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An international team of astronomers using NASA's James Webb Space Telescope has obtained an in-depth inventory of the deepest, coldest ices measured to date in a molecular cloud. In addition to simple ices like water, the team was able to identify frozen forms of a wide range of molecules, from carbonyl sulfide, ammonia, and methane, to the simplest complex organic molecule, methanol. This is the most comprehensive census to date of the icy ingredients available to make future generations of stars and planets, before they are heated during the formation of young stars.

This image from the telescope's Near-Infrared Camera (NIRCam) features the central region of the Chamaeleon I dark molecular cloud, which resides 630 light-years away. The cold, wispy cloud material (blue, center) is illuminated in the infrared by the glow of the young, outflowing protostar Ced 110 IRS 4 (orange, upper left). The light from numerous background stars, seen as orange dots behind the cloud, can be used to detect ices in the cloud, which absorb the starlight passing through them.

(https://www.nasa.gov/image-feature/webb-unveils-dark-side)

The Story Of Cosmology Through Post Stamps 32

THE NEW VIEW OF THE SKY

SOLAR SYSTEM -JUPITER AND SATURN

Set of six stamps (on FDC) depicting some significant features of various bodies of Solar System as photographed by robotic probes during their fly by.

1-Particle ejected from the solar surface seen by SOHO.
2-Cloud on the southern hemisphere of Venus, seen by Venus Express
3-Ice within impact crater photographed by Mars Express
4-The asteroid's cratered surface seen by Rosetta probe
5-The gas giant Saturn and its sun lit rings seen by Cassini
6-Large moon of Saturn on which Huygens probe landed on 2005

Jupiter has 79 known moons largest one is Ganymede

Seen by Hubble, Jupiter, lack well define solid surface. Due to rapid rotation, shape is oblate Spheroid

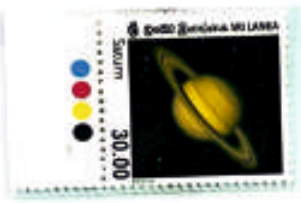
A gas giant, shown are atmospheric features- Great Red Spot and coloured belt

Airmail Stamp—depict mythology of abduction of Ganymede by Jupiter

Greek deity Zeusz-Jupiter is named after Zeusz

Artist imagination of Saturn

It is a gas giant with 82 moons



Its important feature is Ring System

BULLETIN OF
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Professor YR Waghmare: A Remembrance

IAPT has lost a friend, philosopher and guide in the passing away of Professor Y R Waghmare. A great teacher, researcher and educationist he steered IAPT to achieve its potential as President of IAPT in difficult times. A researcher who rubbed shoulders with Noble laureates had an iconic personality with a permanent smile gleaming his face. An easy to approach person, his talks always inspired listeners. He was master story teller with physics interwoven beautifully in the narration. A prolific author of text books in core areas of Physics, he made sure that Indian physics students get best books to learn physics at affordable price and of best quality. As the tributes started pouring in of his demise on the WhatsApp group, a flood of tributes followed showing how IAPTIANS respected him and loved him.

I had the opportunity to first meet him in Lucknow Convention, when he was President IAPT. As I write this many memories of Professor Waghmare's presence vividly come in front of my eyes. I can see his picture in front of me with Professor Arvind

Kumar of HBCSE and Professor HS Virk talking about the role of Physics Education Research and its role in addressing conceptual gaps in students learning of different topics.

On my election to the post of President, he sent me a beautiful e-mail underlining the pivotal role played by the duo of President and the General Secretary and offered to help us in whatever way we desired. When I telephoned him to seek his blessings after assuming charge as president of IAPT he gave valuable tips to strengthen IAPT about initiating programs, raising the number of members from untouched areas and using IT to broaden IAPT'S reach and depth. He was very particular about the financial resources of IAPT and stressed the need to have enough to run our star programsfrom endowments. His advice was, do not worry in reaching out to corporate sector for endowments to bring permanence in the programs of IAPT at both central and regional councils. An advice which can help flourish the role of physics teachers and hence its students at all levels. He was also very emphatic in saying IAPT needs young blood with mentoring by senior colleagues.

IAPT will always remain indebted to Waghmare Sir for his contribution in fulfilling its objectives in changing learning environment. He was a benefactor of Physics Education, Physics Teachers and Physics Students who worked for it wholeheartedly till his last breath. On behalf of IAPT and my own behalf I offer heartfelt condolences to his family and extended family of his students and colleagues spread all over the world.

We pray to the God to give his family strength to bear this unbearable loss. We will always cherish his lofty ideals and touch of belonging to us. We will miss you Professor Waghmare Sir!

Professor PK Ahluwalia
President
27/01/2023

PHYSICS NEWS

The first experimental bosonic stimulation of atom-light scattering in an ultracold gas

Bosons are one of the two fundamental classes of particles. When bosonic particles are transitioning into an already occupied final quantum state, the rate of this transition is enhanced by its so-called "occupation number," an effect known as bosonic stimulation.The appearance of bosonic stimulation in light scattering processes was first predicted over three decades ago. Researchers at the MIT-Harvard Center for Ultracold Atoms have recently observed bosonic enhanced light scattering in an ultracold gas for the first time.

To conduct their experiment, Lu and his colleagues prepared an ultracold cloud of 23Na gas at a high density. They found that scattering of photons was already enhanced before the system transitioned into a Bose-Einstein condensate (BEC).

The team's observations clearly demonstrate how quantum statistics and interactions can modify the optical properties of a Bose gas.In their next studies, the researchers also hope to use light scattering to characterize strongly interacting systems.

Read more at:https://phys.org/news/2023-01-experimental-bosonic-atom-light-ultracold-gas.html

Original paper: Nature Physics. DOI: 10.1038/s41567-022-01846-y

Active matter theory explains fire-ant group behaviour

The fire ant, a hymenopteran with a high reproductive and dispersal ability, has been used as a reference model for studying active systems at high density. Under different conditions, the ant collective experiences what is known as activity cycles: the group of ants' changes back and forth from a situation where many ants are stationary, to a situation in which practically all the ants are moving.In nature, the collective mode of fire ants can be seen under different conditions. These insects, which come from an area with abundant rainfalls and floods, have evolved to overcome these extreme episodes through these activity cycles.The variations in ant aggregation state have implications in the material properties.In attraction-dominated phases, the behavior was similar to that of an elastic solid. In active phases, the community reorganizes itself at the particle level to somewhat flow as a liquid.

Read more at: https://phys.org/news/2023-01-theory-fire-ant-group-behavior.html

Original paper: Nature Communications. DOI: 10.1038/s41467-022-34181-0

Photonic hopfions: Light shaped as a smoke ring that behaves like a particle

We can frequently find in our daily lives a localized wave structure that maintains its shape upon propagation. They can be made resilient to perturbations. This is known in mathematics and physics as topological protection.

Recent studies of structured light revealed strong spatial variations of polarization, phase, and amplitude, which enable the understanding ofand open up opportunities for designingtopologically stable optical structures behaving like particles. Such quasiparticles of light with control of diversified topological properties may have great potential, for example as next-generation information carriers for ultra-large-capacity optical information transfer, as well as in quantum technologies.

This newly developed model of optical topological hopfions can be easily extended to other higher-order topological formations in other branches of physics.The optical approach proposed in this work may provide a deeper understanding of this complex field of structures in other branches of physics.

Read more at:https://phys.org/news/2023-01-photonic-hopfions-particle.html

Original paper: Advanced PhotonicsDOI: 10.1117/1.AP.5.1.015001

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DID A FEW UNREPLIED LETTERS CHANGE THE COURSE OF EINSTEIN'S CAREER?

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Albert Einstein does not need any special introduction. His distinction lies in the fact that his contributions not only revolutionized physics but also the thought processesforthe generations to come. The way he underlined the constancy in the velocity of light in all frames of reference irrespective of the motion of the observer in his Special theory of Relativity (STR, 1905)or the way the gravity was interpreted as a space-time curvature in the vicinity of a mass in his General Theory of Relativity (GTR, 1915-16) were all not only very unique but were iconoclastic all the way. And all these concepts first impacted the world of physics in a big way and then the philosophical process of human being, big or small.

We know Einstein began this journey in 1905 when he was not a part of the academic edificebut was a 26-year clerk in the patent office at Bern, Switzerland and was so to speak 'far from the madding crowd' of the community of the leading scientists. The astonishing contribution of Einstein in the understanding of quite a few scientific phenomena, in that single year was mind-boggling. He not only came up with the STR, but wrote path-breaking papers on the explanation of Brownian motion, mass-energy equivalence and the explanation of the observations of the characteristic photoelectric effect using the quantum theory.And the last one found place in his Nobel citationfor his Nobel Prize in Physics of 1921 (announced in 1922). All these led historians to identify that year (1905) as the 'Annus Mirabilis' (A Miracle Year) in the life of Albert Einstein.

All these are well known. But if we look back only by four years from 1905, to be precise if we focus our attention to the months of March and April of 1901 something very interesting comes to light. Albert was barely 22 years old and has just come out of the Zurich Polytechnic School. At that time, it was officially known as '*Eidgenössische Polytechnische Schule',* and this was actually a forerunner of today's ETH, Zurich that came into being in 1911. ETH, Zurich and is now one of the premiere universities of not only Europe but in the world. Einstein graduated from the Zurich Polytechnic with physics and mathematics in March 1901.

He immediately found himself in need of a job as his family was not in a position to provide him further financial support. And that was not all. He was in deep love for her only female classmate Mileva Marich who came from a place that is today a part of Serbia. They were planning to get married. Albert's family at that point of time was living in Milan, Italy. Einstein went to Milan after completing his degree in Zurich but soon could know that his family was going through financial hardship and was not in a position to support him. That led him to write a couple of letters to a few scientists who were reasonably established at that time in their respective fields.

He wrote his first letter to Wilhelm Ostwald who was a German speaking chemist and came to Leipzig. He was born in the present-day Baltic nation of Latavia and his university years were passed at Estonia. He received the following letter from Albert Einstein that he wrote on March 19, 1901. The letter is given below.

92. TO WILHELM OSTWALD

Zurich, 19 March 1901

Esteemed Herr Professor!
Because your work on general chemistry inspired me to write the enclosed article, I am taking the liberty of sending you a copy of it. On this occasion permit me also to inquire whether you might have use for a mathematical physicist familiar with absolute measurements. If I permit myself to make such an inquiry, it is only because I am without means, and only a position of this kind would offer me the possibility of additional education.
Respectfully yours

Albert Einstein
Via Bigli 21
Milan
Italy

My son therefore feels profoundly unhappy with his present lack of position, and his idea that he has gone off the tracks with his career & is now out of touch gets more and more entrenched each day. In addition, he is oppressed by the thought that he is a burden on us, people of modest means.

Since it is you, highly honored Herr Professor, whom my son seems to admire and esteem more than any other scholar currently active in physics, it is you to whom I have taken the liberty of turning with the humble request to read his paper published in the Annalen für Physik and to write him, if possible, a few words of encouragement, so that he might recover his joy in living and working.

If, in addition, you could secure him an Assistent's position for now or the next autumn, my gratitude would know no bounds.

I beg you once again to forgive me for my impudence in writing to you, and I am also taking the liberty of mentioning that my son does not know anything about my unusual step.

I remain, highly esteemed Herr Professor, your devoted

Hermann Einstein

Ostwald and in fact, Einstein did not receive any reply from Ostwald.

Naturally the question comes up why did Ostwald behave like that? Since we do not have any direct source to explain the approach of Ostwald, we can look for some indirect reason. Now we know that Ostwald received one more letter from Einstein immediately after this letter. But that was not written by Albert but by Hermann Einstein, father of Albert. In this letter Hermann could be seen as a quite disturbed person who on one hand did not have much resources to support his young son and on the other hand was worried about him rightly gauging that his son is a talented one and needs a break to pursue his interest in science, particularly in physics and mathematics. This letter is produced below.

99. HERMANN EINSTEIN TO WILHELM OSTWALD

Milan, 13 April 1901

Esteemed Herr Professor!

Please forgive a father who is so bold as to turn to you, esteemed Herr Professor, in the interest of his son.

I shall start by telling you that my son Albert is 22 years old, that he studied at the Zurich Polytechnikum for 4 years, and that he passed his diploma examinations in mathematics and physics with flying colors last summer. Since then, he has been trying unsuccessfully to obtain a position as Assistent, which would enable him to continue his education in theoretical & experimental physics. All those in position to give a judgment in the matter, praise his talents; in any case, I can assure you that he is extraordinarily studious and diligent and clings with great love to his science.

This has been included in the collection of the communications of Albert Einstein (please see ref no 2) though strictly speaking this was not a letter either written or received by Albert.

This letter might have made Ostwald a bit disgusted. He, it appears did not like the appeal from Hermann to show some favour to his son at that point of time. Interestingly Hermann in this letter has talked in much more details about Albert, his academic qualifications and his financial position. Hermann has pleaded for an Assistant's position at Ostwald's lab. That way Albert was brief and candid. Moreover,around the same time, may be within a day or two, Ostwald received a second letter from Albert. This letter, it appears was like a mild reminder albeit in a circuitous way and that also might have caused displeasure of Ostwald. This letter, like the one written by Hermann was actually from Milan and possibly from the same address.

95. TO WILHELM OSTWALD

Milan, 3 April 1901

Esteemed Herr Professor!

A few weeks ago I took the liberty of sending you from Zurich a short paper which I published in Wiedemann's Annalen.

Because your judgment of it matters very much to me, and I am not sure whether I included my address in the letter, I am taking the liberty of sending you my address hereby.

Respectfully, yours truly

Albert Einstein
cand[idatus] phys[icae]
Milan
Via Bigli 21

One can see that Albert was impatient like any other 22-year-old in search of a suitable position in the scientific edifice. He was possibly expecting a positive reply from Ostwald and wrote another letter underlining his address of Milan. But in the first letter it was very much there though Albert wrote that letter from Zurich. Moreover, one can see that considering those days of postal mails Albert did not provide adequate time to Ostwald to reply his first letter. In a way this shows that Albert was getting impatient.

With his training in physics and mathematics Albert actually wanted to have some sort of an assignment that would involve teaching, theory or experiment. However, at the same timehe was not averse to other possibilities that would essentially provide him with an opportunity of earning. Albert began his search for suitable positions immediately after he got his results and grades from Zurich Polytechnic. He did very well in Physics and mathematics and actually came first among the total six students of his batch.

It is interesting to note that Ostwald went on to develop a very good relationship with Albert Einstein most probably after 1905, when Einstein published four very famous papers not only to change the face of science but also the though process of the scientific community. It appears that Einstein's paper on the explanation of Brownian motion drew the attention of Ostwald as he was a chemist. Ostwald went on to win the Nobel prize in Chemistry in 1909. That automatically gave him a right to send nominations for physics and chemistry Nobel Prize as per the guidelines in vogue at that time. In fact, in the very next year, he exercised his right and nominated Einstein for Physics Nobel prize andTheodore Richardsof USA for the chemistry Nobel. Incidentally that was the first nomination for Nobel Prize in favour of Einstein. Ostwald once again nominated Einstein in 1913. And Theodore Richards eventually became the first winner of Nobel Prize from USA in 1914.

The 1901 was a stormy year for Albert. He was in love with Mileva Marich from Serbia. Mileva was the only girl student in the group in Zurich Polytechnich in the batch of six students along with Albert. This group had Mileva Maric from Serbia as the only girl student. And she was an exceptional woman as she was only the second lady in entire Europe to pass out as a graduate with Physics and mathematics from an institution of higher education. Incidentally, the facts that Albert and she were in love from their student days, her giving the birth of a daughter fathered by Albert before their formal marriage in 1903and Mileva and Albert's subsequent divorce in 1914, and Einstein's transfer of the Nobel Prize money to her as the part of a commitment made by Albert at the time of divorce are possibly highlighted more. Of course, some historians argue that Mileva had significant contribution in what Einstein did particularly in 1905 when she was his wife. This is once again a debated issue and has not been taken up for the present discussion.

The story of the possibility of Albert Einstein's picking us a career different from what he actually pursued does not end here. In fact, in April 1901, virtually in the same breath Albert also wrote a letter to Dutch physicist H Kamerlingh Onnes. Once again this was a query if there would be any opening of the position of an assistant in Onnes' laboratory at Lieden University at Netherlands.He of course here also included his published paper with the letter.

98. TO HEIKE KAMERLINGH ONNES

Milan, 12 April 1901

Esteemed Herr Professor!

I have learned through a friend from college that you have a vacancy for an assistant. I am taking the liberty of applying for that position. I studied at the department for mathematics and physics of the Zurich Polytechnikum for 4 years, specializing in physics. I obtained there my diploma last summer. Of course, I will make my grade transcripts available to you with pleasure.

I have the honor to submit to you by the same mail a reprint of my article that has appeared recently in Annalen der Physik.

Respectfully,

Albert Einstein

We should not forget that KamerlinghOnnes was a Professor of Experimental Physics and he went on to win the 1913 Nobel Prize in Physics for "for his investigations on the properties of matter at low temperatures which led, inter alia, to the production of liquid helium". Yet Albert felt applying for a position to the lab of Professor Onnes and he actually came to know about a vacancy in the lab from one of his friends. He mentioned this in the letter written on April 12, 1901 from Milan, Italy. Once again, this letter did not fetch any reply and another possibility of Albert of entering a first-gradeexperimental physics lab went in vain. Had he been taken in by Onnes, as an assistant he might have compelled to shift his interest in experimental physics and we would have lost the Albert Einstein we know today.

These two letters and the letter from Hermann Einstein to Wilhelm Ostwald were very significant as those could have changed the course of academic life of Einstein had there been any offer from either of them to Albert. Albert was so eager to have an assignment commensurate to his academic background that he actually went on exploring the other possibilities. However,possibly at very early May 1901 or may be, in late April he received some encouraging communication from Switzerland. It was not from the scientists he wrote for a position in their labs but a letter from an Institute (Technikum Winterthur) in Switzerland with an offer to teach mathematics at that

Institute for two months starting from May 15, 1901. Winterthur is another town in Zurich canton about 24 km away from Zurich. The concerned teacher was going for military training and would not be available during that period. We find that he reveals this information in a letter (written on May 03, 1901)to Alfred Stern (Ref. 5) a Professor of History at Zurich and a much senior person but had a very friendly relation with Albert. Possibly Professor Stein was instrumental in getting this offer for Albert.

For Albert Einstein it was an important break. After he took over this assignment he never looked back and began his journey to give shape to his own ideas. In 1901 he took up the Swiss citizenship that he preserved all along his life. And in 1902 he got a job in the patent office at Bern. It was the place where the Annus Mirabilis in the life of Einstein ushered in 1905. And the rest is history.

References:

1. Letter to Wilhelm Ostwald from Albert Einstein Volume 1: The Early Years, 1879-1902 (English translation supplement) Letter no 92 p 159
2. Letter to Wilhelm Ostwald from Hermann Einstein Volume 1: The Early Years, 1879-1902 (English translation supplement) Letter no 99 p 164
3. Letter to Wilhelm Ostwald from Albert Einstein Volume 1: The Early Years, 1879-1902 (English translation supplement) Letter no 95 p 162
4. Letter to Heike Kamerlingh Onnes from Albert Einstein Volume 1: The Early Years, 1879-1902 (English translation supplement) Letter no 98 p 164
5. Letter to Alfred Stein from Albert Einstein Volume 1: The Early Years, 1879-1902 (English translation supplement) Letter no 104 p 168

These letters are available from the website of Princeton University (Collected papers of Albert Einstein)

https://einsteinpapers.press.princeton.edu/vol1-trans/181?printMode=true

To our readers

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A MENTORING-CASCADE MODEL FOR IAPT ACTIVITIES

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In-service training of teachers is an issue of national concern for India. That it is also an international concern is reflected by the UNESCO document on teacher training (Fundamentals of Education Planning 84, 2007).

Various initiatives for teacher development and quality improvement of education are being undertaken worldwide. India is trying out a massive exercise of improving the quality of primary education. It is continuously allocating and spending a sizable budget on in-service training of its school teachers.

At the higher education level there are also concerns expressed about the quality of instruction and the out put of the education.

The traditional model adapted in the Indian situation is the Top-down Cascade Model (TCM). This model attempts in effecting changes through a cascading sequence of trainings with marginal or nil follow-up.

In Mentoring-Cascade model there is a cascade of long term mentorship. Mentoring cascade starts with a core group (Chief Mentors) and a support group (Consultants). There is a long term mentorship relation between the various cascade levels. Depending on the total size of the trainee group the number of mentoring cascades will change.

Mentoring involves a reasonably close relationship between two individuals (Mentor and Mentored) where there is a lot of mutual learning and long term contact with a need based frequency. It has a more experienced partner (Mentor) and one or more junior partners practicing certain (similar) profession. Mentoring the belief systems and assessing the skill systems of the mentored is the most crucial component of the mentoring processes.

The time demand on the mentor for mentoring varies, depending on the situation, from about 30 minutes a day to a few hours in a day. Our wide experience has shown that the actual input time required by the junior, while mentoring a group of about 10-15 juniors, is generally less than an hour in a day.

This time demand is principally for taking a review of the tasks, diagnosing obstructions to performance (including attitudinal components) and providing remedial on task training. Going by building one or two skills at a time over a period of a week or two, it takes around two years time to build competencies to the required threshold level.

The skills required for effective mentoring can be broadly summarized as below

1. Clear perception of what constitutes breadth and depth of understanding of a subject topic and working command on subject
2. Good time management – uniform high score on planning, logging, implementing and evaluation
3. Good communication management – uniform high score on, planning, listening, persuading, scheduling
4. Good interpersonal abilities – accepting and inviting cooperation, thick skin, taking criticism constructively, giving due credits and general leadership skills
5. Good resource management ability – identification, development, deployment and documentation of multiple resources - financial, subject, skill, infrastructural resources

6. Good documentation ability -
7. Diagnostic ability in assessment of performances – knowledge of skill-performance relationships including emotional skills zone
8. Belief that attitudes are an outcome of past experiences and that attitudes change slowly with the acquisition of newer consistent experiences
9. Belief that commitment gets built through consistent experience and all individuals are capable of lifelong improvement
10. Belief that no teacher wants students to under-perform

Tools like questionnaires, interview and group tasks are readily available for the use of mentors. Some specific tools can be developed as per the requirement of the IAPT program needs.

A good quality mentoring program will be of definite help in expanding the membership base.

A suggested mentoring cascade model for reaching about 40,000 teachers and the process for implementing such a model is outlined below. The model can be utilized for various activities of IAPT that require substantial capacity building. It is suggested that IAPT should model quality enrichment of junior college students, UG students and school students using the Mentoring-Cascade Model (MCM).

600,000 = 40,000 * 15 students expected beneficiary group of students

40,000 target trainees – Last level of mentoring cascade

8000 target trainees – last but one level of mentoring cascade

800 target trainees – 3rd level of mentoring cascade

100 target trainees – 2nd level of mentoring cascade

20 persons, Main Mentoring Group – 1st level of mentoring cascade

6 persons - Core project monitoring committee

The Core Project Monitoring Committee (CPMC) will be constituted by IAPT executive committee. Suggestions for inclusion of persons in the Main Mentoring Group (MMG) will be done on basis of the recommendations of the project monitoring committee. Each member of the MMG will use the tools for themselves and create a self-analysis log, on basis of which peer mentoring will take place between the MMG members and the CPMC. Use of Google or Yahoo discussion forums will also be made for this purpose.

Each member of the MMG and the CPMC will recommend the names of the individuals for the 2nd level of the mentoring cascade. These individuals may be from outside the IAPT membership. Those non-members who are recommended for 2nd level of MCM will be requested to become IAPT members.

The geographical spread of the group being mentored by a mentor becomes restricted as we move up in the model.

The names of individuals in the next level of mentoring cascade are recommended by persons from the previous mentoring cascade levels. Thus, the names for the 3rd mentoring cascade will be recommended by mentors from the 1st and 2nd levels. The individuals invited to join a mentoring level undergo gradual self-evaluation as well as evaluation by the mentor for appropriate inputs.

Activity Based Lectures

Lecture-1

Organized: UGC-HRDC, HyderabadUniversity

Anchored by Dr Mary Anthony, Botany **Platform:** Zoom Meetings

Date: 2 Nov 2022 **Time:** 2- 5.15pm

No. of teachers: 55 **Participants of Professional Development Program**

Topic: Observe, Analyse and Recreate

Resource Person: Sarmistha Sahu

No dearth of events, actions, nature, objects all around to observe. Everyone perceives and reacts differently. Some delve deep into its meaning, significance and weave their own knowledge around it. That is what the teachers were encouraged to do. Observe, observe, observe intently, and create complex pictures from a simple one! Bring forth the deeper meaning and add to your library of knowledge. That's how a child learns too.

Activities and understanding of them lead to their realization of science process skills. An online activity enthused the whole group to interact and share with each other. A rich heritage was rediscovered and put to practice there and then.

A classroom teaching style evolved from the discussion. Here are a few voices quoted -

Dr Debashish Dey, Biotech: " genes explained with moving train - chain-pulling- slow down and dna-inhibition."

Dr Sasi Kumar, Criminology: " victim-offender-facilitator understanding observing a robbery-loss- commits a crime but repairs the losses due to irresponsibility …..

Almost half of the group interacted, questioned, answered, and promised to take back all that they gained, to their classrooms at the Universities. The outcome of the session was achieved.

Lecture-2

Organized by: UGC-HRDC, Osmania University

Anchored by Dr Shubhamoy Ghatak, Physics, Kolkata

Platform: Google Meets **Date:**27 Dec 2022 **Time:** 2- 5.15pm

No. of teachers: 35 **Participants of Professional Development Program**

Topic: Watch, Learn and Interact

Resource Person: Sarmistha Sahu

To construct knowledge from what you observe, reflect, add to the existing knowledge and multiply, is the instinct of human beings. Why shy away from it. It can be the pedagogy in a classroom.

A teacher group from pan-India realized it and adapted it immediately. Videos and pictures were enough to deliberate and deliver. Interaction and inclusiveness was the basis. With the initial starting problem, the group thrashedout ways and means to make one's class interesting, engaging, exploratory and expansive.

A classroom teaching style evolved from the discussion. Here are a few voices quoted

Question of Dr. Shravanthi C, Chemistry teacher from AP: "Why do you use a pressure cooker in your kitchen?" And the students understood the concept of temperature increase with pressure increase. Her topic of Clausius

Clapeyron relation was explained by her student not the teacher. Teacher Facilitates, students *learn* on their own.

Dr Narasimhulu, Applied Maths taught Fibonacci Series with his fingers--- 'my hands have **one** left thumb and **one** right thumb, adds to **two** bones in each thumb, 1+2 is **three** bones in the rest of my fingers, the sum of 2 and 3 equals **five** fingers in each hand, we have four fingers in left and four fingers in the right hand all facing in the same direction, totally **eight…..**

I don't think the students will ever *forget* the Fibonacci series 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, …….. ... F0 = 0 and F1 = 1.

Dr Nixon Azaru, a multidisciplinary teacher explains 'free energy of a system' with a simple analogy- 'in a election meeting 4000 people are present listening intently to the contestant of the election, but only a few hundred were free to vote'.

Teachers allow multiple interpretations and expressions of learning, for students to learn from them.

Some teachers encourage group work and the use of peers as resources. This is clear from a geography Prof, Dr Jenny Leivang's episode, "students identify the location of mountains and rivers and plateau in the empty map on the blackboard, from one another ", she is only an onlooker.

Learning activities arouses interest among the students. Quantum Mechanics is tough, yet particle trapped in a well is enacted by a boy in the classroom for his friends to nod in agreement. "My job is done," says Dr B Masood Valli, a Physics Professor.

Students are not blank slates upon which knowledge is etched. "No, no, given one assignment to study one country, they come back with details of very many other countries", says Tourism teacher, Dr Shiva Mahakrishna.

Dr Shubhamoy's elaborate introduction had prompt precis at the end of the whole proceedings was surprising and soothing.

In conclusion, Constructivist teachers pose questions and problems, and guide students to find their own answers!

The group participated whole heartedly all through the three-hour-session and expressed their satisfaction profusely.

Sarmistha Sahu
Secretary

REPORT(Anveshika –Jaipur)

Anveshika Workshop

"SCIENCE IN SECONDS"

Organised by: St. TERESA'S School Mansarovar, Jaipur, Rajasthan

Date:10th & 11th, December 2022 **Time:** 9 am to 3 pm on both days

No. of participants: 900 + students from 15 + School of state.

In association with anveshika Jaipur the department of physics St TERESA'S School Mansarovar, Jaipur organized a two days workshop "SCIENCE IN SECONDS" based on fun of doing experiment. The students, faculty members and science lovers accorded a warm welcome to the resource person Dr. G.S.Menaria. The program started with the inaugural address by Rev Sr. Juicy, superior General in dignified presence of Rev Sr Sushama, Rev Sr Neelima, principal St Francis School Bandikui , Head Department of physics of various schools. Rev Sr. Jommy Principal of the school, delivered a talk on significance of experimental learning in science. Students of St. Anslem's Mansarovar, Army public school, Evolution international school, St Paul's School, Morning Star, Subodh school, St. Angela Sophia ,Birla school and others enjoyed physics in joyful way.

Seven sessions each of about 60 students per day were taken, where demonstration on the concept of physics were performed. The presentation were from topics related to the curriculum.

Through demonstration, Dr. Menaria motivated students to give more stress upon learning by doing in their laboratories. Looking into various concepts of mechanics, optics & electromagnetism through demonstration was really an awesome experience for the students. 35 demonstrations were performed in the workshop. The workshop was highly interactive and responsive.

The students, parents and dignitaries were highly impressed with the overall format and the way of explaining concept by the resource person.

The event was coordinated by Mr Binnu, Mr Prince and Mr Kevin . Student coordinator Miss Eishwarya, senior student Aviral, Aayush ,the vote of thanks was given by Mrs Jibby

G S Menaria

REPORT (RC-02)

Celebrating the World Science Day

Topic: Demonstrating various physics principles in playful way

Resource Persons: Dr K S Mann and Dr Gurpreet Singh, Dept. of Physics, DAV College, Bathinda

Date and time: 11am on 11/11/2022 **Venue:** Innovation-Hub, DAV College Bathinda

Sponsored by: DBT Star College Scheme and IAPT (RC-02)

Participating Departments: Physics, Chemistry, Zoology, Botany& Mathematics

Beneficiaries: 48 Students & 16 Teachersof neighbouring schools

Under the banner of an outreach activity of DBT-Star Scheme on the eve of the World Science Day, about 26 physics concepts were demonstrated to students and teachers of neighboring schools. The students of 9th to 12thclasses enjoyed this activity. The teachers took keen interest in the activity. Four distinguished science-mentors namely Mr. Jatin Sethi, Mr. Jagdeep Singh, Mr. Sarabjeet Singh and Mr. Manish Gupta from Goniana, Talwandi Sabo, Bhagta and Sangat Blocks, respectively participated in the event.The event organized with an aim to inculcate students interest in science practicals and to motivate them for pursuing higher studies in life-sciences. The event concluded with a feedback session and by proving a link to the YouTube channel (bit.ly/Ch_I) dedicated to provide quality Physics Education.

K S Mann

REPORT (RC-02)

Webinar-Cum-Training

Topic: MS-Excel for Practical-based Simulations

Resource Persons: Dr. Vijay Bhat, Associate Professor, Institute of advanced computing, SAGE University, Indore, Madhya Pradesh.

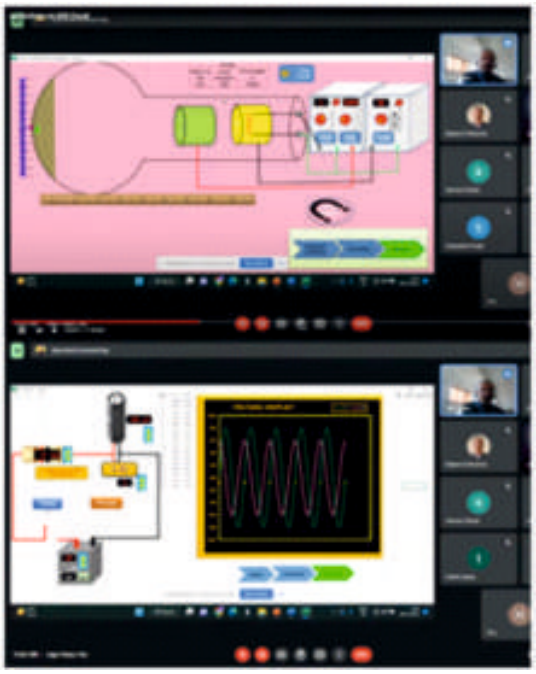
Date and Time: 30/11/2022, at 11am **Venue:** Computer Lab-II, DAV College Bathinda

Sponsored by: DBT Star College Schemeand IAPT (RC-02)

Activity Incharge: Dr Kulwinder Singh Mann (Assistant Professor in Physics)

Participating Departments: Physics, Chemistry, Computer Science& Mathematics

Beneficiaries: 64 Students & 12 Teachers



Under the banner of practical training activity of DBT-Star Scheme, a webinar-cum-workshop was organised by the department of physics, DAV College Bathinda. The webinar aimed to elucidate the use of Microsoft Excel in creating simulations for various experiments in physics. Simulations provide an alternate way of performing lab experiments when physical equipment is unavailable or difficult to set. Sometimes, it provides better observations than physical experiments, as there is greater liberty in deciding the variables of a particular experiment. This may not be the case in actual experiments due to mechanical constraints. It helped the teachers to learn this technique to illustrate various concepts in physics. Students also found the content of the lecture very informative. Active participation was seen in the interactive session by students and faculty members. The webinar was attended by around 60 students of various educational institutions. Principal (Dr.) Rajeev K. Sharma welcomed the guest and stated the importance of MS Excel for science students in various measurements and data analysis. Prof (Dr) P. K. Ahluwalia, president of IAPT was present during the webinar. He congratulated the resource person and physics department for organizing this activity. Dr. Kulwinder Singh Mann, Co-ordinator DBT STAR College Scheme, inaugurated the programme while Dr. Gurpreet Singh, HoD, introduced Dr Vijay.Technical support was provided by Dr. Vikas Duggal. Ms. Harpreet Kaur Brar thanked the resource person and participants for very informative and interactive session.

K S Mann

REPORT (RC-22, Telangana)

Two day work shop and Science fair

Sparking creativity through hands-on Science Education work shop and Science Fair

Date	:	06 & 7th Dec. 2022
Venue of the activity	:	Zilla Parishad High School, Kambalapally, Mahabubabad(Dist), Telangana.
Organising Institute	:	RC-22 in association with Agastya International Foundation
Resource Persons	:	1.Sri Dhasharath , Area Lead , Agastya International Foundation and his team
		2. N.Ranga Reddy retd. Asst., prof. Kakatiya Degree College, Hanamkonda
Participants	:	60 high school students

On 6th, the first day of the Science workshop and Science talks were organized, N.Ranga Reddy, explained the students how they can understand physics easily at school level. A question and answers session was also organised at the end of lectures to maintain the enthusiasm of the participating students. Followed by this lecture **RC**


organized a workshop on **Sparking creativity through hands-on science education workshop in** collaboration with Agatsya international foundation, in which nearly 60 students have had the hands on experience of using experiments in improving the science learning skills. Some of the modern ideas about inheritance based on the Class 8th, 9th and 10th science text books were discussed at the workshop. Second day on 7th conducted science fair, the participants showcased their working models on different topics viz. light, electromagnetism, mechanics, the fair saw nearly 292 students. Agastya foundation area manager Dasharadh talked to students and emphasizes the importance of learning these skills at that age. Master Instructor Mohan and instructors Jagannadam, Shekhar broadened the frontiers of scientific knowledge by touching upon various hands-on activities. The district educational officials and public representatives also visited the science workshop, fair and expressed their appreciation for the initiative of IAPT Telangana.

REPORT (RC-12)

Celebration of International Year of Glass (IYoG)

International Conference on Functional Glasses (ICFG-2022) November 14, 2022

(& Pre conference Poster session to students on Nov 13, 2022)

A two day conference was organized by RC-12 Karnataka, and The Institution of Electronics and Telecommunication Engineers (IETE), Kalaburagi in Association with Visvesvaraya Technological University (VTU), Centre for PG Studies, Kalaburagi, Karnataka Science and Technology Academy (KSTA) and Karnataka State Council for Science and Technology (KSCST) during November 13-14, 2022 at the **VTU, Campus, Kalaburagi.** Dr M S Jogad, EC Member and Dr. Baswaraj Gadgay were respectively Convener and Co-Convener. It was a unique programme with a Pre-conference Poster Session and 3D Printing workshop for students and a regular conference on 14th November in hybrid mode. In all around 220 delegates including students, speakers (India and abroad), resource persons and guests participated in this event. A Souvenir containing Messages and Abstracts of the talks and Posters was released by the guests in the inauguration function.

Hands on skills on "Glass Blowing and 3D Printing Techniques" at the Govt. Tools & Training Centre, Kalaburagi on 13th November 2022 and Poster Presentation Session on "Glass and Glass Ceramics" and "History, Prospects and Future of Glass" at VTU Centre for PG Studies and Regional Office, Kalaburagi on 13 November 2022. Seven best poster awards were presented in the valedictory function of ICFG -2022 held on 14th November.

About Conference: Glass is one of the most ancient materials known and used by mankind. Glass, existing for millions of years, has fascinated and attracted enormous interest both scientifically and technologically, where and when glasses first appeared is not exactly known. The United Nations proclaimed Year 2022 as an International Year of Glass (IYoG), in its General Assembly on 18 May 2021, to throw a light on the role of glass in our societies and show how technologies like glass can contribute to sustainable development. So we arranged special talks by eminent speakers and posters by researchers working in the glass and glass-ceramics. 8 Invited Talks including two from abroad (Aveiro, Portugal and Marburg, Germany) were arranged.

Guests for Inauguration were as follows:

1.Dr. G. P. Kothiyal, Former Head Glass and Advanced Ceramics Division, BARC, Mumbai and Chairman MRSI Mumbai Chapter.

2. Dr. V. Gunasekhar Reddy, President IETE, New Delhi.

3. Dr. B. B. Kale, Director General, C-MET, Pune (Online).
4. Dr. P. K. Ahluwallia, President, IAPT, Simla (H.P)(Online)
5. Dr M S Jogad, EC Member IAPT and Convener IYoG-NCFG 2022
6. Dr. Baswaraj Gadgay, Regional Director I/C VTU, Kalaburagi, Presided
7. Dr K M Jadhava, Professor of Physics, Aurangabad.

Dr M S Jogad, Convener welcomed the delegates and mentioned about the genesis of the conference. He also informed that there were 8 Invited talks and 26 posters presentations.

Dr Gunasekhar Reddy in his inspirational speech said that "Science and Technology" should go hand-in- hand and I am happy to mention that both scientists and engineers have participated in this celebration of IYoG.

Dr G P Kothiyal in his inaugural speech told the audience that this celebration of IYoG is one in the series of celebration events taking place in the country starting from CGCRI Kolkota, Goa, VNIT, Nagpur and other places. We are having another event organized by MRSI Mumbai Chapter and Pune Chapter in C-MET Pune during November 24-25, 2022. He mentioned that Dr Jogad was instrumental in creating a research group in glass and Glass-ceramics at the Sharnabasaveshwar College of Science, Kalaburagi. He appreciated, his efforts being in a small place. President of IAPT- Prof. P. K. Ahluwallia graced the event by virtual presence and talked about how common man looks at the Glass, its formation and the ancient wisdom.

Dr. Baswaraj Gadgay, who Presided over the function, appreciated the efforts of Dr Jogad to be able to arrange the event in very low budget and was able to attract the students even from poor background. At the end Dr S M Khened, proposed the vote of thanks.

Later Dr G P Kothiyal, delivered Invited talk on the topic "Glass for Sustainable Development: Material for every Walk of Life". He explained the audience sustainability is the capacity to exist and progress without the fear of getting extinct in future. Dr B B Kale, delivered a talk (online) on the topic" Nanostructures: Design and Synthesis for Solar Light Driven Hydrogen Production and Storage". Prof A R Kulkarni IIT Bombay presented his talk (online) on "Ionics in Phosphate Glasses: Looking Back Looking Forward". Dr Rashmi Salagare (Jogad), Pune delivered an interesting talk on "Lead Silicate glass Structural unit Investigation by Neutron Diffraction". The online talk by Prof. Jayashankar, formerly with Sri Venkateshwar University, Tirupati, AP, was related to International Year of Glass-2022: Overview of rare earth Doped Glasses". Dr. M. S. Jogad, delivered a talk on "Dielectric and Structural Studies of some Oxide Glasses and Glass-ceramics". Prof Bernhard Rolling, Marburg, Germany, enlightened the audience with his talk(online) on "Characterisation of Solid Electrolytes and All Solid-State Batteries under Active Pressure Control". The last technical online presentation by Prof. José M.F. Ferreira, CICECO, University of Aveiro, Campus Santiago, Portugal was on a very important topic related to medical application of glass. The topic was Alkali free bioactive Glass Compositions for Most Demanding Applications in healthcare, Bone regeneration and Tissue Engineering"

Dr G P Kothiyal, Dr P Nagaraju, Dr G Venkatesh, Dr B G Mullimani, Dr K M Jadhav, Dr M S Jogad, Dr Baburao Sherikar, Dr R H Fattepur, Dr S M Khened, Prof Aravind Dyama, chaired the different invited talk.

Dr U T Vijaya and Dr R H Fattepur evaluated posters.

The conference, concluded with a **Valedictory function** and award presentation ceremony. Prof B G Mulimani, Former Vice Chancelor Gulbarga University, Karnataka, Dr K Jaya Sankar, Vice President IETE, Dr D S Bormane, IETE, Dr U T Vijay, KSCST and Dr Hanumanth Naidu, Registrar SSSHUE, Kalburagi were the dignitaries present during this function.

A small monograph on Glass science in Kannada written by Dr M S Jogad and Dr Rashmi Salagare (Jogad) was also released. Prof Arvind Dyama proposed the vote of thanks to all concerned.

Fig. Inauguration of IYoG-ICFG 2022

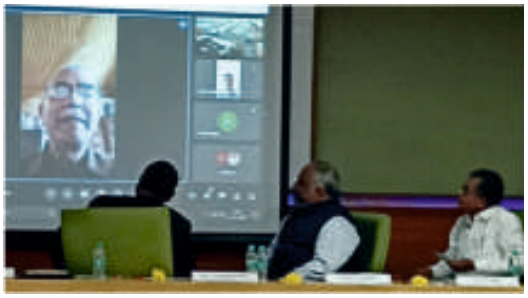


Fig. Dr P K Ahluwalia, IAPT President during Inauguration

M S Jogad,
Baswaraj Gadgay

NATIONAL COMPETITION FOR INNOVATIVE EXPERIMENTS IN PHYSICS (NCIEP) – 2022
A REPORT

National competition for innovative experiments in Physics (NCIEP) is being held since 2003, to encourage Physics Teachers, students and Physics educators to conceive and set up original innovative experiments in Physics. Innovation rather than sophistication is the main theme. The Competition is held every year at the venue of the Annual Convention of IAPT. This year it was held at College of Commerce, Arts and Science, Pataliputra University Patna during the 36th convention of IAPT from 2-4th December 2022. Top 3 experiments from each category A and B are awarded cash prizes.

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/-

"The proposed experiment is deemed to be original, designed and developed by the participant(s) and not published / submitted elsewhere".

Twelve participants were selected in each category to present their experiments at the 36th IAPT convention.

Top ten student participant entries were given an amount of Rs 1000/- each towards expenditure incurred towards setting up the experiment. The first announcement came in the May 2022 bulletin. Subsequently one more announcement came in the August bulletin.

Dr M K Raghavendra , Consultant , Dr H N International Science Centre and Dr Pramendra Ranjan Singh, principal, Narayan Mahavidyalaya, Goreakothi, Bihar graciously accepted to be the judges for the event. Seven participants from Category A and Six participants from Category B demonstrated their innovative experiments on 2nd December.

The Competition was successfully conducted by Dr R Anandakumari, President RC 12A and Dr V S Shantala, Treasurer RC 12 A under the guidance of Prof P K Ahluwalia, President IAPT and Prof Rekha Ghorpade, General secretary IAPT. Dr Himanshu Pandey, Convener 36th Convention had made all the arrangements. Student volunteers did a wonderful job.

All the experiments were appreciated. Padmashri H C Verma, Prof P K Ahluwalia, President, IAPT and all the dignitaries present at the convention meticulously went through all the experiments.

The following were the prize winners.

Category A	I prize Dr J Chandrasekhar Rao, Government Degree College, Vizianagaram	Experiment to find the relation between focal length and radius of curvature
	II Prize Dr Sarmishtha Sahu, M LA College, Bengaluru and Dr Manu Shanmugam MES College, Bengaluru	Energy gap of a photo conducting cell
	III Prize Manjula S N, SJR College for women, Bengaluru and Prof Sarmistha Sahu, MLA College, Bengaluru	Relation between physical quantities from first principles
Category B	I prize Tanay Pradeep and Sharmistha Sahu, Sri Kumaran's Children Academy, Bengaluru	Visualising linear expansion in classroom
	II prize Kishan Chauhan, Ayushi Kotecha, Christ college, Rajkot	Oil Spot Photometer
	III Prize Imroz Khan, Department of Physics, Electronics and Space Science, Gujarat University	Alternate way to determine young's modulus

NCIEP team wishes to thank all the people involved in the smooth conduct of the Event and congratulates all the prize winners and participants.

Dr Geetha R S
Coordinator, NCIEP

REPORT (APhO –Cell)

POLLEX VII – Workshop by the IAPT-APhO cell in Rural Heartland

A section of the audience

POLLEX stands for Phenomena based Olympiad Level Experiment. Pollex also refers to the “thumb" and it is the evolution of our “opposable” thumb which complements the other four fingers and bestows on tool handling abilities on us humans. POLLEX has become the signature workshop of the Asian Physics Olympiad cell of IAPT, an activity which introduces students and teachers at the Pre-University level and UG level to challenging experiments and theories. The seventh in this series, POLLEX-VII was organized at Mahendra High School (MHS), village Jiradei. Siwan District, Bihar on Dec 5, 2022, as a follow up to an ongoing program at the school. The village of Jiradei is the birthplace of Dr Rajendra Prasad, the first President of India and the school, named after his elder brother and built by a local person Shri Hira singh, was inaugurated by the President on June 23, 1953.75 students and 6 teachers of MHS attended the workshop.

A team of expert resource persons led this effort. Dr. Ravi Bhattacharjee, Coordinator, IAPT-APhO cell introduced the students to the Olympiad programme.

This was followed by a lecture and an interactive session on misconceptions in Physics by Prof. Vijay Singh. Dr. Pramendra Ranjan Singh, Principal Narayan College, JP University and Secretary RC 19 delivered an engaging lecture on physics and everyday rural life. He also touched a responsive chord among the students by addressing their anxieties and hopes about career choices.

Ravi S Bhattacharjee addressing the students

This workshop was followed by a number of smaller workshops on career counseling in science for higher secondary students in Siwan and Chapra districts. The schools covered were both Govt and semi-private. A follow up workshop was held at MHS again on Dec 14 2022. These were led by Prof. Vijay Singh ably supported by local teachers.

On Dec 5th and 14th, The Principal Shri Vinod Kumar welcomed the IAPT resource persons. Rakesh Ranjan, Physics teacher MHS, and also an IAPT member, delivered a vote of thanks. Teachers from the school, Shri Adil Nasir, Aniruddh Kumar, Lal Babu Ram, Sunil Dubey, Ms. Archana Aryani and staff lent valuable support. It was felt that this activity in the heartland of rural India is a worthy attempt by IAPT and the APhO cell to reach out at the grassroots level. Having two or three such workshops per year in this region would make for a sustained activity and will provide positive results in the future.

Vijay A Singh

REPORT (APhO Cell)

POLLEX VIII – Workshop by the IAPT-APhO cell in Gaya

The 8th in the series of the POLLEX Workshops- the signature workshop of the Asian Physics Olympiad cell (IAPT_APhO Cell) of IAPT, to introduce students and teachers at the Pre-University level and UG level to challenging experiments and theories, POLLEX-VIII, was organized at G D Goenka Public School, Gaya on December 6, 2022.


Ravi Bhattacharjee being welcomedExhibits by students

A Science exhibition was also organized on this occasion. Students from classes III to XII prepared models related to the various principles of science. Children prepared and presented working models on water conservation, different seasons, space, healthy body and machines. Students through various projects explained the continuous development of working models, utility of machines in everyday life as well as modern practices in agriculture, technology in space, forces and friction, renewable resources, global warming and electric current circuits and designs were prepared on other topics. Students enthralled the parents by getting experiential learning by making projects like smart dustbin, smart lights, waste water management, rooftop farming, drip irrigation, magnetic cars and various circuits. On the occasion, Principal Dr. H.K. Pandey boosted the morale of the students. He also appreciated the guidance of the teachers and parents and said that the present generation needs to be sensitized about the adequate use of resources and they should be taught how to take care of our planet, which will lead to the all- round development of the coming generation.

Ravi Bhattacharjee, Coordinator IAPT_APhO Cell, while playing the role of Senior Judge, praised the exhibits of all the students and encouraged the students

The best performers were awarded gold, silver and bronze medals along with appreciation certificates. Thus, POLLEX has lived up to its purpose of Phenomena based Olympiad Level Experiments and Theory. The phenomena endeavours to invite an interdisciplinary approach and need not necessarily be confined to physics.

On this occasion, anIAPT_APhOLaboratory was also inaugurated by Professor Ravi, in the school, which will house the best experimental equipment.

Himanshu Pandey

REPORT (RC-12)

9th IAPT National Student Symposium on Physics 2022

21 – 23 December 2022

Venue: B V Jagadeesh Science Centre, The National College campus, Jayanagar, Bengaluru 560 070

Organized by: Regional Councils 12 A and 12 Karnataka and Department of PG Studies and Research in Physics, National College (Autonomous), Jayanagar, Bengaluru

Number of participants: ORAL presentations – 26, Poster Presentations -25

Other participants: Out station Students – 12, Local Students – 17

Volunteers: M.Sc. Physics and Mathematics students of National College Jayanagar - 20

Inauguration of the 3-day NSSP- 2022 was held on 21st December at 10.00 AM by lighting the lamp and with invocation by students of M.Sc., Mathematics, National College.

Prof. A H Rama Rao, President of the National Education Society, Karnataka welcomed the Chief guest and the

audience in general.

Dr P Nagaraju, Convener, formally welcomed the guests on the dais and off the dais, IAPT fraternity, invitees and Student participants from across the Country and the gathering at large. He also spoke about the NSSP and its genesis, scope and objectives in brief. He mentioned that NSSP started in the year 2013 at Panjab University, Chandigarh, 8th in the series was held at Indian Academy Degree College, Bengaluru and the 9th NSSP was organized in the National College (Autonomous) Jayanagar, Bengaluru.

Prof N Udaya Shankar of Raman Research Institute and Prof AH RamaRao along with Prof K S Nataraj, Director of B V J Science Centre, Dr Y C Kamala, Principal of National College and Dr P Nagaraju.released the Souvenir &Book of Abstracts of NSSP 2022

Prof Uaday Shankar, Chief Guest of the Inauguration complimented the IAPT for conducting the Student Symposium regularly since 2013. He said that the students from across the country meeting at a place, is itself an achievement. This type of National Student Symposium will be beneficial to them to exchange their ideas with their counterpart. He said, it is for you (Student participants) to make a change of Science and Technology for good and not for bad things. He brought out a story for achievement and expressed that only by hard work, we can understand Physics. Finally, he concluded by pointing the students, that each one of you has a bigger challenge and therefore you have to take up research in your chosen area and contribute to the Nation.

The guest of honour Prof K S Nataraj said that B V J Science Centre aspires to stimulate curiosity and inspire science learning in everyone, because BVJSC values science as an indispensable tool to understand our world in general and Physics in particular. He also mentioned that BVJSC and Jawaharlal Planetarium execute a mega event called **Science in action** every year**.** Dr Y C Kamala talked about IAPT activities especially about the examinations, Olympiad medals, workshops and innovative practices like NCIEP. Dr A H Rama Rao, in his Presidential remarks mentioned that the students from across the country, who are attending this Symposium are fortunate to listen and interact withthe eminent scientists. He expressed his best compliments to IAPT for doing commendable job in the academic field. The students should make use of this opportunity.

Prof Sarmistha Sahu Co convenor, proposed the Vote of thanks to the dignitaries on the dais and off the dais. She mentioned special thanks to the B V Jagadeesh science centre for providing the infrastructure to conduct this NSSP 2022.

After the formal Inauguration, Prof Udaya Shankar delivered the Key note address on

"Astronomical observations to capture whispers of Hydrogen atoms surrounding the first stars born in this universe." He said that Physics builds from observations. No physical theory can succeed if observations do not confirm it. The present age of the universe is 13.7 billion years, it is by itself exciting. He said that the interplay between experiments and theory, tells how passionate you are for doing physics? It is not traversing a boring path but embracing a way of life full of adventures, enquiry and joy of discovering from instruments you built with your hands.

After the Keynote address, Prof Ahluwalia, President of IAPT, addressed the students regarding NSSP and its importance for the young researchers. He said that this platform will help the students to know about the recent work in various fields. He also stressed upon the New Education policy, and as per the new education policy, projects and dissertations have to be an integral part of the curricula.

On Day 1, the 1st technical Session started with an invited talk by Prof P C Deshmukh on **Teleportation and Quantum Computation - Physics Nobel Prize 2022.** He opined that Quantum physics outmoded classical physics in the 1920s in accounting for the laws of nature. Quantum theory, however, involved intrinsically statistical considerations, debated hotly by Einstein and Bohr between 1927 and 1935. Arguing based on what was then commonly understood of reality Einstein maintained that quantum theory implicated 'spooky' action at a distance; hence it is incomplete. In the mid-1960s, Bell scrutinized Einstein's arguments in terms of an experimentally testable mathematical inequality that he set up based on the principles of locality and counterfactual definiteness. Quantum correlations observed in the experiments conducted by **Aspect, Clauser, and Zeilinger**, 2022-Nobel-laureates, violate Bell's inequality. Deductions from these experiments require a mind-boggling, renewed interpretation of reality on account of quantum entanglement.

After this invited talk oral presentations by the participants started. Prof M K Kokila, Department of Physics, Bangalore University chaired the session. 6 (OP1 – OP6) participants presented their presentations. She appreciated all the 6 participants and said, she didn't expect that they would present like this. In fact, she said that these students are extra ordinary.

It is to be noted that 3 judges, Dr. S K Nataraju, former Professor of Kuvempu University, Dr S P Basavaraju, former Professor of Bangalore Institute of Technology and Dr R S Geetha Co Ordinator of NCIEP, were judges for the Oral presentations. In the 2nd Session of the Oral presentations, Prof M S Jogad, EC member, Karnataka Chaired the Session. (OP7 – OP13) were allotted, except one, all presented their papers. Prof. Jogad expressed his happiness over the presentations by the students. But, he also gave his suggestions that the students should stick to S I units and also the significant figures.

In the 3rd Session, Poster presentations were scheduled. Dr M K Raghavendra RC 12 A, Dr Shanthala V S Treasurer of RC 12 A and Dr Madhura K R Co Ordinator of PG Mathematics, National college, were the judges. 12 Posters (PP01 – PP12), were allotted in this session. The judges have interacted with the participants for about 8-10 minutes at each poster. The Cultural programme was arranged by the Students of the National College for the delegates to relax from the hectic academic schedule. The cultural committee convener and the staff members took active part in arranging the cultural event. The PG students along with a few UG students performed the cultural programme. The main attraction was the team of students with Mr Jayanth, Assistant Professor of Psychology on musical instrument. Delegates enjoyed the cultural programme.

On Day 2, the 4th Session got started by an invited talk on **The Physics of White Dwarf Star by Prof B A Kagali, former Chairman of Physics Deptt., Bangalore University.** White dwarfs are unusual type of stars. They happen to be the end states of low mass stars. Their structure and stability were big puzzles in 1920's. R. Fowler was the first to develop an elementary theory for their stability. He said that, S Chandrasekhar and others who arrived at a limiting mass for them refined his theory subsequently. Thousands of white dwarfs having a wide range of masses, temperatures, atmospheres, magnetic fields, rotations etc have been discovered since then. Their cooling has been used to estimate the galactic age. He mentioned that, more recently, some of them have been used for estimating distances of distant galaxies.

After the Invited talk the Oral presentation by the participants started. Dr S M Khened Secretary RC 12 Chaired the Session. The Oral presentation took place for 6 (OP14 – OP19) participants. All of them presented their papers very well.

In the 5th Session, Poster presentation PP 13 – PP 25 took place along with a Tea Break. The judgement was done by the same judges as in PP01 – PP12.

In the 6th Session, the participants were divided into 4 Batches. In the first half of the session, 2 batches visited BVJ Science centre and the other 2 batches visited Research lab of Physics.Later on these batches were interchanged. In BV J science centre, students observed some working models and some demo experiments done by Prof Cheluvappa and Prof Mamatha. Whereas, in Physics Research lab, the students witnessed the preparation of glass by faculty of Physics.The students expressed that the lab visit was very good, but because of time constraints, they were not able to do the experiments by themselves. Then there was a Lecture in online mode by Prof Ahluwalia on **Predictive Simulations- From in Situ to in Silico.** He said that, with the rise of computational power in the last two decades, major advances have been made in design of materials causing a switch from in situ approach to in silico approach, in which first step is to use *basic principles of quantum mechanics via abinitio first principle* calculations to perform simulations to predict the properties of the sought material and then go to the wet laboratory to produce it. In this talk, he explained, how research in basic sciences has made us reach from the time of Newton to this stage. After this talk, there was a panel discussion on “Prospects of Physics”. In this discussion, Professors G Venkatesh, S Somasekara, S C Samanta (Midnapur), P Nagaraju and Abhiram J gave their valuable input. In addition to these members, Mr Altaf Pasha, a former student of the National College and now a Fulbright scholar in USA joined the discussion in online platform and shared his experience with the participants. And some students of IISER also took part in the discussion.

In Day 3, the 7th Session, started by an invited talk on **Free flowing hydrodynamic electrons flowing without**

quantum resistance by Chandan Kumar, Centre for Nano Science and Engineering, IISc Bangalore. He said that, electrical resistance is usually associated with lattice imperfections. However, even a perfect crystal free of defects or faults shows finite resistance, determined by the number of channels available for conduction. This resistance usually appears at the contacts and is known as quantum resistance or Landauer -Sharvin resistance. Recent works have shown growing evidence that electrons can behave as viscous fluid, raising the fundamental question – what is the ultimate conductance limit of strongly interacting hydrodynamic electrons? He mentioned that, our measurements at low temperature in the ballistic limit show that the quantum resistance is no longer confined to the contacts but is instead distributed throughout the bulk of the device.According to their work, the constraint of the ballistic electrons can be lifted by viscous electronic fluid, with significant impact for future science and technology.

After the invited talk, the Oral presentation continued from OP20 - OP 26. Dr R Ananda Kumari, president RC 12 A, Chaired the Session. All the 7 participants presented their papers. She also expressed that all the presentations were very good. The judges, discussed and gave the list of four prize winners for the Oral presentations. The judges of the Poster presentations also gave the list of four prize winners.

Soon after the Technical session, there was a Tea Break and the formal Valedictory function started. There was feedback from the participants. Four participants expressed that the Symposium was well organised. A faculty member – Sudhanshu Dwivedi from Jaipur also expressed that the symposium was organized very well. They said that the invited talks were good and some paper presentations (Oral and Poster) were also good. In the written feedback almost all appreciated the arrangements and the hospitality offered by organisers.

The valedictory function took place on 23rd December 2022 at 12.30 PM. Dr Y C Kamala welcomed the gathering. Sri Pramod G Galgali, Director, Jawaharlal Nehru planetarium was the chief guest. Prof K S Nataraj, noted that the students, who have participated in this event have been greatlybenefited by the eminent speakers and also by the visit to BVJ Science centre and PG Physics lab. The summary of the Symposium was given by Dr Abhiram J.The Certificates and the prizes were given by the chief guest. The prizes for Oral and Poster presentations are as follows:

ORAL Presentations;

1st Prize – AbineetParichha, IISER Mohali, Punjab

2nd Prize – Hariprasad S V, Department of Physics, St Stephens College, Delhi

3rd(a) Prize – Rohit R N, Charles S, Balakrishnan S, V I T, Vellore, Tamil Nadu

(b)Vibhor Khanna, Agam K Jha IISER, Thiruvananthapuram and Delhi University

Group Photo of 9th NSSP 2022

Consolation: Faizan Hassan Shah et al Central University of Kashmir, Tulum Ulla Campus

POSTER presentations:

1st Prize – Vibhor Khanna, IISER Thiruvananthapuram

2nd Prize - KaushalGavankar et al Dr Homi Bhabha State University, Mumbai

3rd Prize - Keerthana Jayaprakash et al Department of PG Studies& Research in Physics,

The National College, Jayanagar, Bengaluru

Consolation: Himanshu Sharma et al &PankajBunkar et al S S Jain Subodh P G College,

Jaipur, Rajasthan

Chief Guest Pramod G Galgali expressed that he is very happy to see the participants from across the Country. He explained about various programmes being conducted at the Jawaharlal Planetarium. He also talked about the Science activities; especially REAP (Research Education Advancement Programme) of the planetarium. It is an interactive – week end sessions from School children to B.Sc., students. This programme was founded by great Physicist Prof C V Vishveshwara, founder director of Bangalore Association for Science Education (BASE).

Finally, Dr P Nagaraju thanked the management of the National education Society in general and the President Prof Rama Rao and the Secretary Prof S N Nagaraja Reddy in particular for all the Infra structure provided to organize NSSP 2022. He also thanked KSCST, KSTA, Gardencity University, DSERT, Vijay College Girls Hostel, B V J Science Centre, Principal and staff of the National College, Principal CR Sampath Kumari and staff of the National P U College. RC 12 & 12A members, Students who performed cultural programme, Invited speakers, Volunteers, Chief Editor and the Editors of IAPT Bulletin, participants, Judges oral and poster, Chairpersons, Advisory committee and the local organising committee.

P Nagaraju

Convener,

Vice president, South zone

REPORT (RC-08B)

Two day workshop for Junior College Physics Teachers

Organized by: Mumbai SRC -08B in association with Patuck Technical High School and College, Santacruz

Venue: Patuck Technical High school and College, RustumbaPatuck Marg, Vakola Bridge, Santacruz East, Mumbai-400055.

Date: 15th and 16th December 2022.

The workshop aims at the discussion and hands on activities suggested in class XI and XII, practical course.The workshop was conducted was attended by 11 teachers from Mumbai, Thane, Palghar and Raigad districts.On 15th December, the workshop was inaugurated at 10 am by the administrator of the college, Mrs Suman Singh. MrsSushmita Meta, Supervisor of Science section and incharge of Physics department, welcomed the guests. Ms. RekhaGhorpade , General Secretary , IAPT gave a brief introduction of IAPT activities and various examinations and competitions conducted by IAPT for students and teachers at school , Junior college and degree college levels. Dr. K G Bhole,secretary, SRC08B explained activities carried out by this sub-regional center. MrsShyamlaBodhane, the treasurer Mumbai SRC-08 briefed the participants about the aim of this workshop and requested participants to be frank in asking questions.

The first session was conducted by Dr. K G Bhole, Mumbai on the topic “Use of Multimeter and component testing”. He demonstratedvarious types of resistors, capacitors, diodes, transistors. Limitations and advantages of using multimeter were also explained. He requested participants that activities play very important role in 'learning by doing”.

The participants were then given hands on experiences on

i) Measurement and testing of electronic components using Multimeter.
ii) Frequency of AC experiment.
iii) Magnification by single lens and a set of lenses.
iv) P.D. in series and parallel circuits and deriving the formulae.
v) A modified simple pendulum.

The members of SRC08B, MrsShymlaBodhane, Mrs. RekhaGhorpade, Mrs. Hemlata, were assisting the participants to carry out the activities. After the lunch break, there was a discussion session. Participants raised many queries about the physics involved in these activities. Also advantages and limitations of each activity werepointed out and discussed.

The additional activities in afternoon session were;

i) Polarization.
ii) Capacitance measurement.
iii) Auto-collimation method
iv) Zener diode characteristics.
v) Law of moments.
vi) Use of travelling microscope.

On second day, the first session was conducted by Dr. ShyamlaBodhne on "Measurements, errors, significant digits and calculation". It was followed by following hands on activities;

i) Newton's rings.
ii) Demonstration of diffraction using gratings of different rulings, CD, DVD etc.
iii) Interference fringes by Biprism.
iv) Earth's magnetic field measurement/ caparison.
v) Melde's experiment.
vi) Bipolar transistor characteristics.

Again it was followed by the interactive session in which all the resource persons and participants participated. The procurement of apparatus needed for all these activities was assisted by Prof. Mahesh Shetti and Prof RekhaGhorpade. Prof. Katdare of the host college made available all their laboratory equipment for these activities. The workshop ended with valedictory session. As a concluding part of the workshop participants made their observations that each session/activity will benefit them in classroom and laboratory teaching and assigning projects to students. Certificates were awarded to all the participants. The program came to an end with Dr. K G Bhole delivering vote of thanks. Mrs. Sushmita Meta from SRC-08B coordinated the workshop.

K. G. Bhole
Secretary

REPORT (RC-06)

Two days Ability Enhancement Workshop for School Science teachers of Rajasthan

November 25-26, 2022.

An Ability Enhancement Workshop for School Science teachers of Rajasthan was organized by Jaipur National University, Jaipur in association with RC-6, Rajasthan during November 25-26, 2022. The participants of this workshop were science teachers of Swami Vivekananda Model Schools of Rajasthan.54 teachers attended this event. The prime objective of this workshop was to introduce and illustrate what is fundamental understanding and put forward a need for the development of it in young students of middle and secondary classes. The other objectives were to study the suitability of various approaches and to develop a few activities for the development of the scientific temperament in the students during the high school education. Moreover the workshop was aimed to introduce the idea of Innovation Hub and its effectiveness in teaching the fundamental science.

Workshop started on 25th November, 2022 with inaugural function. The purpose of the workshop was introduced by convener Prof. Y. C. Sharma, Vice President,RC-6, and Director, Research & Academic Development, Jaipur National University. The workshop started with the inaugural lecture of the Chief Guest, Prof. Y K Vijay, President, RC-6,and Director, CIST, IIS University, Jaipur. Prof. Vijay introduced the idea of Innovation HUB to the participants and demonstrated some concepts through videos. He physically demonstrated about 10 experiments which were appreciated by all the participants. The function was also addressed by Prof. R. L. Raina, Vice Chancellor, Jaipur National University, Jaipur who welcomed all the participants and the invited speaker. He emphasized on learning the methods of teaching so that students could be prepared for the new age science.He further added that this workshop will be very useful for the participants in the enhancement of their knowledge.

Second session of the workshop was addressed by Prof. Yogesh Bhatnagar, former Vice Principal, St. Xavier's School, Jaipur on the topic “Misconceptions in Science”. He pointed out some general oversights and omissions which usually takes place in science teaching. This was very well received by the teachers and they commented about this session as a real value addition in their own teaching.Third session was for the Laboratory session where the participants were introduced with the experiments and helped in performing them by the team of faculty members of JNU, Jaipur.

Day two started with lecture of convener Prof. Y. C. Sharma on the topic “Quantum Information Science, Computational Thinking and Nobel Prize 2022 in Physics: A triplet in terms of NEP2020”.

It was followed by the team of Mr. Kushal and Mr. Himanshu who introduced Atal Tinkering Laboratories to the participants. It was a training session for the participants who already have these labs in their Schools and a motivating session for those who don't have; so that to introduce these new age gadgets in their teaching-learning process.

Third session was again reserved for the Laboratory session.

The valedictory session was graced by the Chief Guest Prof. R K Khanna, Former President, RC-6 and EC-Member. Prof. Khanna emphasized on the development of the gratitude towards the nature which permits us to align our understanding with its working. He emphasized the teachers to focus on sharing the knowledge and simultaneous learning. He shared his experience right from Government colleges in Rajasthan to IIT Madras and UK interactions.

Y K Sharma

REPORT (RC-06)

Quantum Science at visible range: Stage Show, at AAPT meeting, Portland, USA

I,Y K Vijay took part in the American Association of Physics Teacher Winter Meet 2023, during 15-17 February, 2023. I am happy to share my experience and exposure. We all are teaching quantum mechanics through mathematical modelling and computing only few physical illustrations. A FEW SLIDES ARE BEING SHARED. I carried a few models all the way from Jaipur to Portland USA to justify and share with over 100 participants. Dr. MinakshiSiyal from HMV College Jalandhar was also there.

How do atoms/photons interact?

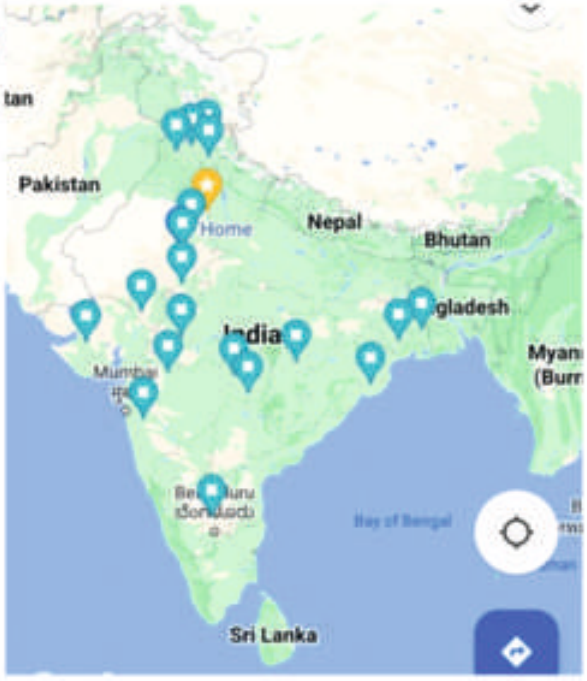
- Atoms are neutral, but develop partial charge due to movement within the constituents.
- A dipole model: two opposite charges separated by a small distance.
- The charges follow Coulomb's inverse square law.
- In a laboratory, permanent magnets as dipoles are available which follow similar behavior, but different size.
- As a model we have used permanent magnets to visualize the collective behavior.

Demonstration of QS Phenomena through models

- Atomic Configurations
- Atomic arrangement and Defects
- Van der Waal Potential
- Lattice Potentials
- An harmonic Oscillator
- Rutherford Scattering
- Bohr Orbitals
- Raman Effect
- Molecular Vibrations

AAPT WINTER MEETING Innovation Hub

- We have developed several innovative Experiments and Concepts, which are useful to understand and develop further for educating the young Science and Engineering Students.
- These are : Demonstrative, Quantitative and Easy to Fabricate and Low Cost.
- Many such models can be developed to improve the SKILL of Making & Developing Innovative Ideas.
- Innovation Hubs across India by: IAPT



Y K Vijay

National Seminar on

Recent Advances in glass materials and Technology

Orgainsed by: Department of Physics, St.Pious X Degree & PG College , Hyderabad

To mark the international year of glass 2022, declared by UN, Department of Physics ,St Pious X Degree & PG college for Women, Hyderabad organised an online National Seminar on ' Recent Advances in Glass materials and technology on 07-12-2022 in association with IAPT. The program began with a prayer session by students followed by welcome address by the Convenor Dr R .Komala, HoD. Dr.V.Rajeshwar Rao, Head, H&S ,Kits IAPT, EC member delivered the Key note address.

Dr G P Kothiyal, Formerly Head, Glass and Advanced Ceramics Division, Bhabha Atomic Research Centre (BARC), and Professor of Physics elaborated on applications of glasses in various fields.

Dr.Ajit Kulkarni Retd Professor from IIT Mumbai spoke on role of glass in Solid state batteries.

Dr M S Jogad, EC member IAPT explained the dielectric and structural studies of some oxide glasses and glass ceramics. He also explained the designing of low cost experiments based on glass.

Students and faculty including research scholars from various colleges attended the seminar.

V. Rajeshwar Rao

Workshop on hand-on experiments – A collaborative initiative of IAPT RC-15

Contai Science Academy has taken a new initiative to inculcate the habit of experimentation among children at the secondary level. The Academy, in collaboration with the Indian Association of Physics Teachers (IAPT RC15), plans to organize workshops on physics in four phases. The first phase started on February 14, 2023. A total of 34 students from 16 schools (including two students of Class X from each school), joined the 6-hour Workshop at The Royal ITI in Contai town. In the first phase, the subject of hand-on experiments was: electromagnetism and electromagnetism. In this way, experiments on topics such as magnetism and electromagnetic induction in the second phase, heat and light in the third part, mechanics and acoustics in the fourth part, etc. will be discussed in different days with an interval of 15-20 days.

Each of the 16 teams had a toolbox. As a result, each team was able to perform the tests on its own, along with the resource person who was showing the tests with necessary demonstration via slide presentation. In addition to the experiments in the syllabus, how a student or student could plan to do a new type of experiment was also highlighted.

Prof. Samit Kumar Roy, President, IAPT RC15 welcomed everyone in a short inaugural session. Prof. P.K. Ahluwalia, President of IAPT, inaugurated the event. At the end, Dr. Subhash Chandra Samanta briefly discussed about the importance of such workshops. All three of them joined online. Academy members,SuvenduKandar, Dr SubhasisMaity, Soumyajit Sahu,SouravKanti Dey and Barun Jana, were present as the resource persons in the technical sessions. At the end, The Academy's Secretary,DilipBera,extended thanks to all concerned. The whole workshop was coordinated in a well-planned manner.

Later Mr Berahas mentioned that, after three months with these students, there will be a model competition. The Academy is planning similar workshops on other subjects (chemistry, mathematics, biology).

Pradipta Panchadhyayee,
Secretary, IAPT, RC15

PROF. BABULAL SARAF MEMORIAL ONE WEEK ALL INDIA LABORATORY WORKSHOP ON EXPERIMENTAL PHYSICS FOR COLLEGE TEACHERS AND STUDENTS

In collaboration with
Indian Association of Physics Teachers
13th March to 18th March, 2023
at
Department of Physics
Institute of Science & Research
IPS Academy, AB Road, Rajendra Nagar, Indore (M.P) – 452012.

A Laboratory Workshop in Physics for College/University teachers and PG Students will be held at the Department of Physics, IPS Academy, Indore, Madhya Pradesh during 13th to 18th March 2023. It will cover Laboratory Experiments in Nuclear Physics and other areas of Advanced Physics.

Teachers and Students of Postgraduate department from Colleges / Universities who wish to participate May registered themselves on the following link or by scanning QR code.

https://forms.gle/5RZdNP9W791K87cf7

Application should be duly forwarded by the Head of the Institution. Those who have already attended this work shop need not apply.

Limited Participants will be provided local hospitality from 13th to 18th March, 2023 only.

Registration Fee:
Rs. 1000/- (For Faculties)
Rs. 500/- (For students)

Payment mode will be in cash only (at the college)
Application will be considered until the seats are full.
Last date of registration is 28th Feb, 2023

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Birth Centenary Year of
Prof. Babulal Saraf

Celebrating with

ALL INDIA LABORATORY WORKSHOP ON EXPERIMENTAL PHYSICS FOR COLLEGE TEACHERS AND STUDENTS

Organized by

IPS Academy, Indore (M.P.)
Institute of Science & Research
Department of Physics

In collaboration with

Indian Association of Physics Teachers (IAPT)

(March 13-18, 2023)

ABOUT THE WORKSHOP

Experiments in science make a person more observant and inquisitive. It increases interest in science and motivates them to learn. Actually, experiments are connecting 'hands on' to 'brain on' or we can say bridge between personal learning and critical thinking skills. Experiments are an integral part of most scientific studies as they are crucial for testing theories and providing a basis for theoretical knowledge. Physics is based on scientific experiments and the conclusion of the laws and their confirmation to explain the natural phenomena around us.

So, in this workshop we will devote our whole time in experimental physics mostly developed by Prof. Saraf. All the experiments are designed and fabricated in the Department of Physics, ISR, IPS Academy (ISR is previously known as ISLE, started by Prof. Saraf). These experiments will clear most of the basic concepts in Physics. Some curious minds after learning these experiments may design in their labs also.

PROF. BABULAL SARAF

Prof. Babulal Saraf, (1923-2009) was an eminent educationist and master experimentalist. He was born in a small town of Badnawar, Dhar (M.P.). After his school education in his town and in Dhar he did his B.Sc. from Jaipur and M.Sc. (Physics) from Agra University in the year 1947 and Ph.D. in 1957 in the field of Experimental Nuclear Physics. He was always interested to serve the science community in general and physics community in particular by way of developing experiments and designing associated equipment for school, college and University laboratories as an aid to teach basic concepts at that level. He developed experimental kits and equipments in almost all fields of physics and supplied them to Universities and colleges throughout the country at no profit no loss basis. He wanted to develop an attitude/culture among the teaching community to emphasize the need of experimental work in understanding the basis of physics and sciences. His work made him popular in his own region, the Malwa Region. When the Ratlam project came to end, IPS Academy, Indore offered him a place where he could continue his activities with its financial support. Age was no barrier for him and during his stay at IPS Academy, he developed various new experiments and associated equipments.

IPS ACADEMY, INDORE

(NAAC accredited)

Ranked in amongTop 100 Science Colleges by best colleges survey of India carried out by INDIA TODAY, THE WEEK and OUTLOOK

Indore Professional Studies Academy (IPSA) is one of the Central India's largest educational hub-premises, playing a major role to develop Indore as Central India's most preferred educational centre. Sprawled in an area of 60 acres, 3 campuses, we house the most profitable intellectual, honing & experienced educational assembly. As in a traditional hierarchy of all institutions under IPS Society, IPSA is a vast universe shining with innumerable educational extravaganzas. Dedicated to honour various sectors with true talent, IPSA every year sends out a batch of brilliant students, who are at once ready to grab the nerve of any industry.

WHO CAN PARTICIPATE

PG Students, and Faculty members of Colleges and Universities

REGISTRATION CHARGES

For Faculties Rs 1000/-
For Students Rs 500/-

Payment would be made in cash only (at the college)

REGISTRATION LINK AND LAST DATE

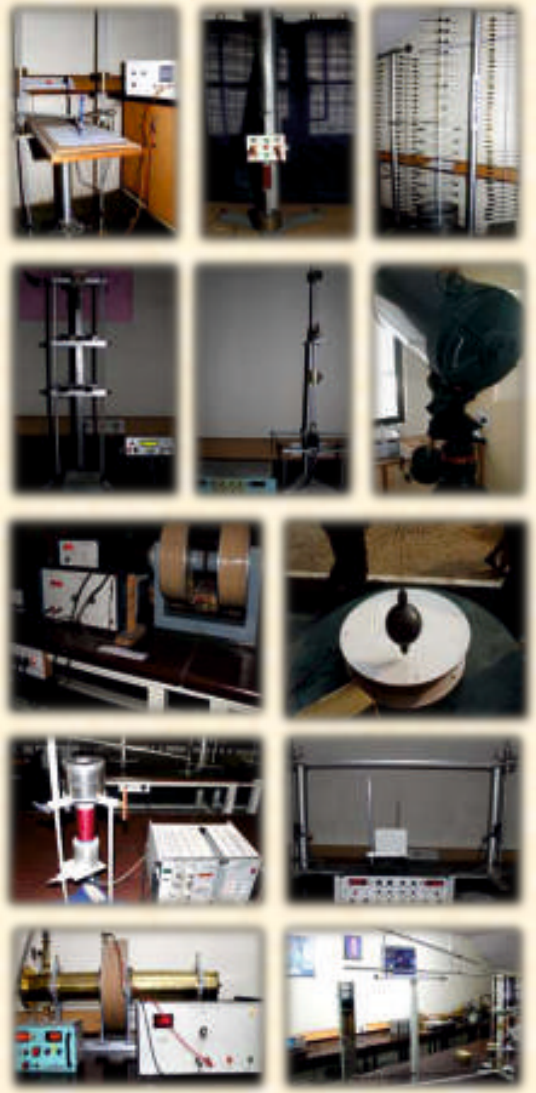
for Registration click on the link/Copy URL & Paste on Browser OR Scan QR code

https://forms.gle/5RZdNP9W791K87cf7

Last date of registration is 5th March, 2023

ACCOMODATION

Limited Local hospitality will be provided to the outsiders only from 13-18 March, 2023



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The Story Of Cosmology Through Post Stamps 33

THE NEW VIEW OF THE SKY ***SOLAR SYSTEM -URANUS AND NEPTUNE***

The solar system formed 4.6 billion years ago from gravitational collapse of giant interstellar molecular cloud. It consists of four terrestrial planet, two gas giant- Jupiter and Saturn and two ice Giant -Uranus and Neptune.

FDC with 8 stamps on planet of solar system and cancellation illustrate Copernican system.

7th and 8th outer planet - Uranus and Neptune

Uranus the Ice Giant, takes 84 years to complete one revolution. With an axial tilt of 97.77° it has ***prograde rotation***

It has 27 natural satellite and a planetary ring discovered in 1977 but predicted in 1789

Roman god of sea-Neptune

Neptune atmosphere composes of hydrogen and hileum. It is an Ice giant, with 13 known moon,and have active visible weather pattern

Neptune is eighth planet of Solar Syatem. Lirbain La Verrier,predicted its existance emperically in 1846.

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