Newsletter of the Physical Research Laboratory

THE SPECTRUM

Image of the Month

National Unity Day was observed in PRL on 31 October 2025, where PRL members across all campuses took the Unity Pledge at their respective workplaces. Reaffirming the spirit of national solidarity, the celebration echoed the message — Together we stand, divided we fall.

November 2025

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Characteristics of Convective Clouds Below and Near the Lifting Condensation Level over the Semi-Arid Western-Indian Region

*(**Dharmendra Kumar Kamat**, Som Kumar Sharma, Kondapalli Niranjan Kumar, Prashant Kumar, Sourita Saha, and Hassan Bencherif)*

The Author

Dharmendra Kumar

Atmospheric clouds play vital role in precipitation and in modulating Earth's' radiation budget. Cloud formation and their height of occurrence in the atmosphere plays significant role in various atmospheric processes. The Lifting Condensation Level (LCL) serves as a fundamental parameter for estimating the convective Cloud Base Height (CBH) and plays a crucial role in various Atmospheric/ meteorological processes. Under typical atmospheric conditions, the CBH generally coincides with or lies above the LCL. This study examines the cloud formation occurring below the LCL over semi-arid region in Western India, from 2022 to 2024. An analytical formulation of the LCL, derived from surface temperature and relative humidity, was evaluated against radiosonde observations and exhibited minimal bias compared to existing empirical formulas. Convective clouds forming near the LCL were most prevalent during the monsoon season, while anomalous occurrences of clouds developing below the LCL were observed during the post-monsoon and winter months, with a mean CBH of 1044 ± 135 m, primarily between 0600 and 1200 UTC. These low-level clouds were characterized by the presence of a strong thermal inversion beneath the LCL, under surface temperature conditions ranging from 24°C to 37°C and relative humidity between 17% and 49%. The surface sensible heat flux during these events was lower than that for clouds forming near the LCL but comparable to clear-sky conditions, whereas the latent heat flux was higher than in clear-sky cases but lower than in near-LCL cloud formations, averaging 147 ± 74 W/m^2. The results highlight the significance of thermodynamic stability and surface heat fluxes in controlling cloud formation processes in semi-arid environments. A better understanding of clouds forming below the LCL can enhance weather forecasting and improve convective parameterization schemes in numerical weather and climate models, particularly for arid and semi-arid regions where cloud development strongly influences regional climate variability.

Source/Reference of the Work: https://doi.org/10.1016/j.atmosres.2025.108542

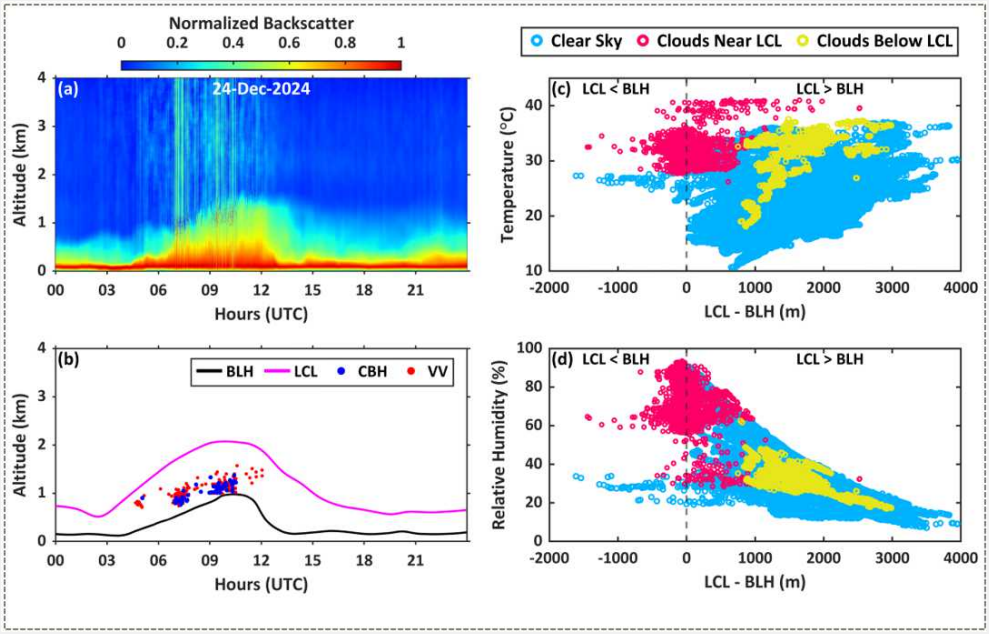


Fig: Clouds formed below the estimated LCL over the Ahmedabad region. (a) Backscatter profile obtained from the Ceilometer Lidar on 24 December 2024. (b) Diurnal variation of LCL and CBH indicates the formation of clouds below LCL between 0600 and 1200 UTC. Scatter plot illustrating the relationship between (LCL – BLH) and (c) surface temperature and (d) relative humidity for different sky conditions: clear sky (blue), clouds near LCL (red), and clouds below LCL (yellow).

Unravelling Seasonality in Origin and Processing of Carbonaceous Aerosols over Western India Using Dual-Carbon Isotopes

(***M. Devaprasad,*** *N. Rastogi, A. Patel, S. Harithasree, R. Meena, A. Dabhi, A. Shivam, and R. Bhushan)*

The Author

Deveprasad M

This study investigated the sources and atmospheric processing of carbonaceous aerosols (CAs), a major component of $PM_{2.5}$ pollution, in Ahmedabad, western India. Samples were collected from November 2020 to June 2021, covering four distinct seasons. By employing dual-carbon isotope analysis (^{14}C and ^{13}C) alongside chemical and optical methods, the study quantified the contributions from different sources. Radiocarbon (14C) analysis revealed that biomass burning (BB) and biogenic sources were dominant, contributing about 64% of CAs in the post-monsoon and winter seasons, decreasing to 49% in summer. Stable carbon isotope (^{13}C) analysis, combined with aerosol mass spectrometry data, indicated that winter aerosols were highly oxidized. This aging or oxidation was attributed to the long-range transport of polluted air masses from the Indo-Gangetic Plain. A key innovation of this work is the use of the f_{bioOC} / f_{bioBC} ratio as a new proxy to distinguish biogenic secondary organic aerosols (SOA) from BB emissions. This proxy showed that while winter aerosols were more aged, the contribution from biogenic sources was actually highest during the summer. These findings highlight the complex interplay between local emissions, regional transport, and seasonal atmospheric processing in determining urban air quality.

Source/Reference of the Work: https://doi.org/10.1021/acsestair.4c00341

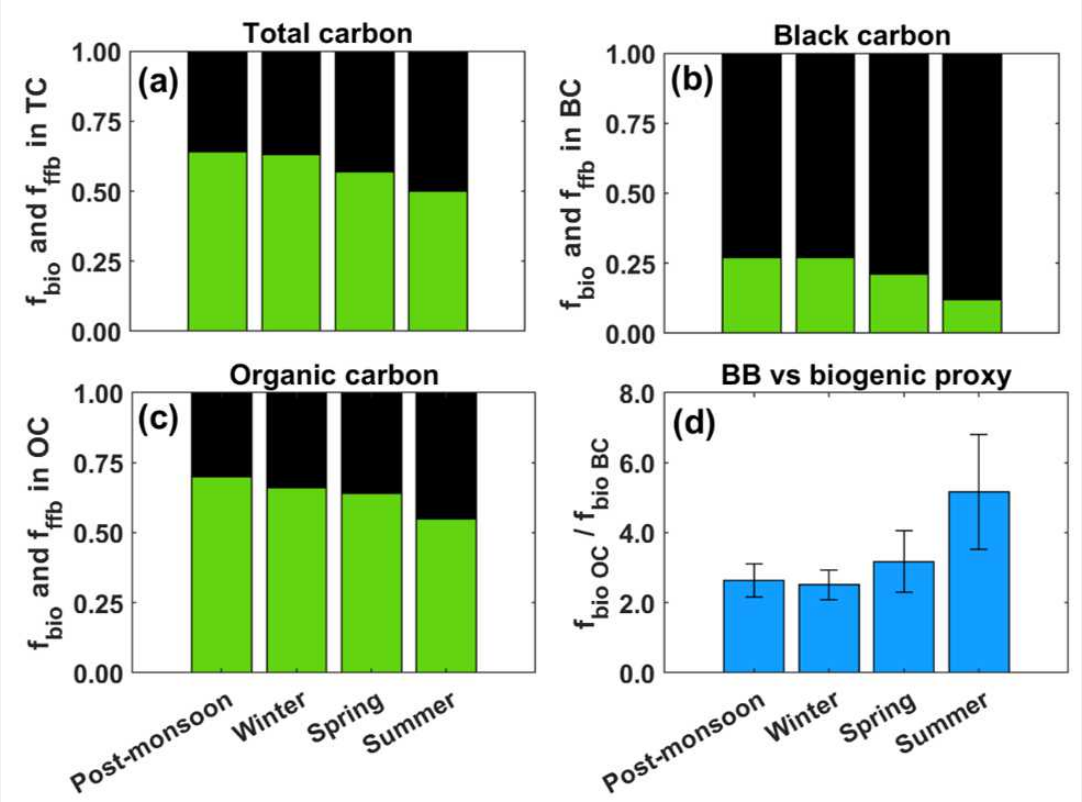


Fig: Seasonal contribution of the BB/biogenic fraction (green bars) and fossil fuel fraction (black bars) to (a) total carbon (TC), (b) black carbon (BC), and (c) organic carbon (OC) (d) Seasonal ratio of fbio in OC to that in BC, used as a proxy for biogenic contribution.

Identifying the ground state in multicomponent quantum Hall systems

*(Jincheng An, Ajit C. Balram, **Udit Khanna**, and Ganpathy Murthy)*

The Author

Udit Khanna

The quantum Hall effect occurs in two-dimensional electronic systems subjected to a perpendicular magnetic field. These prototypical topologically ordered states exhibit many fascinating phenomena, including quasiparticle excitations that carry fractional charge e* < e (the elementary charge), and obey statistics that are neither fermionic nor bosonic. In multicomponent systems, where the low-energy electrons possess internal degrees of freedom such as spin, valley, orbital, etc, topological order frequently appears concomitantly with interaction-induced symmetry-breaking. In this context, graphene systems stand out due to their high mobility as well as experimental tunability. Earlier theoretical studies have established that graphene may support multiple phases with identical topological characteristics which differ only in their spin-valley symmetry-breaking patterns. However, identifying the precise phase realized in a given experiment remains challenging because while topological indices are directly linked to transport coefficients, most measurable quantities depend indirectly on the underlying spin-valley order.

The present work proposes a route to narrow down the large number of theoretical possibilities. The central idea is to use the functional dependence of the transport gap on external control parameters, such as electric and magnetic fields, rather than focusing solely on its magnitude at specific field values. The study first develops a general framework for computing excitation gaps correctly in symmetry-broken fractional quantum Hall phases. This formalism is then applied to prominent fractional states of monolayer graphene, for which extensive experimental data already exist. The analysis offers a possible resolution to a long-standing experimental puzzle involving the behavior of these states under tilted magnetic fields, and yields concrete, testable predictions that can verify or refute our conjecture.

Beyond monolayer graphene, the framework introduced here is broadly applicable to other quantum materials where topology and symmetry breaking intertwine. It thus provides a general method to extract deeper information about the nature of the ground state in topological phases from experimentally accessible quantities.

Source/Reference of the Work: https://doi.org/10.1103/rth3-mkpl

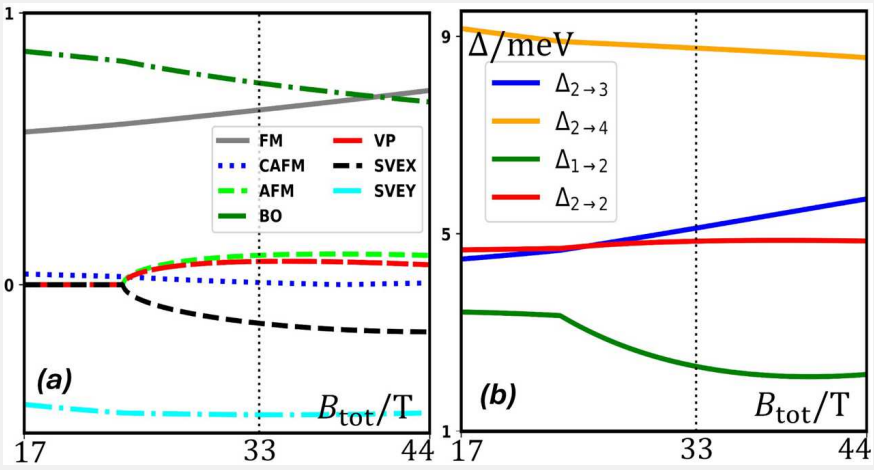


Fig: Variation of the relevant (a) order parameters and (b) excitation gaps with magnetic field, Btot, for a specific filling factor 4/3. The topological character of the phase, determined by the filling, remains fixed as Btot increases. However, a qualitative change occurs in the ground state around B = 23 T, where the SVEX and other order parameters acquire finite values. The smallest gap [green curve in (b)] exhibits distinct functional behavior in the two regimes, serving as a clear signature of the phase transition. Since transport measurements are primarily sensitive to the lowest energy gap, they can be used to experimentally identify the phase in a given sample.

V. J. Emery and P. W. Anderson's views and related issues regarding the basics of cuprates: a re-look

(***Navinder Singh***)

The Author

Navinder Singh

In 1991, the physicist V. J. Emery published an important review on high-temperature superconductors. In that paper, he questioned a popular idea of the time — the attempt to simplify the complex electronic behavior of cuprates by reducing it from a three-band picture to a single-band one. Emery argued that this simplified model could not fully explain how high-temperature superconductors actually behave. Over the past three and a half decades, scientists have continued to debate this issue, but a clear and complete answer has still not been reached. Closely related to this debate is another question: whether cuprates should be described by a one-component or a two-component model. The two-component idea has been most strongly supported by researchers Barzykin and Pines. In this article (for the full article browse with the DOI number given), the author revisits these long-standing questions and reviews a wide range of studies. The conclusion reached is that Emery's early criticism was justified — the single-band model fails to explain several key experimental results on cuprates, such as the so-called Johnston-Nakano scaling (refer to Figure below). Other examples are also discussed. To help clarify the central ideas, the author also presents a simple illustrative model.

Source/Reference of the Work: https://doi.org/10.1007/s10948-025-07065-9

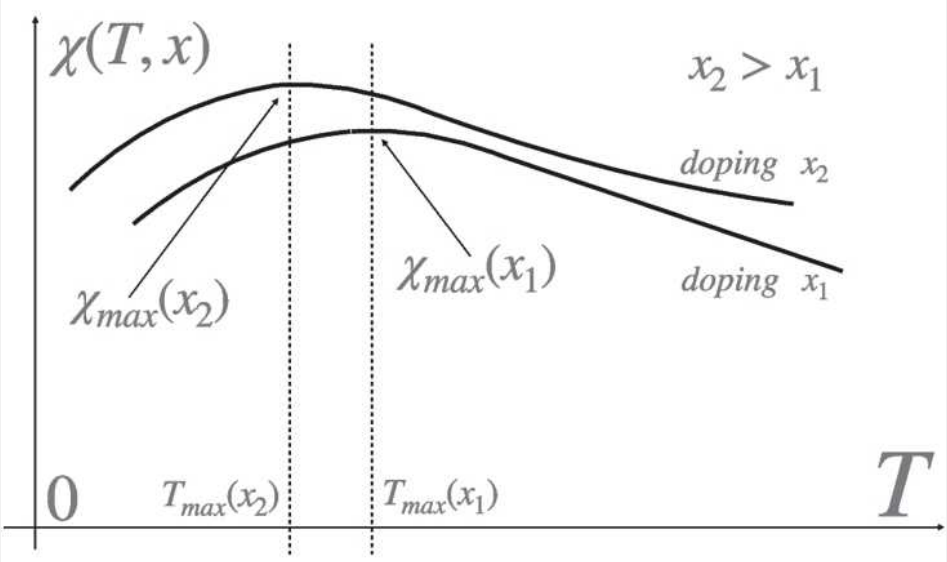


Fig: The static magnetic susceptibility exhibits a maxima as a function of temperature. On a scaled graph all these maxima fall on the same universal curve. This is called the Johnston-Nakano scaling.

Hot (non-equilibrium) electron relaxation: A review of the ultra-fast phenomena in metals and superconductors

*(**Navinder Singh**)*

The Author

Navinder Singh

The well-known Two-Temperature Model (refer to the Figure below), often used to study how energy relaxes in materials after being hit by light, was first introduced by Kaganov, Lifshitz, and Tanatarov in 1957. Later, in 1974, Anisimov and his colleagues expanded on this idea by showing that when a metal is struck by an extremely short laser pulse, its electrons can momentarily become much hotter than the atomic lattice. These "hot" electrons then gradually transfer their excess energy to the lattice through interactions with vibrations in the material, returning the system to balance within a few trillionths of a second. This research area grew rapidly during the 1980s and 1990s, thanks to new experimental techniques that could measure processes happening on femtosecond timescales (a millionth of a billionth of a second). From the 2000s onward, scientists began applying these ideas not only to simple metals but also to more complex materials, such as high-temperature superconductors. In 1987, the physicist P. B. Allen revisited the early theory and reformulated how heat is exchanged between electrons and the lattice, connecting it to an important quantity in superconductivity. More recently, the field has developed models that go beyond the original two-temperature idea and has even entered the attosecond era — where events lasting only billionths of a billionth of a second can be studied. In this article (refer to the DOI number), the author provides a clear and detailed overview of how this fascinating field has evolved, from its beginnings to the most recent advances.

Source/Reference of the Work: https://doi.org/10.1063/5.0262933

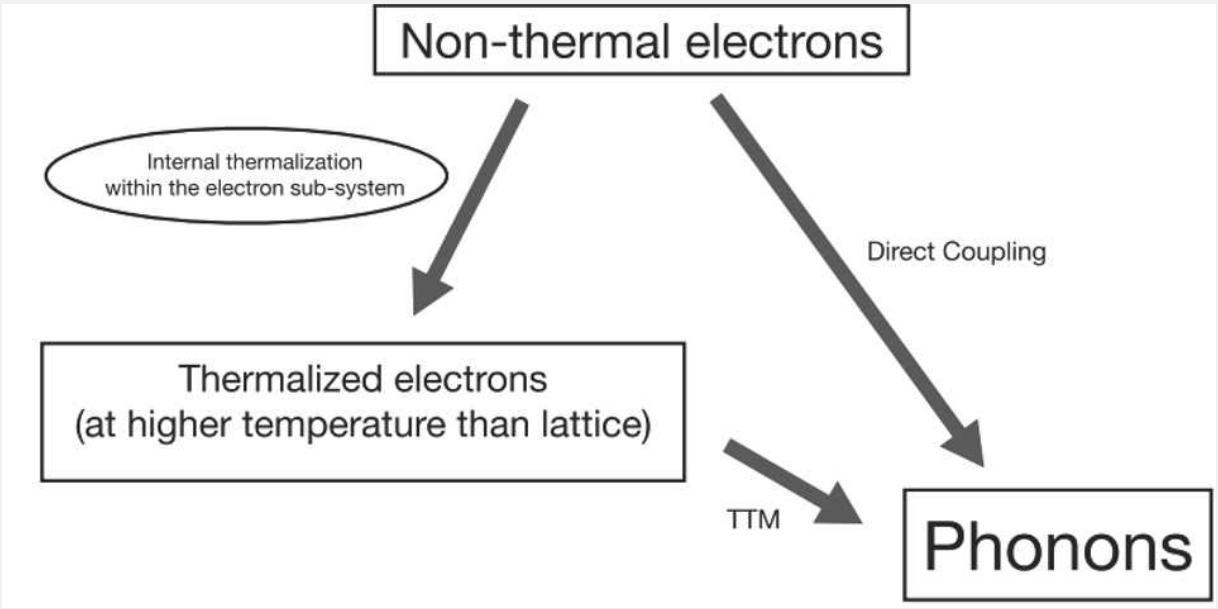


Fig: Schematic diagram of the Two-Temperature model (TTM).

A Statistical Study of delta-Sunspots from Solar Cycle 23 to 25

(***Rohan Eugene Louis***)

The Author

Rohan E. Louis

Sunspots or active regions (ARs) with a delta-magnetic configuration comprise a polarity inversion line within a sunspot as a consequence of two umbral cores of opposite polarity residing within a common penumbra. Several studies have been carried out to determine the role and association of complex sunspot groups, particularly those having a delta-configuration, with strong solar eruptions such as flares and mass ejections. This article investigates the properties of delta-ARs over the course of three solar cycles, from 1996 to 2024, to ascertain if the flare productivity during the presence of the delta-type configuration were distinct from those during the non-delta-type configuration, whether the number of delta-ARs directly translates into enhanced flaring activity, and if the ratio of delta-ARs to the total number of ARs is the same for all solar cycles. Solar cycle 25, while still in progress, has produced the least number of delta-ARs in comparison to the previous two solar cycles, yet the number of M- and X-class flares exceeds that of cycle 24 by 25%. Flare occurrence is higher in C-, M-, and X-class events during the presence of the delta-configuration in an AR, which is seen in all three solar cycles. The total number of flares produced by delta- and non-delta-active regions were 15,875 and 17,033, respectively, across all three solar cycles. The latter are dominated by B- and C-class flares, while the number of M- and X-class flares across all three solar cycles was significantly less compared to delta-ARs. Despite hosting the fewest number of delta-ARs, cycle 25 has produced 2,391 flares in 2024 alone, accounting for 72% of all flares since 2019. This suggests that the number of delta-sunspots is not simply a fraction of the strength or total sunspot number of the solar cycle, and it remains to be seen if the latter phase of cycle 25 will be as active as its earlier phase.

Source/Reference of the Work: https://doi.org/10.1007/s11207-025-02560-7

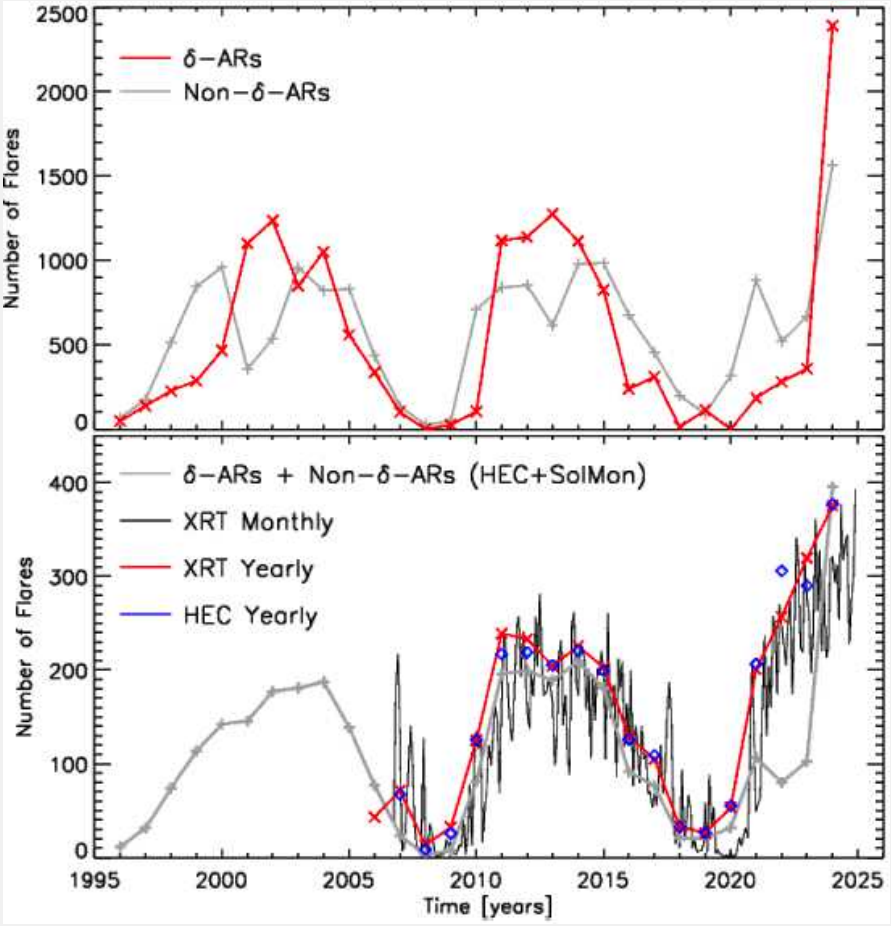


Fig: (Top panel) Number of X-ray flares from delta- and non-delta-ARs indicated by red and grey colours, respectively, and averaged over a year. (Bottom panel) The black and red lines represent the monthly and yearly number of flares, respectively, from the Hinode X-ray Telescope (XRT) catalog. The grey line corresponds to the yearly number of flares from delta- and non-delta-ARs analysed in this work. The blue diamonds represent the yearly number of all flares from the Heliophysics Event Catalog (HEC) alone. The yearly number of flares from all data sources has been reduced by a factor of ten.

The Author

Kiran

On the latitudinal variations of AO, SAO, and ISOs in the MLT temperatures

(***Kiran*** *and Ravindra P. Singh)*

Two years of mesospheric OH(3–1) rotational temperature measurements from the PRL Airglow InfraRed Spectrograph (PAIRS) over Ahmedabad is used to examine annual (AO), semi-annual (SAO), and intraseasonal oscillations (ISOs) including terannual oscillation (TAO), quarter-annual oscillation (QAO), 75-day and 60-day oscillations near 87 km altitude. In order to investigate global variation in these oscillation SABER-measured and NRLMSIS model estimated temperatures have beed used. Lomb–Scargle spectral analysis detects AO, SAO, TAO, QAO, and 60-day oscillations in PAIRS and SABER tempearures, while NRLMSIS model fails in reproducing the observed ISOs, capturing only AO and SAO over Ahmedabad. The absence of the 75-day oscillation in both PAIRS and SABER over Ahmedabad prompted a broader latitude-based investigation of longitudinally averaged SABER temperatures, organized in 10° latitude intervals from 80°N to 80°S. Results show that AO and SAO are present across all latitudes, with amplitudes peaking at the poles and decreasing toward the equator. SABER reveals a secondary maxima of equatorial SAO (4.5 K) nearly twice the AO amplitude (2.6 K). ISOs display pronounced latitude dependence: the TAO dominates low–mid latitudes, QAO strengthens toward the poles, the 75-day oscillation is confined to mid and high latitudes, and the 60-day oscillation is mainly equatorial. These results provide new observational evidence for the latitude-dependent behaviour of mesospheric temperature oscillations, offering insights into possible generation mechanisms, involving harmonic generation, local atmospheric forcing, and tropospheric influence in the Mesosphere–Lower Thermosphere (MLT) region.

Source/Reference of the work: https://doi.org/10.1016/j.asr.2025.10.003

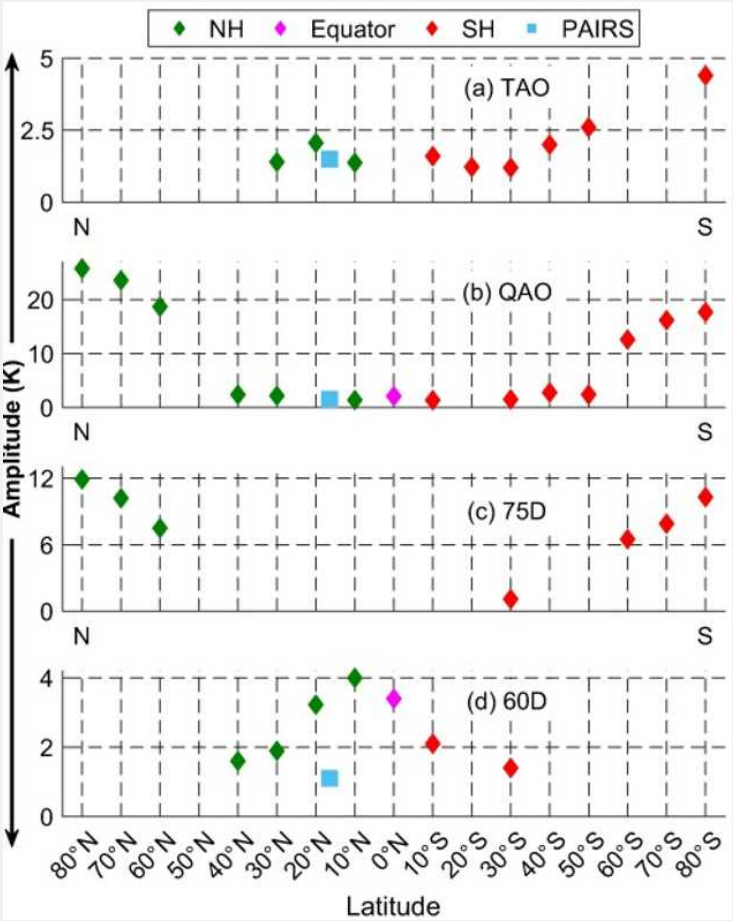


Fig: Amplitudes of (a) TAO, (b) QAO, (c) 75-day, and (d) 60-day oscillations in temperature derived from SABER across 17 latitude sectors covering the region from 80°N to 80°S..

CAMPAS (CAssegrain Module for PAras-2 Spectrograph) : Design and Development at PRL

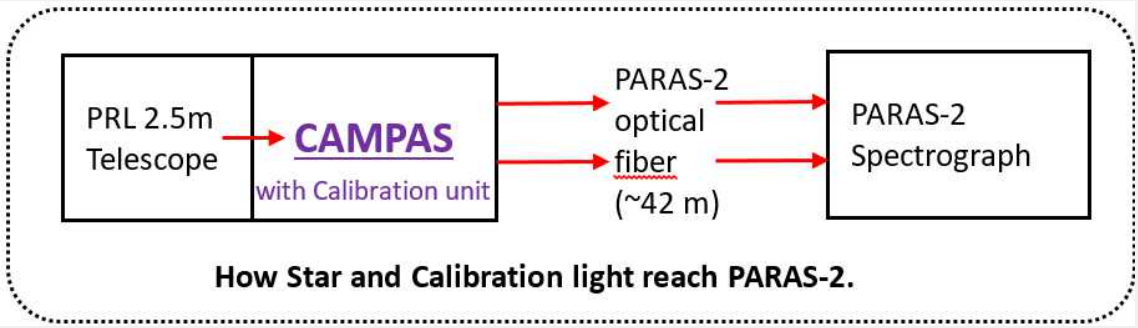
(***Kevikumar A. Lad,*** *Neelam J. S.S.V. Prasad, Kapil Bharadwaj, Nikitha Jithendran, Ashirbad Nayak, Rishikesh Sharma, Abhijit Chakraborty, Vishal Joshi)*

The Author

Kevikumar A. Lad

We have successfully developed and commissioned the CAMPAS (CAssegrain Module for PARAS-2 Spectrograph) instrument with a Speckle imager for the PRL 2.5m Telescope, installed at PRL Mount Abu Observatory. It was extensively used during the acquisition of the star and calibration frames for the detection of two recently discovered exoplanets (TOI 6651 b and TOI 6038 A b) by PRL. The CAMPAS consists of a focal reducer, beam-guiding optics, an atmospheric dispersion corrector, optical fiber mounts, and other auxiliary subsystems. A dedicated calibration unit has also developed and integrated into CAMPAS, allowing for different types of exposures required for high-resolution spectroscopy. The speckle imager has been developed and integrated to allow imaging near the diffraction limit of the telescope. CAMPAS was the first light instrument for the side port of the PRL 2.5m Telescope. It serves critical purposes of precise fiber feed, point spread function estimation, and atmospheric dispersion correction.

Source/Reference of the Work: https://doi.org/10.1117/1.JATIS.11.4.045003



How Star and Calibration light reach PARAS-2.

Fig: CAMPAS + Speckle installled on PRL 2.5m Telescope at PRL Mount Abu Observatory.

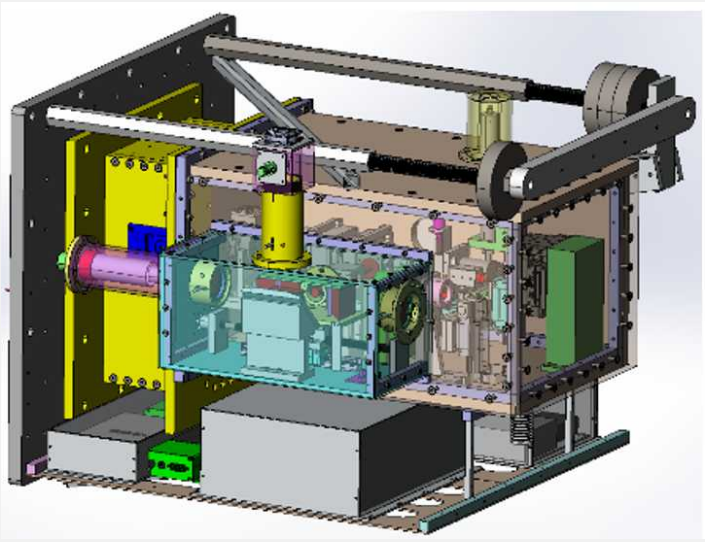


Fig: Computer Aided Design (CAD) model of CAMPAS + Speckle .

Petrology and Geochemistry of Poikilitic Shergottite Northwest Africa 1950: bridging the gap between depleted and intermediate sources in Martian Mantle

(***Varsha M Nair,*** *Amit Basu Sarbadhikari, G N S Sree Bhuvan, T. Vijaya Kumar, Nilanjana Sorcar, Sneha Mukherjee, E.V.S.S.K. Babu, Jyotiranjan S. Ray)*

The Author

Varsha

This study investigates Martian meteorite Northwest Africa (NWA) 1950, a rare cumulate shergottite sample, to better understand magmatic evolution and mantle source characteristics of Mars. Shergottites, which form the largest group of Martian meteorites, are generally derived from either a depleted mantle reservoir (low in incompatible elements, high Nd and Hf) or an enriched reservoir (high in incompatible elements, low Nd and Hf). However, poikilitic shergottites, a cumulate sub class of the shergottite, which crystallized slowly at depth, have so far lacked a representative depleted member, leaving a gap in understanding their petrogenetic link to other shergottite subtypes.

Through detailed petrographic, in-situ trace element, and whole-rock Sr–Nd isotopic analyses, this study reveals that although NWA 1950 displays an intermediate whole-rock composition, the olivine-hosted melt inclusions and the constituent mineral phases are depleted in incompatible elements. This establishes a genetic connection between intermediate and depleted shergottites and provides evidence for the missing depleted poikilitic counterpart. The study further demonstrates that the trace element enrichment and isotopic characteristics of NWA 1950 can be explained by mixing of an enriched melt within a heterogeneous Martian mantle. The findings imply that magma mixing, combined with slower cooling and longer residence times of poikilitic magmas, contributed to their intermediate geochemical signatures, offering new insights into mantle heterogeneity and magmatic processes on Mars

Source/Reference of the Work: https://doi.org/10.1016/j.gca.2025.09.043

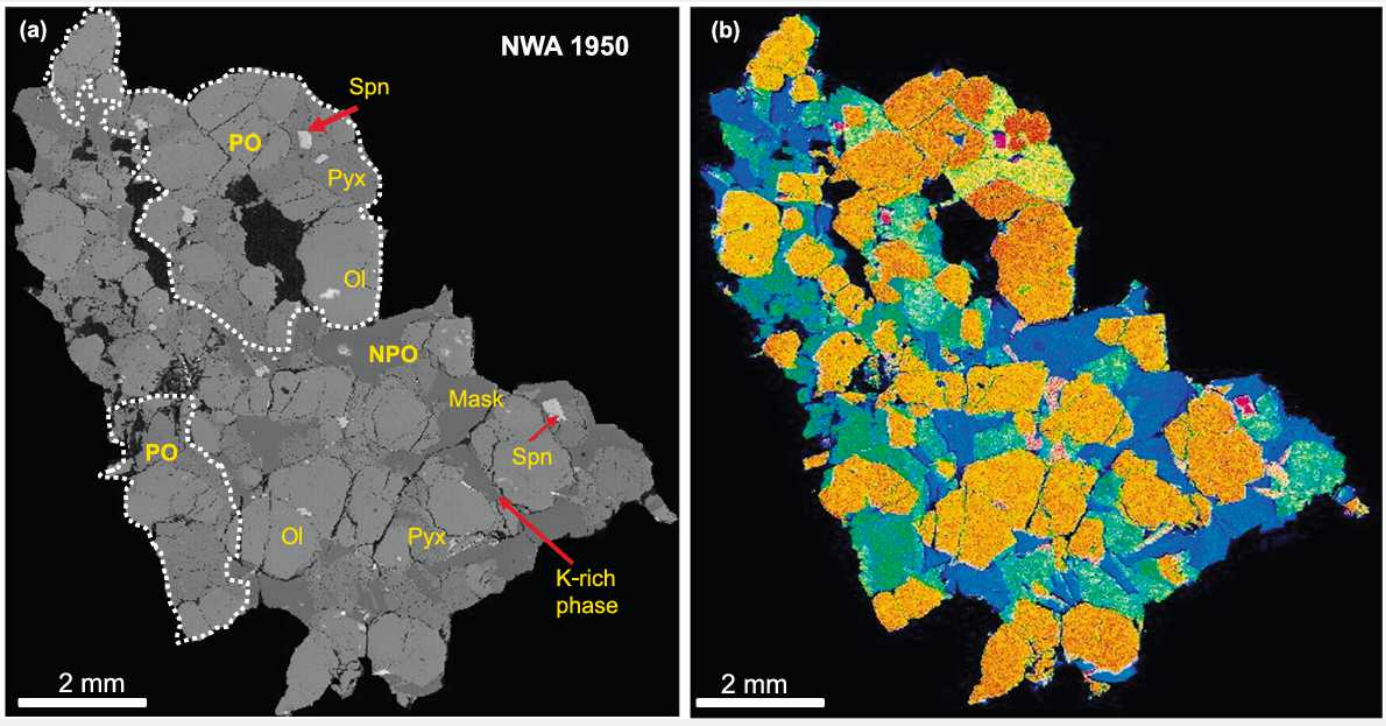


Fig: Backscattered electron image (a) and composite X-ray elemental map (b) of NWA 1950. Poikilitic domain (PO) and non-poikilitic domain (NPO) are marked by dotted lines

हिंदी माह Hindi Maah-2025

भारत सरकार, गृह मंत्रालय, राजभाषा विभाग एवं अंतरिक्ष विभाग के निर्देशानुसार, भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद के मुख्य परिसर सहित अन्य तीनों परिसरों थलतेज, माउंट आबू अवरक्त वेधशाला, उदयपुर सौर वेधशाला में 14 सितंबर 2025 से हिंदी माह अत्यंत हर्षोल्लास के साथ मनाया गया। हिंदी माह के दौरान राजभाषा के प्रचार-प्रसार हेतु विभिन्न कार्यक्रमों/प्रतियोगिताओं का आयोजन किया गया था।

As per the instructions of the Government of India, Ministry of Home Affairs, Department of Official Language and Department of Space, Hindi Month was celebrated with great enthusiasm from 14 September 2025 in the Main campus of Physical Research Laboratory, Ahmedabad and the other three campuses, Thaltej, Mount Abu Infrared Observatory, Udaipur Solar Observatory. Various programs/competitions were organized during Hindi month for promotion of Official Language.

इस वर्ष हिंदी दिवस की शुरुआत 14 सितंबर 2025 को हिंदी दिवस समारोह एवं पंचम अखिल भारतीय राजभाषा सम्मेलन- 2025 भारत मंडपम, नई दिल्ली के माध्यम से हुई, जिसकी अध्यक्षता माननीय गृह एवं सहकारिता मंत्री महोदय श्री अमित शाह ने की थी। इस अखिल भारतीय हिंदी सम्मेलन-2025 में पी.आर.एल. के निम्नलिखित नामित सदस्यों द्वारा सहभागिता की गई।

This year Hindi Diwas was celebrated on 14th and 15th September 2025 with Fifth All India Official Language Conference- 2025 Bharat Mandapam, New Delhi, and this conference was chaired by the Honorable Home and Cooperation Minister, Shri Amit Shah. Following nominated members of PRL participated in this Official Language Conference- 2025.

पीआरएल हिंदी माह समारोह 2025 के लिए गठित समिति द्वारा विभिन्न प्रकार के रोचक कार्यक्रमों/प्रतियोगिताओं का आयोजन किया गया एवं इस बात का विशेष ध्यान रखा गया कि सभी भाषा-भाषी एवं कर्मचारी वर्ग तथा परिवार के सदस्य भी इन कार्यक्रमों/प्रतियोगिताओं में भाग ले सकें।

The Committee constituted for PRL Hindi Month Celebration 2025, organized various interesting programs/competitions and special emphsize was ensured that all language speakers, employees and family members could participate in these programs/ competitions.

हिंदी माह 2025 के दौरान पीआरएल में आयोजित कार्यक्रम/प्रतियोगिताएं

Events/Competitions organised in PRL during Hindi Month 2025:

19 सितंबर 2025

हिंदी माह एवं हिंदी तकनीकी संगोष्ठी (हिं.त.सं.) का संयुक्त उद्घाटन कार्यक्रम

इस कार्यक्रम में हिंदी माह 2025 एवं पूल-डी के अंतर्गत हिंदी तकनीकी संगोष्ठी 2025 का संयुक्त उद्घाटन परंपरागत रूप से निदेशक, पीआरएल के संबोधन द्वारा हुआ। हिं.त.सं. में अंतरिक्ष उपयोग केंद्र (सैक), अहमदाबाद, पीआरएल माउंट आबू एवं उदयपुर सौर वेधशाला ने प्रतिभागी के रूप में भाग लिया। इस हिंदी तकनीकी संगोष्ठी द्वारा जहाँ प्रौद्योगिकी, विज्ञान और नवाचार से जुड़े विषयों पर चर्चा, विचार-विमर्श और ज्ञान का आदान-प्रदान किया गया, वहीं यह संगोष्ठी न केवल तकनीकी ज्ञान को साझा करने का माध्यम बनी, बल्कि हिंदी भाषा में तकनीकी शब्दावली और अभिव्यक्ति को विकसित करने का भी एक प्रयास किया गया। इस संगोष्ठी से छात्रों, शोधकर्ताओं और शोध क्षेत्रों से जुड़े सभी को अपने अनुभव, शोध और नवीनतम तकनीकी जानकारियाँ साझा करने का अवसर प्राप्त हुआ, जिससे ज्ञान का अनूठा सुदूरप्रसारी प्रभाव पड़ा। पीआरएल द्वारा पहली बार हिंदी तकनीकी संगोष्ठी में फ्लैश टॉक (Flash Talk) रखा गया। इस संगोष्ठी में 85 पेपर (54 फ्लैश टॉक एवं 31 मौखिक) प्रस्तुत किए गए। संगोष्ठी को अत्यंत व्यवस्थित रूप से आयोजित किया गया एवं इस विषय में सैक एवं नराकास के सदस्यों की ओर से सराहना-पत्र भी प्राप्त हुए।

Joint Inaugural Program of Hindi Month and Hindi Technical Seminar (HTS)

The joint inauguration of Hindi Month 2025 and the Hindi Technical Seminar 2025 as per DOS Pool-D was marked by Address by the Director, PRL. Space Applications Centre (SAC), Ahmedabad, PRL Mount Abu, and the Udaipur Solar Observatory were participants. While this Hindi Technical Seminar facilitated discussions, deliberations, and knowledge exchange on topics related to technology, science, and innovation, it not only served as a medium for sharing technical knowledge but also an effort to develop technical terminology and expressions in the Hindi language. This Seminar provided students, researchers, and those involved in research fields with the opportunity to share their experiences, research, and the latest technical information, creating a unique, far-reaching impact of knowledge sharing. For the first time, PRL organized a Flash Talk in Hindi Technical Seminar. 85 papers (54 Flash Talks and 31 oral presentations) were presented. The Seminar was organised in a very systematic manner and letters of appreciation were also received from the members of SAC and TOLIC about this.

24 सितंबर 2025

ऑनलाइन हिंदी टंकण प्रतियोगिता (10 मिनट)

यह प्रतियोगिता पीआरएल के सभी परिसरों के सदस्यों के लिए थी एवं ऑनलाइन माध्यम से आयोजित की गई जिसमें सभी को अपने कार्य स्थान से इस प्रतियोगिता में भाग लेने की सुविधा प्रदान की गई थी।

This competition was open to members from all PRL campuses and was conducted online, allowing everyone to participate from their respective workplace.

25 सितंबर, 2025

हिंदी समाचार-पत्र पठन

यह प्रतियोगिता पीआरएल मुख्य, थलतेज, माउंट आबू एवं यूएसओ परिसरों में तत्कालीन ग्रुप -डी (ऑक्जिलरी) और कॉन्ट्रेक्च्यूअल सदस्यों के लिए आयोजित की गई।

Hindi Newspaper Reading

This competition was held for the erstwhile Group D (Auxiliary) and contractual members in PRL Main, Thaltej, Mount Abu, and USO campuses.

29 सितंबर, 2025

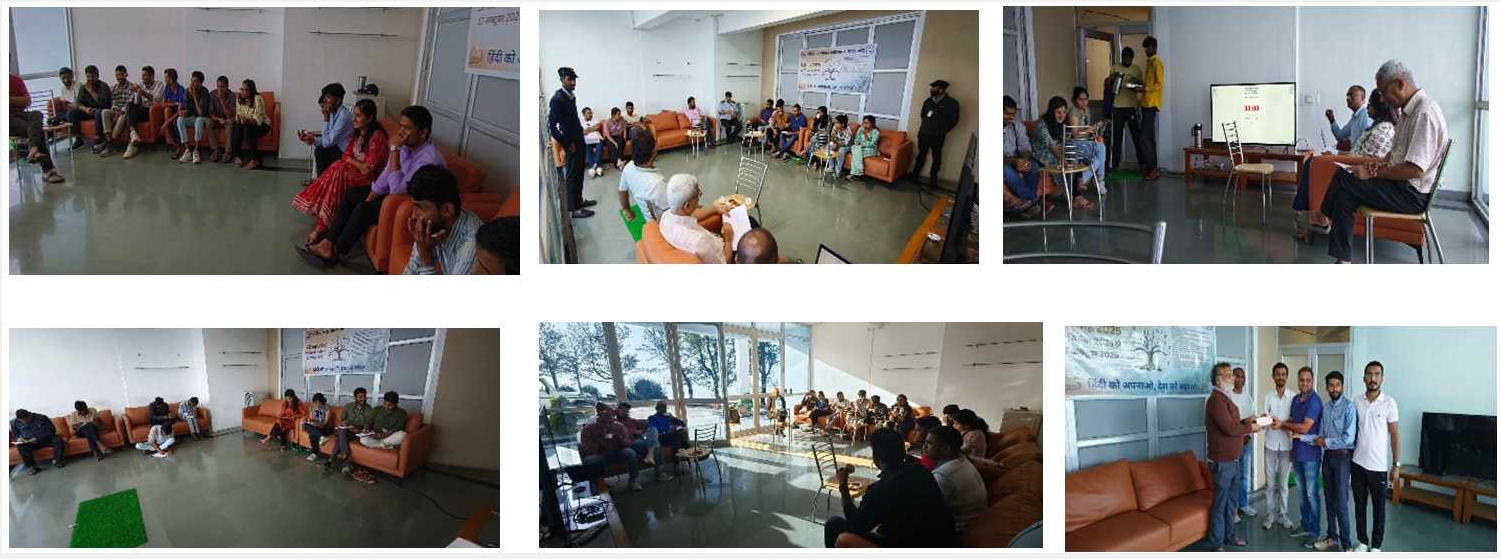
कविता पाठ प्रतियोगिता

पी.आर.एल. के सदस्यों के लिए कविता पाठ प्रतियोगिता का आयोजन किया गया। इसमें हिंदी में स्वरचित कविताएं प्रस्तुत करने का अवसर दिया गया। इस प्रतियोगिता में माउंट आबू एवं यूएसओ के सदस्यों ने भी ऑनलाइन माध्यम से भाग लिया।

Kavita Path competition was organized for the members of PRL. In this, an opportunity was given to present self-composed poems in Hindi. Members of Mount Abu and USO also participated in this competition through online mode.

मातृभाषा से राजभाषा तक

हिंदी राजभाषा होने के साथ-साथ हमारे देश की विभिन्न संस्कृतियों की मोतियों को एक माला में संजो कर रखती है। इसी भाव को रेखांकित करते हुए, हिंदी माह में "मातृभाषा से राजभाषा तक" कार्यक्रम का आयोजन किया गया। प्रतिभागियों द्वारा अपनी मातृभाषा अथवा अपने प्रांत की बोली/भाषा में भावपूर्ण कविता, लेख, कहानी, नाट्य, संगीत के छंद प्रस्तुत किए गए। उसके बाद उस प्रस्तुति का भावानुवाद हिंदी भाषा में प्रस्तुत किया गया, तथा प्रस्तुति का स्रोत-लेखक-संक्षिप्त परिचय भी दिया गया। सभी भाषा वर्ग के कर्मचारियों द्वारा इसकी सराहना की गई एवं इस प्रयास को गौरवशाली बताया।



हिंदी माह 2025 की कुछ झलकियाँ

Being the Official Language, Hindi also beholds the cultural pearl string of our country and unites us. Highlighting this sentiment, a competition "From Mother Tongue to Official Language" was organized during the Hindi month. The participants presented emotive poems, articles, stories, dramas, musical verses in the dialect/language in their respective mother tongue. After that, the summary-translation of the same was presented in Hindi language, and the source/author/brief introduction of the presentation was also given. The effort was appreciated and considered a matter of pride by the employees of all language groups.

03 अक्टूबर, 2025

पोस्टर एवं स्लोगन/पंचलाइन गतिविधि (बच्चों के लिए):

यह गतिविधि पीआरएल सदस्यों के सीएचएसएस आश्रित बच्चों (कक्षा 7 से 12 तक के) के लिए आयोजित की गई। बच्चों को दिए गए विषय पर A1 साइज का पोस्टर एवं स्लोगन/पंचलाइन बनाकर प्रस्तुत करना था। इसमें रचनात्मकता का स्वतंत्र रूप से उपयोग किया जाना था। पोस्टर के लिए एक स्लोगन भी लिखा जाना था।

पोस्टर एवं स्लोगन/पंचलाइन का विषय था 'वर्ष 2500 में मेरा भारत'

Poster and Slogan/Punchline Activity (for Children):

This activity was conducted for CHSS dependent children (classes 7 to 12) of PRL members. Children were given to create and present an A1-size poster and slogan/punchline on a given topic. Creativity was to be utilized freely to portray the idea. A slogan was also required for the poster.

The theme of the poster and slogan/punchline was "My India in the Year 2500."

04 अक्टूबर, 2025

गायन कार्यक्रम

फिल्मी गीतों का हिंदी के प्रचार-प्रसार में अतुलनीय योगदान रहा है। इसी तारतम्य में पीआरएल के सभी सदस्यों एवं उनके परिवारजनों से गायन हेतु प्रतिभागिता आमंत्रित की गई थी। गायन में पीआरएल के सदस्य एवं उनके परिवारजनों ने बहुत ही मधुर एवं मनोरंजक प्रस्तुति दी। सभी प्रतिभागियों ने अपनी प्रतिभा का प्रदर्शन करके सभी को मंत्रमुग्ध कर दिया। गीतों की विविधता और प्रस्तुति की गुणवत्ता ने दर्शकों मंत्रमुग्ध किया। गायन के साथ वाद्य यंत्रों की सुमधुर युगलबंदी भी शामिल थी। सभी सदस्यों नें कार्यक्रम एवं सभी प्रतिभागियों के गायन की प्रशंसा की।

Gayan Program

हिंदी माह 2025 की कुछ झलकियाँ

हिंदी माह 2025 की कुछ झलकियाँ

Film songs have an incomparable contribution to the promotion of Hindi. In this context, all the members of PRL and their families were invited to participate in singing. The members of PRL and their families gave a very melodious and entertaining performance. All the participants mesmerized everyone by showcasing their talent. The variety of songs and the quality of the presentation mesmerized the audience. The singing was accompanied by a melodious entwinement of musical instruments. All the members praised the program and the singing of all the participants.

08 अक्टूबर, 2025

शब्द प्रश्नोत्तरी प्रतियोगिता

शब्द प्रश्नोत्तरी प्रतियोगिता में पीआरएल को विभिन्न समूहों में संरचित करके हिंदी भाषा ज्ञान, वर्ग-पहेली, सामान्य-ज्ञान, मुहावरों, गानों आदि के चक्रों के साथ यह प्रतियोगिता आयोजित की गई।

इस प्रतियोगिता में कुल 09 टीम निम्नानुसार थी:

Word Quiz

In the Word Quiz competition, PRL were structured into different groups and the competition was organized with a cycle of Hindi language knowledge, crossword puzzle, general knowledge, idioms, songs etc. Each team had 5 members each. There were a

total of 9 teams in this tournament.

10 अक्टूबर, 2025

वर्ग पहेली प्रतियोगिता

यह प्रतियोगिता पीआरएल,अहमदाबाद, माउंट आबू एवं यूएसओ परिसरों में एक साथ आयोजित की गई। पहेली हल करने के लिए 45 मिनट का समय दिया गया।

वर्ग पहेली के लिए प्रश्नों के विषय अंतरिक्ष विभाग, इसरो, पीआरएल, हिंदी शब्द ज्ञान, हिंदी साहित्य, सामान्य ज्ञान, गीत-संगीत, फिल्म, खेल आदि से संबंधित थे।

Crossword Competition

This contest was held simultaneously at the PRL, Ahmedabad, Mount Abu, and USO campuses. The time allotted for solving the puzzles was 45 minutes.

The crossword puzzle questions covered topics related to the Department of Space, ISRO, PRL, Hindi vocabulary, Hindi literature, general knowledge, music, films, sports, and more.

15 अक्टूबर, 2025

(1) लघुनाटिका प्रतियोगिता

इसमें विभिन्न वैज्ञानिक/तकनीकी/प्रशासन क्षेत्रों के सदस्यों द्वारा विभिन्न विषयों पर लघुनाटिका प्रस्तुत की गई। लघुनाटिकाएं वीडियो के रूप में प्रस्तुत की गई। सभी लघुनाटिकाएं संक्षिप्तता, भावपूर्णता, विविधता, प्रभावशीलता, सामाजिक संदेश, कल्पनाशीलता, और संगीत के समावेशन के उत्कृष्ट स्वरूप थीं। यह एक ऐसा माध्यम है जो कलाकारों को अपनी प्रतिभा दिखाने का अवसर प्रदान करता है, भाषा के प्रचार-प्रसार का माध्यम बनती है और दर्शकों को नए और अनोखे अनुभव प्रदान करता है। सभी ने राजभाषा के माध्यम से नाटिकाओं में समसामयिक सामाजिक पहलुओं को बखूबी प्रस्तुत किया। प्रत्येक लघुनाटिका की निर्धारित अवधि अधिकतम 7 मिनट थी।

इस प्रतियोगिता में कुल 08 टीम निम्नानुसार थी:

Skit Competition

Members of various scientific/technical/administrative fields presented short plays on various topics. The plays were presented in video format. All the short plays excelled in their brevity, emotionality, variety, effectiveness, social message, imagination, and musical incorporation. It is a medium that provides artists with an opportunity to showcase their talent, promotes the language, and offers audiences new and unique experiences. Each team presented contemporary social issues in the official language in their plays. The maximum duration of each play was 7 minutes.

पर्व व्याख्यान

हिंदी माह 2025 समापन समारोह के दौरान, विशेष पर्व व्याख्यान का आयोजन, पर्व समिति के समन्वयन के साथ किया गया। इसमें “साइबर स्वच्छता” विषय पर वक्ता श्री कृतार्थ झाला, वरिष्ठ वैज्ञानिक अधिकारी डिजिटल फोरेंसिक्स और सूचना सुरक्षा 'राष्ट्रीय न्यायालयिक विज्ञान विश्वविद्यालय (एनएफएसयू)', गांधीनगर, गुजरात ने व्याख्यान दिया।

PARV Vyakhyaan

During the Hindi Month 2025 closing ceremony, a special PARV Lecture was organized in coordination with the PARV Committee. The speaker, Mr. Kritarth Jhala, Senior Scientific Officer, Digital Forensics and Information Security, National

Swachhta Hi Seva – 2025 & Special Campaign 5.0

PRL observed "Swachhta Pakhwada – 2025" from September 15 to October 2, 2025, under the theme "Swachhotsavā"—celebrating cleanliness and sustainable living. This was followed and strengthened by the Special Campaign 5.0 (October 2–31, 2025), which focused on institutionalizing cleanliness practices and reducing administrative pendency.
All four PRL campuses—Main (Navrangpura), Thaltej, Udaipur Solar Observatory (USO), and Mount Abu Observatory—participated actively in a series of cleanliness, awareness, and health-related programmes.

Key Activities Conducted Across PRL Campuses

1. Swachhta Hi Seva Shapath – Cleanliness Pledge
The campaign began with a mass Swachhta Pledge administered to all staff members, research scholars, Post-Doctoral Fellows (PDFs), trainees, and contractual staff across all campuses. Participants reaffirmed their dedication to cleanliness in their surroundings and workplaces, which helped infuse a sense of shared responsibility and community spirit.
2. Cleanliness Drives
Comprehensive cleanliness drives were organized throughout the reporting period.

- PRL Main and Thaltej Campuses: Staff and students cleaned internal roads, laboratories, and garden areas. E-waste was identified and disposed of following MoEFCC guidelines.
- Udaipur Solar Observatory (USO): A drive led by Prof. Shibu K. Mathew was conducted at both the main office and the island observatory, with a specific focus on cleaning the Fateh Sagar lakeshore.
- Mount Abu Observatory: Cleaning drives were organized in observatory areas and residential quarters.

3. Awareness and Commitment Initiatives

- Signature Campaign: Members across all campuses pledged to maintain cleanliness in their daily lives, fostering a strong sense of ownership.
- Sanvaad with Students – Awareness Initiative: A Jagrukta Sanvaad was conducted at Adani Vidya Mandir, Ahmedabad, as part of the “Swachhotsav” objectives. Dr. Vishal Joshi gave a talk on cleanliness and civic awareness, followed by an interactive quiz by Shri Pradeep K. Sharma. Students participated enthusiastically and pledged to become "Swachhta Ambassadors".
- Sapling Distribution: To promote the vision of “Clean Environment, Green Future,” saplings were distributed to staff, scholars, and trainees at all campuses, emphasizing the link between cleanliness and sustainability. Tree plantation was also carried out on the PRL premises at Mount Abu.

4. Facility Maintenance and Pest Control

- Fogging, Fumigation & Pest Control: Regular fogging and fumigation were carried out across Ahmedabad, Udaipur, and Mount Abu campuses to control mosquitoes and pests. Routine maintenance also included cleaning solar panels, sewer lines, and water tanks.
- Cleaning of GLRs and OHTs (Water Storage Tanks): The cleaning of Ground Level Reservoirs (GLRs) and Overhead Tanks (OHTs) was undertaken across all PRL campuses as part of routine hygiene and the Swachhta Hi Seva 2025 initiative.

o Cleaning Frequency: GLRs are cleaned twice a year, and OHTs are cleaned thrice a year.
o The activity is carried out under a dedicated mechanized cleaning contract using professional equipment for disinfection and sediment removal, which helps maintain water quality standards.

5. Health Check-up of Contractual Staff
A two-day Health Check-Up Camp was organized under the Safai Mitra Suraksha Shivirs action plan at the PRL Dispensary, Navrangpura, on October 6–7, 2025. The initiative aimed to provide preventive healthcare, early diagnosis, and health awareness to contractual and support staff.

- Total Beneficiaries: 95 workers, including housekeeping staff, canteen workers, and gardeners.

Key Highlights:

o Basic Health Screening: Vital signs were recorded, and PRL medical officers conducted general and systemic examinations.

o Pathological Tests: Blood glucose screening and sample collection for tests such as Complete Blood Count (CBC), Serum Cholesterol, Serum Creatinine, and SGPT (Liver Function Test) were performed.

o Health Awareness: Interactive health talks were held on adopting balanced diets, physical fitness, preventive habits, and raising awareness about controlling lifestyle disorders (hypertension, diabetes, cancer) and avoiding harmful practices like smoking and tobacco use.

6. Scrap, E-Waste Management & 'Waste to Wealth'

E-waste and scrap materials were identified and properly disposed of in line with environmental guidelines.

- Waste to Wealth & Waste to Art: Competitions were organized for employees and Safai Mitras to promote creative use of waste.

Observations and Impact

The campaign resulted in significant positive impacts across the institution:

- Enhanced Participation: There was greater involvement from all levels of PRL personnel, from scientists to housekeeping staff.
- Institutionalization of Swachhta: Cleanliness is being established as a continuous practice across the campuses.
- Community Outreach: This was achieved through student interactions and awareness sessions.
- Focus on Sustainability: Initiatives like sapling distribution and organized e-waste management highlighted the commitment to a green future.
- Improved Hygiene and Health Awareness: The health camp significantly improved health awareness and provided essential medical check-ups for contractual and housekeeping staff, reinforcing the commitment to employee welfare.

Conclusion

The Swachhta Hi Seva 2025 and Special Campaign 5.0 activities successfully embodied the spirit of “Cleanliness is Service” across all PRL campuses. Through collective participation, sustained cleanliness drives, and targeted awareness programs, PRL reinforced its role as a model scientific institution that promotes environmental and civic responsibility. These efforts have strengthened internal hygiene systems and environmental sustainability practices, aligning PRL with the national Swachh Bharat Mission.

A Few glimpse of Swachta hi Seva PRL

National Voluntary Blood Donation Day 2025 Celebration
"Give Blood, Give Hope: Together We Save Lives."

"National Voluntary Blood Donation Day" is celebrated nationwide on 01st of October every year. To commemorate National Voluntary Blood Donation Day 2025, Physical Research Laboratory Navrangpura Dispensary had arranged Blood Donation Camp on 01.10.2025 in association with Sarvoday Charitable Trust Blood Centre, Ahmedabad.

Prior to the commencement of the camp, efforts had been conducted through various channels to raise awareness & encouragement. Registration for blood donation camp was made available online in form of Google Form. Dispensary team communicated with PRL employees, Research Fellows, Contractual staff, CISF and others to make this camp successful by participating in a large number to donate blood. To ensure a smooth and organized event, blood donors' arrivals had been scheduled in phases to avoid any overcrowding.

A total 40 blood donors had registered themselves in advance to contribute their gesture as a unit of blood. The camp began at 8:30 am and concluded at 1:00 pm. 42 units of blood were collected within 4½ hours of the Blood Donation Camp. Dispensary PRL wishes heartiest thanks to all blood donors for their selfless act of saving lives through their voluntary Blood Donation.

A Few glimpse of the blood donation camp

Garba celebration at PRL-2025

The Garba celebration at PRL was a spectacular and joy-filled evening that brought together over 700 enthusiastic participants in a vibrant display of culture, rhythm, and unity. It was celebrated on Oct 11, 2025. The venue came alive with colorful decorations, dazzling lights, and the infectious beats of traditional Garba music that set every heart dancing. The atmosphere was electric, echoing with laughter, the rhythmic sound of claps as everyone joined in the celebration of tradition and togetherness. The event was more than just a dance—it was a celebration of community spirit and cultural pride and oneness displayed by all the PRL members and their families. From the soulful performances to the energetic dance rounds, every moment reflected the festive essence of Navratri. The overwhelming participation and enthusiasm turned the Garba night at PRL into an unforgettable celebration, leaving everyone with a heart full of joy and a spirit uplifted by the power of collective festivity.

A Few glimpse of Garba 2025

Rangoli of Diwali – 2025 at Infra-Red Observatory, Mount Abu.

During the Diwali celebrations, one of the members demonstrated his artistic talent by creating an impressive Rangoli design. The Rangoli was not just decorative, but a detailed and creative representation of the PRL Mount Abu building, capturing its structure and essence with remarkable precision. The creative art attracted the attention of everyone present and became a visual highlight of the celebration. The design reflected patience, creativity, and a deep sense of connection with the workplace.

The Rangoli was appreciated by staff members, visitors, and officials who praised the effort and artistic skills involved. It brought a festive atmosphere to the premises and symbolized the cultural spirit of Diwali blended with scientific pride. Such artistic contributions not only enhance the festive environment but also highlight the diverse talents within our team. We acknowledge and appreciate Mr. Tanmay Vyas for his dedication and creativity in making the celebration memorable.

29th PRL Amrut Rajbhasha Vyakhyaan

"पीआरएल अमृत राजभाषा व्याख्यान (पर्व)" का 29वाँ व्याख्यान 15 अक्टूबर, 2025 को के.आर. रामनाथन सभागार में हिंदी माह-2025 समापन कार्यक्रम के अवसर पर आयोजित किया गया। इस अवसर पर प्रमुख वक्ता श्री कृतार्थ झाला, वरिष्ठ वैज्ञानिक अधिकारी, डिजिटल फोरेंसिक एवं सूचना सुरक्षा, समन्वयक, सीओईडीएफ, डिजिटल फोरेंसिक लैब, राष्ट्रीय फोरेंसिक विज्ञान विश्वविद्यालय, राष्ट्रीय महत्व का संस्थान, गृह मंत्रालय (एमएचए), गांधीनगर, गुजरात थे।

The 29th lecture of "PRL Amrut Rajbhasha Vyakhyaan (PARV)" was held on October 15, 2025, at K.R. Ramanathan Auditorium on the occasion of Hindi Maah-2025 concluding programme. The eminent speaker for the occasion was Shri Kritarth Jhala, Senior Scientific Officer, Digital Forensics and Information Security, Coordinator, CoEDF, Digital Forensics Lab, National Forensic Sciences University, An Institution of National Importance, Ministry of Home Affairs (MHA), Gandhinagar, Gujarat.

श्री कृतार्थ झाला को विभिन्न संगठनों में आईटी सुरक्षा, डिजिटल धोखाधड़ी की जांच और साइबर फोरेंसिक्स के क्षेत्र में एक दशक से अधिक का अनुभव है।साइबर फोरेंसिक में उनके फोकस समूह मुख्य रूप से कंप्यूटर और मोबाइल फोरेंसिक्स, मैलवेयर ऐनालिसिस, इन्सिडेन्ट रिस्पॉन्स और फोरेंसिक तकनीकों का उपयोग करके संगठनों के सामने निरंतर आने वाले खतरों के उन्नत प्रकृतियों के शमन पर काम कर रहे हैं। श्री कृतार्थ झाला के अनुभवों में विभिन्न कानून प्रवर्तन, निजी डिटेक्टिव एजेंसियों, कॉर्पोरेट आदि जैसे विभिन्न क्षेत्रों में धोखाधड़ी प्रबंधन और साइबर फोरेंसिक जांच के लिए साइबर फोरेंसिक और इन्सिडेन्ट रिस्पॉन्स प्रबंधन टीमों की स्थापना शामिल है।

Mr. Kritarth Jhala has over a decade of experience in the field of IT Security, Digital Fraud Investigation and Cyber Forensics in various organizations. His focus groups in Cyber Forensics are primarily working on computer and mobile forensics, malware analysis, incident response and mitigation of the advanced nature of threats facing organizations using forensic techniques. Mr. Kritarth Jhala's experiences include setting up Cyber Forensics and Incident Response Management teams for fraud management and cyber forensic investigations in various sectors like law enforcement, private detective agencies, corporate etc.

व्याख्यान में, श्री कृतार्थ ज़ाला ने चर्चा की कि इस डिजिटल युग में, जहाँ तकनीक व्यक्तिगत और व्यावसायिक जीवन के हर पहलू में व्याप्त है, सशक्त साइबर सुरक्षा सुनिश्चित करना पहले से कहीं अधिक महत्वपूर्ण है। साइबर स्वच्छता उन अभ्यासों और कदमों को संदर्भित करती है जो कंप्यूटर और डिजिटल उपकरणों के उपयोगकर्ता सिस्टम को व्यवस्थित बनाए रखने और ऑनलाइन सुरक्षा में सुधार के लिए अपनाते हैं। व्यक्तिगत स्वच्छता की तरह, इसमें मैलवेयर, फ़िशिंग हमलों, डेटा उल्लंघनों और आइडेन्टिटी थेफ्ट जैसे खतरों से बचाव के लिए नियमित रखरखाव और जागरूकता शामिल है।

In the Vyakhyaan, Shri Kritarth Zala discussed that in this digital age, where technology permeates every aspect of personal and professional life, it is more important than ever to ensure strong cybersecurity. Cyber hygiene refers to the practices and steps that users of computers and digital devices take to maintain system order and improve online security. Like personal hygiene, it involves regular maintenance and awareness to protect against threats such as malware, phishing attacks, data breaches, and identity theft.

उन्होंने साइबर स्वच्छता के महत्व पर प्रकाश डाला और व्यक्तियों, पेशेवरों और संगठनों के बीच साइबर सुरक्षा की सर्वोत्तम प्रथाओं के बारे में जागरूकता बढ़ाने पर ज़ोर दिया। उन्होंने साइबर सुरक्षा के मूल सिद्धांतों, सामान्य खतरों और सुरक्षित डिजिटल आदतें विकसित करने के व्यावहारिक सुझावों पर भी चर्चा की। श्री कृतार्थ ने प्रतिभागियों को अपनी डिजिटल उपस्थिति की सुरक्षा और एक सुरक्षित साइबर पारिस्थितिकी तंत्र में योगदान देने के लिए आवश्यक ज्ञान और उपकरणों के बारे में भी बताया।

He further highlighted the importance of cyber hygiene and promote awareness of cyber security best practices among individuals, professionals and organizations and discussed the fundamentals of cyber security, common threats and practical tips to develop safe digital habits. Shri Kritarth also informed participants about the knowledge and tools required to protect their digital presence and contribute to a secure cyber ecosystem.

Vigilance Awareness Week 2025

Based on the Circular of Central Vigilance Commission (CVC) dated 10.09.2025 and DOS endorsement thereon dated 17.09.2025, the Vigilance Awareness Week (VAW) – 2025 was observed in PRL from 27th October 2025 to 2nd November 2025. The theme of the VAW-2025 was "सतर्कता:हमारी साझा जिम्मेदारी/"Vigilance:Our Shared Responsibility". All the staff Members of PRL took Integrity Pledge at their respective work places on 27.10.2025.

Apart from Integrity Pledge, all staff members were encouraged to take Integrity e-pledge in CVC portal (https://pledge.cvc.nic.in). A total of 77 PRL Staff have taken E-pledge for which online Certificates are downloadable from CVC portal. Integrity e-Pledge as an organisation has also been taken for PRL. An offline essay writing competition on the occasion of VAW-2025 was also conducted on 31.10.2025 in which 30 PRLites from all the campuses of PRL had participated. The winners of this essay writing competition will be awarded during the Republic Day celebration on 26.01.2026. In connection with the Preventive Vigilance Activities: 3 months' campaign, a training session on the following topics, as suggested by the Central Vigilance Commission was also conducted for permanent employees of PRL during the awareness week on 31.10.2025: -

(a) Framing of Charge Sheet

(b) Conducting CTE type Intensive Examinations

VAW 2025 के दौरान पीआरएल स्टाफ सदस्यों द्वारा ली गई सतर्कता जागरूकता प्रतिज्ञा
Vigilance Awareness Pledge undertaken by PRL Staff members during VAW 2025

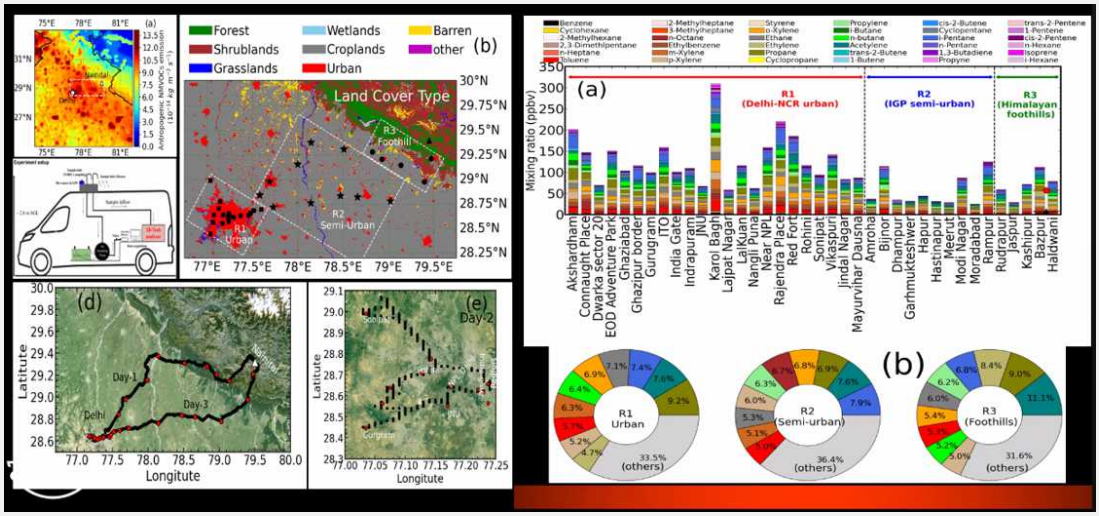
109th PRL ka Amrut Vyakhyaan

The 109th PRL Ka Amrit Vyakhyaan (PKAV) was delivered by Dr Manish Naja, Director Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital, on 31st October 2025. In his Vyakhyaan, titled “Ground and Space-based Observations of Air Pollution and Greenhouse Gases", Dr Naja presented an engaging and insightful overview of various instruments and science studies being pursued at ARIES.

Dr Naja provided the details of the experimental and observational facilities available at ARIES, Nainital, including those related to astronomy, astrophysics, and atmospheric sciences. He highlighted the results of research programs aimed at understanding regional atmospheric chemistry, air quality, and climate interactions, particularly the recent advancements and their implications for understanding various atmospheric processes. Additionally, he demonstrated various observational facilities at ARIES under the Astronomy and Astrophysics Division, focusing on Galactic Astronomy, Extragalactic Astronomy, and Sun and Solar System studies. He also showed glimpses of several important telescope facilities available at ARIES: the 1.0 m ST telescope, the 1.3 m telescope, the 3.6 m Devasthal optical telescope, and the 4 m international liquid mirror telescope. He explained how the data from various facilities available at ARIES for atmospheric science studies, including those for trace gases, aerosols, and meteorology, have been used to enhance the understanding of atmospheric dynamics. Dr Naja emphasised the importance of integrating ground data to improve emission estimation algorithms and enhance modelling efforts to detect pollution hotspots, track source contributions, and monitor pollutant behaviour under varying meteorological conditions. In the Himalayan context, where complex topography and meteorology prevail, such synergy enhances the understanding of pollution impacts and informs mitigation strategies. He discussed how satellite and ground observations create a comprehensive monitoring system that enhances knowledge of air pollution dynamics and informs effective mitigation strategies globally, as well as in sensitive areas like mountains.

Altogether, Dr Naja’s Vyakhyaan provided an inspiring perspective on various studies conducted in India to understand atmospheric chemistry, pollution, and trace gases.

YouTube Link: https://www.youtube.com/live/-HF_cRon_9M



National Unity Day

As per the Government of India's Department of Space directives, 31st October is to be observed as National Unity Day, commemorating the birth anniversary of Sardar Vallabhbhai Patel. Rashtriya Ekta Diwas (National Unity Day) provides an opportunity to reaffirm the inherent strength and resilience of our nation to withstand the actual and potential threats to the unity, integrity and security of our country.

Photo: The National Unity Day was observed in PRL on 31st October, 2025 and the Pledge was taken by PRL members at respective work place on 31st October, 2025.

Awards & Honours

1. Mr. Vaibhav Varish Singh Rathore, Scientist/Engineer-SD of Computer Networking and Information Technology section, PRL has won the Consolation Prize in the domain in Science/Humanities category at the National Level Poster Competition on "AI-Powered Research & Innovation, hosted by the Gujarat Technological University (GTU), Ahmedabad, during 19-20 September 2025.

2. Mr. Akash Ganguly, Scientist/Engineer- SE, Geosciences Division, PRL has won the Consolation Prize in the Engineering category in the National level poster competition - AI-Powered Research & Innovation, hosted at the Gujarat Technological University, Ahmedabad, during 19-20 September 2025.

3. Prof. Santosh Vadawale, Senior Professor, Astronomy and Astrophysics Division, PRL, has been selected for the prestigious Astronautical Society of India (ASI) award - Space Science and Applications.

PRL Monthly Publications Digest

Atomic, Molecular and Optical Physics [04]

1. S. Sathiyaseelan, Kartika Goswami, Naveen Chauhan, S. Bhalamurugan, S. Vijayan, Ragav Ramachandran, B. Asaithambi, R. Sivanandham and Anil Bhardwaj, 2025, Luminescence chronology of sediments from the prehistoric civilisation sites along the Vaigai river, India, CURRENT SCIENCE, Date of Publication: 25/10/2025, Impact Factor: 1.1
2. Ayan Kumar Nai, Vimlesh Kumar, M. Ebrahim-Zadeh, and G. K. Samanta, 2025, Device-independent, megabit-rate quantum random number generator with beam-splitter-free architecture and live Bell test certification, Optics Express, Date of Publication: 16/10/2025, Impact Factor: 3.3
3. Mikhail Gorchtein, Vaibhav Katyal, B. Ohayon, B. K. Sahoo, and Chien-Yeah Seng, 2025, Cabibbo-Kobayashi-Maskawa unitarity deficit reduction via finite nuclear size, Phys. Rev. Research 7, L042002 (2025), Date of Publication: 01/10/2025, Impact Factor: 4.2
4. K. M. Muhammed Shameem, P. Madhusudhan, Pranav Bharadwaj, Rituparna Das, Nimma Vinitha, and Rajesh Kumar Kushawaha, 2025, Spatiotemporal Dynamics of Femtosecond Filamentation, Laser Induced Breakdown Spectroscopy (LIBS) Chemometrics, © 2025, Date of Publication: 01/10/2025

Astronomy & Astrophysics Division [03]

1. Kevikumar A. Lad, Neelam J. S. S. V. Prasad, Kapil Bharadwaj, Nikitha Jithendran, Ashirbad Nayak, Rishikesh Sharma, Abhijit Chakraborty, Vishal Joshi, 2025, Design and development of Cassegrain module for PARAS-2 spectrograph (CAMPAS), Journal of Astronomical Telescopes, Instruments, and Systems (JATIS), Date of Publication: 15/10/2025, Impact Factor: 3.1
2. Mandal, M., Sachindra Naik, and G. K. Jaisawal, 2025, Photospheric Radius Expansion Thermonuclear Burst and X-Ray Reflection from the Neutron Star X-Ray Binary 4U 1702-429, The Astrophysical Journal, Date of Publication: 10/10/2025, Impact Factor: 4.8
3. K. Rajpurohit, A. Botteon, E. O'Sullivan, W. Forman, M. Balboni, L. Bruno, R. J. van Weeren, M. Hoeft, G. Brunetti, C. Jones, A. S. Rajpurohit, and S. P. Sikhosana, 2025, Radial Profiles of Radio Halos in Massive Galaxy Clusters: Diffuse Giants Over 2 Mpc, The Astrophysical Journal, Date of Publication: 07/10/2025, Impact Factor: 5.4

Space & Atmospheric Sciences Division [03]

1. Dharmendra Kumar Kamat, Som Kumar Sharma, Kondapalli Niranjan Kumar, Prashant Kumar, Sourita Saha, Hassan Bencherif, 2025, Dynamics of convective clouds near and below the lifting condensation level over a semi-arid Western-Indian region, Atmospheric Research, Date of Publication: 16/10/2025, Impact Factor: 4.4
2. V. Karthik, B. Vijay Bhaskar, S. Ramachandran, Qianlai Zhuang , 2025, Dynamics of organic and black carbon in high-altitude soils: Insights from morphological, chemometric, and environmental analyses, Environmental Pollution, Impact Factor: 8.07
3. Kiran and Ravindra P Singh, 2025, On the latitudinal variations of AO, SAO, and ISOs in the MLT temperatures, Advances in Space Research , Date of Publication: 01/10/2025, Impact Factor: 2.8

Planetary Sciences Division [03]

1. Trinesh Sana, S.K. Mishra, 2025, Electrostatic detachment of dust from the lunar surface: Microscopic fluctuations could be the key, Earth and Planetary Science Letters, Date of Publication: 15/10/2025, Impact Factor: 5.1
2. Varsha M Nair, Amit Basu Sarbadhikari, G N S Sree Bhuvan, T. Vijaya Kumar, Nilanjana Sorcar, Sneha Mukherjee, E.V.S.S.K.

Babu, Jyotiranjan S. Ray, 2025, Petrology and Geochemistry of Poikilitic Shergottite Northwest Africa 1950: bridging the gap between depleted and intermediate sources in Martian Mantle, Geochimica et Cosmochimica Acta, Date of Publication: 09/10/2025, Impact Factor: 5.
3. Neha, S. Natrajan, K. K. Marhas, 2025, Spectroscopic Investigation of Insoluble Organic Matter in Aubrites and Enstatite Chondrites, Journal of Geophysical Research: Planets, Date of Publication: 08/10/2025, Impact Factor: 4.26

Geosciences Division [07]

1. Swagatika Chakra, S. Vishnu, Harsh Oza, Akash Ganguly, Amit Pandey, Virendra Padhya, R. D. Deshpande, 2025, Insights into Indian summer monsoon rainfall variability: early twentieth century warming vs. mid-twentieth century cooling, Climate Dynamics, Date of Publication: 21/10/2025, Impact Factor: 4.3
2. Kalyani Sivan, Aninda Mazumdar, Aditya Peketi, A.K. Sudheer, S.P.K. Pillutla, Subhashree Mishra, 2025, Pyritization may archive the influence of Sulfate-AOM and bioturbation activities in marine sulfidic shelf sediments, Continental Shelf Research, Date of Publication: 17/10/2025, Impact Factor: 2.2
3. Devaprasad, M., Rastogi, N., Patel, A., Harithasree, S., Meena, R., Dabhi, A., Shivam, A., and Bhushan, R., 2025, Unraveling Seasonality in Origin and Processing of Carbonaceous Aerosols over Western India Using Dual-Carbon Isotopes,F, Date of Publication: 13/10/2025, Impact Factor: 10.8
4. Siddhartha Sarkar, Ajayeta Rathi, Sangeeta Verma, A. K. Sudheer, Sanjeev Kumar , 2025, Increase in Productivity Enhances CH4 but Limits N2O Production in a Shallow Tropical Lake Experiencing Seasonal Volume Reduction and Salinization, Environmental Research, Date of Publication: 08/10/2025, Impact Factor: 7.7
5. Ajayeta Rathi, Siddhartha Sarkar, Abdur Rahman, M. Atif Khan, Sanjeev Kumar , 2025, Monsoon decline versus summertime intensification of carbon and nitrogen fixation in a shallow tropical lake, Ecohydrology & Hydrobiology, Date of Publication: 07/10/2025, Impact Factor: 2.2
6. Siddhartha Sarkar and Sanjeev Kumar , 2025, Tracking the transport and processing of dissolved inorganic carbon, particulate organic carbon and particulate nitrogen in engineered rivers and canals, Hydrological Processes, Date of Publication: 07/10/2025, Impact Factor: 2.9
7. Dhandapani, A., Maheshwari, M., and Rastogi, N., 2025, Degradation of Microplastics and Nanoplastics: An Underexplored Pathway Contributing to Atmospheric Pollutants, ACS Earth and Space Chemistry, Date of Publication: 03/10/2025, Impact Factor: 2.9

Udaipur Solar Observatory [04]

1. S. S. Rao, Nandita Srivastava, D. Chakrabarty, Monti Chakraborty, 2025, Contrasting Latitudinal/Longitudinal Response of Equatorial Ionization Anomaly (EIA) Around ± Longitude Sectors During the 23–24 April 2023 Geomagnetic Storm, Journal of Geophysical Research, Date of Publication: 18/10/2025, Impact Factor: 2.9
2. Louis, R. E., 2025, A Statistical Study of delta-Sunspots from Solar Cycle 23 to 25, Solar Physics, 300, 151, Date of Publication: 08/10/2025, Impact Factor: 2.4
3. Nandi, A., Manju Sudhakar, Srikar Paavan Tadepalli, Anand Jain, Brajpal Singh, Reenu Palawat, Ravishankar B. T., Bhuwan Joshi, Monoj Bug, Anurag Tyagi, Sumit Kumar, Mukund Kumar Thakur, Akanksha Baggan, Srikanth T., Arjun Dey, Veeresha D. R., Abhijit Avinash Adoni, Padmanabhan, Vivechana M. S., Evangelin Leeja Justin, James M. P., Kinshuk Gupta, Shalini Maiya P. R., Lakshmi A., Sajjade Faisal Mustafa, Vivek R. Subramanian, Gayatri Malhotra, Shree Niwas Sahu, Murugiah S., Medasani Thejasree, Narayan Rao G. S., Rethika T., Motamarri Srikanth, Ravi A., Nashiket Premlal Parate & Nigar Shaji, 2025, HEL1OS – A Hard X-ray Spectrometer on Board Aditya-L1, Solar Physics, Date of Publication: 08/10/2025, Impact Factor: 2.4
4. Kharayat, Hema, Bhuwan Joshi, Binal D. Patel, Ramesh Chandra, 2025, Blowout Expansion of Overlying Coronal Loops and Subsequent Filament Eruption: AIA and RHESSI Observations, The Astrophysical Journal, Date of Publication: 03/10/2025, Impact Factor: 5.4

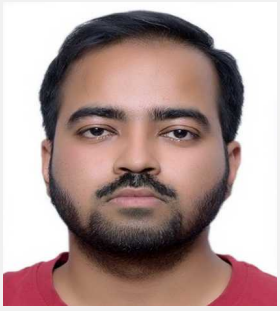
Hearty welcome to our new members

NAME: MR. VINAY KUMAR YADAV

DESIGNATION: ASSISTANT

DATE OF JOINING: 03.10.2025

DIVISION/AREA: ADMINISTRATION GENERAL



NAME: DR. DEBESH BHATTACHARJEE

DESIGNATION: PDF

DATE OF JOINING: 06.10.2025

DIVISION/AREA: UDAIPUR SOLAR OBSERVATORY

NAME: DR. MONIDIPA PRAMANIK

DESIGNATION: PDF

DATE OF JOINING: 09.10.2025

DIVISION/AREA: ATOMIC, MOLECULAR & OPTICAL PHYSICS DIVISION

NAME: MR. ASHISH SENGAR

DESIGNATION: JR. PERSONAL ASSISTANT

DATE OF JOINING: 17.10.2025

DIVISION/AREA: ASTRONOMY & ASTROPHYSICS DIVISION

NAME: DR. SAFNA BANU K

DESIGNATION: PDF

DATE OF JOINING: 27.10.2025

DIVISION/AREA: UDAIPUR SOLAR OBSERVATORY

Visitors

1. Dr. Prolay Krishna Chanda, a Post Doctoral Fellow from Tata Institute of Fundamental Research, Mumbai, visited Physical Research Laboratory, Ahmedabad, from 05.10.2025 to 08.10.2025 for a seminar and collaborative research work.
2. Dr. Ranjan Laha, Assistant Professor of the Indian Institute of Science, Bengaluru, visited Physical Research Laboratory, Ahmedabad, from 08.10.2025 to 10.10.2025 for a seminar and interaction.
3. Mr. Moore Williard Sutton, Professor from the University of California, USA, visited Physical Research Laboratory, Ahmedabad, on 17.10.2025 in connection with a Scientific discussion with PRL scientists and interaction with research scholars.
4. Fifty eight (58) students and Two (2) teachers from Nanakmatta Public School, Uttarakhand, visited Udaipur Solar Observatory (USO), PRL, Udaipur on 24.10.2025 for various scientific facilities at USO
5. Dr. R.Sridharan from IIAP, Bangalore visited Udaipur Solar Observatory, Udaipur during the period 27.10.2025 to 29.10.2025 to finalize the collaborative research work on adaptive optics and Golay Mask experiment for future based high resolution imaging technique.
6. During October 2025, the following have visited Infra-Red Observatory, PRL, Mount Abu: -

- Fourteen (14) Officials from other DOS/ISRO Centres/Units.
- Thirteen (13) Officials from BARC/TIFR
- Nineteen (19) VIPs, and defense personnel which include Air Marshal KAA Sanjeeb Desai, VSM (Visisht Seva Medal) , Currently Appointed as Director General, at Air Headquarters, New Delhi.
- One hundred twenty two (122) students and five (5) General Public.

Image: Air Marshal KAA Sanjeeb Desai visit to PRL.

You will be missed

NAME: Late Shri D.R. Shelat

DESIGNATION: Administrative Officer

DATE OF JOINING: 02.08.1971

DATE OF RETIREMENT: 30.11.2008

DATE OF DEATH: 14.10.2025

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Mr. Rutuj Gharate	Member
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