman, SKIT. Dr. Vipin Kumar Jain was welcomed by Prof. R.K. Jain, Dean, SKITM&G by presenting him a flower bouquet and memento.

Prof. Y.K. Vijay started his presentation by paying tribute to Prof. Babulal Saraf, Indian Physicist and experimentalist who received first prize in the apparatus competition, American Association Physics Teachers in 1979.

Prof. Y.K. Vijay threw light on the aims and objectives of the IAPT. He described the fundamentals of Quantum Physics through simple experiments. He explained Vander wall Interaction, Bohr model, Simple harmonic motion, Resonator, Alpha decay, Atom- atom interactions, and Plasma generation at RF frequency through the simple models and experiments in an interesting way.

On the Second day, we had Dr. Vipin Kumar Jain as a keynote speaker. He explained the fundamentals of electronics and optics through self-developed models. Dr. Jain explained several concepts, through experimental demonstrations, related to Transmission of data by TIR in Optical Fibre; Diffraction by single slit, double slits, and grating; Semiconductor diodes and applications; Resistance: Heating effect and Fuse; Light brightness effect in electric bulbs; Sensors: LDR and Thermistor; Heat transfer in Solids; Sound waves in metal bowl; Vibration modes, Doppler effect and Speedometer; LED and Development of Rise light; Electromagnetism, Hertz experiment, Charge on flame, Magnetic gun, Vortex formation, etc. using simple projects. The session was interactive, and participants learned the phenomena by performing the experiments by themselves.

Both sessions were quite educational. The participants must have benefited from the discussions and would have substantial take away.

2. Workshop on 'Joy of Learning Physics through Hands-on Experiments' at Vivekanand Global University, Jaipur, Rajasthan on April 15, 2023.

Resource Person Dr. Vipin Kumar Jain conducted the workshop. In his expert talk, Dr. Jain explained several concepts, through experimental demonstrations, related to Transmission of data by TIR in Optical Fibre; Diffraction by single slit, double slits, and grating; Semiconductor diodes and applications; Resistance: Heating effect and Fuse; Light brightness effect in electric bulbs; Sensors: LDR and Thermistor; Heat transfer in Solids; Sound waves in metal bowl; Vibration modes, Doppler effect and Speedometer; LED and Development of Rise light; Electromagnetism, Hertz experiment, Charge on flame, Magnetic gun, Vortex formation, etc. using simple projects. About 100 students, faculty members, and Dean of the University enjoyed the workshop and appreciated the pedagogy of learning physics through hands-on experiments and demonstrations.

3. Interactive Session on 'Chandra-Yaan Mission' of India at India International School (IIS), Jaipur.

On 17th April 2023, the students at India International School attended a session on space and the solar system at the school's auditorium. The session aimed to educate students about the significance of space exploration, with particular focus on the Chandra-Yaan mission of India.

The session started with a demonstration of several models of the solar system by the students of class XI, which helped the students understand the concept of centripetal force and how it causes celestial bodies to move in elliptical paths around the sun. They were also introduced to Newton's law of universal gravitation, which describes the force of attraction between two objects in the universe, centrifugal force, Motion of Satellite etc.

Following the demonstration, the students were shown a video that explained the Chandra-Yaan mission of India. The video showcased the various stages of the mission, including the launch, the journey to the moon, and the data collected by the spacecraft. Prof. Y. K. Vijay also highlighted the role of the mission in enhancing India's reputation in the field of space research.

Overall, the session was a valuable learning experience for the students, as they gained a better understanding of the principles that govern the force of attraction between celestial bodies and the latest advancements in space technology, including the Chandra-Yaan mission.

4. Teachers Training Workshop on 'Experimental Learning in Science' at Cambridge Court High School, Jaipur on 24th June 2023.

On Prof. B.L. Saraf Centenary year celebration, Teachers Training Workshop on 'Experimental Learning in Science' was organized by Cambridge Court High School, Jaipur in association with RC-06 on 24th June 2023.

The Resource Persons of the workshop were Prof. Y.K. Vijay, President –RC-06 and Director - Centre for Innovation in Science Teaching (CIST), IIS University, Jaipur, and Dr. Vipin Kumar Jain, Executive Committee Member, IAPT RC-06 and Associate Professor-Physics &HoD, JK Lakshmipat University, Jaipur. This workshop was attended by more than 40 Science teachers from various prestigious schools of Jaipur in the auditorium of the school.

With ever evolving new generation, the teachers today must stay updated to solve and satisfy the queries of their ever-inquisitive students. Not only do they have to answer their queries but also must convince them. Mere telling the information doesn't work, it must be proved also, which can be done through experimental demonstration. Conduction of simple experiments with simple tools or objects to fix the complex principles of science in the young mind is what was taught to the teachers in theworkshop.

Be it Physics principle or be it of Chemistry, there were ready- to- hand experiments demonstrated to the teachers, who found them to be highly useful for their class. Teachers were made to conduct experiment by themselves which helped them to learn quickly and gain confidence. All the teachers felt benefitted especially because they were introduced to conduct experiments for clearing the doubts of their pupils as well as for their quick and easy understanding.

Prof. Vijay and Dr. Jain explained scientific concepts with hand-on experiments on measuring Sparking potential and Relative dielectric constant of medium by Hertz Experiment, Behavior of flame in high potential; Refractive Index of liquid by prism; atomic configuration; hanging/ floating magnets; vibration modes; Bohr Model; Lorentz Oscillator and different forces; Doppler effect; Thermal conductivity in solids; Heating effect with resistive wire; Electric Bulb and Brightness; Exploring material structure with digital microscope; Interference in water waves; LASER and Diffraction with Single slit, double slit, grating, Concept of CD and DVD formation; Raman effect; Optical fiber, etc. Under Hands-on activity, participants also made models of Manometer (Using pipes and balloon), Submarine dynamics (Using small and larger size plastic water bottles), and Vortex formation using plastic bottles in the workshop to understand the concept of pressure, density, surface tension respectively. Participants were very excited to learn these cost-effective scientific models which are very useful for developing scientific temperament.

Thanking the Resource Persons Prof. Y.K. Vijay and Dr. Vipin Kumar Jain, the Mentor of the school Ms. Lata Rawat, Principal Ms. Swati Mathur, and Vice- Principal Ms. Sunita Bhat appreciated them for spreading their knowledge to benefit the teaching fraternity. There can be no other noble deed than sharing your knowledge, said Ms. Rawat in their praises and wished for many more to keep the teachers updated for the latest and the best.

Y K Vijay
V K Jain

Inauguration of Physics Demonstration Laboratory at IIEST, Shibpur

'Physics Demonstration Laboratory' of the Physics Department at IIEST, Shibpur was inaugurated by the Director Prof. Parthasarathi Chakrabarti on June 15, 2023, in the gracious presence of Prof. Y.K. Vijay, President, RC-06, Rajasthan, Dean Academic -Prof. Sudip Roy, Dean Planning and Development-Prof Subhasis Bhowmik, Dr Pradipta Panchadhyay, Secretary (RC-15), esteemed faculty members of the department, interested faculty members of the Institute and physics teachers from the nearby schools, research scholars, postgraduate students and the 70 invited school students of class XII. It was a part of the outreach program of the department with school students from four schools from the locality namely, B E College Model School, Shibpur SSPS Vidyalaya, Tarasundari Balika Vidyabhavan and Jogesh Chandra Girls' High School.

Prof. Parthasarathi Chakrabarti delivering the Inaugural Speech.

It always feels better in a class of relatively young students when after doing the derivations about a natural theory on the blackboard, a teacher can demonstrate the outcome with a real physical system. Consequently, physics departments in every premier institute of the country like to have a demonstration laboratory for imparting knowledge to young minds in a lucid manner.Last year in June we decided in our departmental faculty committee and unanimously resolved to establish a demonstration laboratory aiming primarily at the undergraduate students of the institute and senior school students of the state. We discussed the matter with some senior enthusiastic faculty members like Prof. Arindam Biswas of the IT department and Prof. Sudip Kumar Chattopadhyay of the chemistry department and Prof Parthasarathi Mukhopadhyay of Architecture. We proposed and placed it before the Director of the Institute. He approved it happily and with his suggestions, guidance and support we could procure and set up about 30 small pieces of equipment for demonstration purposes.

This is the first one of its kind in our institute where some complicated rules and laws of nature will be demonstrated in a very lucid and playful manner using equipment made of components easily available in the market. Here comes the role of Prof. Y K Vijay whose innovative ideas along with the technical skills and craftsmanship of the IAPT Rajasthan unit could realize these setups with low cost but the robust structure that can be placed over a cart and taken to the lecture rooms easily.

We all know that seeing is believing and doing is learning. This laboratory will help the students joyfully learn physics. Let me give you some examples: We all know that light is an electromagnetic wave but here you'll see (?) the presence of an electric field in the light! You will see how Faraday's law work! We know pulleys give a mechanical advantage but here you'll feel how great it is! We have defined torque and angular momentum in the textbooks but here you will feel their real existence through direct experience.We have many such pieces of equipment that can be used during teaching or can be taken to nearby schools as a part of our outreach program.

Another beauty of the setup is the scope of developing them for the next level. One such example is the magnetic anharmonic oscillator that shows a double well potential structure with two magnets coupled in repulsive mode demonstrating nicely the presence of two minima separated by a maximum in the middle. Here, the upper magnet is free to oscillate but the lower one is fixed. You can easily demonstrate stable and unstable equilibria to undergraduate students with this setup. Now, you may think of extending it for postgraduate students just by increasing the degrees of freedom of the system. This can be done by allowing the lower magnet to move and believe it or not you will be able to demonstrate 'chaos' topic we usually teach at the postgraduate level.

Our master's degree students need to take up projects as a part of their curriculum. Some of this equipment may be used for that purpose also. Nowadays, 2D materials like graphene are very attractive topics of research. One can easily design an analogous macroscopic system with magnetic dipoles floating on water (by attaching them with plastic balls) to form a finite spin-lattice and get some flavour of mainstream research at the postgraduate level.

We also plan to organise regular interactive programs or workshops including undergraduate engineering students of our institute along with undergraduate physics students from different Colleges of West Bengal.

We hope the students will enjoy coming to the Laboratory and learning physics by playing with the setup in the form of toys. At this point, we must talk about Mr Kailash Chandra Sharma, the silent partner of Prof Vijay in making these models. In search of the beauty in Mother Nature the students, teachers and researchers of science need to communicate with her in natural language: the language of mathematics. We understand them in the form of equations and equations are always approximations of reality. So, to realize the outcome of these equations in real models, one needs to satisfy the approximations properly. People like Kailash Ji play a great role in bringing the equations to life through the models with their innovative craftsmanship to satisfy the required conditions.

The inauguration program started with curtain raising by Prof. Parthasarathi Chakrabarti followed by the welcome address by Prof. Dipali Banerjee. At the Alumni Seminar Hall, Dr. Syed Minhaz Hossain, Head of the department delivered a short speech on the objectives of the Laboratory. Then Prof. Chakrabarti, Honorable Director of the institute delivered the inaugural speech highlighting the need for having an open mind for students of science. After this Prof. Y.K. Vijay presented his demonstrations.

He showed a short movie on Prof. Babu Lal Saraf's biography and then presented hands-on demonstrations of different setups installed in the laboratory. In the post-lunch session, the school students visited the laboratory where the research scholars of the department demonstrated the physical principles behind the models. It was a day full of fun with physics for all the participating students and teachers. You are always welcome to visit this laboratory in case you are interested in physics teaching and learning.

Syed Minhaz Hossain
IIEST,Shibpur

Prof.Y.K. Vijay demonstrating some models.

Physics Workshop At Chinmaya Vidyalayas

To work and adapt to the new methodologies as per NEP that are most suitable for children, the Chinmaya Vidyalayas, Chennai, together with Ratna Sagar Publishers come together to organise a two- day workshop for the physics teachers of Chennai city at Chinmaya Vidyalaya,Taylors Road on the 14th & 15th July , 2023.The formal inauguration took place in the presence of the chief guest Shri Neelakanta Pillai, Director MVM group of schools, Resource person Mrs SarmisthaSahu, Retd. Prof of Physics & Coordinator Ammanni IAPTAnveshika, Bangalore, Shri Sathiyamoorthy.C, Director Chinmaya Vidyalayas, Principal CVT Mrs Usha Nandhini and Principal Mrs Gowri Lakshmi CVA and 48 participants.

Mrs Sarmistha Sahu's activity on multiple reflection from mirrors in which she added solid angles very beautifully enthralled the participants. The session onInquire & explore saw the teachers in groups perform simple, fun packed activity with pendulums to design the Lissajous' figure and calculate the time period. The post lunch session was packed with demos on electromagnetism which drew the attention of the participants by a way of questioning, answering and linking to the concepts.

The day 2 surprised us because the demo apparatus was simple day to day items like razor blade, comb etc to show the interference pattern using the green and red lasers, the difference in the intensity pattern of a single hole and double hole,Fraunhofer and Fresnel diffraction with same slit, Newton's rings, round bottom flask to show total internal reflection, scattering of light.

Different groups were provided with a CD grating on a mount, 2 long scales, CFL bulb fixed on a vertical mount, a cardboard box with one long thin slit to cover the bulb, Clothes peg (4) to determine the wavelength of all the colours produced by the CFL bulb.The trump card of the events for the 2-days was the interference pattern using the coral drawing of concentric circles on the transparency sheet and a A4 sheet which made it easy to determine the wavelength of the source.The post tea session was devoted to concepts in rotational motion through simple items and few you tube videos to make it interesting. The workshop concluded with distribution of the participation certificatesand Mrs Gowrilakshmi Principal CVA proposing the vote of thanks.It was an enriching and informative workshop for all the participants who had lot of take ways.

Vijaya Devanathan
Chinmaya Vidyalaya,Taylors Road

REPORT(RC-16)

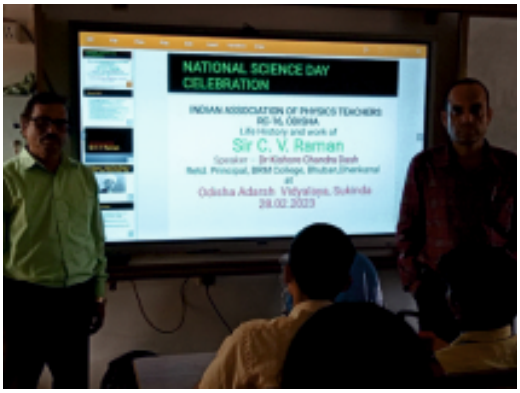
Observation of National Science Day Activities

National Science day was observed by members of IAPT RC-16 in different schools and colleges of Odisha on 28.02.2023. In Odisha Adarsh Vidyalaya, Sukinda, Jajpur, Dr Kishore Chandra Dash, Retd. Principal of Baji Rout Memorial College delivered a talk on **'Life History and work of Sir C. V. Raman'.** 75 number of Class IX students were present in the class. Even they could answer some intesting questions on the life history of Sir C. V. Raman before start of the talk. A talk on **'The Beauty and Mystery of the firmament'** was delivered by Dr Rabindranath Mishra, Retd. Reader of Physics, Ravenshaw University, Cuttack at Sri Sri University, Cuttack. Similarly National Science day was observed at CB Degree Mahavidyalaya, Kanas, Puri. Sri Bipin Kumar Sethy, HOD of Physics Department delivered a talk on ' Utility of Science in Daily Life'. 45 number of students with Principal and staff of Physics Department were present during the

talk. National Science Day was observed by RC-16 at Gopabandhu Choudhury College, Bari, Jajpur also. Dr. Narayan Sasini, life member IAPT, RC-16 had delivered a talk on this occasion.

Rita Paikaray
Secretary
Odisha

Prof. Rabindranath Mishra at Sri Sri University, Cuttack



G. C College, Bari, Jajpur CB College, Kanas

REPORT

Observation of National Technology Day and Seminar

On May 11, 2023 National Technology Day was observed by the Odisha Vigyan Mandal at Bhuban Women College, Bhuban, Dhenkanal. Dr Kishore Chandra Dash, asst. Secretary RC-16, IAPT was invited to deliver a talk on ' The Story of Nuclear Program in India'. Dr Dash delivered a talk on the topic extensively citing the dream Homi Jahangir Bhava, his Three stage Nuclear Program in India and its progress and achievements till date. The talk started with mention of Maharshi Kannada(600 BC to 200 BC) and 400 BC Scientist: Democritus (Greek Philosopher), who had discovered and used the name Atom, meaning indivisible.

On 23.04. 2023, an invited talk was delivered by Dr Dillip Kumar Bisoyi, Professor, NIT, Rourkela and EC member, IAPT RC-16 on **'X-Ray Optics for material** Rourkela Municipal College, on the occasion of Annual Seminar of Department of Physics. Besides all Physics Honours Students, teachers from different colleges and retired Professors like Dr. P. K. Nanda, Dr Srikant Mohanty, Sri Kulamanai Nayak were present on the occasion on behalf of **'Rourkela Association of Physics Teachers (RAPT)'.** The program was organised with collaboration of RAPT and RG-16, IAPT.

Rita Paikaray
Secretary
Odisha

Seminar at Rourkela Municipal College

IUAC Workshop on Innovative Experiments in Physics

As part of Birth Centenary Celebrations of Prof. Babulal Saraf and Prof. HS Hans celebrated scientists, teachers and founders of IAPT in 1984 a two workshop on innovative Experiments in Physics was organized by Academic and Teaching Unit of Inter University Centre New Delhi from 13th July 2023 to 14th July 2023. Following were the highlights of the two days program in which 70 participants registered.

Day 1: Thursday 13th July, 2023

With the help of Prof. Y K Vijay, President, IAPT RC-3, Jaipur, the Innovation Hub Science Gallery was set up in the lounge area outside the Seminar Hall of the IUAC main building. Five physics experiments were set up for display, and during the workshop, the participants utilized the opportunity to understand the experiments. Before the program started, Prof. Y K Vijay interacted with Prof. Avinash Chandra Pandey, the director of IUAC, and other participants and demonstrated the experiments from 9:30 to 10:00 AM.

The following Experiments were kept for demonstrations:

1. Air Track setup for demonstration of finite square well potential.
2. Mechanical Transmission line.
3. Plasma state demonstration.
4. Anharmonic Oscillator by introducing magnetic perturbation to harmonic oscillations
5. Coupled Pendulums and Lissajous Figures demonstration.

Director of IUAC, Prof. A. C. Pandey, with the participants and organizers

Registration : Ms. Veena C. P., Ms. Rushmika Rawat, Mr. Mahesh Shridhar More, and Mr. Rahul Kumar Ray, took the responsibility of handling registration. A total of 62 participants registered and attended the program, out of 70 who had shown interest to participate.

Inauguration Program: The dignitaries Prof. Y K Vijay, Prof. Avinash Chandra Pandey, and Prof. O S K S Sastri were invited to light the lamp to begin the inauguration program, which was then followed by an invocation of Vedic chants for God's blessing. The dignitaries received assistance from Ms. Megha Prakash during the lamp-lighting ceremony. The dignitaries were invited to the dais and Ms. Supriya Mehta, Ms. Sejal Chandna, and Ms. Chaitya Aswal presented the dignitaries with flower bouquets. The Welcome address has been given by Mr. V V V Satyanarayana, the joint convener of this program. The opening remarks were given by Prof. Y K Vijay, while the Benedictory address was given by Prof. Avinash Chandra Pandey. The presentation of mementos to the dignitaries and members of the organizing committee was organized by Dr. Seema Vats, President of IAPT RC-1. A group photograph was taken with all dignitaries and the participants and session ended with

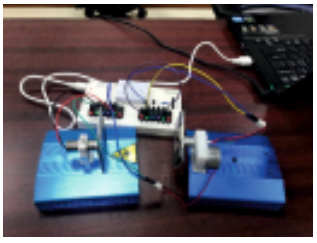
Inaugural Program in the Seminar Hall, IUAC Main Building

Group Photo with the Dignitaries, Participants and Organizing Committee Members

Post-Tea session was handled by Prof. Y K Vijay, President of IAPT RC-3, Jaipur. He demonstrated many interesting experiments by involving the participants while taking the observations and performing the experiments. Interesting demonstrations include the molecular vibrations, coupled pendulums, periodic lattice potential and dynamics, stationary orbits model at 50 Hz, etc.


Prof. Y K Vijay during the Experiments Demonstration

In post-lunch session, all participants introduced themselves. Then, Mr. V V V Satyanarayana, IUAC and Prof. O S K S Sastri, CUHP have talked about PHOENIX (Physics with Homemade Equipment and Innovative Experiments) project, which was launched in 2005. The innovative experiments developed at IUAC based on ExpEYES (Experiments for Young Engineers and Scientists) interface, such as Simple harmonic oscillations of mass spring system using ultrasonic echo sensor, Pendulum waveform digitizer, electromagnetic induction, Malus law, Spring and Mass system and additional experiments, were demonstrated.

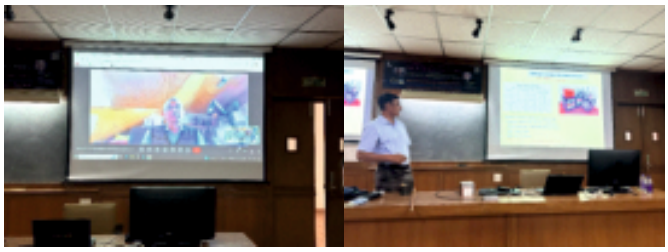



Malus Law Experiment Demonstration

20 minutes video of Prof. Babulal Saraf was shown in the last session of the day and the day-one program ended at 16:30 hrs.

Day 2: Friday14th July, 2023

Morning session stared with talk by Prof. P K Ahluwalia, President of IAPT in on-line mode from Shimla, Himachal Pradesh. The title of the talk was 'Prof Hans Star Performer of Big Science: Cyclotron'.



Sessions by Prof. P.K. Ahluwalia and Dr. Raj Kumar

Post-Tea session stared with a talk and hands-on on the topic 'Computer Simulations in Nuclear Physics' by Prof. O S K S Sastri, CUHP, Dharamshala. This was followed by a talk on 'Alpha Spectrometer developed at IUAC' and was also demonstrated Er. V V V Satyanarayana of IUAC. Another talk and demonstration were by Er. S Venkataramanan, IUAC on the 'Gamma Spectrometer developed at IUAC'. Finally, a talk on the "Table-Top Accelerator developed at IUAC" was given by Er. Raj Kumar, IUAC.

Post-lunch session started with a video documentary Courtesy film maker Jhanvi Phalke on Prof. Hans' remarkable story of raising a cyclotron from Rochester. . The live launch of Chandrayaan-3 was aired and all the participants felt proud of our ISRO scientists.

Distribution of Participation Certificates : The participation certificates were distributed by Dr N Madhavan, In-Charge of IUAC on 14th July 2023, Dr. P. N Prakash, Scientist-H and Prof. O S K S Sastri, CUHP to all participants. Dr. Yogesh Kumar, Secretary of IAPT RC-1 and Mr. Abhijit Sarkar, Scientist-H, IUAC have organized this event.


Concluding Remarks: The concluding remarks were given by Dr. N. Madhavan, Scientist-H, Dr. P. N. Prakash, Scientist-H, IUAC by congratulating the participants and the organizing committee members for successful completion of this program. They specifically expressed

their appreciation for the wonderful organization of the two-day workshop by Er. V.V.V. Satyanarayana and team.

Feedback: All the participants have expressed how they have benefited from various demonstrations. The teachers who have from various colleges and schools have expressed their gratitude and requested for more such programs to be hosted by IUAC. They have also requested that a complete Science exhibition should be setup at IUAC which could inspire many young students from all over Delhi to visit and take up science research and become scientists.

V.V.V. Satyanaryana

State Level Final CPEx-2023

Regional Council (RC) – 07) provides a platform to demonstrate innovative experiments to both the teachers and the students, from secondary to the university level, through an event called CPEx (Competition of Physics Experiments). Participation in National Competitions, such as NCIEP and NCICP is encouraged through such an event.

CPEx – 2023 was held in five categories as under:

1) For students studying in standard 11 and 12 (Science Stream)
2) For Undergraduate (UG) students
3) For Postgraduate (PG) students
4) For Research Scholars
5) For Teachers

Initially, the competition is held at the Cluster Level and then there is a State Level Final. The Regional Council (RC) – 07 is divided into 10 clusters for this competition. The details of the clusters are given in the following table.

Top two best entries from each category from all the clusters get qualified for the State Level Final. The State Level Final of CPEx-2023 was hosted by The Department of Physical Sciences, P. D. Patel Institute of Applied Sciences, Charotar University of Science and Technology, CHARUSAT Campus, Changa, Gujarat, on March 9, 2023 in collaboration with the IAPT RC – 07. 49 participants from 9 clusters, out of the 10 clusters, participated in the State Level Final.

Prof. R.V. Upadhyay (Provost, CHARUSAT), Dr. Gayatri Dave (Dean, Faculty of Science, CHARUSAT), Prof. K. N. Joshipura (former General Secretary IAPT), Prof. P. C. Vinod kumar (President, RC – 07), Dr. C. K. Sumesh (Local Coordinator of CPEx-2023, HOD, DPS, PDPIAS), Prof. V. H. Thakkar (Coordinator of CPEx – State Level), distinguished guests, faculty members from various schools and colleges, PDPIAS faculty members and students were present in the inaugural session. Prof. K. N. Joshipura encouraged the faculty and the students to participate in more and more such events. He outlined different activities of IAPT at various levels also. Prof. V. H. Thakkar gave a detailed account of the cluster level competitions and the State Level Final of CPEx. Prof. R. V. Upadhyay addressed the audience and exhorted the students to get more enthusiastic about developing new experiments.

For the presentation and evaluation of innovative experiments, parallel sessions were set up for the school/undergraduate and postgraduate/teacher categories. Then the competition was started and judges for different categories started visiting students for the evaluation. The judges reviewed the experiments and gave suggestions to the students on how to improve for the competitions at the national level.

The winners and each of the participants were given prizes, certificates and mementos. The overall 1st Prize winner from (i) School, (ii) UG category and (iii) PG category students were felicitated with special cash prizes, sponsored by Prof. R.V.Upadhyay and Prof. P. C. Vinodkumar. The participants and guests had an opportunity to visit various research

laboratories of the Institute and get information about the research facilities available there.
The distinguished visitors and student participants were asked for their overall impressions of the program. Dr. C. K. Sumesh's vote of thanks brought the event to a close. The students' overwhelmingly positive engagement contributed to the program's overall success.

Vireshkumar Thakkar
Sir P. T. Sarvajanik College of Science, Surat

C. K. Sumesh
P. D. Patel Institute of Applied Sciences, Changa

Glimpses of "State Level Final CPEx-2023"

IAPT AFFAIR

Minutes of the EC meeting(online) held on May 5, 2023 at 10:00 AM:

Following members were present.

1. Prof. P. K. Ahluwalia, President, IAPT
2. Prof. Rekha Ghorpade, General Secretary, IAPT
3. Prof. Ranjita Deka, VP-East Zone
4. Prof. Ravi Bhattacharjee, VP-North Zone
5. Prof. P. N. Nagaraju, VP-South Zone
6. Prof. A. K. Jain, VP-Central Zone
7. Prof. H. C. Verma, VP General and Coordinator NANI
8. Prof. D. C. Gupta, Treasurer, IAPT
9. Prof. O. P. Sharma, Member RC-01
10. Prof. Meenakshi Sayal, Member RC-02
11. Prof. R. K. Khanna, Member RC-06
12. Prof. M. S. Jogad, Member RC-12
13. Prof. Makhan lal Nanda, Member RC-15
14. Prof. Kalipada Adhikari, Member RC-18
15. Prof. Himanshu Pandey, Member RC-19

Ex-Officio Members:

16. Prof. K. N. Joshipura, Immediate past General Secretary.
17. Prof. B. P. Tyagi, Chief Coordinator, IAPT Examinations.
18. Prof. Sanjay Kumar Sharma, Secretary, IAPT Kanpur Office

Co-Opted Members:

19. Prof. Bhupati Chakrabarti
20. Prof. G. Venkatesh

Invited Members:

21. Prof. S. K. Joshi, Coordinator, NCEWP
22. Prof. Y. K. Vijay, Coordinator, Prof. Babulal Saraf BCC Committee
23. Prof. Manjit Kaur, Editor, IAPT Bulletin
24. Prof. C. N. Kumar, Coordinator, NSSP-23
25. Prof. O. S. K. S. Sastri, Ex. Editor, Physics Education Journal(IAPT)
26. Prof. Sapna Sharma, coordinator, PER Lecture series
27. Mr. Vinod Prajapati, Staff, Kanpur Office

1. **To read and confirm the minutes of the earlier EC meeting:**
   Minutes of the EC meeting held on December 2,202 at Patna were presented and read by Prof. Rekha Ghorpade, GS and all the members present confirmed the same.

2. **Address by the President, Prof. P. K. Ahluwalia:**
   Prof Ahluwalia welcomed the esteemed executive members of IAPT EC and invited members to the meeting. He expressed satisfaction over last year's activities in different regions of the country and the various initiatives taken to reach out to schools, colleges and universities. Some imaginative and new programs have been initiated. Best part was that the RCs are getting very active and showing keen interest in the vision and mission of IAPT. Young members are also coming forward which is very encouraging and bodes good for the future of IAPT. He emphasized that when RCs work IAPT works. He further said, we took certain decisions on which action has been taken, e.g. Beta Version of IAPT website (www.indapt,org.in) has been launched. Till date we have about 2000 members who are connected with us through their emails and mobile numbers. We are trying to update more members with their emails and mobile numbers and target is to bring all 9000 members on the dynamic web site. This will give us instant connectivity with our members through messaging and emails. With a click of a button one can see that IAPT has members from every corner of the country are there. Last one year Vice Presidents' group has done a wonderful job. They took lots of initiatives in carrying forward the activities of IAPT. Prof. Ahluwalia also informed the members about the separate page for each Regional Council and Sub Regional Council, he requested all members of EC to visit the website and give their feedback. Each RC and sub-RC is now empowered to showcase their programs and reach out to their members very conveniently through these pages. He also briefly explained how to go about this process.
   As was being repeated again and again in last year, that we should have a calendar of activities by central IAPT, President congratulated General Secretary Prof. Ghorpade to bring out calendar of activities well in time for RC's to have enough time to prepare for various flagship programs of IAPT, which also gives an overview of planned/projected activities like competitions, lecture series, workshops, etc. as well as the completed programs.
   He informed the members that regarding our special programs on Birth Centenary Celebrations of Prof, Babulal Saraf and Prof. H. S. Hans our former presidents, the work has been in progress. The RCs who have been given responsibilities are working in orgainizing and hosting these programs. We are hopeful of some innovative things as those emerged during Prof. D. P. Khandelwal's Birth Centenary Celebration. One

plus point of such programs is that IAPT is able to gather an archive and bring out their inspiring works before the members and the stakeholders, a fitting tribute to their tireless work. He profusely thanked the members of DPK BCC committee, in this regard for setting a trend for others to follow.

He mentioned about generation of e-resources by Prof. S. K. Joshi, Coordinator, NCEWP, through e-publication of award-winning essays (. He informed that we IAPT is also working on e-publication of awarded experiments at NCIEP for which Prof. Ananth Krishnan has completed the task from 2003 to 2007.

President also shared members worry that, IAPT- Physics Education Journal was not coming out regularly. He informed that we are working on it, so that it will be start coming out regularly in next three months. raise. Prof. O. S. K. S. Sastri has taken the initiative and with the help of a dedicated team it should start working without glitches. He also informed about the steps being taken to bring out IAPT bulletin online. We have started working on it. Hopefully, in next three months we will definitely move forward in this direction.

He also mentioned about an line program started 6 months back to reach out to student community studying in class 11 and 12. One of this is Facebook page of Let Us Solve It (LUSI), where now we have 1K+ registered members regularly interacting with the mentors. He especially thanked Prof. DA Desai, Prof. Meenakshi Sayal, Prof. TN Soorya and Raj Kumar Parashari.

He was also happy to inform that IAPT finances last year have considerable improved. This was mainly due to efforts from the examination team led by Prof. B. P. Tyagi, Chief Controller of Examinations and the volunteers spread all over the country.

3. Report on activities by Central IAPT (January - April 23) by GS:

Prof. Rekha Ghorpade, GS-IAPT, informed the members about following activities/tasks at central level:

- Launching of beta version of IAPT dynamic website.
- Purchase of two Zoom Licenses.
- 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:

  RC 08: 3-Days Lecture Series.

  RC 03: 6- Days National workshop on Nano Materials at JNU New Delhi

Proposed Activities

- Women's cell of IAPT
- A series on Quantum Mechanics and Quantum technologies
- Interviews with IPhO and APhO medalists
- Starting MOODLE quizzes for NEET, JEE, etc
- Lecture Series on PER
- Lecture series on NCF
- Podcast on Physics Series
- Publication of NCIEP Awarded Experiments
- Student ambassadors of IAPT in Educational Institutions

- Convention of Stage Shows at RC level to be conducted by one of the RC's every year.
- Starting MOODLE quizzes for NEET, JEE, etc
- Publication of NGPE experiments
- To establish National Problem-Solving Network of India (NPSNI) on the lines of Anveshika

After this, listed agenda item were taken up one by one.

4. Updates:

i) On Accounts and Budget (2023-24)

Prof. Sanjay Sharma and Prof. D. C. Gupta presented the proposed budget for the year 2023-24.

They also discussed the expenditure under various heads during financial year 2022-23. The income-expenditure statement was not complete, as some of the account details were not received by the Kanpur office. Prof. B. P. Tyagi, CCE, informed that he would soon update on IAPT Examinations (NSE & NGPE). They also appealed to all the EC representatives of RCs to submit the audited accounts to the central office by May30, 2023 for the last year. They especially appealed to EC representatives from various RC's to convey this to their office bearers to do the needful and expedite the matter. The audited account statement will be published in the bulletin at the earliest.

ii) Registration of Amended Constitution Document, Current Status:

Prof. D. C. Gupta informed that we submitted the documents to the office of Registrar of Society, twice. However, it was returned. First, it was not signed by the signatories and second time, the Govt. changed the format of submission. We have requested for the revised format which is expected to receive by 12th of this month. Thus, the process would be completed in next 2-3 months.

Prof. Sanjay Sharma also informed the members that the copies of Aadhaar cards of all the members are required by the office of Society Registrar for the renewal of registration every five years. He requested the members to mail their Aadhaar copies to Kanpur office at an earliest.

Prof. Ahluwalia also informed that for the past one year we have been following the matter of Amended constitution and explained the problems at Registrar of Society level. He also assured the members that this exercise would be completed in next three months and the copy of amended constitution will be available on IAPT Website.

iii) Birth Centenary Celebrations.

a) Prof. B. L. Saraf BCC- Prof. Y. K. Vijay, Convenor/ Prof. R. K. Khanna

- Prof. B. L. Saraf Birth Centenary Celebration was announced during Annual convention of IAPT at Patna. A short video on Prof. Saraf was shown. RC 06 has constituted a National Steering Committee for Prof. B. L. Saraf Birth Centenary Celebrations. They have conducted more than 50 programs which include demonstration lectures, screening of film etc. in last six months and propose to have around 100 programs during the year. Recently, Physics alumni-meet from University of Rajasthan was organized. A film on Prof. B. L. Saraf was screened for young people to make them aware of his contribution. Some senior members shared their memories about Prof. Saraf.
- Prof. Y. K. Vijay appealed that other RCs also should conduct at least one program dedicated to the memory of Prof. Saraf. He said, he would share a short video which can be shown before every program. He further informed that a proposal to scan and upload the book **'Physics Through Experiments'** by Prof. Babulal Saraf on IAPT website is under active consideration. And effort is to launch it in concluding ceremony of 37th annual convention to be held in Jaipur.
- Prof. Ahluwalia added, these celebrations have given us the opportunity to bring out events, which can go across the country. Both RC06 and RC09 are working in coordination. Prof. Dubey (RC06) is reaching out to small schools in villages to propagate the work of Prof. Saraf. He said, good, edited versions of the interviews

of Prof. R. K. Khanna on Prof. Saraf should be made available on YouTube for others as a part of the celebration. He requested members of organizing committee to bring out a stamp and a cover to commemorate the contributions of Prof. B. L. Saraf and Prof. H. S. Hans during the convention at Jaipur. He suggested that we can sell the stamp and the cover to recover the expenses.

- Prof. Ahluwalia and Prof. B. P. Tyagi said that the Birth Centenary Activities of two stalwarts should not be restricted to only two or three RCs, but they should spread over across the country.
- Prof. R. K. Khanna Suggested to award few medals in the memory of Prof. Saraf and Prof. Hans. A committee can be formed to frame the rules and guidelines. RC06 is given the freedom to decide.

b) Prof. H. S. Hans BCC- Prof. O. S. K. S. Sastri (Convenor)

- RC03 has started the Prof. H. S. Hans Birth Centenary Celebrations as per the guidelines of IAPT. A committee has been formed to design the activities.
- An International conference on Nuclear Physics in honour of Prof. Hans, was organized during March (2-4) 2023 both on/offline in Central University Of Himachal Pradesh Dharamshala.
- One day workshop, in honour of Prof. B. L. Saraf, on Expise for school teachers. Videos on Prof. Saraf and Prof. Hans were also shown.
- Committee is Planning to conduct one week FDP in Nuclear Physics in honour of Prof. Hans.
- He also informed that printed version of the books by Prof. B. L. Saraf under COSIP program be converted into pdf's as e-books and should be made available to students online. Books by Prof. H. S. Hans on Nuclear Physics are excellent and should be included in the UG syllabus.
- Prof. Sastri informed that many eminent Professors from different universities have agreed to deliver sessions at Birth centenary celebration.
- Prof. Ahluwalia informed that both B.L. Saraf and H.S. Hans BCC started at St. Bede's college, Shimla where they tried to generate resources that can be used by other RCs also. A movie 'Cyclotron' and a quiz based on it are available, which can be used for reach out programs at various schools and colleges. He also suggested that the books by Prof. Saraf and Prof. Hans be included in IAPT low-cost books list. We can reach out to publishers for the same.
- He added, Prof. S. C. Samanta brought our notice a book by Prof A W Joshi, Prof D P Khandelwal and Prof A. Nigavekar published by UNESCO. Prof. Samanta shared a PDF. However, to reprint we need to seek permission from UNESCO. All such resources should be pulled together to make them available to people.

iv) National Standard Examinations and National Graduate Examination in Physics:

Prof. B. P. Tyagi, Chief Coordinator, IAPT Examinations, presented a report, key points of which are as follows:

- After a break of two years IAPT conducted National Standard Examinations separately in November 2022. Earlier NSE Biology and NSE Astronomy were conducted at the same time, so that students were allowed to appear for one of them. It was with the initiative of Prof. Anwesh Mazumdar, National Coordinator-Science Olympiads, this time these were conducted on separate days, so that students can appear for both. However, Junior Science students can not appear for senior Olympiads and vice-versa.
- Information booklets and posters were sent to about ten thousand plus institutions and also by emails to authorities.
- Good news is, there was an increase in the enrolment, 137535 against 68735 last year. Process of enrolment was both, individual and through centers online. Observers were sent to the centers for the smooth conduct of examinations.
- He requested EC members to help in enrolment in their regions, to strengthen the IAPT.

- Prof. G. Venkatesh suggested that evaluated answer sheets should be made available to all students using improved technology, so that process becomes transparent.
- Prof. Ahluwalia suggested prof. Tyagi to have a group with him to analyze the data and publish a paper in Physics Review journal. He also suggested to make a committee to create a 'Blue Book' on the Standard Operating Procedure for pre-conduct, conduct and post-conduct of the examinations conducted by IAPT, so as to avoid any confusion when problems arise and how to resolve them. Prof. B. Chakravarty suggested to get inputs from Prof. M. L. Ogalapurkar and Prof. G. Venkatesh, past CCE for preparing the *Blue Book*.
- Since IAPT has question papers of all standard and graduate Physics Examinations held in the past, a proposal to create a **MOODLE** question bank be initiated to start generating academic resources in the form of quizzes and mock tests. Prof. Ahluwalia thanked Prof. Tyagi for maintaining the records of NSE which are very necessary for the transparency of the whole process.
- Prof. Jogad suggested, some minimum fees should be charged for revaluation of NSE papers.
- Prof. Ahluwalia suggested that we at central office and RC's must inculcate the habit of archiving important documents, so that future office bearers be aware of hard work behind the exam process and slip into the work without much anxiety and memory loss.
- Report on **NGPE-23** was presented by Prof. Tyagi on behalf of Prof. Anil Kumar Singh, coordinator as he could not attend the meeting due to his illness. He informed that Enrolment was done individually as well as through the centers. He also informed that this time NGPE-23 Part C will be conducted at Shri Vaishnav Vishwavidyalaya Vidyapith, Indore (MP) under the leadership of Dr. Uttam Sharma and Dr, P. K. Dubey. Prof Tyagi and Prof. Devesh Tyagi, President RC 04 will be present as resource persons. On the basis of students' performances in theory and experiments both, top five students will be selected for awarding gold medals at 37th annual convention of IAPT at Jaipur. Prof. Tyagi requested EC members to promote NGPE in their regions.

v) Competitions:

a) **NCEWP - Prof. S. K. Joshi, coordinator.**

- Prof. Joshi reported, as per the new guidelines the competition was announced in the month of January 2023 in IAPT bulletin and was uploaded on the website. Last date for the entries is July 30, 2023. He requested the members to help him getting entries in teachers' category. Students participate in good number, he added. As suggested by the president, he has come out with second volume of awarded essays and the e-book is available on new website of IAPT. Prof Joshi informed that now onwards there will be yearly publication of e-book. (https://www.indapt.org.in/f/essay-writing-ncewp-19875?source=view)
- He thanked President, GS, EC members, judges and Prof. Joshipura, in particular, as the past coordinator he established a good framework which is helpful.
- He requested EC members to conduct regional level competition and send the top two entries to National level. Prof. Ahluwalia appreciated the hard work put in by Prof. Joshi in editing, plagiarism check, design and specially the writeup at the end of the book which will help participants how to go about.

b) **NCIEP- Prof. Geetha:**

Prof. Geetha could not attend the meeting; however, she sent an update which was read by Prof. Rekha Ghorpade. She conveyed:

- The President and GS conducted a meeting of all the competition coordinators. Fine tuning of the announcements was done. As per their suggestions, the announcement was published in the March-23 issue of the bulletin. It was also uploaded on IAPT website.
(https://www.indapt.org.in/f/experiments-nciep-19874?source=view)

- This time one more category has been added. High school students are allowed to participate in this category. They have been allowed take the help of mentor. Most of the students have vacations. She is planning to give announcement in the June-23 issue of the bulletin, with subsequent reminders in July and August. All the details will be shared with RCs and Sub-RCs. She has received enquiries from school students. More updates will follow.

c) NCICP- Prof. Pradipta Panchadhyaee

- Prof. Pradipta could not attend the meeting. President and GS reported on his behalf. The announcement was published in the bulletin and also was uploaded on the website. (https://www.indapt.org.in/f/computer-based-experiments-ncicp-19877?source=view)
- He has formed a local committee to frame the guidelines and they have planned to a one-week workshop to sensitize the participants, and how to go about it. Which is a welcome addition to encourage participation of students.

vi) NSSP - Prof. C. N. Kumar, Coordinator.

- Prof. C. N. Kumar thanked Central IAPT for allocating funds of Rs. 1.5 lakhs for NSSP-23. He informed the members that National Student Symposium in Physics 2023 (NSSP 2023) was conducted successfully from 2013 to 2019 at Chandigarh, with the support from IAPT. He shared information about the conduct of NSSP at length.
- He said that the registration fees charged are completely spent on students' lodging, boarding and food. He further reported that the first announcement of NSSP-23 will be coming soon and notified. The program is scheduled in the last week of October 2023.This time they are planning to invite IAPT officials and some IAPT members, may be one each from every RC, so that they can observe the proceedings. Preparations have started. Taking NSSP to different RCs is the proposal. He said, Chandigarh being the costlier city, expenditure could be more and looking forward to generous contributions.
- President and GS thanked Prof. C. N. Kumar for accepting the responsibility. Prof Ahluwalia said, whenever we want to rotate different regions, we must look for the higher education institutions, as students go around such institutions they will find lot of motivations with exposure to good laboratories, research activities and other facilities. It is not that we are not interested in small institutions but the purpose of this program has to be met widely. We can make higher education institutions into our fold to enrich student interactions

vii) Journal of Physics Education.

Prof Ahluwalia informed that no issue of the journal has come out. He has been following, talking to Chief Editor, had a meeting with him, writing emails, but nothing was happening. So decided to have a committee to revive the journal. Prof. O. S. K. S. Sastri accepted to be one of the executive editors.

Prof. O. S. K. S, Sastri updated on reviving of IAPT Physics Education Journal.

- **Committee of Executive Editors** has been formed.
  - Assign DOI for all the articles.
  - Prepare for SCOPUS and Web of Science listing.
  - Revamp the entire editorial process to bring it on par with current trends in publishing.
- **Vision of Physics Education Journal (IAPT)**: It is pedagogic international journal that is dedicated to high quality presentation of research papers in all disciplines of Physics suitable for +2, UG and PG students and teaching community.
- **Plan of Action:**
  - Publish the issues of 2022 by the end of May 2023.
  - Finalize the issues of 2023 by end of the year.

- Prepare to launch new version of Physics Education (IAPT) from 1st January 2024.

- **Changes Envisaged:** Prof. Sastri informed; we need at least 16 articles to be published to have listing in the web of Science. We plan to change the publication from Monthly to Quarterly.
- Prof. Ahluwalia added, we are moving on the right track. In next six months people will see the change in e-interface of PEJ (IAPT), SJP(PRAYAS) and the Bulletin of IAPT. He requested the senior members to come forward to write the reviews so that we are at par with the journal by IOP or AJP.
- Book talk on zoom: Purpose is to bring an author, interview him which can be published in PEJ(IAPT) as Book Review.
- Prof Rekha Ghorpade and Prof. Khanna thanked Prof. Sastri for taking this work.

viii) Online interface of IAPT bulletin- Prof. Manjit Kaur / Prof. P. K. Ahluwalia.

- Prof. Manjit had to leave, Prof. Ahluwalia reported
  - that he along with Prof. Manjit Kaur and Prof. Sanjay Sharma had a meeting with Prof. Sushil Kumar, in which Prof. Sushil gave a presentation on how to go about IAPT bulletin online, so that it also becomes dynamic platform in receiving communications between the authors and the editors. He informed that under Open Source Journal interface such a possibility is there.
  - At the outset, Prof. Manjit Kaur also reported difficulties in editing the bulletin this time. While reporting the NSE in the bulletin, we overshoot the number of pages of the bulletin, 40 plus pages. It was not possible to cut down anything, which Prof. Tyagi has sent. Once it is done online, it is possible to publish supplementary data which will be available to the members.
  - Furthermore, as such IAPT bulletin does not have a structure. If one has to look for particular paper or an article, it is possible to categorize in an online publication mode and one can see the material of one's interest. We can bring out a particular series together to make a e-book of the topics published in the bulletins, as is being done in the case of Indian Science Academy "Resonance" journal. Hopefully in next three months we can see something of this kind emerging. We are getting lot of support from willing members in this regard.
  - As Prof Bhupati Chakravarty suggested that for the editorial board and advisory board, a new set of people must be brought in. Which must be done at the earliest.

ix) IAPT-APhO Cell

- Prof. Ravi Bhattacharjee informed the members, APhO-23 will be held during May 21-29, 2023 at Ulaanbaatar, Mongolia. Five students will represent the country. They have attended OCSC at HBCSE in the month of April. A small workshop is planned as a part of Pre-Departure Training at Khalsa college. The Indian team will be accompanied by two leaders, Dr. Vijay Kumar (Co-ordinator), Dr. Himanshu Pandey and an observer Prof. Ravi Bhattacharjee.
- He further informed, two more APhO labs at Patna and Gaya, apart from one at GEHU, Dehradun, are coming up. He added, POLEX programs are conducted at few places.
- President and GS wished the Indian team all the success for APhO-23.

x) IAPT JSO Cell

- Prof. J. P. Gadre, coordinator reported, the responsibility of conducting stages 2 to 3 of Junior Science Olympiad is now with IAPT. For the members who are not familiar with JSO program, he informed that the various stages are; 1) NSEJS 2) INJSO 3) OCSC 4) PDC 5) IJSO. Stages 2 to 5 were conducted by HBCSE earlier.
- From October 2022 IAPT has started working in this direction. The first task was to set the question paper for INJSO. Resource Generation Camp was organized to set the paper. The list of 173 qualified students was sent by Prof. Tyagi, out of these, 154 registered and 138 actually appeared for INJSO at various centers. It was decided to conduct exam at the centers finalized by HBCSE. After evaluation, the marks were uploaded on the IAPT-JSO

website, students were able to access their own marks. Re-evaluation was allowed, if student is not satisfied. One week window was given to freeze the result. Finally, the list of 36 students was published on March1, 2023 on IAPT-JSO website (www.jso.indapt.org.in).

- He further informed that currently they are in the phase of preparing for Orientation Cum Selection Camp (OCSC) which is scheduled from May 20 to June 02, 2023. This time IAPT team is working with the hand holding from HBCSE in their premises.
- Prof. Gadre thanked the HBCSE authorities for their support at both academic and administrative level. This time Thailand is hosting IJSO at Bangkok during December (02-10), 2023. Pre-Departure Camp will be organized five days before the departure at some place convenient, preferably Mumbai.
- The Indian delegation for International Junior science Olympiad at Bangkok, will have 3 leaders, one each per subject, Physics, Chemistry, Biology, one observer and six students selected on the basis of the performance at series of tests in theory and experiments during OCSC.
- Prof. Rekha Ghorpade added, OSC is conducted offline as well as online. She also informed the members that we are looking out for the center for JSO from next cycle and requested members to come forward to accept this very prestigious program. Those who are interested may submit the proposal. Prof. G. Venkatesh asked the requirements for the same. Prof. Gadre provided the information. The requirements to carry out JSO program from stages 2 to 3:
    - About 10 plus resource persons per subject, Physics, Chemistry, Biology plus about 40 local persons for standardization, about 10-15 support staff,
    - Hostel with canteen facilities for about 70persons(students+ resource persons), Laboratories to accommodate 40 students during the camp.
    - Labs and workshop also should be available three months before the camp for replication and standardization of experiments to be given for tests, Hospital near by in case of an emergency. The activities are carried on throughout the year.
    - Funding will be provided by DAE Govt. of India.
    - Prof. Ravi Bhattacharjee added, Anveshika lab at Kanpur can be an ideal place for this activity.
    - Prof. Y. K. Vijay has also a good workshop at Jaipur, Prof. Tyagi suggested.
    - IAPT decided to explore all the places from where we get proposals to carry out the JSO program.

xi) NANI:

Prof. Verma Presented the Report.

1) MAC-2023; Meeting of Anveshika Coordinators is planned during June (18-20), 2023 at Agra. To mark Prof. B. L. Saraf Birth Centenary Celebration, we will propose in the meeting 100 programs in Anveshikas. This will be called as LEPTON (Learning Physics Through experimentation). The component of designing experiment will be introduced in this program.
2) NAEST-2023: Registration is open till May 20, 2023. 13000 registrations till now, which is less, Prof. Verma said. Website is enhanced for Question-Answer discussions. Students are having very useful information. Every Saturday, there is a webinar talk by some eminent speaker. The website helps students in updating and understanding concepts. IAPT database sent by Prof. Tyagi is very helpful in contacting Principals of the institutions to get the registrations.
3) Regular activities around the year: IAPT-BVN(Delhi), FOCUS(AP), SSB have done very good jobs. BVN-IAPT has done diverse kind of programs (total 7), under the leadership of Dr. Pragya Nopany. 10 programs by FOCUS-IAPT, Dr. J. Chandrashekhar Rao is doing very exciting programs at all kinds of levels; Govt, Z.P schools, colleges in rural and urban areas.
4) NGPE center at Kanpur: there was no NGPE center at Kanpur. SGM-IAPT Anveshika and Students' Research Exposure Lab have set up a NGPE center. Though students' strength is very good in this region,

the registration was poor. For 2024, they have planned some activities to enhance the participation. Nankari is another center they are trying to explore.

5) NAEST: The screening is a special kind of exams. Based on a short video, MCQ test is given. Video is on day-to-day phenomena. It is open for class 9 to 12 and also for UG and PG students. Same question paper is given to everyone. There is no difference in junior and senior level, but the evaluation is different. Totally new questions and experiments are given every year. This process is worth doing a research analysis, that how students react to different phenomena.
6) Prof. Verma appealed to EC members to help reaching out to students in their regions.
7) Prof. Ahluwalia suggested,
    a. out of 100 programs planned by NANI, have at least 25 programs online, One Anveshika can conduct one program.
    b. we have started focusing on e-publications. He requested, "Can we think of e-publication of Anveshika programs, such as worksheets of the experiments developed under IAPT NANI?" They can be designed in the same fashion as is the case APhO, IPhO, etc. He further mentioned if we have 25 such worksheets from Anveshikas for each category, it will be very helpful and will become part of resource generation for Anveshika Network in the country. We will give a dedicated page on IAPT new website with admin rights to control. Once it comes there it will not be confined to Anveshikas only, it may become a bit broader on daily update.
    c. He further informed, Dr. Amey Karkare from IIT Kanpur has some program from History of Education regarding converting task of multilingual resources. Can IAPT become a part of this task through different RCs? He requested Prof. Verma to facilitate it. Prof. Verma agreed to talk to Dr. Amey.

5. **Announcement and updates of 37th Annual convention at Jaipur:**

Prof. Rekha Ghorpade, GS, thanked Prof. Y. K. Vijay and the members of RC 06 for accepting to host the annual convention this year. Prof. Y. K. Vijay, Convenor, updated on the preparations of annual convention. The theme is Prof. B.L. Saraf and Prof. H. S. Hans Birth Centenary celebrations. Dates are October (7-10), 2023. Venue: IIS (Deemed to be University), Jaipur. He also gave organizational details, the committees which have people from different institutions and shared the scheduled program details for all the days of convention. 150 shared accommodations will be available from October 7, 2023, this amounts to accommodation for about 300 people.

6. **Decision on sending IAPT Bulletin by email.**

Prof. Sanjay Sharma suggested to send a Google form to get the option from the members, whether they want the e-copy or hard copy. Prof. Venkatesh said that the decision was already taken at Indore Convention (2021) to send a hard copy to those who would inform by email. Prof. Rekha G. suggested, though such decision was taken, we did not get enough response, so should try once more through our website. Prof. Ahluwalia added, we were not able to reach out all the members as their emails were not available. One last time we must try and then take the decision to cut down on printing the bulletin. Presidents and secretaries of different RCs can help us in getting updates from their regions as most urgent task.

7. **Proposal for new sub-RCs and restructuring of existing SRCs.**

- RC 08 proposed a restructuring of SRC 08B and formation of new SRC. However exact data was not available, and it was not discussed.
- RC 03: Prof. Pawan Kumar submitted the proposal for new sub-RC of Himachal Pradesh to GS. Since Prof.

Pawan Kumar was not available, Prof. Ahluwalia briefed about the proposal. As HP has more than 100 members, it can be given the status of sub-RC/RC. It was felt by few members that H. P. being the state it should be, it can be the separate RC. After much deliberation, it was decided that the proposal must be routed through RC 03(Chandigarh and Himachal Pradesh). The resolution should be passed by RC03. Prof. C. N. Kumar was requested to send back the resolution. Prof. CN Kumar also requested to send the proposal to RC 03 for further action. In this regard Prof. Ahluwalia referred to his editorial in the bulletin and emphasized that bigger states must be divided into more sub-RCs, so that network of IAPT expands to bring more stake holders within its reach.

8. **Suggestions regarding appointments of various coordinators by Prof. G. Venkatesh.**

Following suggestion was made by Prof. G. Venkatesh.

a) Any appointments like the Chief Coordinator, Coordinators of various competitions like NCIEP, NGPE, NCIEWP, APhO etc. (all non-elected appointments) to be made as follows.

b) Applications inviting for the appointment of the above posts be published in the IAPT Bulletin/WhatsApp group six months in advance before the term of the present incumbent ends.

c) One month time to be given for applying by interested members.

d) Applications received by the Gen. Secretary to be scrutinized by a committee nominated by the EC (the committee may consist of the President, Vice President General, General Secretary, the incumbent Chief Coordinator and the immediate past coordinators of the respective competitions.)

e) In the event of more than one applicant for any post an online discussion be held with the applicant and the members of the committee.

f) The term of office of each post should be co-terminus with the office of the elected office bearers. Also, a maximum of two terms be allowed to these appointed posts.

g) This should come into effect from the next term of the new office bearers. He said, IAPT has grown from nominal to more than 10000 members now. Some new members may be interested to work for IAPT at various capacities. EC members can think and take the decision in the next EC meeting.

h) Prof. Jogad said, it is a good suggestion, so that new members can have opportunity to work for IAPT. Prof. Nagaraju said there is no need to take the decision immediately. Prof. Ranjita Deka, Prof. Tyagi supported the suggestion. Prof. Ahluwalia asked whether he can be authorized to form a sub-committee. Members agreed and it was decided that President will form a sub-committee to look into the suggestions given by Prof. G. Venkatesh and in the next meeting we will bring it for discussion.

9. **Comments and suggestions on IAPT Dynamic Website (www.indapt.org.in) from the members:** Prof. B. P. Tyagi said the new website is very good and working fine.

10. **Actions and follow ups:**

a. *International Young Physics Tournament (IYPT):* Prof. Rekha G. informed that we had a meeting with Mr. Gyaneshwar, a school teacher from Dehradun. Prof. P. K. Ahaluwalia reported, it has very interesting format, which is open ended. 17 problems are declared in the beginning. Students have to choose a problem and work under the mentor. Selected students make a presentation at IYPT. Currently, Shashi Kumar, a teacher from Mumbai is managing the selection process which is not transparent. Hence IAPT must come forward, think of taking initiative to select students who represent the country. We can move forward in that direction. GS informed, in an earlier meeting some people have shown interest to get involved in this program. So we can form a group and move ahead.

b. *Students' ambassadors of IAPT:* We are working on this proposal.

c. *Publication of NCIEP Awarded Experiments:* Prof. Rekha Ghorpade informed, she along with Prof. Vijay

Soman have compiled the list of prize-winners up to 2021. Prof. Ananthkrishnan has provided the data from 2003 to 2007. The work is in progress.

d. *Lecture Series on PER:* Prof. Sapna Sharma briefed about Physics Education Research and its importance in teaching-learning. Organizing a lecture series on PER is an admirable idea of IAPT. It will be a valuable resource for anyone who is interested in improving on Physics Education. Valuable insights and methodology will not only help Physics but also other STEM fields. With the experience from renowned speakers, national and international, participants will gain deeper understanding of how students are learning Physics. It will help teachers more effectively to design curriculum which will give better outcome of teaching. We aim to get speakers from various fields. We are starting the series from this month only. Prof. Ahluwalia suggested, along with this lecture series we can think of publishing the lectures. He also said, such lecture series are welcome, we have to bring in people who are interested in conducting such programs. e.g. RC 07 has planned an online program on 'Revisiting Feynman Lectures' as a series through mentors especially for young faculty under Faculty Development Program, which will run over weekends in both online and offline mode.

e. *Lecture series on NCF*: It is an initiative of Prof. K N Joshipura, we intend to get speakers to talk on NCF and prepare suggestions for apex bodies such as NCERT, CBSE and UGC.

f. *Podcast on Physics Series* : IAPT has planned to start podcast on Physics lectures led by Prof. Govind Lakhotia from Maharashtra.

g. *Status of LUSI(Let Us Solve It)*: This Facebook page of IAPT is quite active. Prof. Ahluwalia, Prof. D. A. Desai, Prof. Meenakshi Sayal and other members are contributing regularly. Students and teachers are having good interaction. We have 1.3K members now. GS requested the members to visit FB page of IAPT-LUSI. https://www.facebook.com/groups/lusiiapt and become mentors, problem setters, concept clarifiers, dialogue initiators on different problems being sent by students. Prof. H. C. Verma gave his comments on LUSI-FB page of IAPT. He said, he liked the idea, however; we must see that it works well. He is also concerned about the misconceptions in the answers provided. He felt that it is a very big task, to look at the question, all the comments, answers given by the number of people, etc. His main concern is authenticity. Once it is made public, the responsibility is with IAPT to see that nothing wrong goes people.

h. *Status of RC Exemplar Award*: Prof, Rekha Ghorpade informed that we have formed a committee to frame the rules and guidelines for Exemplar RC award. We are ready with the guidelines and a poster with links for the RCs to apply.

i. *Google Group of NAEST Members and ANVESHIKA Coordinators*: Prof. H. C. Verma is requested to form a google group of Anweshika coordinators. He has agreed to do so.

j. *Lecture series on AI and Machine Learning*: Prof. Vandna Luthra has taken the initiative to organize a lecture series. We already had a lecture and will continue with more programs in this series. We also have a group of more people with Prof. Vandna as a coordinator.

11. **Proposals:**

a) *To establish National Problem-Solving Network of India (NPSNI)*: Prof. Meenakshi Sayal gave a proposal for National Problem-Solving Network of India to upgrade the quality of Physics teaching. Establishment of this network is to achieve efficient outreach throughout India and to pull and mobilize talent resources of teachers nationwide. Problem solving skills are essential in quantitative course like Physics.

Functions of NPSNI:

- To create topic-wise knowledge bank on basic concepts and related topics.
- To conduct workshops for teachers to prepare question banks.
- To conduct mock tests which will help to analyze strengths and shortcomings of individuals. This will all intellectuals on one platform to discuss and find solutions to the problems.

- It is envisaged that this will inculcate the habit of problem solving and help students to prepare for many competitive exams. Prof. Ahluwalia and many others appreciated the idea and accepted the proposal.

b) A series on Quantum Mechanics and Quantum technologies: Proposed to have a lecture series by eminent professors from various institutions.

c) Publication of NGPE experiments: As Prof. Anil Kumar is unwell, it was decided to discuss with Prof. B. P. Tyagi to find someone else to take up the responsibility.

d) Starting MOODLE quizzes for NEET, JEE, etc.: Delhi RC 01 has taken the initiative. They already had a workshop in collaboration with GEHU. This group will work with people from other RCs.

e) Interviews with IPhO and APhO medalists: Prof. P. K. Ahluwalia is planning to have interviews with IPhO and APhO medalists on our Zoom platform and will be uploaded on IAPT YouTube channel.

f) Convention of Stage Show: We have requested Prof. Jaswinder Singh to take the lead to organize a convention of Stage Show. IAPT members who are doing stage shows will be contacted. We have prepared a tentative list.

g) Women's cell of IAPT: GS informed that Women's cell of IAPT is formed. It was inaugurated by a panel discussion on 'Women in Science'. A talk by Prof. Prajwal Shastry, who has prepared Hyderabad charter for women's cell, will be organized on May 7, 2023 on zoom.

12. **Any other item with the permission of the chair:** There was no other item for discussion. However, President Ahluwalia gave his concluding remarks: The first EC meeting of the year is very important, as it sets an agenda for us to work in a year. He apologized for the delay in conducting the meeting. He said, we have covered a lot of ground in discussing various items. We are always ready to listen to members and RC's. If we don't listen to RCs, we cannot discuss and execute things. There is an International Conference of Women Physicists (ICWP) in the month of July organized by HBCSE, TIFR and IAPT is one of the endorsers to it. Participation is by nomination. President has nominated women from all parts of the country.

At the end President and General Secretary thanked the members sitting throughout the day for their patience and participation in the deliberations and the possibilities which internet is offering us. Special thanks to Prof. Akhilesh Tiwari, IIIT, Allahabad for creating the link for an uninterrupted meeting and providing the recording.

Rekha Ghorpade
General Secretary, IAPT

ANNOUNCEMENT

Indian Association of Physics Teachers
Notice: AGM

Date: July 31, 2023

We are pleased to inform all the registered Members of IAPT that as per our constitution Annual General Body Meeting (AGM) will be held on 9th October 2023 at 6 pm in Abhinandan Auditorium at the IAPT Convention Jaipur. All the registered members are requested to attend the same. No TA-DA for attending the meeting will be paid. You can contact the convention organizers for stay etc. If needed.

For registration click the following link:
https://forms.gle/XuuUoHJfRsu19TQz6

Rekha Ghorpade
General Secretary

FIRST STEP TOWARDS INTERNATIONAL OLYMPIADS

NATIONAL STANDARD EXAMINATION IN PHYSICS	: NSEP 2023 - 24
NATIONAL STANDARD EXAMINATION IN CHEMISTRY	: NSEC 2023 - 24
NATIONAL STANDARD EXAMINATION IN BIOLOGY	: NSEB 2023 - 24
NATIONAL STANDARD EXAMINATION IN ASTRONOMY	: NSEA 2023 - 24
NATIONAL STANDARD EXAMINATION IN JUNIOR SCIENCE	: NSEJS 2023 - 24

These are the only examinations that lead to participation of Indian students in the National and International Science Olympiads. No other examination is recognized for this purpose.

Organized by

INDIAN ASSOCIATION OF PHYSICS TEACHERS (IAPT)

206, Adarsh Complex, Awas Vikas - I, Keshavpuram, Kalyanpur, Kanpur-208017

Step II Toppers from these NSEP, NSEC, NSEB, NSEA & NSEJS from each State/Union Territory will be eligible for II stage i,e Indian National Olympiads (INOs) 2024 in respective subjects. For details see the website: www.iapt.org.in and the student's brochure.

Step III About 35 toppers in each of INPhO, INChO, INBO, INAO and INJSO will qualify for the Orientation Cum Selection Camp (OCSC) in respective subjects for about two weeks at Homi Bhabha Centre for Science Education (HBCSE), Mumbai. Indian teams to participate in International Olympiads -- 2024 will be selected on the basis of performance of students in respective OCSC.

In addition, about 8 toppers from INPhO may get an opportunity to participate in **Asian Physics Olympiad (APhO)**. The APhO will be held in May 2024.

Language: **Question Papers are in English, Hindi, Gujrati, Bangla, Tamil and Telugu or any Indian Language provided 300 students OPT for it**

Awards: Students attending OCSC will be awarded Gold medals and a merit certificate in all subjects. Certificates shall be awarded to Toppers (National & State) of Nationa Standard Examination.

Syllabus: NSEP, NSEC, NSEB: Upto CBSE class XII; **NSEA:** Physics & Mathematics upto CBSE class XII along with basic Astronomy; **NSEJS:** Physics, Chemistry and Biology upto CBSE class X.

Programme:

Centre registration: Aug 1, 2023 to Aug 20, 2023.
Student enrolment: Aug 21, 2023 to Sep 14, 2023

1. **Enrollment at Centre:** Pay fee to Centre In-charge.
2. **Direct Online Enrolment:** A student can enroll directly online at www.iapt.org.in; He/She will pay fee by online payment.

DATE AND TIME OF EXAMINATION: SUNDAY 26.11.23

NSEP : 8:30 AM to10:30 AM
NSEC : 11:30 AM to 1:30 PM
NSEB : 2:30 PM to 4:30 PM
NSEJS: 2:30 PM to 4:30 PM
SATURDAY 25.11.2023
NSEA : 2:30 PM to 4:30 PM

Fee Rs. 200.00 per student per subject

PREVIOUS 5 YEARS QUESTION PAPERS BOOKLET IN EACH SUBJECT IS AVAILABLE FOR Rs 100/- EACH FROM IAPT KANPUR (iaptknp@rediffmail.com)

Prof. BP Tyagi
Chief Coordinator (Examination)
23 Adarsh Vihar, Raipur Road,
Dehradun - 248001
Ph: 9837123716, E-mail: bptyagi@gmail.com
Visit Website: www.iapt.org.in

Dr. Anand Singh Rana (9412954316) NSE Coordinator
Dr. Vijay V Soman (9822107522) NSEJS Coordinator
IAPT Examination Office:
15, Block II, Rispana Road, DBS College Chowk, Dehradun-248001
Email: iapt.nse@gmail.com
Helpline: 9632221945, 9411190162, 8533993332

For all queries regarding the examination: Student may contact local centre in-charge else the Helpline.

NATIONAL GRADUATE PHYSICS EXAMINATION (NGPE-2024)

Conducted by

INDIAN ASSOCIATION OF PHYSICS TEACHERS

Registered Office : 206, Adarsh Complex, OPR 4, Awas Vikas-1, Keshavpuram, Kalyanpur, Kanpur - 208017
Web: www.indapt.org (Regd. No. K 1448)

Day, Date & Time of Examination SUNDAY, January 21, 2024
TIME : 10.00 AM to 1.00 PM

Last Date for Enrolment : 17th November 2023

Eligibility for Appearing in NGPE-2024 : Students of B.Sc. I, II and III (Pass, Hons. or Integrated) are eligible. (Any one who has already passed B.Sc. is NOT eligible)

Exam Information :

Registration Fee - ` 200 (Rupees Two Hundred Only)
Language for NGPE - English, Hindi, Gujarati, Tamil, Telugu or any other language if 100 or more Students opt for it.

Format for NGPE :

Part A : 25 MCQs with any number of options (1,2,3 or all 4) may be correct.
Credit is given only if all the correct options are marked (6 marks each; Total 150 marks)
Part B1 : 10 Short Answer (5 to 6 Lines) Questions (5 marks each ; Total 50 marks)
Part B2 : Ten Problems (10 marks each ; Total 100 marks)

Unique Features of this Examination :

- Fully voluntary examination in a stress free environment.
- Carry away the question paper both part A and part B.
- It provides Individual's own assessment at all India level.
- Same paper for all BSc I, II and III Year Students with separate national merit.
- Solutions in printed form are provided to Centre In-Charge for each participant.
- The only national level examination testing students in both theory & experiment.
- Previous Year (2023) Question Paper & Solution for every centre registered for NGPE - 2024.

CERTIFICATES AND AWARDS IN NGPE - 2024

(Cash Award will be released only if the candidate continues higher studies in Physics)

NGPE-2024 Awards

TOP 10% at Each Centre	:	Centre Topper Certificate
TOP 1% at State Level	:	State Topper Merit Certificate
TOP 1% at National Level	:	National Topper Merit Certificate + Book Prize
Top 5 Students in India	:	Merit Certificate + GOLD MEDAL + ` 20,000/- Cash Award

- Top 25 will be eligible for appearing in NGPE Part-C Examination - 2024 (an examination in experimental skill) for final selection for GOLD MEDAL and one time Scholarship (Max. 5 in Number) worth ` 20,000/- for pursuing higher studies in Physics. TA is paid and free lodging arranged.
- Top 25 will have eligibility for an interview for Admission in Post - B.Sc. Integrated Ph.D. Programme in Physical Sciences 2024 of S N BOSE NATIONAL CENTRE FOR BASIC SCIENCES. KOLKATA, (Only BSc III year students with more than 60% Marks)
  For more details must see website - http://bose.res.in/admission.htm or write email to admission@bose.res.in
- May get opportunity to attend one week EXPERIMENTAL PHYSICS WORKSHOP organized by IAPT AT KOLKATA (Regional Council - 15). TA is paid.
- Top 5 to 10 students of B.Sc. First year (of University 3Yr System) shall be eligible to participate in prestigious NATIONAL INITIATIVE FOR UNDERGRADUATE SCIENCE [NIUS] program of Homi Bhabha Center for Science Education, TIFR, Mumbai. [This is A Govt. of India, DAE Program organized at Mumbai].
- Top 20 students of B.Sc. I appearing in NGPE-2024 may get an opportunity for two weeks Academic Workshop on Basic Physics at IIT Guwahati (Preferably for those from University 3-yr B.Sc. System)
- Some more programmes for toppers may be declared later.

To obtain previous Ten Year Question Papers with complete solution deposit / transfer Rs. 150/- (One hundred fifty only) per set in IAPT account as per Bank details: Name of the account: Indian Association of Physics Teachers, Name of the bank : Central Bank of India, Branch : DBS College, Dehradun - 248 001, Account Number : 3750324600, IFSC Code : CBIN0283283. Then write a mail to iaptddn@gmail.com

FOR FURTHER INFORMATION : CONTACT

Dr Pradip Kumar Dubey
Coordinator NGPE
75, Bhagat Singh Marg, Opp. Shani Mandir, Dewas, Madhya Pradesh - 455 001
Ph: 9425059796,
Email: pradipkdubey@gmail.com

Prof B P Tyagi
Chief Coordinator (Examination)
23 Adarsh Vihar, Raipur Road, Dehradun - 248001 (Uttarakhand)
Tel : +91 135 4050260, 9837123716, 9632221945, Email: iaptddn@gmail.com

Local Contact
Tel : _____

NATIONAL COMPETITION FOR INNOVATIVE EXPERIMENTS IN PHYSICS (NCIEP) – 2023
IAPT CONVENTION, JAIPUR FROM 8TH TO 10TH OCTOBER 2023

Category	Participants	First prize	Second prize	Third prize
A	Teachers/scientists/science communicators/ Students pursuing M.Phil/Ph.D	Rs 7000/-	Rs 5000/-	Rs 4000/-
B	Students pursuing UG/PG course	Rs 7000/-	Rs 5000/-	Rs 4000/-
C	Students studying from 9-12 standard	Rs 7000/-	Rs 5000/-	Rs 4000/-

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

For category 'C' students can work under the guidance of a teacher.

submit the write-up of experiment as an email attachment (word & PDF file) to the coordinator at the email id: **nciepiapt03@gmail.com** in the following format: ***Times New Roman, font size 12, line spacing1.5, justified, sufficient margins on all sides. It should contain title of the experiment, abstract of the experiment (not exceeding 300 words), detailed theory with necessary diagrams, procedure, observations, calculations, graphs, results and references. There is no limit for the number of pages. The participant should not write his / her name, name of college / school, etc. anywhere..***

Selected entries from each category will be invited for demonstration at the 37th IAPT convention.

The invited participants will be paid sleeper railway fare from work place to convention place

Please feel free for any query at e mail **nciepiapt03@gmail.com**

The abstracts of all the selected experiments will be published in IAPT bulletin after the competition. IAPT bulletin has ISSN number 2277-8950. Closing date to receive the entries is 30th August , 2023.

All participants after submission of the experiment, register at the following link https://forms.gle/fF61yAiwK8cLQzn1A

Dr Geetha R S
National Coordinator, NCIEP
(m) 8088812890
You can also WhatsApp
E mail : **nciepiapt03 @gmail.com**

The Story Of Cosmology Through Post Stamps 56

FACTS ABOUT THE SUN

SOLAR ECLIPSE

Solar eclipse occurs when the New Moon moves between the Sun and the Earth, lying in the same plane, blocking out the Sun's rays and casting a shadow on part of the Earth. There are four different types of solar eclipse: Partial Solar Eclipse, Annular Solar Eclipse, Total Solar Eclipse and Hybrid Solar Eclipse.

Stamp with tab-show Solar Prominence during total solar eclipse. **Tab** -illustrate geometric alignment of Sun, Moon and the Earth during Eclipse

Corona, an aura of plasma as seen during total solar eclipse.11 Aug. 1999. ***Corner of stamp*** -depict four stages of Eclipse

Partial solar eclipse

Total solar eclipse

Third contact creating Baily Beads as first light shine through mountains and valley of moon

Solar prominence is dens cloud of gas projected above the limb of the Sun

Stars visible in sky during total solar eclipse

Total solar eclipse and the path of shadow traced though the country

Coronal Streamers and the black disc of moon covering sun. Tag depict the path of shadow across the country

Postal Regd. No. Kanpur City-28/2021-23 Date of printing 02-08-2023 Date of posting 08-08-2023 RNI No. UPENG/2009/29982

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Dr. Sanjay Kr. Sharma

Managing Editor

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