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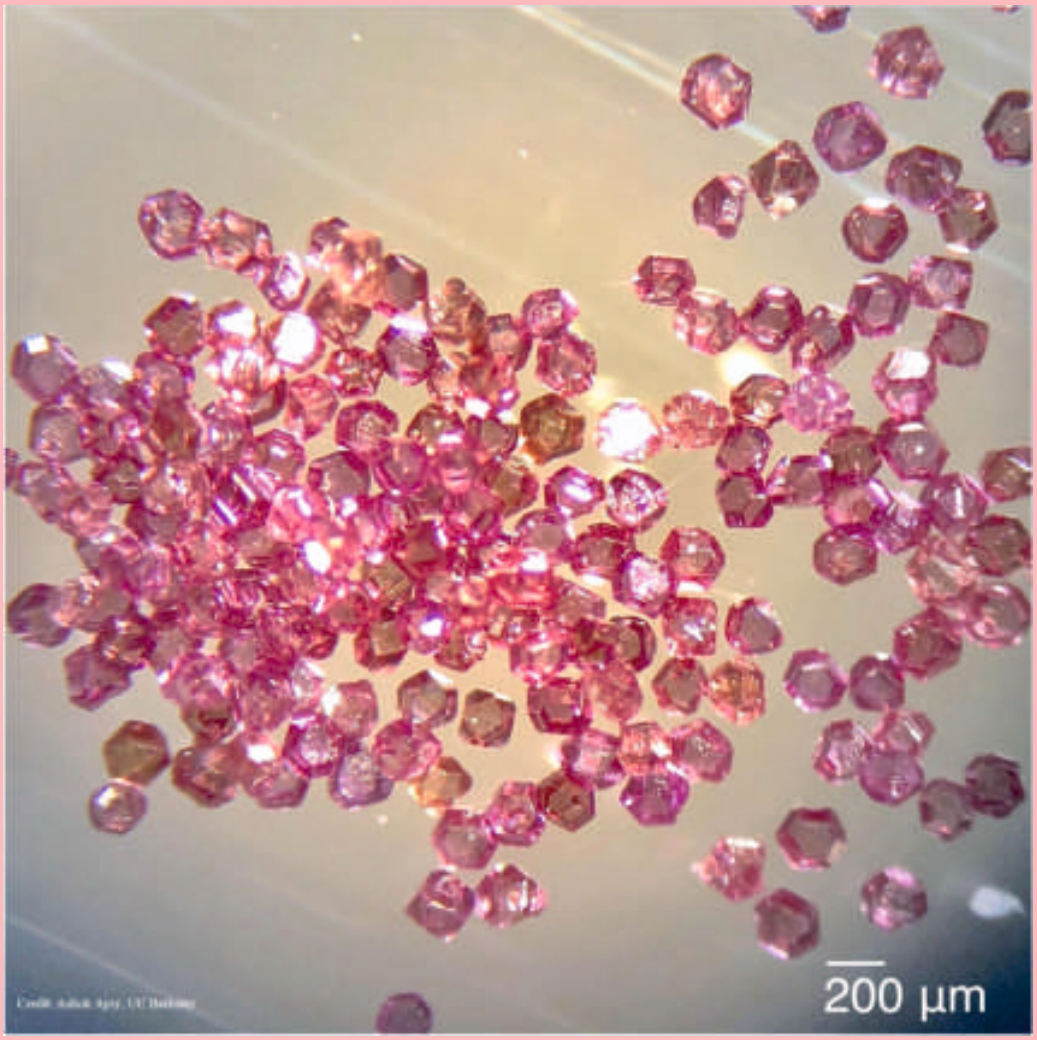

Microdiamonds have had some of their carbon atoms kicked out and replaced by nitrogen, leaving behind empty spots in the crystal—nitrogen vacancies—that fluoresce when hit by laser light.The microdiamonds used as biological tracers are about 200 microns across, less than one-hundredth of an inch. They fluoresce red but can also be hyperpolarized, allowing them to be detected both optically—by fluorescence microscopy—and by radio-frequency NMR imaging, boosting the power of both techniques.
(https://www.labcompare.com/617-News/576047-Diamonds-Engage-Both-Optical-Microscopy-and-MRI-for-Better-Imaging/)

PHYSICS NEWS

Researchers see atoms at record resolution

In 2018, Cornell researchers built a high-powered detector that, in combination with an algorithm-driven process called ptychography, set a world record by tripling the resolution of a state-of-the-art electron microscope.As successful as it was, that approach had a weakness. It only worked with ultrathin samples that were a few atoms thick. Anything thicker would cause the electrons to scatter in ways that could not be disentangled.Now a team, again led by the same Professor, has bested its own record by a factor of two with an electron microscope pixel array detector (EMPAD) that incorporates even more sophisticated 3D reconstruction algorithms.The resolution is so fine-tuned, the only blurring that remains is the thermal jiggling of the atoms themselves.

Read more at :https://phys.org/news/2021-05-atoms-resolution.html

Original paper : Science (2021). DOI: 10.1126/science.abg2533

Unexpected 'Black Swan' defect discovered in soft matter for first time

In new research, scientists have for the first time revealed a single microscopic defect called a "twin" in a soft-block copolymer using an advanced electron microscopy technique. This defect may be exploited in the future to create materials with novel acoustic and photonic properties.

Materials can be broadly classified as hard or soft matter. Hard materials, like metal alloys and ceramics, generally have a very regular and symmetric arrangement of atoms. Further, in hard matter, ordered groups of atoms arrange themselves into nanoscopic building blocks, called unit cells. Typically, these unit cells are comprised of only a few atoms and stack together to form the periodic crystal. Soft matter can also form crystals consisting of unit cells, but now the periodic pattern is not at the atomic level; it occurs at a much larger scale from assemblies of large molecules.

Read more at :https://www.sciencedaily.com/releases/2021/05/210519163631.htm

Original paper : Proceedings of the National Academy of Sciences(2021). DOI: 10.1073/pnas.2018977118

New evidence for electron's dual nature found in a quantum spin liquid

A new discovery led by Princeton University could upend our understanding of how electrons behave under extreme conditions in quantum materials. The finding provides experimental evidence that this familiar building block of matter behaves as if it is made of two particles: one particle that gives the electron its negative charge and another that supplies its magnet-like property, known as spin.

The experimental results fulfil a prediction made decades ago to explain one of the most mind-bending states of matter, the quantum spin liquid. In all materials, the spin of an electron can point either up or down. In the familiar magnet, all of the spins uniformly point in one direction throughout the sample when the temperature drops below a critical temperature.However, in spin liquid materials, the spins are unable to establish a uniform pattern even when cooled very close to absolute zero. Instead, the spins are constantly changing in a tightly coordinated, entangled choreography. The result is one of the most entangled quantum states ever conceived, a state of great interest to researchers in the growing field of quantum computing.

Read more at :https://phys.org/news/2021-05-evidence-electron-dual-nature-quantum.html

Original paper : Nature Physics(2021). DOI: 10.1038/s41567-021-0124

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From the President's Desk ...

The Silent Majority

We recently had a special EC meeting where representatives from different RCs acquainted us with the activities carried out in the past year. It was very heartening to hear speaker after speaker describing the work of their RC so enthusiastically. The total number of Webinars organized was well over 200 exhibiting a very high outreach in these troubled COVID times. The Webinars were in the form of conferences, with speakers both local and national and at times international. The audience ranged from 50 to 1000. There were also programmes which had demonstrations where the speaker performed the experiment and then explained it or vice versa. Remarkably, some of the activities were offline. I personally went to Assam in February this year and spoke at a few venues and witnessed the high level of interest among students and teachers there. Some of our RC even have their own you tube channels.

A notable academic activity was the continuation of the annual memorial events by RCs. We were happy to learn of (i) the VedRatna memorial lecture (RC-01); (ii) C. K. Majumdar Memorial Workshop (RC-19); (iii) Mrs. B. N. Chandrika memorial programme (RC-12) ; an newly initiated Ebook launch in memory of Dr. Tushar Pandya (RC-07). We thus remember the very worthy members who contributed to our Association. It was also heartening to learn about the National Science Day programmes organized at different places.

These "decentralized" activities is what makes IAPT a grassroots organization. (Note: that is not to downshift the importance of our national programmes: Anveshika (a very strong presentation) ; APhO, our national competitions and others which give us a national and international sheen.)

Most of the RC activities were carried out on a shoe string budget. It was also good to see that apart from academic collaborations, some of our RCs have gone out and received financial support from other national/state-level institutions or organizations. The work carried out by this **silent majority** needs to be lauded. It gives us hope in these sombre times.

Vijay A Singh
President, IAPT

Pollution in our community: Measurements and physical insight

Mahendra Madhukar Khandpekar

(IAPT National Competition on Essay Writing in Physics (NCEWP-2020)
This Essay won the first Prize in Teacher's category)

Introduction

Pollution has become part and parcel of the modern world we live in. Knowingly or unknowingly we all are exposed to Pollution of various kinds. We are experiencing tremendous growth in Science Technology and Physics have been playing pivotal role in these advancements. Physics has been helping technology to grow and provide gadgets that a human desire. On the other hand, we are facing the problems such as pollution and waste disposal responsible for pollution. Air Pollution, Industrial Pollution, Sound Pollution, Light Pollution, Water Pollution, Electronic waste, Nuclear waste is harming our Environment 24/7.

Scientific and Technological Growth is the mark of advancement of human life. Science and Technology have made our lives so exciting and full of discoveries which one could not imagined 100 years before. Scientific and technological growth has brought the whole world on our finger tips. We have been continuously striving to control and prevent the negative effects of technology. Instruments / Technology based on principles of Physics are being used to monitor levels of all types of Pollution. Physics has been helping in detection of degradation of environment, in medical diagnosis, in development of laser source for medicine etc. Sophisticated Instruments used for detection and environment have undergone immense change.

During times of recent Covid -19 pandemic we have been using X-Ray, CT-Scan, Oxy Meters., all of which are gift of Physics and Technology. We get so much of confidence using these sophisticated instruments providing precise measurements. We cannot imagine our life without technology. We have Decibel Meters for sound pollution, Lux Meters for light pollution, AQI – Monitoring Equipment for Air Pollution and Water Quality and Instrument for Water Pollution. We have developed sensors useful in accurate and precise determination of pollutants in air. Satellites are continuously monitoring the environment, thereby sharing the information globally and signaling us to take measures to reduce pollution world over.

Scientists Speaking in International DW News-German Channel (20th November 2020)

Constant Pollution in air has very negative effects on nature and in turn on human health. The photo shows, scientist speaking in international DW news (A German News Channel) yesterday on 20th November 2020 regarding air pollution creating ideal conditions for recent pandemic (Covid-19), which has shaken the whole world. Causes and effects of Pollution are very complex in nature and difficult to solve. It causes global warming, affects climate change, causes acid rain and smog. It causes deterioration of fields and of building materials, extinction of animal species, chemical instability etc.

Local quality of air depends indirectly on the climate change and in turn on the environment in which we all live. Humans have been modifying the environment for thousands of years by various activities like emission of pollutants (NASA News, October 23, 2019). Ozone in atmosphere, particulate matter (PM) have either

warming of cooling effect on climate. Satellites images have clearly indicated the change in atmosphere by human activities. Based on this data US, Europe and some other nations have reduced pollution by implementing strict environment laws. It further says 'India is getting worse'. Pollutants in air cause various types of allergies and diseases. Inhalation of toxic gases affect our lungs and other respiratory organs causing respiratory diseases of upper tract.

Similar to air pollution in most Cities noise is unavoidable. Levels of noise pollution are growing day by day and due to lack of proper data, laws and civic bodies have failed to take timely steps to control and stop these. Noise rules are flouted especially in crowded cities and during festivals or celebrations. Noise pollution is a serious hazard and is one of the upcoming problems for people and animals. In city areas vehicular traffic, construction work, rock concerts, aero planes, helicopters with loud sounds is causing hearing loss, high blood pressure and stress. Study shows considerable work has been done on air pollution but the data available and awareness for noise pollution is still lacking. This has led to the creation of so called 'Noise Mapping Projects' undertaken by Bombay Municipal corporation with the help of private bodies to track the sources of noise, which will further help them in town planning to segregate between commercial, residential and silent zones.

Advanced nations have started using noise shields with new acoustics meta materials, scientifically developed for this purpose. European Environment Agency recently found that 125 million people reside in noise environment and noise is responsible for nearly 10,000 premature deaths. According to noise pollution – regulation & control rules (2000), maximum noise level is restricted to 55 dB with 50dB in day and 40-45 dB in night for silence zones. Exposure to noise above 80 dB for about 8 hours a day for long period induces permanent deafness. During recent lockdown the noise levels fell to nearly 50 -56 dB as against 85-100 dB in the residential areas in Mumbai. We can learn a lot from this situation and make changes in our lifestyle for future human betterment.

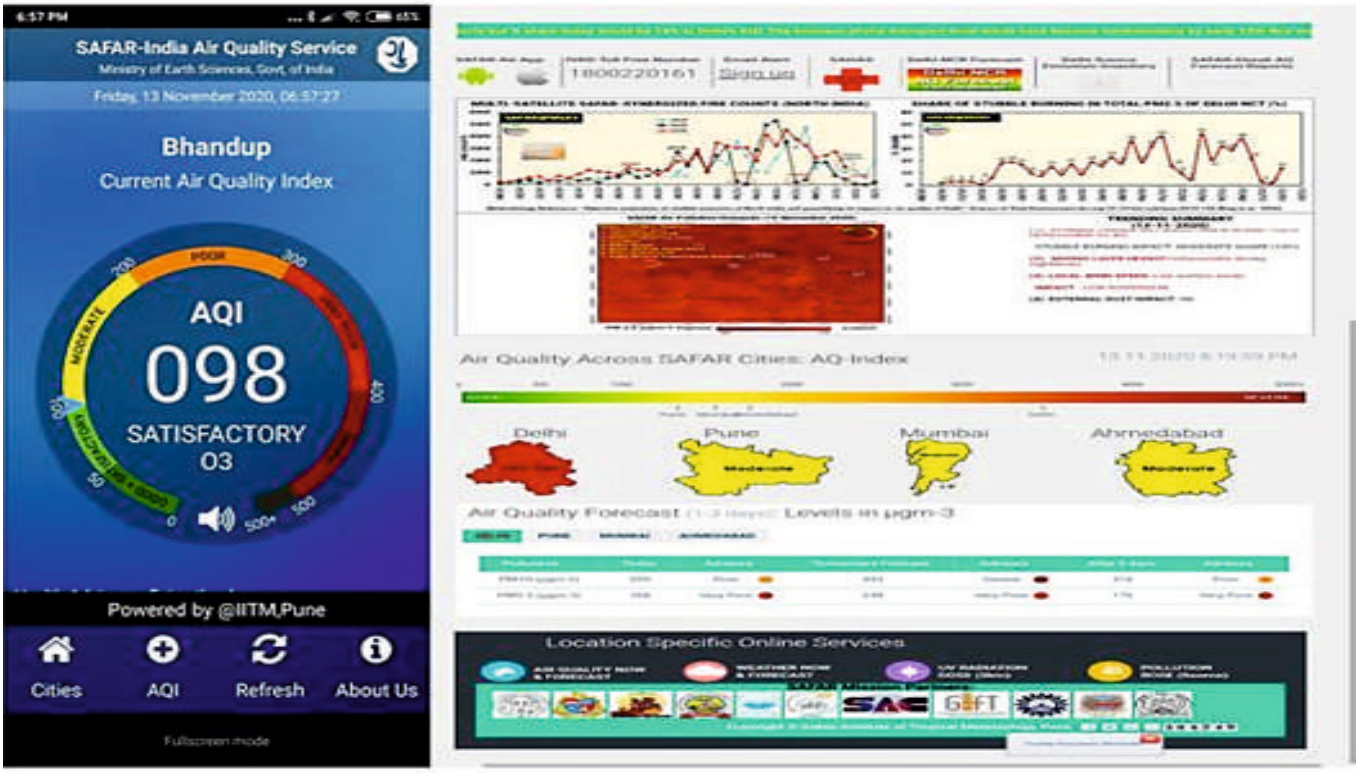
Mumbai is a commercial City and is full of air and sound pollution. Central Pollution Control Board (CPCB) has listed Mumbai as one of the noisiest city of India based on the noise measurements for 3 years in line. This write-up reports the air and sound pollution in city of Mumbai as it is my residential city and I could closely monitor the sound and air quality using the mobile apps. Also there are some running incidences of busiest cities in India and reports around the world.

Air Pollution

Scientists have shown direct relation between Covid-19 and the quality of air(DWNews,20th November 2020). More Covid Cases and more deaths have been observed in areas having poor quality of air. It has been recorded that every 1 g/cubic meter increase in PM2.5 particles, the mortality rate increases by 8 % (The Hindu, 13th November 2020) Moreover studies show positive association between other particulate matter (PM10), CO, NO_2, O_3 and Covid-19. WHO limits PM2.5 to 10 g/cubic meter annually. Levels beyond 500 g/cubic meter are considered to be extremely high and are responsible for health deterioration in relation to Covid-19 and beyond.7 day average of PM2.5 in major north Indian Cities around Delhi is approximately between 300 – 400 g/cubic meter (TOI, October 26, 2020) which is very alarming. Long term exposure to high levels of PM2.5 weakens the ability of the lungs to fend off infections, making people more and more susceptible to Covid-19 and related cardiovascular problems.

SAFAR- the online monitoring of Air Pollution in India under Ministry of Earth Sciences, Government of India is supported by the Indian Institute of Tropical Meteorology (IITM) for Air Pollution Mitigation. It is in fact the first type of network which continuously monitors several air pollution parameters together with others and maintains up to date data base with robust quality control and quality assurance. Efforts are made

under SAFAR to collect data from diverse microenvironments which is a true representation of city environment. As a result the observational Network of Air Quality Monitoring Stations (AQMS) and Automatic Weather Stations (AWS) have been established within city limits in some selected microenvironments like industrial, residential, background/cleaner, urban complex, agriculture, SEZ zones as per the international guidelines. Air Quality indicators are typically mounted at a height of about 3 m from the ground level with



SAFAR App and SAFAR - AQI Monitoring Chart

associated online sophisticated instruments operating 24/7 and the record is stored at every 5 minute interval. The pollutants typically monitored include PM1, PM2.5, PM10, Ozone, Co, NOx (NO, NO2), SO2, BC, CH4, Non methane hydrocarbons (NMHC), VoC's, Benzene, Mercury and other metrological ones.

Through SAFAR online App we can see the air pollution in our city / area as shown in the monitoring chart below. The left hand side shows the app as it looks in to a mobile phone and the right hand side shows charts and air quality forecast across the selected cities.

AQICN- The world Air Quality Index Project was established in 2007. Its mission is to promote air pollution awareness to citizens and provide a unified and worldwide air quality information – Air Pollution in Mumbai: Real Time Air Quality Index Visual Map (as shown below). It clearly shows moderate, unhealthy and Hazardous Zones all over our Country.

Using the Safar Air- App, I have collected data for a weeks' time around the Diwali Festival (2020). The graph shows variation of AQI for different cities across

Mumbai during Diwali with AQICN generated real time AQI – Visual Map. Out of 10 cities where monitoring is done by SAFAR, Mumbai Overall has 75% PM 2.5, and 25% PM10 followed by Ozone in atmosphere. The

graphs show complex variation of AQI and several sources may be responsible for it. Pollution created by crackers, emission from vehicles as the unlock- down process has begun as well as from other human activities. Effect of changing climate cannot be ruled out. Winter is setting in and at the same time the human activities are slowly taking pace due to unlock down process. Like when it rained in Delhi during this time which was experiencing all time high (Severe AQI nearing 500) due to stubble burning in the areas /states around, was brought down to (Poor AQI nearing 250) limits bringing much relief to its citizens. Effect of climate can similarly be seen in the cities surrounding Delhi.

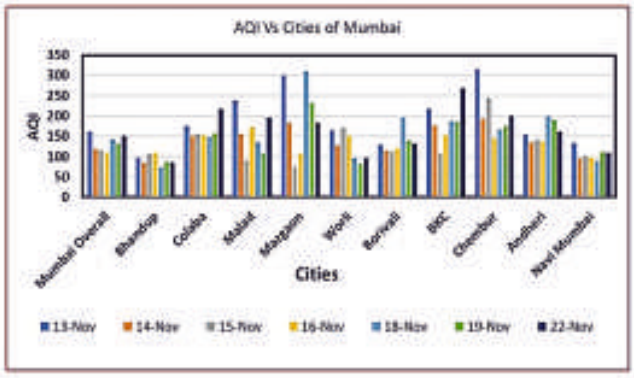


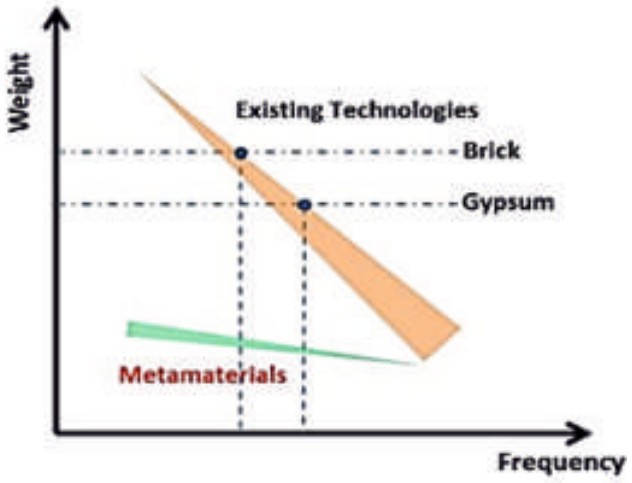
Figure: AQI of Cities across Mumbai Vs Dates (Diwali Festival) and AQICN– real time AQI Visual Map

MPCB – the Maharashtra Pollution Control Board Monitors the quality of air and other pollutions like sound pollution across cities in Maharashtra. CPCB is responsible for the Ambient Air Quality monitoring network in Maharashtra. MPCB has generated table showing the Air Quality Index 2020 as with Green colour for satisfactory zones (green / light green) and moderate (yellow) zones. It clearly shows the variation of the quality of air during various seasons across Maharashtra. AQI in Mumbai is in dark green zone in the month of July (rainy season). This is in contradiction to Navi -Mumbai where from May -September the AQI is very satisfactory, even when it is so near to the city of Mumbai. Moderate AQI can be noted from October -November and January, so during winter season the particulate matter and hence the air pollution is high. Across Mumbai also there is lot of variation in the pollution (AQI) levels as indicated in the Figure above.

Noise Pollution

There was a good news on the World Environment Day namely 5th June 2020 (TOI) with air and noise pollution significantly decreasing during lockdown. AQI was seen to be at its best a day after the cyclone Nisarga with Raigad recording lowest AQI of 17 this year. Bombay Municipal Corporation (BMC) affirmed this observation with the help of SAFAR where the levels of pollutants PM2.5, PM10, CO and NO_2 levels falling sharply due to lockdown. The data was collected from 10 pollution monitoring stations in Mumbai City. This was clearly due to closure of Vehicular Traffic, Construction sector, Transport and some Industries.

Noise consists of sound waves and hence can pass through Wall. Thick walls are needed to blocking noise but in highly populated / commercial cities we also have to keep in mind high cost of living space. This is related to universal mass-density law which in turn is based on volume mass and friction. Figure below shows weight per area of wall needed to block noise as a function of frequency (Z Yang et al, Phys. Rev Lett 101, 204301, 14th Nov 2008). Decorated membrane Resonators (DMR) having low-transmission and low-reflection are used as dampers for structural vibration.

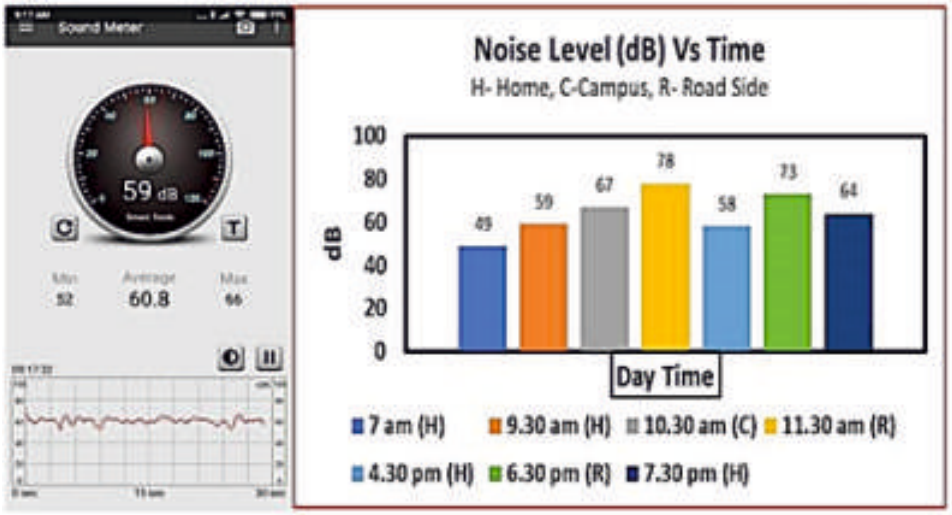


Weight per area of wall needed to block noise Vs Sound Frequency

Noise Shields which are compact, light-weight and cost-effective 'Resonance Acoustic Meta Materials' have been developed commercially. A centimeter thick easily mountable noise shields on existing home walls helps to block noise over 40dB in entire 100 -1500 Hz range. These noise shields combine the benefits of thick walls blocking high frequency noise and the noise shields blocking low-frequency noise. Also, flexible standalone panels designed to mimic human hearing curve with average transmission of 35 dB are in use. These flexible sheets (curtains) can cover noisy power generators / air compressors or during construction work.

Noise Standards are set according to the rules laid down in noise pollution (Regulation & Control, 2000). Noise Mapping Project has been undertaken to classify different city zones according to noise levels. Levels of

Noise are compared with ideal levels using sound level meter. Nitesh Joshi et.al has carried out Noise Mapping in Mumbai City and reported it in a Research Article. We must be aware of noise pollution around us and discuss the issues on various platforms as it may be a salient killer.



Sound Mobile App and Variation in noise levels (dB) at different times in

Bombay Municipal Corporation (**BMC**) measured sound levels at 740 of its 1200 locations across the city (HT, September 25, 2016). With the help of private bodies, noise levels at 50 places across 24 municipal wards were monitored. The continuous mapping showed that most locations in Mumbai are crossing safe limit set for noise pollution. The noise levels for residential/ salient zones were found to lie at 65dB (night time) and 75 dB (day time). Bombay high court made it mandatory for all authorities to carry our noise mapping in given time frame all over Maharashtra. It is said that before the mapping process, Maharashtra Regional Planning Act was not taken seriously. It was essential to identify the primary causes of noise for integration in to development and city planning.

Maharashtra Pollution Control Board (**MPCB**) has been developing Ambient Noise Protocol -Monitoring Network in India. It also has responsibility to establish Committee for Noise Pollution Control. Central Pollution Control Board (**CPCB**) has already declared Mumbai as India's noisiest city. Excessive Noise is directly affecting human health – hearing loss, high blood pressure, mental health problems. Exposure to excessive noise is also known to cause heart and mind cancer.

Variation of average sound over the week: changes with construction work on roads and blowing of horns by vehicles, monitored using Sound Mobile App as shown below. The graph shows variation in noise levels (dB) at different times during the day in Bhandup West residential zone (Mumbai). During lockdown these figures look good but as we are heading slowly towards un lockdown process, these levels will be further enhanced.

High frequency noise generated by construction work, moving vehicles, aero planes/ helicopters and low frequency noise due to human steps, music, highway traffic, trains, air conditioners, factories and power plants are harming human and animal lives.

Awaaz NGO Foundation conducts Awareness Campaigns. During recent current lock down the noise levels were noted to be good and satisfactory in residential areas. Various Environment protection groups have now launched a campaign 'Saalbhar 60' putting pressure on the government to make environment laws stricter, implement them to control and reduce the pollution levels in City.

The importance of pollution control especially during recent Covid Pandemic has taught us a very hard lesson. Bad weather due to air pollution created favorable conditions for Covid indicating that there was direct relation between pollution and Covid and possible many other lung diseases in future. SAFAR, AQICN, CPCB are clearly showing we are exposed to very severe pollution and vulnerable to so many cardiovascular diseases. Particulate Matter (PM) is wide spread and is major cause of pollution in air affecting human health compared to all others. PM is approximately caused by traffic (5%), Industrial activities (15%), domestic fuel (20%), natural dust and salt (18%) and unspecified sources of human origin (22%). Majority of the cities around Delhi and Mumbai have PM2.5 and that around Ahmedabad have PM10.

Happily, World Environment Day (5th June 2020) saw significant reduction in air and noise pollution due to recent lockdown. However, there was some concern about the rising levels of O_3 in the Mumbai City. It came as surprise to MPCB which analyses and endorses the data collected. The Mumbai Metropolitan Region (MMR) from Greater Mumbai extending up to suburban Kalyan saw a hike of 24.8 % in ground- level Ozone (GLO) in the analysis carried out by National Clean Air Program (NCAP) tracker comprising of Mumbai based quality research group ' Respirer Living Sciences (RLS)' and 'Climate Trends' an Delhi based communications initiative (HT, 28 May 2020).50 % rise in O_3 levels have been recorded in the MMR region compared to last year.

The safe average limit for ozone is placed at 80 g/m^3 per day. Many cities across India recorded ozone concentration between 64 -70 g/m^3 per day. Surface Ozone is formed by reaction between organic compounds and NOx in presence of heat and sunlight. GLO is said to aggravate *Asthma*, Cardiovascular and other related ailments. One cannot imagine all these, when the spread of Corona was at its peak and affected the lungs of people. This clearly shows the atmosphere around us was favorable for the spread of Covid-19. Which primarily shows that air pollution is a complex process than what we thought or know.

The rise in ground – level O_3during lockdown is in fact related to NO_2 levels(caused due to coal burning and vehicular exhaust), which fell down by 50 – 58 % for Mumbai -Thane Region. Photochemical production of ozone is enhanced by low NO_2 in presence of heat during summer as analyzed by MPCB authorities. MPCB Chief Scientist said ground – level O_3 may be secondary pollutant as a result of reduction process from other major pollutants (industries). Hence more scientific investigation is needed to identify the source of ground – level O_3. As a part of NCAP, Cities across Maharashtra want to reduce various pollutants at least by 20 -30 % in coming four years. New challenges like rise in ground level ozone at the time of already existing health crisis calls for more serious efforts to identify the impact of other pollutants apart from Particulate Matter. China to is said to have witnessed rise in Ozone and has already being putting efforts to control it. So now onwards in months of summer, we need to consider precursors for Ozone in addition to adopting measures to control other pollutants.

The lesson we can learn this year was the factors which we can control to reduce air and noise pollution in the city. It is possible!. Climate greatly affects the atmosphere around us. Delhi has severe AQI crossing 500+ level during winter (Diwali) on account of particles caused due to burning of crops after yield. Sudden rains this Year in Month of November on 15th November 2020, the air quality was enhanced from severe to poor (228 overall, moderate). So the timely rain was actually a boon to the citizens of Delhi. During same period an improvement in quality of air was noted in Ahmedabad (SAFAR- India data).

SEZ Zone and proximity to Sanjay Gandhi National park, possible results in satisfactory API for Bhandup

city near Powai, Mumbai. This can be clearly seen in AQI graph of various cities across Mumbai (discussed before). Which clearly shows the number of trees (Green Zones) and open places restricted for human activities have a major role to play together with climatic rains. As if our natural environment is supporting us in a big way. But we must realize this and take immediate measures to prevent pollution of mother nature thus benefitting each other in the process.

Green and Pollution free Environment is the dream of all whole world. We need to have more salient zones like the initiative of Mumbai International Airport. Urban and Planning Development can make it mandatory to use noise shields around our homes / commercial setups. Our modern society must be more aware of dangers of salient killer “noise” and take timely actions. The Mumbai Metropolitan Regional Development Authority (MMRDA) and its partners have been undertaking several massive projectslike Metro-Rail, Sea Link, Express Highways, Trans-Harbour Sea Links which passes through the residential parts of the Mumbai cities and has already been a matter of concern for noise pollution.

MMRDA has promised to carry out partial mapping through the noise mapping project.

What is all this telling us? To live a contended life, manufacture only that which is actually needed and not

exploit nature. It is very difficult for the government and NGO's alone to control pollution. We have many festivals throughout the year and music is inseparable part of the same. During these festivals, people are in jovial mood and not in position to listen to the law makers. We as a society must be responsible to take our part and think scientifically and environmentally. We need to think of old people and small children around us while playing high pitch music (DJ) at our home. Children's living near noisy airports have been found to suffer from stress, memory impairment, disturbed attention levels and reading skills. We have seen in spite of so many laws available to curb Pollution, it has failed to control the situation.

We forget about the nature around us, the birds, and the wild animals who too are badly affected by loud noise. Loud noise causes death of tender just born birds, caterpillars' hearts to beat faster, birds to have fewer chicks etc. Some animals use sound to navigate, trace food, attract their mates, and avoid predators. Noise pollution impairs all these tasks and in turn affects their ability to survive. In our Sea's activities too, movement of Ships, Oil drills, sonar devices create noise adversely impacting sea life. Making laws stricter would surely go long way. Every one of us must be aware of the pollution and take oath to use only those things which are nature friendly and really needed.

We have to develop and adopt and plan for the new technology which takes care of pollution (Green Technology). Our research must be focused in that direction. We have advanced instruments for research to help us to do that through new ways like Delhi government's initiative to use bio decomposers with the help of IIAR Pusa, New Delhi to take care of burning stubbles in and around Delhi causing severe air pollution with good soil fertility. We can slowly start to use electric vehicles and shift to solar energy (even in villages) thereby preventing burning of wood for food or hot water. This is the responsibility of every one of us. Time is not far when our honorable Prime Minister would float the idea of "Pollution Free Bharat".

ARTICLE

On the Occasion of Birth Centenary of Professor D. P. Khandelwal

Vivek Wagh
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My first meeting with Prof. DP Khandelwal happened sometime between 1991-92 period at Prof. BA Patki's residence at Nagpur. Prof.Patki greatly admired Prof. Khandelwal. Major part of my interaction with Prof Khandelwal was from 1993 to his untimely death in 1996.

Leaving my nascent career in mathematics research I had returned to Nagpur during 1987. This was the time when I had started studying the situation of mathematics and science education in India. My central focus for the rest of my life turned out to be research in quality improvement education on large scale.

During 1988 Prof.Patki and I had initiated a study circle activity for UG students. A small group of UG students would meet every Saturday at 4 pm. The venue was invariably Prof.Patki's office at Institute of Science, Nagpur. These students were from different institutions and some PG students also joined the discussions. The discussions were around various branches of physics and mathematics. This activity later led to a leading science education and popularization movement in Vidarbha region of Maharashtra. The momentum was quite strong during the 1990's and early part of the first decade of the new millennium. Today it continues but has lost its strong thrust. A number of beneficiaries of the activity of the 90's are now reviving it for their children. This is indeed an encouraging sign and gives us strength to move forward.

Before I met Prof Khandelwal I had gone through his 1989 article [1] in IAPT bulletin that has been republished in the January 2021 issue of IAPT bulletin. I consider it to be a must read for every educated person in India.

My first meeting with Prof. DP Khandelwal happened

sometime between 1991-92 period at Prof. BA Patki's residence at Nagpur. Prof.Patki greatly admired Prof. Khandelwal. Major part of my interaction with Prof Khandelwal was from 1993 to his untimely death in 1996.

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Some of the things that he had suggested as necessary reforms have been implemented. One such suggestion was a national test for educators. NET or SET for lecturer position has been introduced and a TET was added later for school teaching position. In last 20 years we have generally seen more degradation of learning. Clearly these tests have made little impact on quality of learning.

The pedagogical approach that Prof. Khandelwal pleaded constantly seems to have been falling on deaf ears. His comments in [1] about teaching of Newton's law of gravitation are still valid in today's scenario. We indeed have a very long way to go as far as bringing desired pedagogical change in overwhelming majority of classrooms of the country.

It will be worthwhile to begin writing out detailed exposition on Newton's law of gravitation in the way Prof. Khandelwal pointed out in [1]. It is also necessary to create small books with this type of exposition on different foundational topics of classical and contemporary physics. These will be helpful for educators and self-learners to develop proper insight and appreciation of different topics. It may eventually help in the desired pedagogical transformation to come about. No doubt that there are some popular expositions for a few topics but these mostly lack the type of approach that Prof Khandelwal had visualized.

Another area of primary concern for Prof Khandelwal was the neglect of good quality training in experimental physics in particular and experimental skills in sciences in general. He would have been happy with NAEST. NAEST 2000 has definitely shown us (with its preliminary round experiments) that it is possible to leverage modern technology to advance the goal of developing skills for experimental physics. Another noteworthy initiative was by DPKFSE and RC-15 for 10+2 level students [3]. Prof PK Ahluwalia also narrated his use of virtual labs during a course he taught online. A few years ago RC-8 exposed nearly 200 students and 300+ teachers to construct measuring devices and perform experiments using those devices. However, no systematic follow up study was undertaken for formal evaluation of gains.

Prof. SmitaFangaria [4] reported that error analysis is a key area that we need to emphasize. This fact has been brought about time and again during documented and undocumented discussions held at various events.

Another idea that Prof Khandelwal had pursued was that of Center for Scientific Culture. With short term support from MHRD GOI, three centers were started in 1993. Only CSC Midanaore took roots while the other two perished. Midnapore CSC stands tall on the footings of tireless work of Prof. S Samanta and his support institution and support team. We need to conduct a study to document its impact on students and science education around it. Such a study will help us in mobilizing efforts and resources for activities at other places.

The idea of establishing model labs to expose teachers and students was also there in [1]. I had intense discussions with Prof Khandelwal on this area and had differences of opinion with him. The model laboratories do have their importance but the problem of improving quality of learning on very large scale is in my opinion needs to be handled differently.

I am an active member of IAPT for last 30 years and I still believe that as an organization we have not seriously formed research teams to address the issue of mass physics education. We need to establish permanent research groups that can meet on a quarterly basis and present their findings annually on basis of field research.

In a recent article Prof E Duflo [5] emphasized the importance of field research. Although this article is written in the context of primary mathematics education it is equally relevant in the context of physics education at various levels.

Most of the research that is being carried out in the field of physics education in India is largely focused on design of experiments, alternative conceptions and possible pedagogical intervention on lab scale. However, we need to define, design and execute field research interventions spanning a period of three years and on a scale covering at least 100 institutions. This will allow us to figure out strategies that can possibly be scaled up to regional or national level.

If we review various articles form old issues of Physics News and IAPT Bulletin we see that a lot has been discussed about the declining quality of Physics Education, research and physics lab education in the context of our nation [6], [7], [8], [9]. I am sure we will find many more references to such discussions. This has led to some action points also. However, a more structured work needs to be done.

At present majority of IAPT membership is from physics teachers form UG level and above. There is no separate physics teacher at the upper primary and secondary level. Someone who teaches physics portions at these levels is a physics teacher. We should make serious efforts to bring these teachers in the IAPT fold. We should also make more effort to have higher secondary teachers among us as active members.

We should seriously think of forming the following Topic Study Groups (TSGs).

1. School Physics Study Group (SPSG)
2. Higher Secondary Physics Study Group (HSPSG)
3. UG Physics Study Group (UGPSG)
4. Graduate Physics Study Group (GPSG)
5. Physics Teacher's Professional Development Study Group (PTPDSG)

These study groups should be an integral part of IAPT structure. Just as we have a chief coordinator and coordinators of exams, we should have coordinators and teams of appropriate sizes for these study groups.

Formation of these study groups is important in the context of developing a strong resource base that is necessary for building pressure on the critical elements of our mass education system. At present we do not have any long term continuing program for professional development of our members or other non-member physics teachers.

High quality programs established by IAPT in Physics Education Research (PER) and Professional Development (PD) will enhance the development of professional career of many of our members and prepare them to understand the nuances of physics and any research activity. As such a vast majority of our members are primarily involved with physics education and physics research per say is a secondary function that some of them may be performing. This necessitates the establishment of a quality PER and PD programs at national and RC levels. If IAPT wills it surely has the strength to establish such credible programs.

On a personal note I have been involved with field work and educational research for more than 30 years as a self employed person. Nearly 52% of earners in India are self-employed, 25% are contractual or casual wage earners and the rest 23% are regular salaried as per 2017-18 data [10]. As per 2016 statistics nearly 5.42 million students are enrolled in pure science streams and 4.89 million students are in engineering and technology streams. We can safely assume that 10% of these will have a physics topic interface. So, nearly 1 million students from UG level up have an exposure to physics can be safely assumed.

Only a small number of these will have an opportunity to pursue a PG course in physics and a small fraction of those who pursue a PG in physics will eventually get a teaching position opening or a research tenure position opening. Consequently a significant majority of these 1 million students will end up in other jobs or be self-employed.

However, for all these students quality understanding of physics and development of good lab skills will go a long way in their personal as well as professional lives.

In each state, we need the science and mathematics subject expert or resource person at Block Resource Center upwards to become an active member of IAPT. This will help in our effort to form better understanding of physics and allied subjects at school level. This may help in reducing overall under-preparedness at +2 and upward levels. It will probably also lead to them being better able to use this understanding in their surroundings.

During the period 1993 to 1996 Prof Khandelwal tried to find suitable land near Nagpur so that a center for training teachers and students can be established. It could not materialize during his life. But, through the efforts of Prof S Samanta and Prof B A Patki a land was acquired on a long term lease. This land now has water, electricity and basic structures.

We will definitely establish a credible physics education research and training activity at this place in this decade. We will begin in all earnest once the pandemic subsides a bit and life returns to a new normal. This would be our way to pay our respect to the memory of Prof Khandelwal. We desire to create a 20 year perspective plan for the center. We would like to do this by the end of the next year i.e., by December 2022. You ll are welcome to contribute to this effort.

To ensure continuity, particularly over a long period of time, is crucial to the long term success of any activity. A strong and committedhuman resource along with an equally strong long term financial resource is needed for such an activity. We are confident of raising it. Both resources need careful nurturing. A disaster management plan and survival strategy is also needed in the face of any adversity that may crop up. All this requires a careful thought and a group effort to vet different possibilities and to accommodate different perspectives as well as avoid stagnation.

Just as we have an ELCB program we can think of a ELCE program (Extra Low Cost Equipment program). Good equipment can be made available at substantial discount under this program.

This may help individual members, particularly at smaller places, to posses and use good quality equipment for experiments. Small towns do not have scientific stores from where one can buy for example a good Vernier calipers or even a set of good lenses or magnets. Availability of such equipment and materials will help in developing interest in experimental work. This coupled with decent training inputs along with PD opportunities may help us move forward towards our goals as an organization.

I am thankful to Prof B A Patki, Prof S Samanta, Prof V Ghuge, Prof M Shetty, DR. Rekha Ghorpade and Prof P K Ahluwalia for sparing their valuable time to share their thoughts and provide relevant information in the context of this article. I also thank my family members for their support to my activities.

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Dr. Srikumar Banerjee

(25.4.1946 - 23.05.2021)

Our community sadly lost a pillar, when, a well-known Indian metallurgist, researcher and academician, Dr Srikumar Banerjee, former Chairman of Atomic Energy Commission, passed away on May 23rd, 2021 due to cardiac arrest.

Born in Kolkata on 25th April, 1946 to ShriNarayana and Shrimati Shanti Banerjee, Dr. Banerjee received his B. Tech in Metallurgical Engineering from Indian Institute of Technology, Kharagpur in 1967 after which he joined the Metallurgical Division, BARC in 1968. He earned his Ph.D in 1974 from IIT Kharagpur.

Dr. Banerjee did pioneering work in the field of martensitic transformations, rapid solidification, omega transformation, quasi-crystalline solids, shape memory alloys, effect of radiation on order-disorder transitions and tailoring microstructure and texture of nuclear structural materials through thermo-mechanical processing. A reputed specialist in physical metallurgy and material science, he was a leading global expert in the use of specialised alloys used in nuclear processes. At BARC he organised research in Nuclear fuel cycle, design of innovative reactors, application of radiation and isotope technology in agriculture, healthcare, food preservation and industry.

He created a horizon of knowledge from his work which was useful for developing the technology in Nuclear Fuel Complex. Moreover, he along with his colleagues also developed the technology for making the shape memory alloy rings for the Light Combat Aircraft (LCA) and this technology was transferred to the Aeronautical Development Agency (ADA).

It was a unique learning experience and scientifically rewarding to make this journey along with him for many of his colleagues like the undersigned.He has over 300 research papers to his credit, a book entitled "Phase Transformation: Examples from titanium and zirconium alloys" and has co-edited eight books.

Dr. Banerjee held visiting positions overseas which included University of Sussex, England, Max Planck Institute for metal research, Germany, University of Cincinnati and Ohio State University, USA.

Dr. Banerjee occupied several important positions during his career spanning more than 40 years, such as Director, BARC (2004-10), Chancellor of HomiBhabha National Institute, Mumbai and Chairman of Board of Research in Nuclear Sciences (BRNS), DAE. Dr. Banerjee has been the Chairman of Atomic Energy Commission of India (AEC) and the Secretary, Department of Atomic Energy (DAE) till April of 2012 and Chancellor of Central University of Kashmir, Srinagar (2012 to 2017).

In recognition of his seminal contributions to the field of materials science, Dr. Banerjee was conferred with many prestigious national and international awards which include the Government of India's civilian award, Padma Shri in 2005, the INSA Young Scientist Award, Shanti Swaroop Bhatnagar prize in Engineering; INSA Prize for Materials Science; Alexander Von Humboldt Research Award; Prof. BrahmPrakash Memorial Medal (2004); Indian Science Congress Association's Excellence in Science and Technology Award (2009); Ram MohunPuraskar of Rammohun Mission (2010); CNR Rao Prize in Advanced Materials; Presidential Citation of American Nuclear Society; National Metallurgist award from the Ministry of Steel (2010), W. J. Kroll Zirconium Medal Award from American Society for Testing Materials (ASTM); and Robert Cahn Memorial Award.

He has been conferred Doctor of Science (Honoris Causa) degrees from 11 universities and institutions. He was an elected fellow of the Indian Academy of Sciences, National Academy of Sciences India, Indian National Science Academy, Indian National Academy of Engineering, Third World Academy of Sciences, and International Nuclear Energy Academy.

Dr Banerjee was an excellent teacher, a great mentor and guide. The undersigned particularly benefitted by having him as guide and mentor. He was a great scholar, dedicated scientist, and a fantastic human being. He will be remembered for a long time by those who came in touch with him.

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Professor Chintamani Mande

(28.10.1925 - 27.04.2021)

Professor Chintamani Mande, a well known researcher in the field of X-ray Spectroscopy, an educationist and an excellent teacher, passed away at the residence of his son, Dr. Shekhar, (Director General, CSIR) in New Delhi, on April 27,2021.

Born in Nagpur, hedid his M. Sc. in Physics from Banaras Hindu University in 1947 and obtained D.Phil. from Allahabad University in 1952 under the guidance of Professor G.B. Deodhar. He later went to Paris in 1953 as a scholar of the National Centre of Scientific Research where he worked with Professor Y. Cauchois, a world famous X-ray Spectroscopist. He carried out X-ray spectroscopic studies of gold-silver and gold-palladium alloys covering a very large spectral domain of about 0.5Å to more than 5.5 Å,necessitating the use of various techniques - a work which demanded a great deal of dexterity and patience. He was awarded D.Sc. degree by the University of Paris in 1958 with mention 'Very Honourable'. He had written his thesis in French.

Dr. Mande returned to India in 1958 and worked as a Research Officer in the Spectroscopy Division of Bhabha Atomic Research Centre till 1961. He joined the Physics Department of Poona University in 1961 as Reader where he established an X-ray research laboratory. Six students obtained their Ph.D. under his guidance. In 1967 he joined Nagpur University as Professor and Head of the Post Graduate Teaching Department of Physics. Apart from X-ray Spectroscopy Professor Mande promoted researchprogrammesin Nuclear Magnetic Resonance, Ultrasonics, Luminescence, Atmospheric Physics, Materials Science, Electronic Instrumentation, New Energy Resources, etc.

Professor Mande and his wife, Mrs. Latika Mande, were instrumental in starting the Department of Foreign Languages in the Nagpur University. They both taught French for several years.

Professor Mande, with an active support from his colleagues, organized Summer Institutes in 1968,1969, 1971 and 1972 for college teachers. The last two were special All India Summer Institutes meant for adapting the Harvard Project Physics Courses to Indian conditions. In this connection Professor Mande went to the USA. in 1969 on invitation from the National Science Foundation to study the science educational projects in that country. With the assistance from the UGC a project physics laboratory was built up in which were displayed demonstration experiments and other educational aids designed and fabricated by the faculty members and participants in the summer institutes.

Realizing the importance of popularizing science, the Department organized science exhibitions, sky watching, science films and popular science lectures for a few years during November 7 -14, a week bracketed by birthdays of Sir C.V. Raman and Pandit Jawaharlal Nehru. Establishment of the Raman Science Centre in the city by the National Council of Science Museum is an outcome of that.A physics study group ofNCERT worked in the Department from May 1970 to June 1973 under the Directorship of Professor Mande. The group prepared text material for classes VIII to the XI, on mechanics, wave motion, optics and properties of fluids for the Text booksr printed by the NCERT.

Under his leadership the Department carried out the University Leadership Project (part of UGC College Science Improvement Programme – COSIP)from 1974 to 1982. In this project , the B.Sc. syllabi were modernized and suitable course materials were produced , hands on training was given to the teachers during the summer institutes, a contact programme was started in which senior physics teachers visited the affiliated colleges. Dr. Mande visited Penang University in Malaysia in 1977 as a representative of the UGC for attending the South-East Asian Regional Conference on Physics Education.

Professor Mandealong with Professor Bonnelle of Paris edited a book 'Advances in X-ray Spectroscopy' that was

published by Pergamon Press in 1982. It carries a foreword by Professor Francis Perrin, a French High-Commissioner for Atomic Energy from 1951 to 1970, and an introduction by Sir Nevil Mott, a Nobel Laureate (1977).

Professor Mande retired from the Nagpur University on October 31, 1985. He was later invited by Goa University to join as Professor and Head and develop the recently started Department of Physics. He served there from 1987 to 1991. Thereafter he returned to Nagpur, the city he loved most.

Professor Mande received several awards and fellowships. He was a Fellow of the Indian Academy of Sciences and also that of the National Academy of Sciences. He was a founder Fellow and President of the Maharashtra Academy of Sciences. He was a UGC National Lecturer during 1980-81. He received the Best Teacher Award of the Maharashtra Government in 1983. He was President of the Physics Section of the 67th session of the Indian Science Congress Association held in Calcutta in 1980 and also President of the Indian Association of Physics Teachers during 1996- 97. In 1987 he got the National Prize for Instrumentation given by the Instrument Society of India. He was felicitated by the Marathi Vidnyan Parishad as Outstanding Scientist in 1981. He was a member of the National Advisory Committee of the Inter University Consortium for the Department of Atomic Energy Facilities established by the UGC in Indore. He was a member of the UGC's Committee for the revision of the pay scales of University and College Teachers. For several years he was associated and also worked as Chairman of the Centre of Science for Villages at Wardha.

Prof Mande,(LM 123), was one of the early members of IAPT who nurtured it. When Dr Khandelwal (who was the IAPT President then) passed away in Feb'96, Prof Mande took over as the President (Prof Umadikar was the General Secretary) and ran the organisation smoothly till the end of the term, December 1996.

Dr. Mande was an avid reader with a deep interest in the history of science. Painting was his hobby which he continued almost till the end. He leaves behind his wife- Smt. Latika Mande (passed away on June 5, 2021), daughter- Mrs. Veena Gokhale and son , Dr. Shekhar.

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Prof Mande – A remembrance

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I came to know Prof Mande during College Science Improvement Programme (COSIP). We at PU Chandigarh also ran COSIP from 1974 to 1983. Prof Mande visited us, I think in 1980, in connection with evaluation of our COSIP. On that occasion, Professor HS Hans, our Head of the Department, told us that he and Prof Mande were class fellows at BHU..

One or two years later, it so happened that I was travelling to Hyderabad by train and got unwell during the journey. Nagpur was 1 hour away. I decided to drop at Nagpur and seek the help of Prof Mande. When I reached their residence I found they were not at home. It was evening, I became worried - what if they were out of station ? I got relieved when on inquiring in the neighbourhood I was told they were very much at home and would be returning any time now. I did not have to wait long. When Mandes returned, they were surprised to see me lying in the verandah. Prof Mande recognised me , took me inside where I told them my plight. Mrs Mande immediately prepared a bed for me and prepared tea. Prof Mande talked to some doctor. Soon he arrived and examined me. All of us were relieved when the doctor told - nothing serious, only high blood pressure. He gave some tablets, permitted me to resume my journey to Hyderabad next day and advised to get detailed checkup on reaching Chandigarh.

I can never forget the kindness and affection with which Professor Mande and Mrs Mande took care of me.

U S Kushwaha
Chief Editor

Prof Simon George

(10.05.1931 - 5.01.2021)

With love and remembrance, as physics professor and friend to many of us, Dr. Simon George, born on May 10, 1931, in Quilon, Kerala, India passed away on January 5, 2021, a very senior IAPT Life Member.

I met him, during International Conference on Physics Laboratory held in late December 1983 at the University of Rajasthan on Prof Saraf turning 60. He was one of the several delegates from abroad. He was from California State University, Long Beach, USA. On that occasion he demonstrated several phenomena, like holography (lady giving flying kiss), parabolic mirrors to show real image, total internal reflection using pocket LASER and colours from the scotch tape. Some of them were quite mesmerising. He was always smiling and eager to talk to anyone.

That was the time when Dr Khandelwal was doing the loud thinking about an Indian Association of Physics Teachers. During the conference, I saw Simon, an active member of American Association of Physics Teachers, in discussion with DPK on several occasions. I am almost certain that Simon's input must have played a significant part in DPK making up his mind for having an IAPT. When the IAPT was formed , Simon promptly became a life member and persuaded some others also in USA.

Inspite of many years in the U.S., Simon never forgot his roots in India. He was born in the state of Kerala, to the late Julia and William George. He received his B.S. from University of Travancore (Kerala) and M.S. from the University of Sager followed by teaching at the University of Guwahati, Assam. He arrived in the US on a Fulbright in 1957, later obtaining his Ph.D from the University of British Columbia in 1962.

Starting his professional career in the U.S. in 1961, he was promoted through the ranks to tenured full professor in the Department of Physics and Astronomy at California State University, Long Beach (CSULB) where he taught in that Department until his retirement 37 years later. He was rewarded for his efforts as the recipient of three of the University's most coveted awards -- Outstanding Professor Award (1984), Scholarly and Creative Activity Award (1985), and one that was particularly meaningful to him, the Academic Leadership Award (1997) which was given for his tireless work in faculty governance. He was an active participant in the California Faculty Association and the American Association of Physics Teachers. During his career he was awarded several National Science Foundation Grants for travel to England, India, Mexico, and Venezuela. He authored/co-authored more than 50 papers in scientific journals and presented an equal number of papers at scientific conferences all over the world, including numerous invited lectures. A number of CSULB students completed their research work under his supervision for a master's degree in Physics and he served as external examiner for several Ph.D. theses for universities in India.

After retiring completely from teaching at CSULB in 2004, Simon continued to dress in his usual suit and tie to go to his office on campus every day until the building was razed to make way for a replacement. During that post-retirement period, he travelled extensively throughout Europe, South America, and Asia, and enthusiastically led tour groups of 10-20 people on 3-week tours to India, Nepal and Sri Lanka.

He travelled and delivered guest lectures at many institutions in India, and interacted with many of us who found him a good friend , a 'Jolly Fellow' and motivator of IAPT in the country as well as abroad.

He also attended IAPT events in India when it suited his time schedule. Special mention may be made of our Silver Jubilee Year Celebration Convention (2009) at

Kanpur. He is seen in the picture with Prof B A Patki (the then IAPT President), Prof. K L Chopra (Chief Guest) and Dr. Sanjay Sharma.

His key - note speech was remarkable - a long session of discussion with participants and demonstration on Plasma science ,Laser beam interactions and Holography along with an introduction of those who got Nobel prize in this field.

Y K Vijay
IIS University, Jaipur

Simon , My Friend

I too met Simon at Jaipur in December'83 where I had gone to present the lab component of what we , at the Dept. of Physics , P U Chandigarh , had done in the University Leadership Project of UGC. He became interested and spent some time with me to know more about it. He was interested in visiting Chandigarh and promised that next time when he came to India he would definitely visit Chandigarh. And he did, not once but twice. The first visit was in 1988 and the second, perhaps, in 1992.On both the occasions he gave a talk and also some demonstrations. On his first visit I took him around in an auto – rickshaw. We had just started on our first leg that I was surprised to find Simon striking a conversation with the auto driver in fluent Hindi. He told me that he visits India quite often and each time makes it a point to visit a university in a different location and that perhaps I would not be knowing that much about state of education in India as he did. He said he likes to talk to common man, cruise around in a cycle rickshaw and get a real feel of the place and the people. Besides south Indian languages and Hindi , he knew Gujarati and Bangla too, enough to hire a rickshaw and visit a roadside eating place.

On his second visit, I remember an incident , typical of Simon . We went for lunch at an eating place in the university market. There, he ordered *chhola and bhatura*, a typical Panjabi meal.

We were in touch with each other by occasional emails in which he would invariably ask how the IAPT was doing.

Last, I met him in USA in 2011. I was at my daughter's place at Los Angeles . Long Beach is not far from LA. I got in touch with him on phone and he asked me to visit him. A few days later when we reached his place he was happy to see me . His wife was not at home , not likely to return soon . He took us to an Indian restaurant , praising that the *gulabjamuns* at this place are even better than what you usually get in India. And, indeed, they were worthy of his claim.

Simon loved Physics and loved India. A simple and 'Jolly fellow', to an unacquainted, he could easily pass as a common man on the street.

US Kushwaha
Chief Editor

Announcement

Attention NCIEP Award Winners

Your Award Winning NCIEP Experiments can now be put in a 20 minutes Video form in KSSS YouTube, a program of IAPT).

For details contact me.

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A Tribute to Late Prof AS Nigavekar


14.03.1942 - 23.04.2021

On April 23 we heard of the sad demise of Prof AS Nigavekar. He was an eminent physicist and an educator. He was a pride of the Savitribai Phule Pune University and the city of Pune.

Prof. Nigavekar was born on March 14, 1942. He got his undergraduate education in the Rajram College, Kolhapur where he got the Dakshina Fellowship. He then came to the then Pune University for his postgraduate studies. After obtaining the masters degree, he worked on X- ray spectroscopy under the guidance of Prof Mande for Ph.D. For postdoctoral research work he went to Uppsala, Sweden where he had SIDA fellowship. In 1971 he came back from Uppsala and joined the Department of Physics, Pune University. His intelligence, ability to work hard and dedication to the profession helped him to acquire the post of professor of materials science in 1977. He has 70 research papers to his credit. He established the Centre of Advanced Studies in Physics in the University in 1980. He served as Director of Educational Media Research Center and established Communication Science Department in the University in 1996. He was Vice Chancellor of the University of Pune from 1998 to 2000.

He was a member of the University Grants Commission (UGC) from 1993 to 1996 and initiated reforms such as decentralization of the UGC administration. Due to his excellent work in education he became first the vice chairperson and then the chairperson of the UGC in 2000 and worked in that capacity till 2005.

Prof. Nigavekar helped formulate the strategy for higher education in the Tenth plan of the Government of India. He was a man of vision and established the National Assessment and Accreditation Council (NAAC) body as the Founder Director. Dr. AP J Abdul Kalam, the former President of India called him the 'Father of Quality Education in India'.

Prof Nigavekar developed instruments and methodology for judging quality in Indian higher education which was endorsed by International Network for Quality Assuring Agencies in Higher Education. He was a member of Distance Education Council and an advisor to commonwealth of learning in Canada.

He was a visiting Professor in the University of York, in U.K. and University of Western Ontario in Canada. He was a permanent member and Vice Chairman of Asian Physics Education Network, a UNESCO organization. He headed many important committees and wrote many articles on education in the local dailies.

Prof. Nigavekar was awarded honorary doctorate by several Universities. He won the Phia Foundation award, UNESCO honor, Swami Vivekanand award,Advocate D. R. Nagakar award, Shiromani award and Delhi Ratan award.

Prof Nigavekar. (LM 111) was one of the early members of IAPT. He was always supportive of IAPT activities. As the Chairman of UGC he was the Chief Guest at the 2003 IAPT Convention at Jalandhar.

I have known Prof. Nigavekar since 1971 as I was also closely associated with the activities in the Department of Physics, Univesity of Pune. I have the priviledge to be a Ph.D. student of Prof. Nigavekar. He was extremely helpful in my research and I enjoyed working under his guidance.

We in the Savitribai Phule Pune University would definitely feel the loss. My condolences to his family. May his soul rest in peace.

Varsha Joshi
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A Tribute to Tauji[#]

***Inspiring a generation of teachers and learners**

As I grew up, Tauji became my role model. He has this subtle way of encouraging me to pursue professional goals, consider teaching, explore newer areas like computer science when it was a new field. Tauji used to visit Kamptee and Nagpur for IAPT and academic work. I was really lucky to have opportunities to meet Tauji. His ideology about what it means to be a teacher, how teachers can optimize learning and how sharing fundamental-concepts with clarity is at the heart of a teacher's endeavour had large impact on me. I owe most of my professional success to the ideals he instilled deep inside my heart and mind.

***Winning hearts of colleagues across geographies**

Taujihad this aura around him. Whenever I would go to Nagpur University - initially as a student and later as a University Board of Studies member, I would usually meet someone from the physics fraternity who knew Tauji and talk about these initiatives fondly.

Some of these colleagues would frequently express their desire to have the opportunity to meet him. Those who had met him would first talk about this down-to-earth nature and then bring up his stellar professional accomplishments.

***Flag bearer of inter-disciplinary learning**

Once during his visit to my place, tauji said, "No science subject can prosper without having an interdisciplinary approach". This very idea of Tauji resulted in IAPT conducting National Standard Examination for Chemistry, Biology, Astronomy along with Physics leading towards

India participating in IPhO, IChO (started in 1997 shortly after his demise and 1999 respectively). When I joined Computer Science Department as Head in 1990, Tauji had an elaborate discussion with me as to how computer-based experiments in Physics could help students grasp the insight of basic concepts inPhysics. I clearly remember - this was the first time I had gathered the courage, given his stature, to present my views. As I look back, while my views were not as sharp as his, he never made me feel awkward and was such a patient listener!

***Love for the nation**

Tauji always thought for society, we all are aware of. Papaji used to share multiple times that Tauji had participated in the freedom movement ... but now I came to know how intensely he was associated with our nation's independence.

It's amazing to see everything Tauji achieved in a single lifetime. This is the Birth Centenary year, and it will be celebrated till 1st Oct 2021 by IAPT. We all are really blessed to be so closely related to Tauji.

***Shat ShatNaman**

Abha Khandelwal
(D/o Dr Khandelwal's younger brother,
Saran Swaroop Rawat)
Department of Computer Science
Hislop College, Nagpur, Maharashtra

[#]Elder brother of father

A Tribute to Professor Khandelwal

It was probably the third week of August or the first week of September 1993. This was the time when I stayed in Lonavla (about 65 km away from Pune) and worked as a lecturer in the Nowrosjee Wadia College of Pune. I received a message from Dr Mrs. Varsha Joshi, my senior colleague and later the head of the department of Physics in my college, that I should meet her.

When I met her, she told me that there was a group of eminent persons working in the Pune University (now SPPU) in the area of my interest namely, physics education. She asked me if I had an inclination to be associated with the group since they required someone with a good hand at practical work in physics. Since I always loved working in physics laboratories much more than reading theory books, I nodded. Later when I was introduced to the group by her, I learnt that it was an international UNESCO project on which several veterans including Prof AS Nigavekar who had taught me while I did my M.Sc. in the same department. Gradually I got acquainted with other members of the group too.

Prof DP Khandelwal and Prof AW Joshi were the most active members of the group and both had a vast treasure of knowledge in the field of physics. They had already established a tiny laboratory in one corner on the ground floor of the University physics department. It did not take much time for me to be a confidant of Prof Khandelwal since I often had good conversation with him while dropping him close to his residence in Pune (quite near my college)in the evening. He was such a down-to-Earth simple person that I never felt hesitant to take him as a pillion rider on my M-50 moped. This would usually be my evening schedule twice or sometimes thrice a week. I could then leave the city for Lonavla by Indrayani Express. It was much later that I learnt about his bright contributions with Prof BL Saraf in the past.

I still do not know what exactly impressed Prof Khandelwal but it was probably my volley of questions particularly about activities and experiments in physics that created affection. He would speak not only about activities but also about the people involved in the group and sometimes even beyond; to assess the depth as well as quality of the final outcome of the UNESCO project in the form of books. When he asked me about my background and interests and I told him about late Prof MR Bhiday and Prof RN Karekar's unimaginable support to promote the spirit of inquiry in us while doing MSc in Pune University. I told him about our schedule of experimentation spread over several nights during emergency days in order to complete all experiments successfully . This was when I could see the glitter in his eyes very clear. It was the kind of glitter that one would often see when he would himself be able to accomplish something with complete satisfaction.

There are many great teachers who are impressive orators and have an excellent style of communicating physics to students but I found a distinctly different great teacher in Prof DP Khandelwal. He did not offer a complete explanation at one go. He would instead, ask me to do something in the laboratory or think about it as a thought experiment and investigate. This, as I soon learnt, ensured my deepest mental involvement 'in solving the problems' myself for enhanced pace of learning.

On some occasions, we could work on several experiments and he would leave the task of verifying the outcome of some novel deviations from the normal procedures to me. I think I should have passed his informal assessment, as he strongly recommended my name to the departmental authorities as a resource person in the forthcoming refresher courses in physics at the department. I must also mention that prior to this honour, I had also received a remark “one thing at a time!” on my write-up of one of the experiments formally assessed by him. Thus, it was always more through his actions that Prof Khandelwal delivered a strong message to his students and associates that for attaining deeper understanding, one must narrow down the scatter in thinking as well.

I recall his passion and dedication towards self-reliance ('atmanirbhar bharata') when he used to ask me or other

younger generation associates how to add omit or shift a part of text somewhere in his file on a computer. Today it might sound trivial to youngsters but this was both commendable and memorable since it was much difficult compared to that today after WINDOWS OS came in. After watching the zealous student in him working for several hours even after completing seventy years of age, everyone in the group felt inspired to perform better with each passing day. I remember that we had Mr Nitin Bhamare as our assistant in the group who would help us set up experiments.

Whether it was Prof Pandit Vidyasagar or Prof AW Joshi or Prof Tillu, Prof Khandelwal would always be extremely attentive to what they said and gave immediate response to their views or suggestions. Perhaps he never believed in keeping the matters pending which could be immediately sorted even in a minute. This, needless to say enhanced the pace of physics learning for many, including myself. Only such matters that needed to be tested experimentally would sometimes linger beyond a day or two. I could see him working silently all alone with some mathematical equations in order to arrive at some concrete conclusions while he was scripting the major book "The World View of Physics". Prof AW Joshi who later took over the mission to completion after the sudden and sad demise of Babuji in Feb 1996 (and with whom I remained very closely associated till he passed away in July 2010) had mentioned on at least three occasions that Prof Khandelwal had done almost 85-90% of the work in terms of the series of booklets in the project and he could provide the finishing touches in time only because of it.

Prof Khandelwal being a pre-independence freedom fighter, had a strong sense of justice and always felt that due credits must be given to all involved team members in a mission regardless of their designations or even limited roles if the contributions were significant. In my opinion, this was the highest and essential leadership quality that led him to successfully create the large workforce of selfless teachers in schools, colleges and Universities in our country. Today, when we see what IAPT is and compare it with many other organizations which have a large funding but severe shortage of workforce in the field, the importance of being one Prof Khandelwal in thousands of teachers becomes very evident.

I was pursuing my M.Phil. degree while I was working with Prof Khandelwal and the group in Pune. In February 1996 there was a refresher course arranged for physics faculty in the University department of physics. Prof.Khandelwal was of course the senior most resource person and for reason unknown he preferred to deliver his lectures right in the first week of the course. Some experiments that our group had set-up were later demonstrated to the participants and faculty members. Prof BD Chaure from Nashik region who was then the Pro-Vice Chancellor of Pune University and Prof Jayant Naralikar were invited as special guests to see our experiments. They both honoured the invitation and had very meaningful interaction with our group members on two consecutive days. Prof Naralikar visited us probably on Saturday. Some photos were clicked. I returned home that night with great satisfaction.

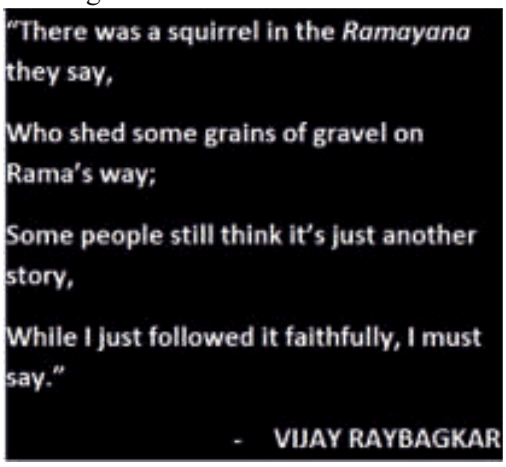
On Monday, I came to Pune by train as usual and received a message note in my department. It mentioned that Prof Khandelwal had suffered from an attack and he was admitted to Jehangir nursing home, a reputed hospital quite near my college. I rushed to the hospital to see him but since he was in ICU and I was not his blood relative, I had to be content only watching him through a glass window. I could just pray for his recuperation distantly. I returned to my college and discharged my duties almost as a ritual –my mind was restless from within. The next day when I landed in Pune, I heard the sad news that he had breathed his last. It was a rude shock for me. Even the fresh photographs clicked with Prof Chaure and Naralikar were received the next day and cruelly stared at me.

Babuji's demise shook me so heavily from within that I could not even write an obituary article on him in the special issue of the IAPT bulletin published soon after his demise though it included our last photograph together. His sudden departure could be compared only with that of my father some years earlier. However, my association with the University group continued, Prof AW Joshi successfully led the group to finish the incomplete work on books and the work consolidated my resolve to pay my tribute to Prof Khandelwal through my experimental work rather than words.

I was fortunate to be allowed to convert my registration

for the M.Phil. degree to Ph.D. by the YCMOU, Nashik authorities (although it was not a hassles-free passage due to formalities involved and took more than an year) and I could obtain a doctorate degree from them in 'subject communication' aka Physics Education with the distinction of working on designing, developing, testing, implementing and pedagogically assessing a set of a dozen simple low-cost experiments suitable for undergraduates. Further, my experimental work completed successfully through a University that was 'Open'(and consequently had no laboratories of its own) aroused much curiosity among IGNOU authorities who invited me to be a Ph.D. guide and it was surely due to the silent blessings of late Prof Khandelwal that my friend Umpatai Pattar from Karnataka did much similar work to acquire his doctorate under my guidance through IGNOU later.

Thus, I have the life-time contentment of having paid my rich tribute to the noble soul who had illuminated my life like an angel in less than three years of his divine personal presence. I would prefer to summarise my emotions in the following lines –



Vijay Raybagkar
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A Tribute to Prof Hari Prakash

Pioneer of quantum optics in India

14th July,1945 – 3rd May, 2021

Recently (on 3rd May, 2021), we have lost Prof. Hari Prakash. A week before that we lost his wife Prof.Ranjana Prakash. Both of them were formerly professors of physics at the University of Allahabad. Their sudden demise is a great loss to Indian academia in general and quantum optics community in particular. They guided and encouraged many students at the University of Allahabad,

He was born at Pilibhit, India. He did BSc and MSc from the University of Lucknow (1959-1963) and PhD from University of Roorkee.

After pursuing Ph.D. at the University of Roorkee in nonlinear optics and matter-field interaction, in 1966 ,he became interested in quantum optics. For next two years he published a few solitary papers and a few other papers with Vachaspati and N Chandra

. His efforts led to the development of a strong quantum optics group in the University of Allahabad, which was later complemented by Ranjana Prakash. Chandra, Prakash and Prakash together considerably contributed in the development of quantum optics in India. A total of 28 students completed their PhD under him. The legacy that started about 55 years ago is still continuing. His areas of specialization are Quantum Optics; Nonlinear Optics; Entanglement quantum Information Processing Quantum; Quantum Teleportation

He worked in the university in different capacities, like Head of Physics Department (2003-05), Dean Science Faculty (2004 -07), Director IIDS. Post-retirement, he served as Adjunct Professor, IIIT, Allahabad and as Visiting Faculty at VBS Purvanchal University, Jaunpur. He was conferred with "Distinguished Teacher Award" by the University of Allahabad.

His sudden demise is a great loss to the entire physics community, but we are sure that his legacy will continue.

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Prof DP Khandelwal Birth-Centenary Activity

Online Summer School 2021
Computational Physics

The aim of summer school by IAPT, Mumbai Sub-Regional Council (8B) has always been to help, students graduating in Physics, with important areas/topics which are not covered in the regular curricula. This year the topic was chosen to be Computational Physics.

Being pandemic time the course had to be planned as an online course. Keeping in mind the practical part which was an important aspect of the course, to be handled for two weeks, google classroom was chosen as a platform after a lot of deliberation. There was a good response from students applying from all over India and one international student. In all 85 students enrolled for the course from Maharashtra, Karnataka, Jharkhand, Tamil Nadu, Haryana, Gujarat, Kerala, Delhi, Uttar Pradesh, Odisha, Puducherry, Madhya Pradesh, Jammu and Kashmir, Bihar and Doha .

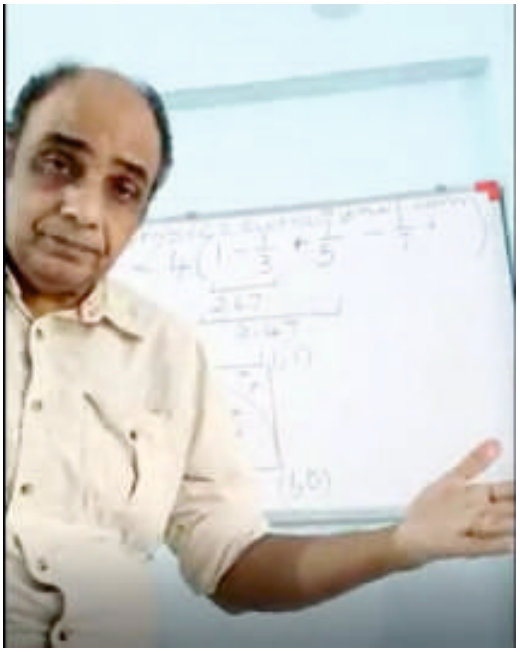
The course was held from 17-29,May 2021. The total duration of the course was of 42 hours. There were two sessions every day. The morning session used to be of one and half hour and afternoon of two hours duration. Students had to submit assignments given every day. The assignments were monitored and students' doubts were removed on WhatsApp as it was the quickest way to interact.

The resource person for the course were

Mr. Mahesh Shetti (Wilson College) – Topics covered, involved physics problems- plotting physics functions, Numerical Integration using Trapezoidal rule and Simson's 1/3rd rule, differentiation, Solving Differential Equation using Euler method and solving non-linear equations using Iterative method, on Excel platform.

Mr. AM Shaker (KJ Somaiya College) – Topics covered -Descriptive Statistics, regression, Graph plotting, Matrices, Moment of Inertia Tensor, Eigenvalues and eigenvectors on Excel platform.

Dr.Nishita Desai (TIFR) – Topics covered- Gravity: n-



body problems, Modelling infection spread, wave mechanics, quantum mechanics and statistical mechanics on Python platform

Mr. Pratik Barveand Mr. Jigarpatel handled Python basics, tutorials and fractals.

Enrichment lectures delivered by

1. Prof PD Lele – Areas in Physics and Applications requiring tools of Computational Physics.

2. Dr. Varun Bhalerao – Astronomical Calculation using Astropy library in Python

3. Prof PK Ahluwalia – Predictive Simulation: A Game Changer in Understanding Nature

Conveners: A M Shaker and Mahesh Shetti

The link for the lectures on YouTube will be: https://www.youtube.com/channel/UCFxQ1xtKrAfigYSjPh7mMtg/videos

AM Shaker

Science Fair

February 28, 2021

SGM-IAPT Anveshika organized a Science Fair on the occasion of National Science Day, February 28, 2021 in collaboration with Shiksha Sopan, IIT Kanpur. It was organized at Sopan Ashram, Nankari, IIT Kanpur from 10.30 AM to 4.30 PM. The aim was to connect the society to science and technology. Sopan Ashram is the place which is developing as science tourism center in Nankari.

Some students of class 6th to 12th and few from B.Sc. were selected for demonstrating the science experiments. A 10 days training camp was held to train them to handle audience questions, dialogue delivery, body language etc. They were also trained to handle drill machine, wood cutter machine, vice, soldering and make circuits on bread board. They fabricated/ assembled the exhibits/ models for the Science Fair.

The Vigyan Mela was inaugurated by the Chief Guest, Sri Satish Nigam, Ex-MLA of UP. Dignitaries present included Prof H C Verma. Prof Verma took the Chief Guest around the Mela where they interacted with the students manning the exhibits. They were impressed with the confidence the students exhibited in explaining the scientific principles behind their exhibit.

The Mela was visited by the general public which included villagers, school students, college students, guardians and teachers. For many of them it was a novel experience and they felt happy about it.

Two volunteers at the entry gate were instructing everyone to follow guidelines of Covid 19, checking their temperature, sanitizing their hands and also providing them a fresh mask.

The Science Fair had four main sections:

1. **Display of posters:** Sir C V Raman's notable discovery "Raman Effect" was depicted through a poster exhibition together with his biography. A total of 25 posters, made by students were exhibited. The highlight of these handmade posters was Raman's love for Nature and Music.
2. **General Experiments:** This section included experiments related to Mechanics, Sound, Electrostatics, Electromagnetism, optical illusions, optics and some attractive chemistry experiments.
3. **Experiments related to electronics:** The stall of electronics was very attractive for everyone because some electrical and electronic appliances like computer, CPU, UPS, Monitor and Television, Fan etc were dismantled and its each and every component was easily viewable by visitors. Some of the visitors (students) first time saw capacitors, resistors, ICs etc.
4. **Activities and puzzles:** One stall was especially put up for activities using paper. Visitors learnt cap-making using old newspapers and save them from the sun. Many more things related to mathematics like angles, shapes etc were also explained.

   many mind boggling and interesting puzzles games were also part of the Mela which created much fun and enthusiasm.

The whole environment of Sopan Ashram seemed to be



filled with science, wonder, enthusiasm, positive energy, fun etc.

In the Mela, a photo frame was also set which made them to click pictures and selfies and collect some Vigyan Mela memories..

Amit Kumar Bajpai
Coordinator

Report (SRC-08C)

State Level Essay Competition

Venue: Online mode link:
https://fb.watch/4LBVHMhe3R/

Date: March 24, 2021 **Coordinator**: Dr. Sandip Kakade

SRC-08C, Pune organized a state level essay competition in collaboration with Science Association, Sir Parashurambhau College, Pune in January-February 2021. We received about 700 essays from different regions of Maharashtra and some outside the state. The competition was organized in three different categories: junior college, undergraduate and postgraduate students. Two topics were given in each category, Science: Next generation perspective, Skill Development: Challenge for coming era, Science behind Dark Matter, Covid 19: Growth, Spread and Control-A Scientific Approach, Innovation and Research: A Basic Need and Interdisciplinary Education: A new Approach. Many students expressed innovative ideas and scientific and logical thoughts.40 faculties voluntarily evaluated the essays.

Attractive cash prizes were sponsored by Science Association, Sir Parashurambhau College, Pune and distributed in the prize distribution ceremony organized on 24th March 2021 to the students of total amount Rs. 26,500/-. Prof. Dr. Sanjay Dhole, Assistant Professor from Department of Physics, Savitribai Phule Pune University was the Chief Guest. He delivered a talk on the topic of "Vidnya Khitije". Prof. Dr. Savita Datar, Principal, Sir Parashurambhau College, Pune presided over the function. Prof. Bharat Kangude, President,SRC08C, Pune informed about the different activities and the role of IAPT in student development. Dr. Sandip Kakade, Coordinator, state level essay competition and Incharge, Science Association and Secretary, IAPT, SRC08C, Pune gave overview of the essay competition, the qualities of the essays received, efforts of the examiners and participants in COVID pandemic situation. Ishwari Nalawade and Harshal Vyvahare expressed their views about the essay competition. Dr. Manisha Modak, Prof. Ajinkya Thorat, Girija Mahmuni and Jayesh Saraswat worked for successful completion of the event. Dr Kakade proposed the vote of thanks to the Chief Guest, Principal, examiners and all participants.

The list of top rankers who have received cash prizes are as follows.

Junior College Level Top Rankers with Prize:

1. Ishwari Atul Nalawade : Sir Parashurambhau College, Pune : Rs. 3000/-
2. Aarya Suryakant Dharmadhikari: Sou Vimlabai Garware College, Pune : Rs. 2000/-
3. Mrudula Chandrkant Bandgar: Yashvantrao Chavan Warana Mahavidyala, Warana. : Rs. 1000/-
4. Namrata Dadarao Chapale: Shri Sant Tukaram Lohgoan College, Lohgoan : Rs. 500/-
5. Hrucha Sharad Shinde: Rajarshi Shahu Mahavidyalay (Autonomous), Latur :Rs. 500/-
6. Shraddha Pandurang Bhagwat: Fergusson college, Pune : Rs. 500/-

Undergraduate Level Top Rankers with Prize:

1. Mitali S. Garurkar: Government Institute of Science, Nagpure: Rs. 4000/-
2. Shriyash Ramakant Nagaonkar from : J. S. M. Collage Alibag : Rs. 3000/-
3. Sanjana Sunil Gade : Naik Arts, Commerce, Science College, Raver: Rs. 1000/-
4. Gopika S. Nair from Sir Parashurambhau College, Pune: Rs. 500/-

Postgraduate Level Top Rankers with Prize:

1. Harshal Ambadas Vyvahare: Dr. Babasaheb Ambedkar Marathwada University, Aurangabad: Rs. 5000/-
2. Muskan Bashir Kazi: Sir Parashurambhau College, Pune: Rs. 3000/-
3. Vrushali Raghunath Kale : Gogate, Joglekar Art, Science and Commerce College, Ratnagiri: Rs. 1000/-
4. Nita Rahul Ranvirkar: Vasantraoji Kale Mahvidyalay, Ratnapure: Rs. 500/-
5. Nishma Suyeshkumar: K.J. Somiya College of Science and Commerce, Vidyavihar, Mumbai: Rs. 500/-
6. Tejal Sambhaji Honawale : H. V. Desai College Pune : Rs. 500/-

Sandip Kakade

Report

Einstein Nobel Prize Centenary Year Celebration

National Anveshika Network of India (NANI) has initiated a program titled Einstein Nobel Prize Centenary Year Celebration (ENOPCYC) to celebrate hundred years of Nobel prize to Albert Einstein. The program was initiated in April 2021 and gained momentum in May 2021. The program is organized under D. P. Khandelwal Birth Centenary Celebrations (DPKBCC).

The program includes a series of webinars, demonstrations, quizzes, and story writing competitions centered on the Photoelectric Effect. Many IAPT members have joined hands as resource persons.

In May 2021, a total of 29 events were conducted in which 3016 students and teachers participated. Most of these programs were online, and a few were contact programs. This was a good beginning given the second wave of COVID pandemic peaking this month. The numbers are likely to increase substantially in the coming months. Interested IAPT members are invited to join as resource persons.

Jitender Singh
ENOPCYC Coordinator
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Inauguration of Amity Inspire Laboratory

Innovation Hub at Amity University Chhattisgarh, Raipur

Observing the working models/instruments, identifying the Physics behind each one of them and experiencing the principles in action hands-on promote the thought patterns of an inquisitee: to further delve into innovation or invention of new models (in-a-way: toys) making the world more interesting, challenging and beautiful. The significance of the newly inaugurated Amity Inspire Laboratory: Innovation Hub at Amity School of Engineering and Technology, Amity University Chhattisgarh, Raipur on February 19, 2021 is in the said lines. The models housed at Innovation Hub in Department of Physics encompasses subjects in the realm of mechanics, electricity and magnetism, waves, plasma, Quantum Physics for demonstration and performance purpose.

The Innovation Hub will serve as a place of learning, inspiration, motivation and recreation leading to observations, discussions and blossoms of imagination kindling the lamp of innovation in intuitive young minds

The inception was in cooperation with Prof. Y K Vijay, President RC-06. Honourable VC Prof. (Dr.) Rajendra Kumar Pandey ,Amity University Chhattisgarh cut the ribbon, in the presence of Registrar, Deans, Directors, Heads of Institutions, Heads of Departments and faculty members of the University.

The various models/instruments in display at Amity Inspire Laboratory are:

Sr. No.	Name of the models/instruments	Functionality
1	Angular Momentum Conservation Equipment	A setup using bicycle wheel with handles and tubeless tyre and a rotating stand to demonstrate conservation of angular momentum
2	Maxwell's Top	Demonstration of spin and precision with the mechanism of wheel balancing
3	Coupled Oscillator Lissajous Figure	Superposition of two simple harmonic motion resulting intolinear, elliptical and end circular visual patterns demonstrating phase difference concepts
4	Magnetically Coupled Oscillator	Demonstration of transfer of energy form one oscillator to another through magnetic coupling presenting two modes of oscillations (i) in-phase and (ii) out-of-phase
5	Plasma Application	Model of Plasma Glass Globe
6	Tesla Coil	Demonstration of generation of R G supply and illumination of CFL lamp
7	Plasma Flame Set up with high voltage	Demonstration of ionized plasma and charge on a flame
8	Racing Track	Demonstration of rotational motion dynamics
9	An-harmonic Oscillator	A magnetically coupled oscillator system
10	Importance of Curved Surface	Visualization of Space-Time Coordinate system and its dynamics
11	Kundt's Tube	Demonstration of superposition of waves
12	Lorentz Oscillator	Demonstration with random pendulum with multiple degrees of freedom
13	Motion on Inclined Plane	Mechanism of Roller-Coaster

14	Frictionless Track	Demonstration of air track levitation
15	Measure Your Weight	A calibrated weight measuring system working hydraulic mechanism
16	Series of Pendulum	Demonstration of phase differences and its significance.
17	Six Coupled Oscillators	Demonstration of longitudinal and transverse energy transfer in a wave.
18	Solar Concentrator	Demonstration for utilizing solar energy
19	Air Cannon	Demonstration of propagation of impulse through air
20	Vortex Formation	Demonstration of imbalance of surface tension imposed by tangential force leading to vortex formation
21	Bohr Orbitals	Study of Bohr Orbitals with the support of function generator and understanding the concepts of standing waves
22	Function Generator	Demonstration of vibrational modes in a molecule with Methane Molecule model with the support of function generator
23	Newton's Cradle	Demonstration of linear momentum transfer
24	Doppler Effect	Demonstration of Doppler's effect by a strip oscillator
25	Manual Lift	Demonstration of action of pully
26	Mechanical Transmission Line	Propagation of wave using torsional disturbance and demonstration of phase reversal, damping and superposition
27	Equilibrium of Magnets	Demonstration of atomic/molecular distribution in solids
28	Eddy Currents	Demonstration of back emf
29	Meldies Experiment	Demonstration of laws of vibration.
30	Multiple Image	Demonstration of multiple image formation rules

Roshan Mathew
Amity School of Eng. and Tech.
Amity University
Chhattisgarh, Raipur

Six Days' National Level Virtual Physics Meet-'Physics Hunt'

Venue: Sri Ramakrishna Mission Vidyalaya College of Arts and Science (SRMVCAS),
Coimbatore-641010 Tamilnadu.

Dates: 25/4/2021 to 30/4/2021.

Student Beneficiaries: 305 (Tamilnadu-278 Other States-27)

Convener: Dr. J. Chandrasekaran**,** Head, Department of Physics, SRMV CAS

Coordinators: Dr. K. Sathishkumar and Dr. C. Mahendran, Assistant Professors of Physics, SRMV CAS

Cash Awards Sponsored by: Indian Association of Physics Teachers (IAPT)

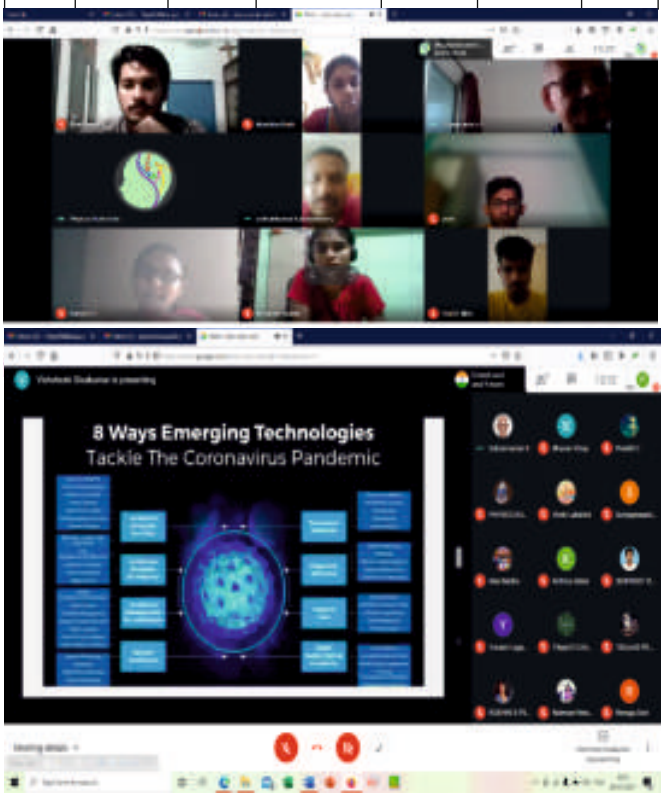
IAPT Coordinator: Prof. K. Subramanian

Department of Physics, Sri Ramakrishna Mission Vidyalaya College of Arts & Science (SRMV CAS) and Indian Association of Physics Teachers (IAPT) Jointly Organized A National Level Virtual Physics Meet – 'Physics Hunt' through online mode from 25th to 30th April 2021. On 25th April 2021 Rev. Swami Nirmaleshananda Maharaj, Secretary, Sri Ramakrishna Mission Vidyalaya College of Arts and Science inaugurated the National Level Physics Meet with a Benedictory Address and his blessings. Dr. J. Chandrasekaran, Head, Department of Physics delivered the welcome address. Dr. R. Thangavel, Principal, Sri Ramakrishna Mission Vidyalaya College of Arts and Science gave the Presidential Address. Prof. K. Subramanian, IAPT Coordinator, Bangalore delivered the Keynote Address. He highlighted the importance of Basic Sciences and opportunities in research and various fields. He gave the Profile of IAPT and its various activities. Dr. K. Sathishkumar, Coordinator Assistant Professor of Physics presented the Dynamics of the Meet, and Dr. C. Mahendran, Coordinator, Assistant Professor of Physics proposed the vote of thanks.

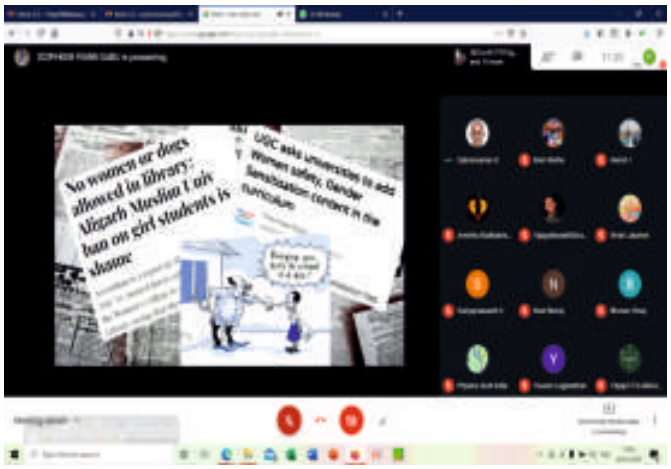
Three events were conducted in the Meet; all through online mode namely quiz competition, Paper presentation, and Treasure Hunt. Totally 305 students Registered for the Meet across the country at various Universities and Colleges, among that 278 were from Tamilnadu State and 27 students were from other states (Uttar Pradesh, Kerala, Chhattisgarh, Andhra Pradesh, Bihar, Gujarat, Karnataka and Punjab).

Participant's details

S.no	Dates	Events	Registere	Rounds	Selected	Finali
1	25/4/ 27/4/	Quiz comp-	156	Prelims Semis	87 35	3
2	26/4/ 28/4/	Paper Present ation	49	Prelims Finals	49 10	3
3	30/4/	Treasu	100	Semis	59	1



Paper Presentation Photos



In the concluding session, Dr. J. Chandrasekaran, Convener delivered the welcome address. Rev. Swami Nirmaleshananda Maharaj, Secretary, SRMV CAS distributed certificates to all participants and cash prizes. Prof. K. Subramanian IAPT Coordinator appreciated six days' efforts of Department of Physics. IAPT sponsored Rs. 15,000, utilized as cash awards for event winners, cash being deposited in the SB Accounts of all the prize winners. Dr. K. Sathishkumar, Coordinator, proposed vote of thanks and Virtual Physics Meet through online mode thus concluded with National Anthem.

List of Prize Winners with Cash Awards

Quiz Competition: First Prize Rs. 3000//:

1. Monisha K

III BSc Microbiology, RVS College of Arts and Science, Coimbatore Tamilnadu

Second Prize Rs. 2000//:

2. Divyanshi Dubey

II B.Sc. Physics, Women's Christian College Chennai, Tamilnadu

Third Prize Rs. 1000//:

3. Noel Benny

III B.Sc. Physics, St. Berchmans College, Changanassery, Kottayam, Kerala

Paper Presentation:First Prize Rs.3000//:

4. Suriyaprasanth S

II M.Sc. Physics, Madurai Kamaraj University Madurai, Tamilnadu

Second Prize Rs. 2000//:

5. Pradhyumna R

III B.Sc. Physics, Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai, Tamilnadu

Third Prize Rs. 1000//:

6. Umesh Kumar Soni

II B.Tech., Bhilai Institute of Technology, Durg, Chhattisgarh

Treasure Hunt: First Prize Rs. 3000//:

7. Rukmani R

I M.Sc. Physics, Madurai Kamaraj University Madurai, Tamilnadu

K. Subramanian
and Coordinator of 'Physics Hunt'
Bangalore-560048
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To our readers

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Springer International Conference on Trends in Modern Physics 2021

I. Duration: 26 – 27 February 2021

II. Beneficiaries of the conference:

a) Undergraduate students: **7** b) Postgraduate students: **46**

c) Research scholars: **37** **d)** Scientists: **2** **e)** Faculty: **10**

d) Total participants: a) Offline: **27** b) Online: **28**

e) Resource persons:

a. Prof. Vijay A. Singh, President, IAPT

b. Dr. Jan-Uwe Ness, European Space Agency, Spain

c. Dr. Ramakrishna Podila, Clemson University, USA

d. Prof. Ashok K. Jain, Amity University, Noida

e. Prof. K. Venkataramaniah, SSSIHL, Andhra Pradesh

f. Prof.Saurya Das, University of Lethbridge, Canada

g. Prof.AtriDeshamukhya, Assam University

h. Prof.Yatendra Singh Jain, North-Eastern Hill University

i. Dr. Anthony Childress, NortheasternUniversity, USA

j. Dr.SrikumarGhorui, Bhabha Atomic Research Centre, Mumbai

k. Prof.BuddhadebBhattacharjee, Gauhati University

f) Online platforms: Zoom, Google Meet

g) Websit:
https://conferences.dbuniversity.ac.in/timp2021/

The Department of Physics at Assam Don Bosco University in collaboration with IAPT organised its 3rd annual conference, **Springer International Conference on Trends in Modern Physics *2021*** (TiMP 2021), during 26 – 27 February 2021. The conference was partially sponsored by RC-17 of IAPT. Mr. Parag Bhattacharya from the Department of Physics, ADBU was the convener of the conference, along with his colleagues Dr NgangomAomoa and Dr Debajyoti Dutta as the co-conveners. Other members of the organising committee, Dr.Ranjita Deka (President, RC-17) &Dr Manab Deka (Secretary, RC-17), together with other IAPT colleagues participated in the conference. Fifty-five participants from twenty-seven different institutions presented their research on diverse topics from astrophysics & cosmology, material & nanophysics, nuclear physics, particle physics and plasma physics. Due to the restrictions imposed by the COVID-19 pandemic, the conference was held in hybrid mode, with twenty-eight participants making their presentations online and the remaining twenty-seven participants presenting offline in person.

The organizers of the conference made all possible efforts to ensure that every delegate is able to seamlessly access all the presentations, irrespective of whether the presenter or the presentation is online or offline. To this end, all the offline presentations were also streamed live via web-conferencing and all the posters were made available online.

The conference was inaugurated by Prof. Vijay A. Singh. Prof. Singh then set into motion the proceedings of the conference with his illuminating plenary talk titled *Seminconductor Nanostructures: Simple Scaling Approach*. This was followed by five separate technical sessions for oral presentations and a single session for poster presentations over the course of the next two days.

The first technical session had nuclear physics as its theme. This session was jointly chaired by Dr.Samrat Dey, Head, Physics Department, ADBU, and Dr Simanta Chutia, Head, Physics Department, St. Anthony's College, Shillong. Prof. Ashok K. Jain, former professor at IIT Roorkee and currently professor at Amity University, Noida, delivered an invited talk titled *Extremely Low Energy Isomers and their applications*. This was succeeded by contributory talks from delegates, followed by lunch.

The second technical session, with astrophysics & cosmology as the theme, began after lunch on the first day with two invited talks. This session was chaired by Dr.Monmoyuri Baruah, Director of SFAS, ADBU. Prof.Atri Deshamukhya from Department of Physics, Assam University, made a presentation titled *Tropical Cyclones: A look through double eye walls*. This was followed by a presentation by Dr. Jan-Uwe Ness from European Space Agency, Spain, who enthralled the

audience with his talk titled *Observing Nuclear Burning on the Surface of White Dwarf Stars*. Then the delegates proceeded with making their contributory talks.

The morning session of the second day consisted of two parallel technical sessions. The session on the theme of material & nanophysics was chaired by Prof Singh. Because of the large number of presentations on this theme, this session had to be split into two sub-sessions. The first sub-session began with an invited talk by Dr Ramakrishna Podila from Clemson University, USA, who regaled the audience with personal anecdotes and insights in his talk titled *Stories from the Nano-bio lab at Clemson*. This was followed by another invited talk by Dr. Anthony Childress from Northeastern University, USA, who made an informative presentation titled *Directed Assembly of Nanomaterials: Methods and Applications*. The delegates then made presentations on their contributory talks. The second sub-session continued after a tea-break.

The parallel technical session on plasma physics was chaired by Dr.Ngangom Aomoa from the Department of Physics, ADBU. Dr Srikumar Ghorui from Bhabha Atomic Reseach Centre (BARC) delivered an invited talk titled *Addressing Some of the Key Challenges in Thermal Plasma Technology*, followed by presentations by delegates.

Another session, parallel to the second sub-session on material & nanophysics, began after the tea-break. This session was dedicated to the theme of particle physics. This session was chaired by Dr Samrat Dey. Dr Saurya Das, from the University of Lethbridge, Canada, delivered his invited talk titled *Our Universe: the known, unknown and some speculations*. He was followed by Prof Buddhadeb Bhattacharjee, from the Department of Physics, Gauhati University, who made a presentation on the topic *Primordial Matter*. This was followed by presentation by delegates.

The afternoon session on the second day was dedicated to poster presentations by the delegates. This time the organizers of TiMP had offered the participants the opportunity to also present their posters online, apart from presenting in-person. For online posters presentations, all the posters were hosted on the TiMP 2021 website at https://conferences.dbuniversity.ac.in/timp2021/index.php/online-poster-presentation/ and a comment section was enabled for duration of seven days for every poster, so as to enable the viewer to post queries or

suggestions for the benefit of the presenter.

The conference ended with a valedictory session where many participants shared their thoughts and feedback with the organizers. The conference was formally brought to a close by the deliverance of the vote of thanks by the convener of TiMP 2021. All the offline participants were handed their certificates immediately after the closure of the conference. For all the online participants, the certificates, along with their copies of the book of abstracts, were sent by speed post within a month.

Parag Bhattacharya

Report-RC-03

Physics Education Research Scholars Online Network (PERSON)

An initiative taken up by IAPT RC-03

Vision: To grow (aim) our competencies, capabilities and communication (objectives) through mutual interactions (process) and sharing of knowledge, skills, resources and experiences (goal).

Mission: To empower all the members, the fellow physics teachers, with resources, methodologies and strategies to constantly enhance our capabilities in our pedagogical processes (through online).

The inaugural of this initiative has been done with two awareness programmes held on May 23 and May 30, 2021:

S. No	Title of the Talk	Resource Person
1.	Introduction to **PERSON** (Why, What, How, Where and When)	Prof. O. S. K. S. Sastri, Central University of H.P. (CUHP)
2.	**Data Acquisition** Experiments in Electronics using ExpEYES	Eng. V. V. V. Sathyanarayana, IUAC, New Delhi
3.	**Statistical physics** concepts of Microstate, Macrostate, Equilibrium: Woksheet Simulation in **Gnumeric**	Dr. Vandana Sharda (PhD from CUHP)
4.	**Video analysis** of Freely Falling Body: Using **Tracker**	Prof. O. S. K. S. Sastri (CUHP)
5.	**Modeling Theory:** Non-homogeneous Diatomic Molecule	Prof. O. S. K. S. Sastri (CUHP)
6.	**Simulation Methodology:** Computer Simulation of Diatomic Molecule using **Gnumeric** Worksheets	Ms. Aditi Sharma (Research Scholar at CUHP)
7.	**Crystal Structure:** Activity for Constructing 2D Bravais Lattices	Dr. Jyothi Bharadwaj (Ph.D from CUHP)

Eligibility: Any interested IAPT RC3 life member can become part of this network provided they commit to spend one hour per week either as faculty participant or resource person.

A total of 23 members have presently joined this network and a few one-on-one interactions have been conducted in quantum physics simulations and introduction to Scilab programming. A website https://person.saivyasa.in has been hosted online for sharing various resources with all the members of the group. The videos of inaugural sessions have been uploaded on the website. This initiative is currently limited to IAPT-RC3 life members to be the participants and shall be extended to other RCs after the processes evolve and become sustainable over a period of time. We do invite talks and hands-on sessions by resource persons from all over the country to share their knowledge through the online platform.

Anyone who wish to share their expertise and innovations in teaching-learning process may please send an email to sastri.osks@hcu.ac.in.

O. S. K. S. Sastri
Vice President, IAPT-RC-03

Minutes of the special EC Meeting (online)

held on Sunday April 18, 2021

A special meeting of the Executive Council (Central EC) of the IAPT was held online, on Sunday April 18, 2021. The meeting commenced at 10.00 am, and continued till about 1.30 pm. The members including the invitees present in the meeting were as follows.

1. Prof. Vijay A. Singh, President
2. Prof. K. N. Joshipura, GS
3. Prof. Manjit Kaur, VP(N)
4. Prof. J. D. Dubey, VP (E)
5. Prof. A. K. Jain, VP(C)
6. Prof. P. N. Nagaraju, VP(S)
7. Prof. H. C. Verma, VP (General)
8. Dr. Oum Prakash Sharma, Member RC – 01
9. Dr. Jaswinder Singh, Member RC – 02
10. Dr. Anil Kr. Singh, Member RC – 04
    Also, Coordinator NGPE
11. Dr. Anand Singh Rana, Member RC – 05
    Also, Coordinator NSE
12. Prof. R. K. Khanna, Member RC – 06
13. Prof. Viresh H. Thakkar, Member RC – 07
14. Dr. S. B. Mane, Member RC – 08
15. Dr. P. K. Dubey, Member RC – 09
16. Dr. S. K. Patel, Member RC – 10
17. Prof. S. Sanyasiraju, Member RC – 11
18. Dr. M. S. Jogad, Member RC – 12
19. Dr. Kishore Chandra Dash, Member RC – 16
20. Dr. Swapan Majumdar, Member RC – 18
21. Dr. Himanshu Pandey, Member RC – 19

Ex-Officio Members

22. Prof. Bhupati Chakrabarti, Immediate-past GS
23. Prof. B. P. Tyagi, Chief Coordinator of Exams
24. Dr. Sanjay Kr. Sharma, Secretary

Co-opted Member

25. Dr. S. C. Samanta

Invited Members

26. Prof. Ravi Bhattacharjee, Coordinator APhO
27. Prof. Rekha Ghorpade, Coordinator NCIEP
28. Prof. P. D. Lele, Coordinator NCICP
29. Dr. Vijay Soman, Coordinator NSE – JS
30. Prof. M. L. Oglapurkar

Invited RC (Sub-RC) presidents and Secretaries

31. Dr. V. P. Srivastava, President RC – 01
32. Dr. M. S. Bhandari, Secretary RC – 01
33. Dr. Major Singh Randhava, President RC – 02
34. Dr. Rajeev Sharma, Secretary RC-02
35. Dr. R. K. Dwivedi, President RC – 04
36. Dr. Sanjeev Rathore,(Member RC – 04)
37. Dr. Vijay Kumar, Secretary RC – 05
38. Prof. Y. K. Vijay, President RC – 06
39. Dr. Nitin S. Shinde, Secretary RC – 08
40. Dr. Mahesh Shetti, Secretary RC – 08B
41. Dr. Bharat Kangude, President Sub RC – 08C
42. Dr. Sandeep G. Kakade, Secretary RC – 08C
43. Prof. Shantinath J. Patil, President Sub RC-08D
44. Dr. B. D. Srivastava, President RC – 09
45. Dr. Uttam Sharma, Secretary RC – 09
46. Dr. A. K. Shrivastava, Secretary RC -10
47. Prof. M. Krishnaiah, President RC – 11
48. Dr. J. Chandrashekhar Rao, Secretary RC – 11
49. Dr. L. A. Udachan, President RC – 12
50. Dr. S. M. Khened, Secretary RC – 12
51. Dr. R. AnandaKumari, President Sub RC – 12A
52. Prof. G. P. Das, President RC – 15
53. Dr. Achintya Pal, Secretary RC – 15
54. Dr. Sunil RanjanBiswal, Secretary RC – 16
55. Dr. Parimal Majumdar, Secretary RC – 18
56. Dr. Manoj Kumar, Secretary RC – 20
57. Dr. V. Rajeshwara Rao, President RC – 22

The meeting started with a brief opening statement from the President Prof. Vijay Singh. Welcoming the members, he thanked them for being present, and said, "We have a single point agenda today, and that is to learn about the RC activities in the past year: webinars, off - line events, demos, publications etc. We have come, not to give advice, but to listen."

Item-wise Agenda proceedings

Item 1. To read and confirm the Minutes of the previous EC meeting organized online on March 07, 2021 and to discuss matters that may arise from the same: The Minutes were published in the IAPT Bulletin

April 2021,page no. 131.Two comments were received on the draft-Minutes initially circulated to the EC members. Prof. Bhupati Chakrabarti had pointed out that, as per the Constitution, for purpose of the Examination, the only Ex-officio member in the EC was the Chief Coordinator of Exams (CCE). The other coordinators such as ones for NSEJS, NSEs and NGPE were invitees to the EC meetings, and should be designated as such. Secondly, Prof. Kushwaha had pointed out an error in the draft-Minutes regarding the combined issue of the Bulletin that was published online. The error has since been corrected in the published Minutes. The Minutes were passed by the EC.

Item 2. To receive the activity-cum-progress reports from the period Nov2019-March2021:

(i) RCs no. 1 to 22

The RCs were invited for presentation by the respective EC member-representative or by the RC Secretary/President with each presentation of at most 07 minutes, with a maximum of 05 ppt slides - if any. They were asked to spell out their problems and difficulties in carrying out the activities/programmes. In the summary given below, the report was presented either by EC member (ECM), or RC Secretary (S) or RC President (P).

RC-01, Dr. Oum Prakash Sharma (ECM); RC-02, Dr. Jaswinder Singh (ECM); RC-04, Dr. Anil Kr. Singh, (ECM); RC-05, Dr. Vijay Kumar (S); RC-06, Prof. Y. K. Vijay (P); RC-07, Prof. Viresh H. Thakkar (ECM); RC-08, Dr. NitinShinde (S), including Sub-RCs-08B,C,D; RC-09, Dr. Uttam Sharma (S); RC-10; Dr. A. K. Shrivastava (S); RC-11, Dr. J. Chandrashekhar Rao (S); RC-12 Dr. S. M. Khened (S); SubRC-12A, Dr. R. Ananda Kumari (P); RC-15, Dr. G. P. Das (P); RC-16, Dr. Kishore Dash (ECM); RC-18, Dr. Swapan Majumdar (ECM); RC-19, Dr. Himanshu Kr Pandey (ECM); RC-20, Dr. Manoj Kumar (S) and RC-22, Dr. Rajeshwara Rao (P). There were no presentations and also no attendees from the RCs 03, 13, 14, 17 and 21.

It is difficult to give here a detailed account of the interesting activity-cum-progress reports presented so we shall give a summary. It was heartening to see the RCs keeping the IAPT flag flying through their activities and programmes and maintaining a good rapport with various academic institutions /organizations. We could see a unity in diversity regarding the programmes carried out.

2.1(a) The total number of Webinars organized was well over 200 exhibiting a very high outreach in these current COVID times. The Webinars were in the form of conferences some lasting 3 days to those of half a day. They had a mix of local speakers, as well as national and international level speakers. The participants ranged from 50 to over 500 with even international participation. Some of these programmes were specifically directed towards students but many had both student and faculty audience in mind. Heartening aspects were seminars or talks of cross disciplinary nature as well as those for the general public. The outreach was pan Indian and webinars became the activity of choice in "locked down" COVID times.

2.1(b) There were also programmes which had demonstrations where the speaker first performed the experiment and then explained it. These were interactive programmes for students and teachers. Remarkably, some of the activities were offline. Several webinars had prizes for speakers and students. Another important outreach feature in the new era was in the form of YouTube channels initiated by some of the RCs. It must be noted that we already have the central YouTube channel for the IAPT.

2.1(c) A notable academic activity was the continuation of the annual memorial events by the RCs. We were happy to learn of (i) the Ved Ratna memorial lecture by RC-01 (ii) C. K. Majumdar Memorial Workshop by RC-19 (iii) Mrs. B. N. Chandrika memorial programme by RC-12, and (iv) a newly initiated Ebook launch in memory of Dr. Tushar Pandya RC-07. We thus remember the very worthy members who contributed to our Association. It was also heartening to learn about the National Science Day programmes organized at different places.

2.1(d) A novel feature was added this time in the

form of Eklavya Teacher Training (online) Workshops, organized at two RCs with the motivation and support from the Ministry of Tribal Affairs New Delhi. It is also good to see that apart from academic collaborations, some of our RCs have gone out and received financial support from other national/state-level institutions or organizations. This aspect needs to be encouraged.

At a later stage it was suggested that the power-point presentations and the detailed reports from all the RCs could be uploaded on the IAPT website.

2 (ii). National Competitions and other activities

2.ii(a) **NCIEP -**A brief report on NCIEP was given by the coordinator Prof. Mrs. Rekha Ghorpade. The announcement for NCIEP-2021 has come up in our Bulletin, and good initial responses have been received from Dr. Ananthakrishnan, Dr. V. V. Soman and others, she said. She appealed to all the members present in the meeting to encourage participation of one or two entries each. This is being said repeatedly, and the GS asked the Meeting as to what was the difficulty/problem in participating in the national competitions. The problem seems to be to get an 'idea', said Prof. S. C Samanta and suggested to all to refer to books like Prof. Khandelwal's Lab manual, and also recalled the efforts put in earlier by Prof. Dharkar, Prof. D. A. Desai and others.

2.ii(b) **NCICP -** A brief report on NCICP was given by the coordinator Prof. P. D. Lele, by displaying the competition Announcement for the current year 2021. He outlined the kinds of experiments that can be submitted to this competition.

2.ii(c) A report on **NCEWP** sent by Coordinator Prof. S. K. Joshi was outlined by the GS, who pointed out that in the essay competition the participation by most of the RCs was nil. The Announcement of NCEWP 2021 had already come up in the April issue of our Bulletin. For students, the competition is to be organized first at the RC level, as usual.

2.ii (d) Next, a presentation on **Prof. D. P. Khandelwal Birth Centenary Celebrations**was given by the Committee Convener Prof. Samanta. Several activities were in the pipeline, while the National Science Day programme Feb 28-March 01 was completed successfully. A Workshop for NGPE toppers was being planned. A questionnaire regarding the status of Lab education in our country would be modified and circulated for feedback. Highlighting the other activities being planned, he mentioned about the active support from Prof. Y. K. Vijay and others. A suggestion to have a separate competition on +2 level Physics experiments, preferably as a part of NCIEP 2021, was also put forward.

2.ii(e) **APhO -** Prof. Ravi Bhattcharjee, Coordinator APhO Cell reported about the competition APhO for the year 2021, and also about the international event 2022 to be organized in India. He recalled the contributions of late Prof. Dharkar, and made a suggestion that in the resulting vacancy, Dr. Vijay Kumar of GEHU-Dehradun might be included in the IAPT APhO Cell. APhO-2021 would be organized offline/online in Taiwan during May 19-20. He talked about our preparatory Workshop for APhO-2021 to be held in Dehradun, where the APhO-2022 is planned to be organized, but added that the Workshop would have to be postponed to May in view of the prevailing situation.

2. (iii).Anveshikas– NANI, and NAEST

The activity-cum-progress report in this regard was presented by Prof. H. C. Verma, for whom it was a big task to cover some 87 activities involving a very large number of students and teachers, along with the highlights of NAEST, in a short span of 10 minutes. Following his suggestion the report prepared in the Excel was circulated to all the EC members and invitees, in advance. The NAEST-2020 was organized progressively from July to October last, with support from IIT-K and *Vigyan Prasar*. For the felicitation of NAEST toppers the guests were Prof. H. C. Pradhan and Dr. Arvind Ranade (*Vigyan Prasar*). Participating students expressed their happy experiences and also their love for physics. For the finals, a '*NANI ka dabba*' kit was sent to finalists, for doing 3 experiments in 5 days, with extra explorations encouraged. The top 3 were selected for 'IAPT Shipa Nandkumar Memorial Award'. Amongst the Anveshikas the maximum of 26 activities were conducted by

Ammani Anveshika at Bengaluru, with the highest Activity index. He gave details of the participation of Anveshikas in the NSD programme organized by *Vigyan Prasar*. A *vigyanmela* event was organized on Feb 28, 2021, where all the visitors were thermal-scanned.

The President Prof. Vijay Singh expressed happiness and thanked all the speakers for succinctly showcasing the varied activities within the time constraints.

Item 3. To take up any other matter from the Chair and/or with the permission from the Chair: The GS pointed out about our annual Convention 2021, which is already proposed to be held by RC-09 (MP). With uncertainties still looming large on organizing the Convention, there was a proposal from RC-08 (Maharashtra) to hold it online. In this connection Dr. P. K. Dubey member from RC-09 said that the Covid situation in Indore and surroundings was fearsome, and might not improve till December. Even the online mode could have problems of lack of manpower, he said. RC-08 Maharashtra had submitted a proposal to conduct the annual Convention online, and giving some details (e.g. having at most 50 participants per RC), Dr. Mane the EC-member said that RC-08 was ready to hold the Convention online. He also replied to a query from Prof. Bhupati Chakrabarti. Prof. A. K. Jain (VP-C) opined to not make any haste, and suggested that we should refrain from taking a decision right now. Dr. Rajeshawara Rao supported him. Dr. B. Kangude (SubRC-08C) said that the Pune Sub-RC had the technical expertise and experience of organizing the online programmes with a large number of participants, but the arrangements would require about 3 months' preparation time. At this juncture, the GS made two points; "(i) in the online mode we would have practical difficulties in arranging the Annual General Body Meeting, and (ii) if not anything else, then at least on October 01 2021, we should organize an online countrywide programme in memory of Prof. Khandelwal." Prof. Bhupati Chakrabarti also opined that we should wait, and expressed concern about the voluntary examinations, for which a separate meeting could be held (Prof. Tyagi). Replying to other suggestions, the President proposed for having special issues of our Bulletin for the RC activities, for examinations and for the Convention. Opinions expressed in the online chat box were also in favour of waiting as regards the mode and date of the Convention. "We can always hope for the better of course. We can have another short EC meeting on this issue around June 15. We are thankful to RC-08 for their proposal, but let us see if other RCs are interested." said the President. In addition, Dr. Anil Kr Singh (RC-04) expressed briefly that the UG syllabi needed to be looked into under the New Education Policy-2020, but then he agreed to mail the details to the GS. Prof. Lele said that in the spirit of the NEP-2020, the efforts to spread physics education in local languages were already a part of the IAPT agenda, and he mentioned 'Pragaami Tarang' magazine, Anveshikas, CSC-Midnapore etc. Leading articles/books in English should be translated into local languages, and we can reach the masses in the online mode, he added. Thanking all once again, the President showed on-screen his own notes taken down during the meeting, and expressed his desire to contact the RCs further.

At the end, the GS recalled that the tenure of the current EC would end on the 31st of December 2021 and elections would be due. The President said that a proper procedure in this regard would be started in due course of time. Prof. Bhupati Chakrabarti added that there was enough time still for starting the procedure. Reverting to publication of special issues of our Bulletin, he opined that the relevant reports could rather be uploaded on our website.

With all the items of the Agenda completed successfully, the GS thanked the President and all those present in the meeting, and declared the meeting closed.

K N Joshipura
General Secretary

8th IAPT National Student Symposium on Physics

Indian Association of Physics Teachers

and

Department of Physics, Indian Academy Degree College (Autonomous), Bengaluru

November 12 – 14, 2021

D P Khandelwal Birth Centenary Year

To foster a culture of innovation and creativity among the young students, IAPT has instituted the annual National Student Symposium on Physics (NSSP). The yearly series started in 2013 in collaboration with the Department of Physics, Panjab University, Chandigarh. The Symposium provides a National forum to young students, mostly at Master level, to present their new ideas and innovative work at an early stage of academic career. Eighth in the series, NSSP – 2021 will be held during **November 12 – 14, 2021.**

Venue: Indian Academy Degree College -Autonomous, Hennur Cross, Hennur Main Road, Bengaluru - 560 043, Karnataka

Invited Talks by Subject Experts

Oral Presentations by the Students

Postal presentations by the Students

Visit to Research Laboratories

The undergraduate and postgraduate students with Physics background can apply for the symposium latest by **September 15, 2021**.The Registration fee of Rs. 850/- for outstation students (includes hospitality and accommodation) and Rs. 500/-only for local students (excluding accommodation). The selected papers will be communicated by **September 25, 2021** through our Website. Travel support (bus or sleeper class by train) will be provided to the selected papers (for one person only). Application form and other details are available at the website www.indianacademy.edu.in

For more information, contact

Dr P Nagaraju, Convenor NSSP – 2021 (M) 7019976835 / 9900656601

Email: nssp21blr@gmail.com

Office Address:

Indian Academy Degree College-Autonomous, Hennur Cross, Bengaluru 560 043

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