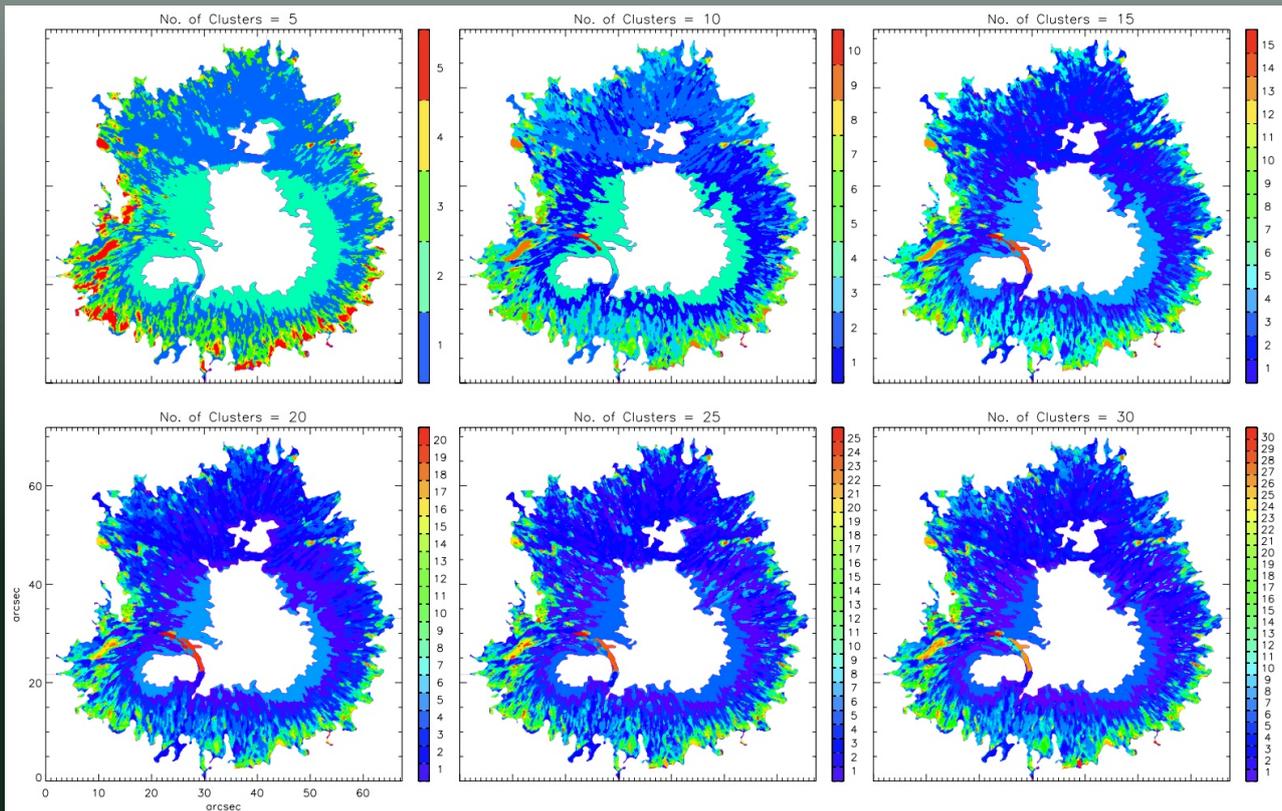




Newsletter of the Physical Research Laboratory

# THE SPECTRUM



## Image of the Month

*Inter-cluster variation for select number of clusters in the Sunspot. The numbers in the legend are in ascending order from the most populous (violet) cluster to the most scarce (red) cluster.*

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## Observations of Geomagnetic Crochet at High-Latitudes due to X1.5 class Solar Flare on 3 July 2021

(S. S. Rao, Nandita Srivastava, Monti Chakraborty, Sandeep Kumar, D. Chakrabarty)

### The Author

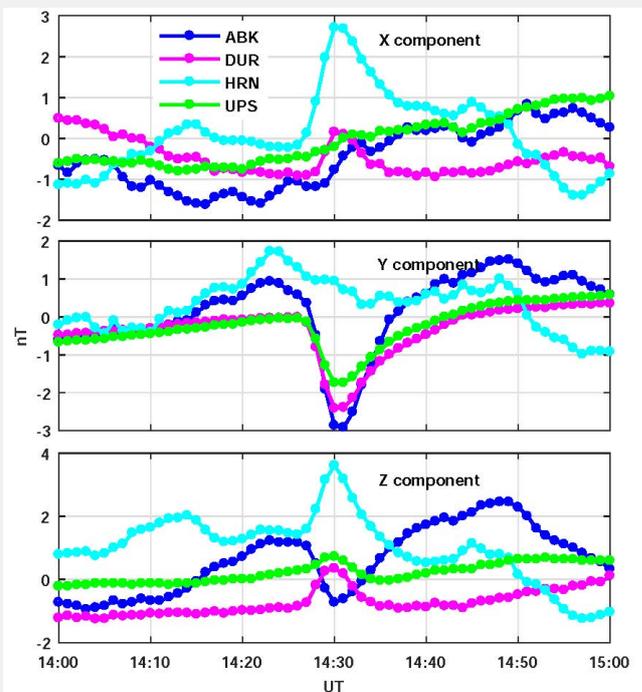


Sardar Singh Rao

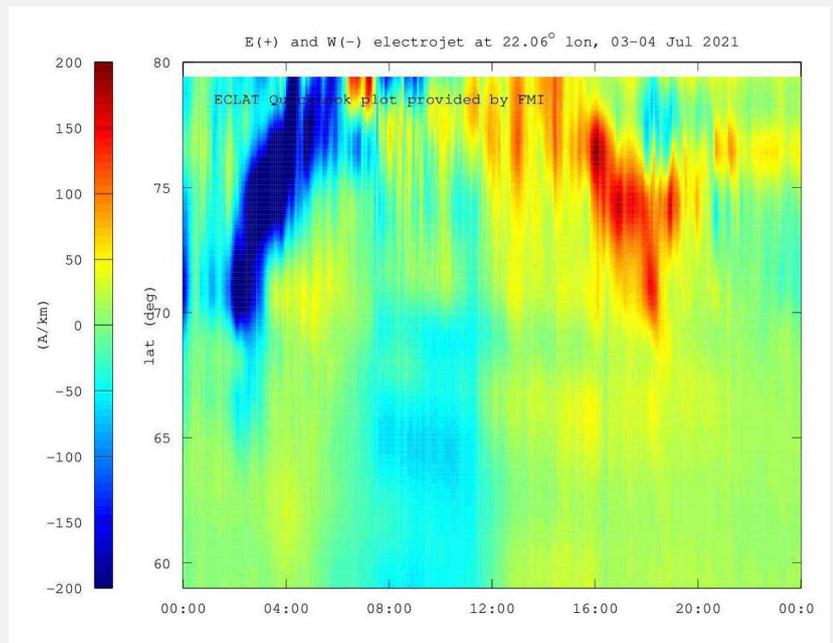
On 3 July 2021, an X1.5 solar flare from the NOAA solar active region AR12838 (24°N, 88°W) occurred at 14:18 UT, peaked at 14:29 UT, and decayed at 14:34 UT. This X1.5 solar flare is significant as an associated geomagnetic crochet feature was observed at high latitudes. In order to understand the solar flare-induced geomagnetic variations, the variation of the northern (X), eastern (Y), and vertical (Z) components of the geomagnetic field at high latitudes (50°–78°N) in the longitudinal grid of 11°–26°E during the X1.5 solar flare of July 3, 2021, is studied.

The findings of the work are as follows: (i) observations of “cusp crochet” of short duration (10–15 min) and smaller magnitude (8–40 nT) at ~78°N; (ii) observation of “sub-solar” and a “newly defined geomagnetic crochet” feature at latitude belt 50°–70° N (Yamauchi et al. 2020; <https://doi.org/10.5194/angeo-38-1159-2020>). These geomagnetic crochet observations (Fig. on left) reveal the following characteristics: (i) an enhancement in geomagnetic field components during flare peak time without spike; (ii) a positive or negative spike in geomagnetic field components, particularly an explicit and coherent appearance in the Y component at equatorward stations; (iii) post-spike enhancement in magnetic field components embodied with multiple peaks at poleward stations and smoothed variation at equatorward stations; (iv) Latitudinally, at first, the X component responded to flare-induced current at the cusp region; thereafter, Z started to respond from 77°N downward, and finally, Y started to respond from the south of 71°N; (v) The observed latitudinal variation of crochet strength, shape, and time evolution is related to the latitudinal distribution and time evolution of the ionospheric equivalent current (Fig. on right), and (vi) different components have different sensitivities to the solar flare effect.

Source/Reference of the Work: <https://doi.org/10.1029/2023SW003719>



The variation of normalized values of X, Y, and Z components at stations HRN (77.00N, 15.54E), ABK (68.35N, 18.82E), UPS (59.90N, 17.35E), and DUR (41.35N, 14.46E) of Intermagnet network are shown.



The pattern of the ionospheric equivalent current (IEC) system (including preexisting Sq current) on 3 July 2021 at 22.06°E longitude sector is shown.

## Classification of circular polarization Stokes profiles in sunspots using k-means clustering

(Louis Rohan E., Mathew Shibu K., Bayanna Raja)

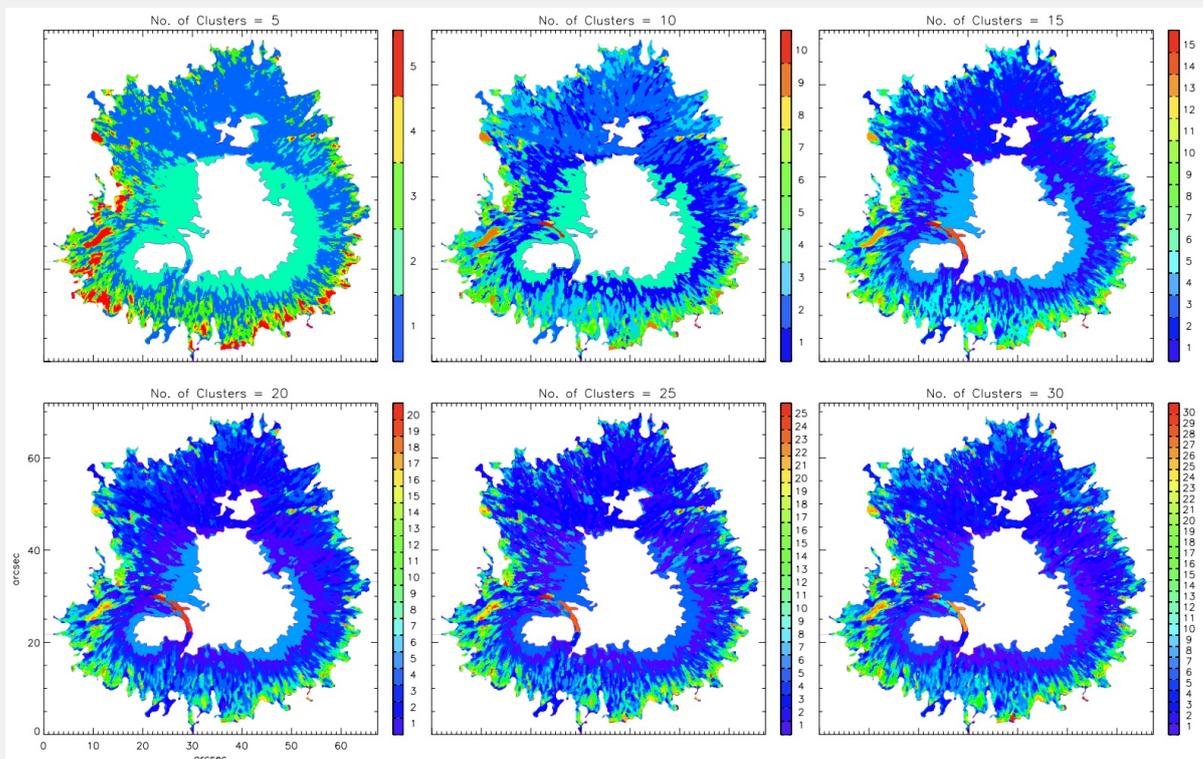
### The Author



Rohan Louis

The magnetic and velocity fields in sunspots are highly structured on small spatial scales which are encoded in the Stokes profiles. The Stokes profiles are in turn, derived from a sequence of polarization modulations on the incoming light that are imaged using an analyser-detector combination. Our aim is to identify Stokes profiles in a sunspot which exhibit spectral characteristics that deviate from those associated with the Evershed flow and their corresponding spatial distribution. To that end, we employ the k-means clustering routine, widely used in machine learning, to classify Stokes V spectra in the penumbra of a regular, unipolar sunspot, that also comprises a granular and a filamentary light bridge. We find that 75% of the penumbral region, corresponding to about 93500 pixels, is dominated by profiles comprising two, nearly anti-symmetric lobes, while 21% of the area is occupied by three-lobed profiles that are associated with the Evershed flow returning to the solar photosphere, where the strong, downflowing component often has a polarity opposite to the sunspot. The remaining penumbral area of 4% is dominated by four groups/families wherein one of them comprises Stokes V profiles with only one red lobe while the other three groups comprise three lobes with different polarity combinations of the two magnetic components present in the profile, making them distinct from those associated with the Evershed flow returning to the photosphere. These minority groups of profiles could be related to dynamic phenomena that could also affect the overlying chromosphere. The simplicity and speed of k-means can be utilized to identify such anomalous profiles in larger data sets to ascertain their temporal evolution and the physical processes responsible for these inhomogeneities.

**Source/Reference of the Work:** [https://ui.adsabs.harvard.edu/link\\_gateway/2024AdSpR..73.3256L/doi:10.1016/j.asr.2023.12.046](https://ui.adsabs.harvard.edu/link_gateway/2024AdSpR..73.3256L/doi:10.1016/j.asr.2023.12.046)



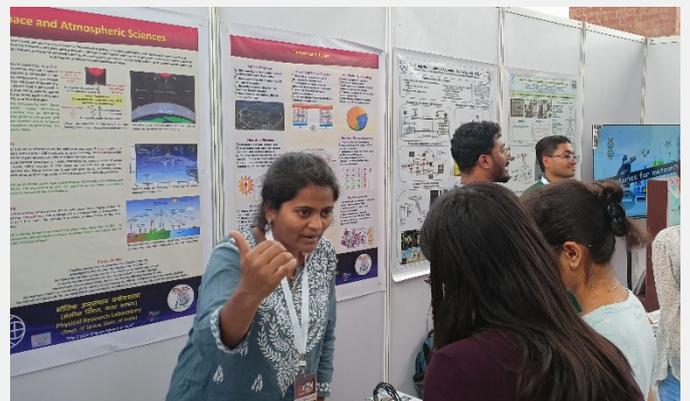
*Inter-cluster variation for select number of clusters in the Sunspot. The numbers in the legend are in ascending order from the most populous (violet) cluster to the most scarce (red) cluster*

## PRL at COLAB, IITGN

IIT Gandhinagar (IITGN) organized the academic-industry meet ('Colab 2024'), an open House event that was held on March 2<sup>nd</sup> 2024. This event aimed to foster sustainable industry-academia collaborations. Many young researchers, entrepreneurs, and academic and industry experts interacted and shared their ideas. Over 150 academic and industry participants from diverse domains participated in this event. During the event, several parallel panel discussions also took place, each focusing on specific domains such as space tech, climate challenges and solutions, artificial intelligence (AI) and computing, biomedical engineering, healthcare and pharmaceuticals, manufacturing, energy and water, and defense.

PRL actively participated in this event. The PRL team (Dr. Rajesh Kumar Kushawaha and 11 others) presented the PRL activities with experimental models, payloads, and posters of each scientific division. Over 100 participants visited PRL's stall and interacted with PRL teams.

Prof. D. Pallamraju, Dean PRL joined this meeting and participated in the panel discussions. Dr. Rajesh Kushawaha attended the panel discussion on space and defense technologies. Other PRL team members attended the panel discussions on climate challenges and solutions, artificial intelligence (AI) and computing, biomedical engineering, healthcare and pharmaceuticals, manufacturing, energy and water, and defense. PRL team members also visited to other stalls and research park of IITGN and benefited from the event.



*Team PRL at COLAB 24, IITGN*

## पीआरएल में चेतक कमांडो बल का दौरा Visit of Chetak Commando Force at PRL

सुरक्षा की नाजुकता एवं संवेदनशीलता और एक महत्वपूर्ण संस्थान के रूप में पीआरएल की प्रतिष्ठित अवस्था को ध्यान में रखते हुए, चेतक कमांडो बल की एक विशेष टीम ने मार्च 4, 2024 को पीआरएल मुख्य परिसर का व्यापक दौरा किया। चेतक कमांडो बल एक उच्च प्रशिक्षित प्रचालन इकाई है जिसे गुजरात राज्य के भीतर महत्वपूर्ण व्यक्तियों और महत्वपूर्ण प्रतिष्ठानों से संबंधित संकटपूर्ण स्थितियों में तत्काल और प्रभावी कार्रवाई की जिम्मेदारी सौंपी गई है।

एक पुलिस उपाधीक्षक के नेतृत्व में, कमांडो बल की टीम ने पीआरएल मुख्य परिसर में भवनों और सुविधाओं का सूक्ष्मतापूर्वक निरीक्षण किया। उनके दौरे के समय, पीआरएल के सीआईएसएफ कर्मियों के साथ सुरक्षा संबंधी कई बैठकें हुईं। इसके अतिरिक्त, निदेशक, पीआरएल और डीन, पीआरएल के साथ सुरक्षा एवं संबंधित सुरक्षा प्रोटोकॉल पर ध्यान केंद्रित करते हुए बैठक और विनिर्देशन (ब्रीफिंग) सत्र भी हुए। यह संपूर्ण निरीक्षण अवधि लगभग 3.5 घंटे की थी।

In light of the security vulnerability and the esteemed status of PRL as an institute of Importance, a specialized team from the Chetak Commando force conducted a comprehensive visit to the PRL Main Campus on March 4<sup>th</sup>, 2024. The Chetak Commando force is a highly-trained operational unit entrusted with the responsibility of swift and effective response to crisis situations concerning important persons and vital installations within the Gujarat State.

Led by a Deputy Superintendent of Police, the commando force team meticulously inspected the buildings and facilities across the PRL main campus. During their visit, there was series of meetings and briefing sessions with the CISF personnel at PRL, as well as with the Director and Dean of PRL, focusing on enhancing safety and security protocols. The total visit duration was for about 3.5 hours.



निदेशक एवं डीन, पीआरएल के साथ चेतक कमांडो बल के सदस्य

### National Science Day celebration at PRL

National Science Day (NSD) in India is celebrated each year to mark the discovery of the Raman Effect. The primary focus of the NSD celebration is science popularization. To mark this day, the Physical Research Laboratory celebrated NSD on March 6<sup>th</sup>, 2024.

In Phase I, the screening tests for the Aruna Lal Scholarship (ALS) and the Vikram Sarabhai Protsahan Yojana (VIKAS) Scholarship were conducted at 21 centers in Gujarat. This year, two new centers were added – Junagadh and Adipur, the test covered 169 schools in the state, with 1360 students appearing for the test. Encouragingly 47% (636) of these students were girls. Along with the screening exam, the PRL team demonstrated science experiments at a few designated rural centers

In Phase II, the students shortlisted from the screening exam were invited to visit PRL to participate in various competitions on Wednesday, March 6<sup>th</sup>, 2024. Over 154 students and 70 teachers/ accompanying parents visited PRL on this day. As an initiative from PRL to encourage the participation of girl students and to give representation to the maximum schools from where students have appeared in the screening test, PRL invited 88 girl students from 88 schools to participate in NSD celebrations. These 88 girls were in addition to 165 students selected to participate in NSD based on their screening test merit. The top 17 selected students were interviewed for the Aruna Lal Scholarship by a panel of experts. 56 prizes were given in the following categories 1) Five Aruna Lal Scholarships 2) Top Twenty Models/Posters 3) Twenty-One Center Toppers 4) Ten Girl Child – Posters.

The significant activities arranged for students and teachers were: 1) Poster and Model competition, 2) Talk on Reaching for the Sun through Aditya-L1 by Prof. Dibyendu Chakrabarty, PRL 3) Talk on "how to become a physicist?" by Prof. Navinder Singh, PRL 4) Talk on artificial intelligence by Prof. Partha Konar, PRL 5) Screening of the Movie 'The Journey of ISRO' 6) Visits to the workshop, Computer Center and Library.



The 10<sup>th</sup> PRL Amrut Rajbhasha Vyakhyan (PARV) was organized on this day and Prof. H.C. Verma delivered a talk on "शिक्षा क्षेत्र में मेरे प्रयोग". About 550 people attended this talk offline and on YouTube. The students, teachers, and accompanying parents enjoyed the activities and actively participated, making for a successful and enjoyable celebration of National Science Day.



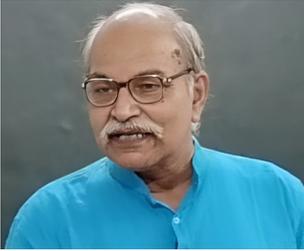
*Prof. Verma during the talk*

*Director, PRL felicitated Prof. Verma*



*Prof. Verma and a few PRL members with Aruna Lal scholarship winners*

## दसवां पीआरएल अमृत राजभाषा व्याख्यान (पर्व)



"पीआरएल अमृत राजभाषा व्याख्यान (पर्व)" का 10वां व्याख्यान 6 मार्च, 2024 को राष्ट्रीय विज्ञान दिवस-2024 के संयुक्त उत्सव में के.आर. रामनाथन सभागार में आयोजित किया गया था।

इस अवसर के प्रख्यात वक्ता प्रोफेसर एच.सी. वर्मा थे, जो प्रसिद्ध भौतिक विज्ञानी, लेखक और भारतीय प्रौद्योगिकी संस्थान, कानपुर में भौतिकी के सेवानिवृत्त प्रोफेसर हैं। आईआईटी कानपुर में शामिल होने से पहले, इन्होंने पटना विश्वविद्यालय के साइंस कॉलेज में वर्ष 1979-1994 के दौरान व्याख्याता एवं रीडर के रूप में अपनी सेवाएं दीं। वे इंडियन एसोसिएशन ऑफ फिजिक्स टीचर्स (आईएपीटी) के कार्यकारी समिति के सदस्य हैं, जो स्कूलों और कॉलेजों में भौतिक शिक्षा के लिए कार्य करता है।

व्याख्यान का शीर्षक था "शिक्षा क्षेत्र में मेरे प्रयोग"।

व्याख्यान के दौरान, उन्होंने बताया कि भारत में हमारी वर्तमान शिक्षा प्रणाली ने असाधारण वैज्ञानिकों, इंजीनियरों और विचारकों को जन्म दिया है, जो हमारे देश के विकास में महत्वपूर्ण योगदान दे रहे हैं। हालाँकि, छात्रों का एक बड़ा हिस्सा इस प्रणाली के भीतर पनपने के लिए संघर्ष करता है और राष्ट्रीय विकास में प्रभावी ढंग से योगदान करने में असमर्थ है। हमारी शिक्षा प्रणाली को बढ़ाने के लिए, अध्ययन को वास्तविक जीवन के अनुप्रयोगों के साथ एकीकृत करना, सीमित संसाधनों के साथ समस्या-समाधान कौशल को बढ़ावा देना, स्वतंत्र सोच को प्रोत्साहित करना, नए प्रश्नों और उत्तरों की खोज करना और बहस को सुविधाजनक बनाना महत्वपूर्ण पहलू हैं।

एक आकर्षक प्रश्नोत्तर के माध्यम से, श्रोताओं को विषय के बारे में अधिक जानने और नए दृष्टिकोण प्राप्त करने का अवसर मिला।

The 10<sup>th</sup> "PRL Amrut Rajbhasha Vyakhyan (PARV)" was held on March 6<sup>th</sup>, 2024 at K R Ramanathan Auditorium in joint celebration of National Science Day- 2024.

The eminent speaker for the occasion was Prof. H.C. Verma, who is renowned Physicist, Author and Retired Professor of Physics at Indian Institute of Technology, Kanpur. Before joining IIT Kanpur, he served as a Lecturer and Reader in the College of Science, Patna University during 1979-1994. He is a Member, Executive Committee, Indian Association of Physics Teachers (IAPT), that works for physics education in schools and colleges.

The title of the Vyakhyan was " शिक्षा क्षेत्र में मेरे प्रयोग".

During Vyakhyan, he informed that our current education system in India has produced exceptional Scientists, Engineers, and thinkers, contributing significantly to our country's achievements. However, a substantial portion of students struggle to flourish within this system and are unable to contribute effectively to national development. To enhance our education system, integrating studies with real-life applications, fostering problem-solving skills with limited resources, encouraging independent thinking, exploring new questions and answers, and facilitating debates are crucial aspects.

Through an interesting Q&A, listeners were able to learn more about the topic and get fresh viewpoints.



कायक्रम की कुछ झलकें



ऑनलाइन उपलब्ध है: <https://www.youtube.com/live/jsB6SYS9xuA?>

### Short Course on Isotopes in Nature (SCIN-2024)

A three-day workshop on “Short Course on Isotopes in Nature” (SCIN-2024) was organized by the Geosciences Division of Physical Research Laboratory during March 7<sup>th</sup> - 9<sup>th</sup>, 2024. The workshop was specifically designed for students and researchers in their early research careers (MSc and early PhD). The major objective of the SCIN-2024 was to bring post-graduate students from various disciplines and early-career researchers on a common platform and introduce them to various applications of stable and radio isotopes in earth science studies. The course content included basics of elements/isotopes, geochronology, radiogenic and stable isotope geochemistry, cosmogenic radionuclides, nucleosynthetic processes, and data analysis in Earth Sciences. Visits to various analytical facilities of the Geosciences Division were also arranged for the course participants as a part of the SCIN-2024. Overall, PRL provided basic trainings to 50 students (MSc and PhD) from various universities and institutes from different parts of India.



*Group photo of participants and resource persons of the workshop*



*Director and Dean of PRL addressing the participants of the workshop*



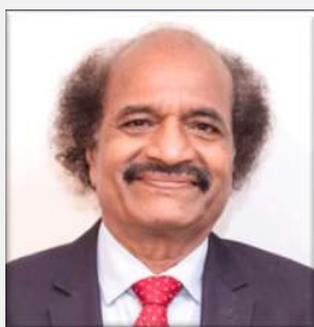
*Participants visiting Accelerator Mass Spectrometer Facility located at Thaltej Campus*

## 90<sup>th</sup> PRL Ka Amrut Vyakhyaan (PKAV)



The 90<sup>th</sup> PRL ka Amrut Vyakhyaan titled **"The Net Zero Goal & Sustainability: Green Hydrogen Technologies, CO<sub>2</sub> refineries, Biomass Valorization & Waste Plastic Recycling"** was delivered by **Prof. Ganapati D. Yadav**, NAE(US), FNAI (US), FTWAS, FNA, FNAE, FNASI, FASc, FRSC, National Science Chair (SERB/GOI), Emeritus Professor of Eminence, Former Vice Chancellor, Institute of Chemical Technology, Mumbai on 14<sup>th</sup> March, 2024.

### Abstract of the Vyakhyaan



The net-zero goal by 2050 is a cherished dream of all world economies. In achieving the 49000 TWh of energy by 2050 will have 73% of its contribution from renewables. In that, hydrogen will have a share of 25%. The new trinity for science will be solar, wind and hydrogen. The leading economies of the world should go for production of green hydrogen in pursuit of the Net Zero goal of the Paris Agreement of 2015. Hydrogen is best suited for converting any biomass and carbon dioxide emanated from different sources, into fuels and chemicals. Hydrogen will also lead, on its own as an energy source, to the carbon negative scenario in conjunction with other renewable non-carbon sources such as solar, wind, tidal, geothermal, nuclear or the like. Hydrogenation of biomass leads to many valuable products. So, tomorrow's refineries will be literally carbon dioxide refineries-converting it into hydrocarbons, methanol, dimethyl ether (DME), formic acid, alcohols, syn gas, electricity, hydrogen vehicles, fuel cells, ammonia, and fertilizers, etc. using hydrogen which should be obtained from water splitting. DME is the best replacement for diesel and LPG, and the same infrastructure could be utilized. That will lead to a carbon-negative economy, bringing down the temperature of the globe below 1.5°C. Today's crude oil-based economy for the manufacture of fuels, chemicals, and materials will not have a sustainable future. Faced with the twin challenges of sustaining socioeconomic development and shrinking the environmental footprint of chemicals and fuels manufacturing, a major emphasis is on either converting biomass into low-value, high-volume biofuels or refining it into a wide spectrum of products. Using carbon for fuel is a flawed approach and unlikely to achieve any nation's socioeconomic or environmental targets. In controlling CO<sub>2</sub> emissions, hydrogen will play a critical role. Hydrogen is best suited for converting waste biomass and carbon dioxide emanated from different sources, whether fossil or biomass into fuels and chemicals as well as it will also lead, on its own as energy source, to the carbon negative scenario in conjunction with other renewable non-carbon sources. This new paradigm for production of fuels and chemicals not only offers the greatest monetization potential for biomass and shale gas, but it could also scale down output and improve the atom and energy economies of oil refineries. There is also a need to rethink on the ban on single use plastic (SUP) and a new policy is required to encourage general public to pay a deposit on every single article irrespective of size and get it refunded when it is returned which will allow segregation at source. Several hydrogenation reactions can be used to depolymerize or to make fuels from waste plastic and the nasty atoms in the plastic such as Cl, S, N can be converted into HCl, H<sub>2</sub>S and NH<sub>3</sub> and absorbed. Waste plastic is a great source of fuel and chemicals.

Available online at: [https://www.youtube.com/live/9GIHoVUp8Ds?si=ezTshhrsD8Y2P\\_9N](https://www.youtube.com/live/9GIHoVUp8Ds?si=ezTshhrsD8Y2P_9N)

### 4<sup>th</sup> workshop of International Network in Space Quantum Technologies (INSQT)

The 4<sup>th</sup> workshop of International Network in Space Quantum Technologies (INSQT) was organized by PRL, Ahmedabad, during March 20-22, 2024. The INSQT Workshop 4 consolidated the ongoing efforts across various domains in Space Quantum Technology (SQT). The workshop was attended by more than 100 participants, including more than 20 foreign participants from more than 10 countries. The workshop discussed topics ranging from quantum key distribution (QKD) in terrestrial and space-based systems, quantum clock, remote clock synchronization, continuous variable QKD systems, high-dimensional states for QKD, security analysis of protocols, random-number generators, and several others.



*Group photo of the participants*

The INSQT is established to bring together the international space quantum community to tackle the engineering challenges and to accelerate the development of quantum space missions. It also aims to establish a roadmap and identify key steps for the space quantum internet. INSQT members include academic and public sector institutions, research organizations, small & medium enterprises (SME), and large companies. There are more than 40 members worldwide. Recognizing the activities in the field of quantum communication at PRL, the institute has been accepted as an academic member of the network. The funding for the network led by the University of Strathclyde, UK, comes through the UK Engineering and Physical Sciences Research Council (EPSRC), and UK Research and Innovation (UKRI).



*Glimpses of the event at K.R. Ramanathan Auditorium, Navrangpura campus, PRL*



**PRL Monthly Publications Digest (February 2024)****Astronomy & Astrophysics Division [3]**

1. Srimanta Banerjee, Gulab C. Dewangan, Christian Knigge, Maria Georganti, Poshak Gandhi, N. P. S. Mithun, Payaswini Saikia, Dipankar Bhattacharya, David M. Russell, Fraser Lewis, Andrzej A. Zdziarski, 2024, A Multiwavelength Study of the Hard and Soft States of MAXI J1820+070 During Its 2018 Outburst, *The Astrophysical Journal*, Date of Publication: 29/03/2024, Impact Factor: 4.9
2. K. Aravind, Kumar Venkataramani, Shashikiran Ganesh, Emmanuel Jehin, Youssef Moulane, 2024, Long-term spectroscopic monitoring of 46P/Wirtanen, *Journal of Astrophysics and Astronomy*, Date of Publication: 16/03/2024, Impact Factor: 1.5
3. Birendra Chhotaray, Gaurava K. Jaisawal, Prantik Nandi, Sachindra Naik, Neeraj Kumari, Mason Ng, and Keith C. Gendreau, 2024, Long-term Study of the First Galactic Ultraluminous X-Ray Source Swift J0243.6+6124 Using NICER, 2024, *The Astrophysical Journal*, 963, 132, Date of Publication: 07/03/2024, Impact Factor: 5
4. K. Aravind, K. Venkataramani, S. Ganesh, A. Surya, T. Sivarani, D. Sahu, A. Unni, A. Bhardwaj, 2024, Optical spectroscopy of comets using Hanle Echelle Spectrograph (HESP), *MNRAS*, Date of Publication: 05/03/2024, Impact Factor: 4.8

**Geosciences Division [2]**

1. Naveen Kumar, Akash Ganguly, Kalyan Biswal, Tirumalesh Keesari, Amit Pandey, R.D. Deshpande, 2024, Relative contribution from different water sources to supraglacial runoff in Western Himalaya, *Journal of Hydrology*, Date of Publication: 27/03/2024, Impact Factor: 6.4
- Zouhair Lachkar, Marcela Cornejo-D'Ottone, Arvind Singh, Javier Arístegui, Boris Dewitte, Sarah Fawcett, Veronique Garçon, Elisa Lovecchio, Veronica Molina, P. N. M. Vinayachandran, 2024, Biogeochemistry of greenhouse gases in coastal upwelling systems: Processes and sensitivity to global change, *Elementa: Science of the Anthropocene*, Date of Publication: 07/03/2024, Impact Factor: 3.9

**Space & Atmospheric Sciences Division [1]**

1. Piyushkumar N. Patel, Jonathan H. Jiang, Ritesh Gautam, Harish Gadhavi, Olga Kalashnikova, Michael J. Garay, Lan Gao, Feng Xu, and Ali Omar, 2024, A remote sensing algorithm for vertically resolved cloud condensation nuclei number concentrations from airborne and spaceborne lidar observations, *Atmospheric Chemistry and Physics*, Date of Publication: 05/03/2024, Impact Factor: 6.7

**Theoretical Physics Division [1]**

1. Paramita Dutta, Jorge Cayao, Annica M. Black-Schaffer, and Pablo Burset, 2024, Nonlocality of Majorana bound states revealed by electron waiting times in a topological Andreev interferometer, Physical Review Research (Letter) 6, L012062, Date of Publication: 19/03/2024, Impact Factor: 4.2

**Udaipur Solar Observatory [1]**

1. Rohan Eugene Louis, Shibu K. Mathew, A. Raja Bayanna, 2024, Classification of circular polarization Stokes profiles in a sunspot using k-means clustering, Advances in Space Research, 73, 3256, Date of Publication: 01/03/2024, Impact Factor: 2.6

## Awards & Honours

- (1) **Dr. Sunil Kumar**, PDF, Space And Atmospheric Sciences Division of PRL has received **The Best Presentation Award in the PS2 session** in the "**National Space Science Symposium (NSSS 2024)**" held at Goa University during 26 February -01 March 2024.
- (2) **Ms. Megha Tomar**, a UNCSSTEAP student working with Mr. Rishitosh Sinha, Scientist/Engineer-SE in Planetary Sciences Division of PRL has received **The Best Presentation Award in the PS3 session** in the "**National Space Science Symposium (NSSS 2024)**" held at Goa University during 26 February -01 March 2024.
- (3) Poster entitled, "**From PARAS to PARAS-2: A Journey Towards Super-Earths**" authored by **Rishikesh Sharma, Sanjay Baliwal, Nikitha Jithendran, Neelam JSSV Prasad, Kapil Kumar, Kevi Kumar Lad, Ashirbad Naik, Shubhendra Das, Abhijit Chakraborty** has received **The Best Presentation Award in the PS4 session** in the "**National Space Science Symposium (NSSS 2024)**" held at Goa University during 26 February -01 March, 2024.
- (4) **Mr. Arijit Roy**, PDF, Atomic, Molecular and Optical Physics Division of PRL has received **The ISMS Jon Hougen Memorial Award 2024** to attend and participate in the "**77th International Symposium on Molecular Spectroscopy**", scheduled to be held in Urbana, USA during 17-21 June, 2024.
- (5) **Mr. B. S. Bharath Saighuan**, Scientist/Engineer-SC, Astronomy and Astrophysics Division of PRL has been placed among the **The Top Performers in the Non IT Category** in the "**Cyber Security Awareness Quiz**" conducted by the National Critical Information Infrastructure Protection Centre (NCIIPC) as part of the Cyber Security Awareness Month, October 2023.

## VISITORS

1. **St. Germain Karen Michele**, Director, Earth Science Division and **Mr. Hurst Kimberly Anne**, Senior International Program Specialist of National Aeronautics and Space Administration (NASA), Washington, DC, USA have visited PRL on 07.03.2024 for discussion/technical facility as a part of ISRO-NASA ongoing co-operation.
2. **Dr. Anish Ghoshal**, University of Warsaw, Poland, visited Theoretical Physics Division from 18.03.2024 to 20.03.2024.
3. A group of **M. Sc. and Ph.D students along with faculty members from Department of Physics, Marwadi Univeirsity, Rajkot** visited Udaipur Solar Observatory on 09.02.2024. The group visited observational facilities viz. Island observatory, GONG and eCallisto.



4. **Mr. Dauderis Gediminas** from M/s. Light Conversion, Keramiku 2B, Vilnius, Lithuania has visited PRL, Ahmedabad from 19.03.2024 to 20.03.2024 in connection with installation of scientific equipment.

5. The following foreign nationals have attended INSQT Workshop at PRL, Ahmedabad from 20.03.2024 to 22.03.2024:

<b>Sl.No</b>	<b>Name</b>	<b>Country</b>	<b>Institute/Company</b>
1	Ady Arie	Israel	Tel Aviv University, Israel
2	Marco Genovese	Italy	INRIM
3	Jasmindar Singh Sidhu	UK	University of Strathclyde, UK
4	Anil K Patnaik	USA	Air Force Institute of Technology, USA
5	Md Tanvirul Islam	Bangladesh	Centre for Quantum Technologies,
6	Oliver Stephen Burrow	UK	University of Strathclyde, UK
7	Keith Abraham Wyman	USA	Air Force Institute of Technology, USA
8	Ayesha Reezwana	Bangladesh	Centre for Quantum Technologies,
9	Deniz Eren Mol	Turkey	Hacettepe University, Ankara
10	Ali Mammadzada	Azerbaijan	Quantum Information Technology Group, University of Gdansk
11	Daniel Kuan Li Oi	UK	University of Strathclyde, UK
12	Yancho Delchev Yordanov	Bulgaria	Visteon Corporation Boulevard, Tsarigradsko
13	Yash Hemant Chitale	Singapore	SpeQtral Pte Ltd, Singapore
14	Costantino Agnesi	Italy	University of Padova, Italy

**OBITUARY**

Late Shri V.G. Shah  
Engineer-SF

**Date of Birth** 18.08.1943

**Date of Joining PRL** 26.11.1974

**Date of Retirement** 31.08.2003

**Date of Death** 10.03.2024

***Tearful Eyes for our Departed Member***

**OBITUARY**



Late Shri P.K. Kikani  
Engineer-SD

**Date of Birth** 14.04.1945

**Date of Joining PRL** 15.01.1968

**Date of Retirement** 30.4.2005

**Date of Death** 22.03.2024

***Tearful Eyes for our Departed Member***

**Heartily welcome to our new members**



**Name:** DR. MONAL KASHAV

**Designation:** POST DOCTORAL FELLOW

**Date of Joining:** 04.03.2024

**Division:** THEORETICAL PHYSICS DIVISION



**Name:** MS. NANDINI SHARMA

**Designation:** JUNIOR RESEARCH FELLOW-CSIR

**Date of Joining:** 11.03.2024

**Division:** GEOSCIENCE DIVISION



**Name:** MS. SMITA BINOY PILLAI

**Designation:** PURCHASE & STORES OFFICER

**Date of Joining:** 15.03.2024

**Division:** PURCHASE SECTION

**SUPERANNUATION**

**Name of the employee** Prof. M.G. Yadava

**Designation at the time of  
superannuation** Senior Professor

**Date of Birth** 11.03.1964

**Date of Joining PRL** 11.09.1987

**Date of Superannuation** 31.03.2024

*Good Luck for your future endeavours*

**SUPERANNUATION**

**Name of the employee** Shri P.S. Patwal

**Designation at the time of  
superannuation** Technical Officer-D

**Date of Birth** 30.03.1964

**Date of Joining PRL** 02.03.1988

**Date of Superannuation** 31.03.2024

*Good Luck for your future endeavours*

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