

Newsletter of the Physical Research Laboratory

THE SPECTRUM

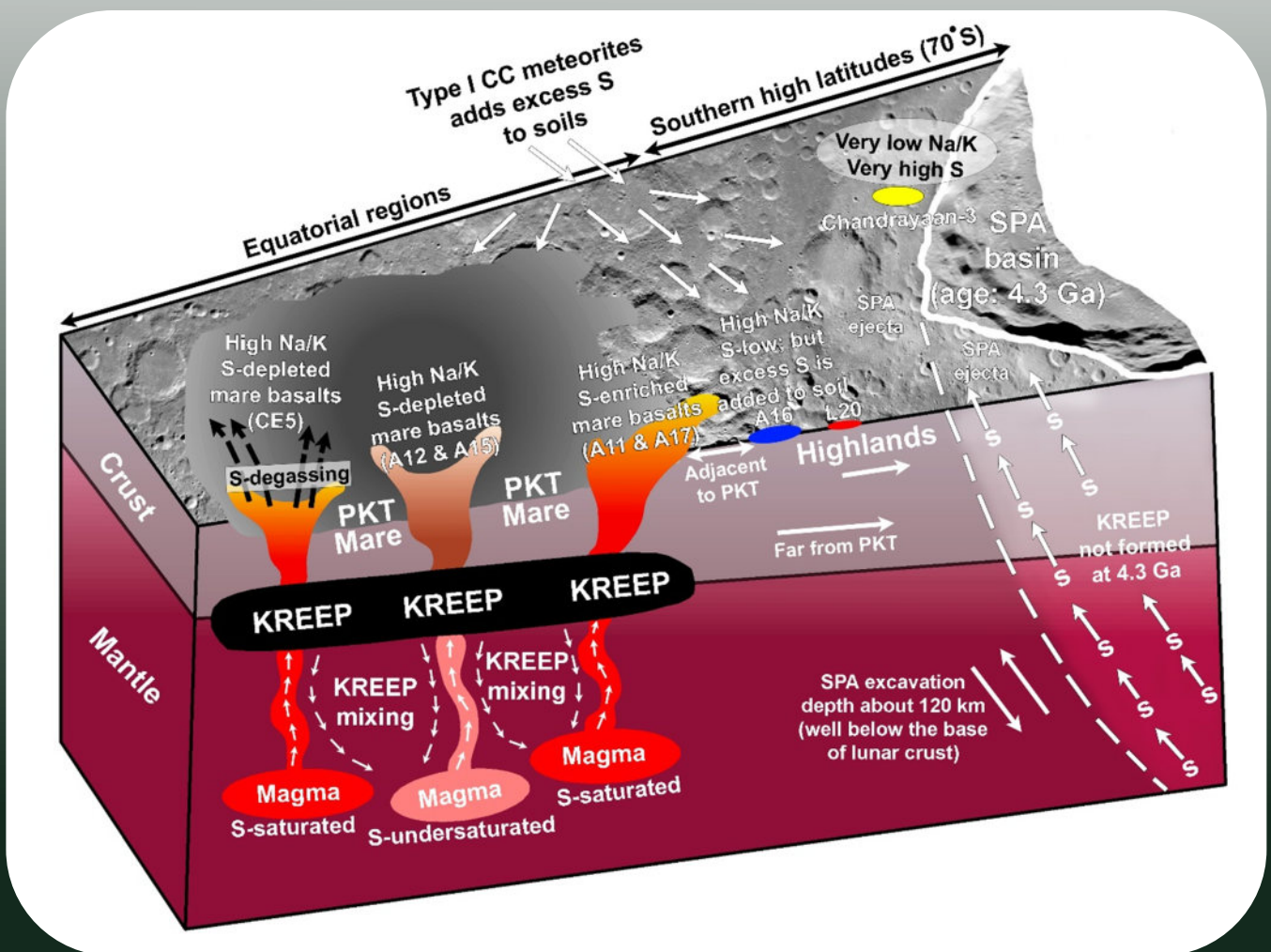


Image of the Month

Discovery of Primitive Mantle Materials at Shiv Shakti Station near the South Pole Region of the Moon

October 2025

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The Author



Kishan Tiwari

Olivine–ringwoodite transformation in Katol meteorite: implications for localized superheating of chondritic melt and seismic attenuation

(Kishan Tiwari, Sujoy Ghosh, Masaaki Miyahara, and Dwijesh Ray)

The Katol meteorite preserves tiny clues of a violent impact event. The authors studied it using powerful microscopes, electron probes, and Raman spectroscopy. They found narrow shock-melt veins (SMVs), which are thin glassy zones formed when parts of the rock briefly melt and refreeze during an impact. Inside these veins, the mineral olivine had changed into ringwoodite, a high-pressure form of olivine that forms only under extreme pressure and temperature, such as deep inside planets or during meteorite impacts. The ringwoodite grains were very fine, about 1–1.2 micrometres across.

By modelling how these minerals grew and cooled, the researchers estimated that the melt reached around 2630 K, which is about 307 K above its melting point, and that the high-pressure pulse lasted only 0.4 seconds. Such a short but intense heating event allowed ringwoodite to crystallize and remain preserved as the rock cooled rapidly.

The study also showed that this transformation produced extremely fine grains, which can strongly influence how seismic waves travel through the rock by reducing energy loss (attenuation) by up to a thousand times. These findings link microscopic mineral changes to large-scale planetary processes and help us better understand how meteorites record violent impact events.

Source/Reference of the Work: <https://doi.org/10.1007/s12036-025-10082-8>

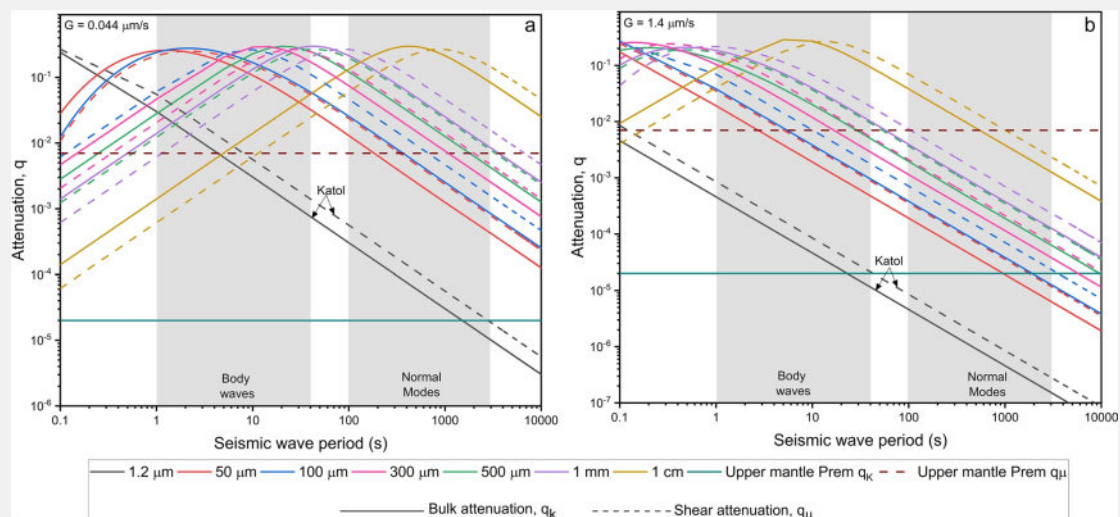


Figure Caption: The graph shows how attenuation (energy loss of seismic waves) changes with wave period at two melt temperatures, 2323 K (a) and 2630 K (b). The curves in different colours represent different grain sizes of the minerals. Solid lines show attenuation of bulk waves, while dashed lines show attenuation of shear waves.

Chasing Cosmic Connection at Particle Collision

(Anupam Ghosh, **Partha Konar**, Sudipta Show)

The Author



Partha Konar

Dark matter is a profound enigma, although it makes up most of the mass of our Universe. It is possibly some fundamental particle invisible to our detectors, revealing its presence only through its powerful gravitational pull at different length scales of the cosmos. Although we know very little about dark matter (in general, the dark sector) yet, lots of efforts are pouring into solving the mysteries, such as how this "dark" substance was created in the moments right after the Big Bang, a process often tied to a theory called "freeze-out", and more recently "freeze-in." However, what if the early Universe expanded much faster during this production phase than our current models (radiation-dominated) assume? This subtle change in the Universe's history would dramatically alter dark matter's behaviour, requiring it to have interacted much more strongly and decayed rapidly. This would also mean traditional searches for long-lived particles at accelerators like the LHC would be fruitless. To solve this, a new strategy is being proposed to find this elusive dark matter. Instead of looking for long-lived particles and displaced vertex signature at the detector, this new search looks for a unique and special combination of signals at particle colliders: "fat jets" and a significant amount of missing energy, a unique "fingerprint" that could finally lead to the discovery of a dark matter particle and also provide a new glimpse into the Universe's first moments.

Source/Reference of the Work: <https://doi.org/10.1103/pj7s-zhcr>

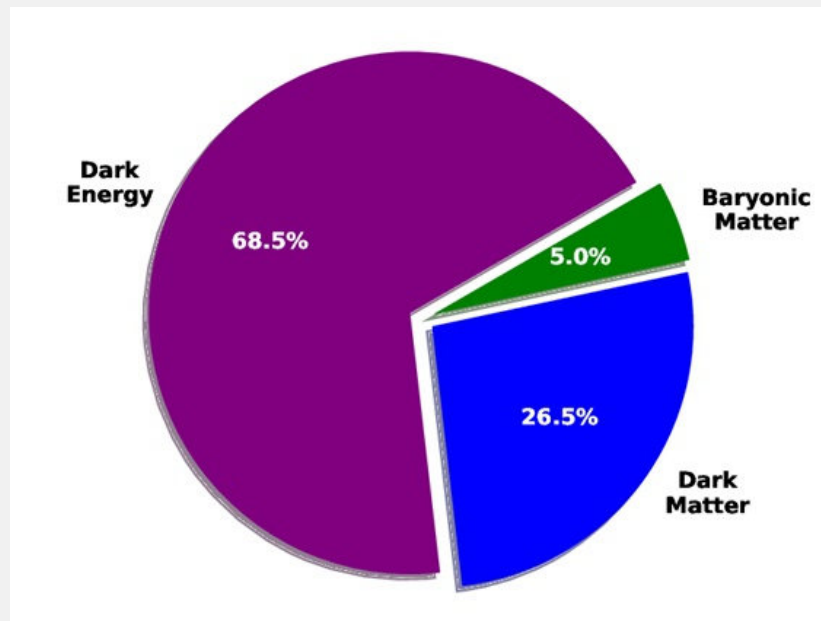


Figure Caption: Current Composition of the Universe -- Approximately 5% of the universe's mass and energy is made up of ordinary matter, which includes hydrogen and helium found in interstellar space, stars and galaxies. The remaining 95% consists of unknown entities referred to as "Dark Matter" and "Dark Energy." The true identity and nature of these components are still to be determined through direct experimentation.

The Author



Rishitosh Kumar Sinha

Discovery of Primitive Mantle Materials at Shiv Shakti Statio near the South Pole Region of the Moon

(**Rishitosh K. Sinha**, Neha Panwar, Neeraj Srivastava, Dwijesh Ray, N.P.S. Mithun, Kuljeet K. Marhas, S. Vijayan, Megha Bhatt, Arpit R. Patel, M. Shanmugam, Santosh V. Vadawale, & Anil Bhardwaj)

On 23 August 2023, the Chandrayaan-3 mission marks the first successful landing in the South Polar Region of the Moon. The Alpha Particle X-ray Spectrometer (APXS) aboard Pragyan rover directly measured the elemental composition of the Moon's surface at unexplored location, i.e., Shiv Shakti statio located at 69.37° S, 32.32° E in the southern high-latitude highlands of the nearside of the Moon. A comparison of the APXS measured abundances of volatile elements (sulfur, sodium, and potassium) with the other available data revealed anomalous depletion in sodium and potassium, but enrichment in sulfur in the soils at the highland landing site. Our study has revealed potential presence of primitive lunar mantle materials at the landing site, which was excavated during formation of the South Pole-Aitken (SPA) basin 4.3 Ga ago and redistributed by subsequent impacts on the SPA basin ejecta. The primitive mantle contributed the excess sulfur, which got mixed up with the materials at the landing site. The low levels of sodium and potassium at the landing site suggests that the KREEP (potassium, rare earth elements, and phosphorus) might not have existed at the place and time of SPA basin formation. This new finding makes the Chandrayaan-3 landing site a promising site to access primitive mantle samples, which is otherwise lacking in the existing lunar collections.

Source/Reference of the Work: <https://doi.org/10.1038/s43247-025-02305-1>

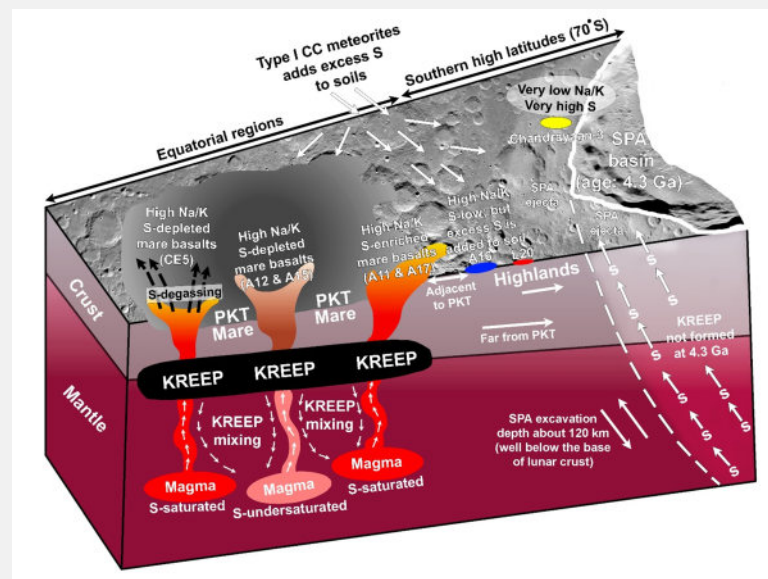


Figure Caption: An illustration showing different patterns of sodium (Na), potassium (K), and sulfur (S) enrichment and depletion on the lunar surface, as inferred from Chandrayaan-3 APXS measurements and earlier lunar missions.

Gas, Dust, and Ions in Comet NEOWISE: Clues to Its Origin and Evolution

The Author



Aravind K

(**K. Aravind**, E. Jehin, S. Hmiddouch, M. Vander Donckt, S. Ganesh, P. Rousselot, P. Hardy, D. Sahu, J. Manfroid and Z. Benkhaldoun)

The study on comet C/2020 F3 (NEOWISE) combines long-slit spectroscopy and narrow-band photometry to trace its activity and composition after perihelion. We monitored the comet with TRAPPIST-North from July to September 2020, deriving production rates for OH, CN, C₂, C₃, NH, along with dust activity through Afp measurements. These showed that NEOWISE had a typical “gas-rich” coma composition, with carbon-bearing species and dust-to-gas ratios consistent with carbon typical class of comets in the Solar system.

Spectroscopic data from the Himalayan Chandra Telescope revealed strong neutral molecular emissions and clear ionic features in the tailward direction, including CO⁺, CO₂⁺, H₂O⁺, and N₂⁺. The detection of CO₂⁺, rarely observed in comet optical spectrum, is particularly significant. From measured fluxes and fluorescence modeling, we derived average ratios of N₂⁺/CO⁺ ≈ 0.03–0.05 and CO₂⁺/CO⁺ ≈ 1.3, suggesting NEOWISE formed in the cold mid-outer regions of the protoplanetary nebula (50–70 K).

Additionally, analysis of CN jets revealed a nucleus rotation period of ~7.3 hours and unusually high CN outflow velocities (~2.4 km/s), consistent with highly active comets like Hale-Bopp. Together, these results provide rare insights into ionic chemistry, activity evolution, and formation conditions of one of the brightest comets in recent decades.

Source/Reference of the Work: <https://doi.org/10.1051/0004-6361/202554842>

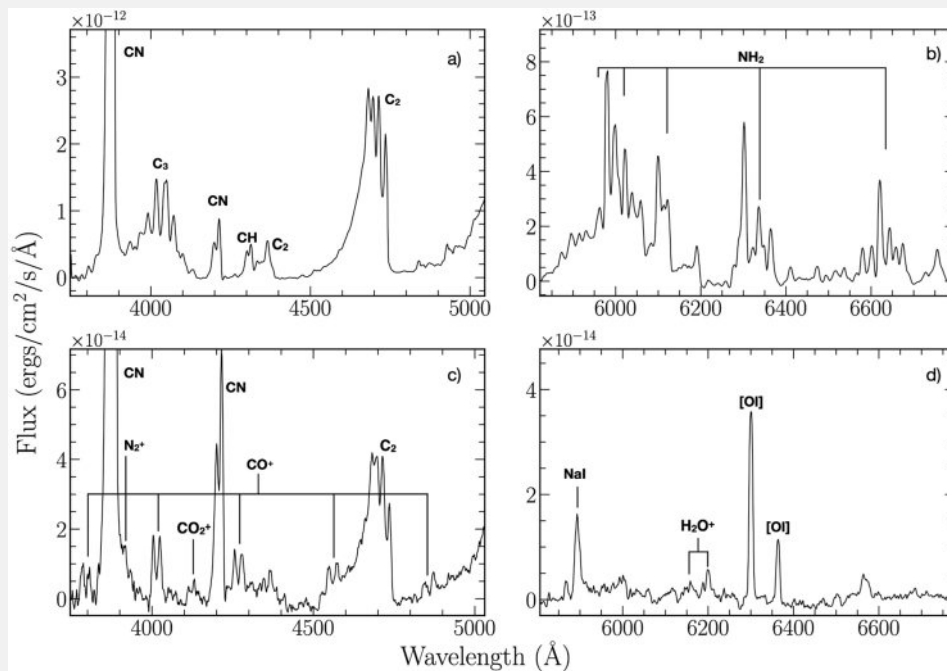


Figure Caption: Depiction of detected emissions for spectra extracted at photocentre (a, b); and at 100,000 km in the tailward direction (c, d).

The Author



Abisheg
Dhandapani

Degradation of Microplastics and Nanoplastics: An Underexplored Pathway Contributing to Atmospheric Pollutants

(Abisheg Dhandapani, Maitri Maheshwari, and Neeraj Rastogi)

Microplastics (MPs) and nanoplastics (NPs) are widespread pollutants present across all environmental matrices, including the atmosphere. They originate anthropogenically from primary sources, like microbeads, glitters, industrial abrasives, etc., and from secondary sources through degradation of larger plastic products, textile fibers, tire wear, waste incineration, etc. Degradation processes, such as mechanical, photochemical, chemical, and microbial degradation, break down plastics into smaller particles and gaseous byproducts. Atmospheric degradation processes of MPs/NPs enhance their area/volume ratio and introduce oxygenated functional groups at the surface, which increases their hydrophilicity and interactions with other pollutants in the surroundings. Thus, MPs/NPs also act as great vectors for toxic substances, including heavy metals, polycyclic aromatic hydrocarbons, and persistent organic pollutants, amplifying their environmental and health risks. MPs/NPs have been detected in various human tissues and fluids. Being bio-inert, they cannot be metabolized and leave the body only through excretory routes. They not only interact with the human organs directly but also indirectly via releasing additives and adsorbed/absorbed pollutants and, thus, can exhibit higher toxicity compared to other atmospheric aerosols. Furthermore, atmospheric MPs/NPs influence radiative forcing and cloud formation, and their photodegradation also releases greenhouse gases, like CO₂, CH₄, and volatile organic compounds (precursors of ozone), linking plastic pollution to climate change. Despite their growing recognition, the study of atmospheric MPs and NPs remains in its infancy, with numerous uncertainties surrounding their behavior, fate, and effects. This review aims to highlight underexplored degradation pathways of atmospheric MPs/NPs that may be enhancing their environmental, health, and climatic implications. It also proposes the future directions for atmospheric MP/NP research.

Source/Reference of the Work: <https://doi.org/10.1021/acsearthspacechem.5c00210>

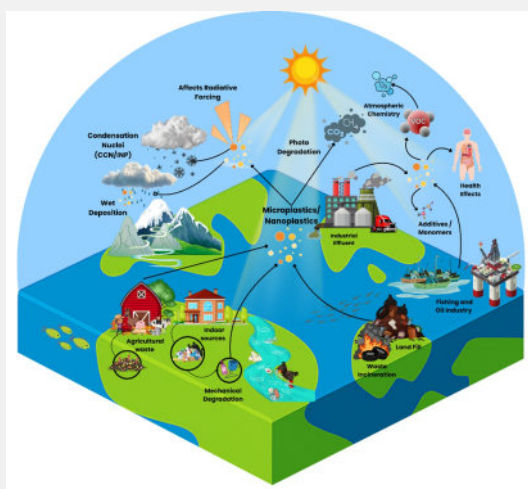


Figure Caption: Schematic representation of sources, transport, degradation, and removal of atmospheric MPs/NPs and their possible effects.

Triplet Scalars in Grand Unification and the Origin of Matter

(Chee Sheng Fong, **Ketan M. Patel**)

The Author



Ketan M. Patel

One of the unresolved questions in particle physics is why the universe contains more matter than antimatter. A widely studied explanation is leptogenesis, where decays of heavy neutrinos in the early universe create a small excess of leptons over antileptons, which is then partly converted into the observed matter-antimatter asymmetry. In a recent study, we examine leptogenesis within $SO(10)$ Grand Unified Theories, which aim to unify the fundamental interactions and naturally explain neutrino masses. While the dominant contribution to neutrino masses often arises from the type-I seesaw mechanism involving heavy right-handed neutrinos, it is shown how an additional particle — an electroweak triplet scalar — can modify this picture. The decays of this triplet scalar can introduce additional sources of CP violation, a necessary ingredient for producing the matter-antimatter asymmetry. Depending on its mass and interactions, the triplet's presence can either enhance or dilute the total lepton asymmetry. The study highlights that even in models where neutrino masses are largely type-I in origin, scalar triplets can play a non-negligible role in determining whether a unified theory can reproduce the observed cosmic matter abundance.

Source/Reference of the Work: [https://doi.org/10.1007/JHEP09\(2025\)148](https://doi.org/10.1007/JHEP09(2025)148)

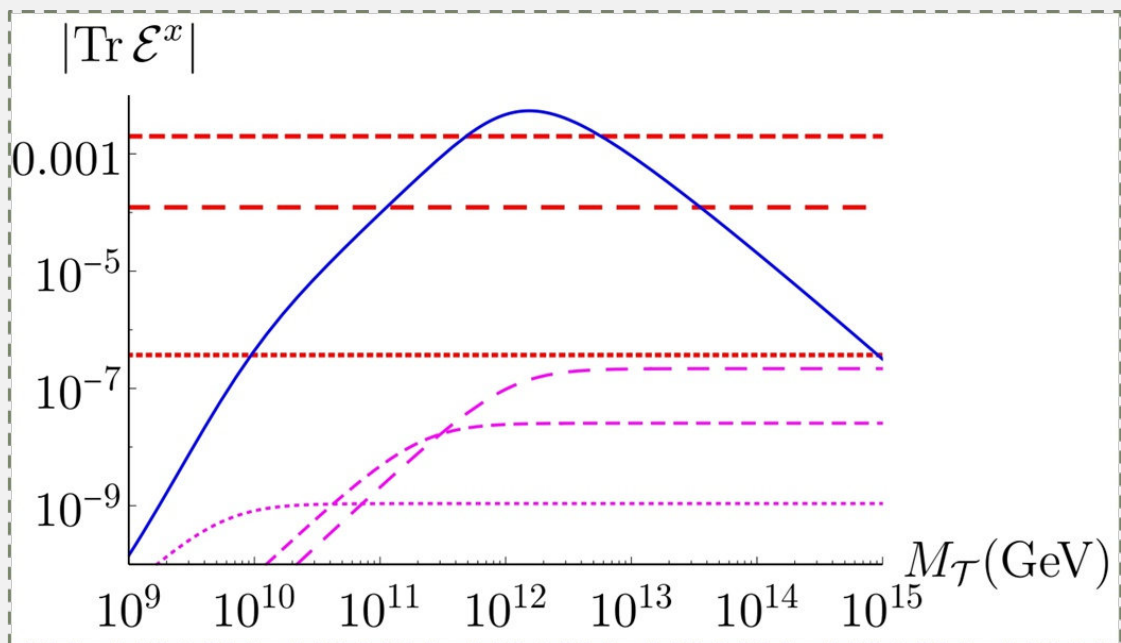


Figure Caption: The CP asymmetry induced by the decays of triplet scalar (blue) and other conventional particles (red and magenta) as function of Triplet scalar's mass.

The Author



Vaibhav Katyal

Robust treatment of finite nuclear size reduces CKM unitarity deficit

(Mikhail Gorchtein, **Vaibhav Katyal**, B. Ohayon, B. K. Sahoo, and Chien-Yeah Seng)

A new study has taken a major step towards resolving one of particle physics' puzzling — the so-called “CKM unitarity deficit”. It is found that tiny details in how atomic nuclei are shaped and sized play much bigger roles in key precision tests of the Standard Model (SM) of particle physics. In collaboration with scientists from other countries, a PRL team focused on the superallowed beta decay of ^{26}Al to ^{26}Mg a process that provides one of the most stringent ways to measure the V_{ud} element of the CKM matrix, a cornerstone of the SM describing how quarks transform into one another.

Through precise atomic structure calculations using Vikram-1000 HPC system at PRL, it has been shown that the decay rate depends on the nucleus's charge radius about four times more strongly than earlier estimates suggested. This means knowing the nuclear size with high-accuracy is crucial for making reliable tests of fundamental physics.

By combining multiple advanced computational approaches, a new level of confidence has been attained demonstrating improved accuracy with which isotope shift factors are calculated for complex atoms. Their refined analyses led to an updated value of V_{ud} that slightly increases its measured strength — effectively reducing the CKM unitarity shortfall by about one standard deviation. In nutshell, a better understanding of the atomic details behind aluminum-26's decay brings the SM into closer agreement with the experimental data, leaving a little less room for “new physics” — but offering a much stronger foundation for the next generation of precision tests.

Source/Reference of the Work: <https://doi.org/10.1103/z8g6-9j25>

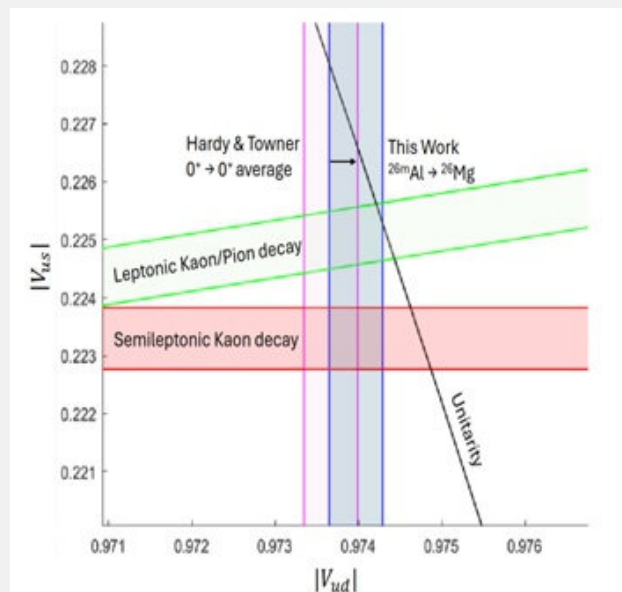


Figure Caption: $|V_{ud}|$ versus $|V_{us}|$ plot demonstrating values from different theoretical works.

The Author



Goldy Ahuja

Long-term monitoring of the dynamically new comet C/2020 V2 (ZTF)

(**Goldy Ahuja**, K Aravind, Shashikiran Ganesh, Said Hmiddouch, Mathieu Vander Donckt, Emmanuel Jehin, Devendra Sahu, T Sivarani)

In this work, we have extensively studied the newly discovered comet C/2020 V2 (ZTF), hereafter referred to as V2, which has been found to originate from a distance of more than 20,000 AU. We have employed both photometric and spectroscopic observations from Indian (PRL's 1.2m and IIA's 2m HCT telescopes) and ESO telescopes (TRAPPIST-North and TRAPPIST-South) to observe this comet over a period of 32 months. In Figure 1, we have plotted the optical spectra of the comet from HCT 2m (in blue colour) and from PRL 1.2m (in black colour), showing that the spectrum contains significant molecular emissions such as Cyanogen CN(0-0), CN(0-1), C₂(0-0), C₃(0-0). We used these emissions to calculate the C₂/CN ratio and found that the comet V2 has a typical carbon composition. In Figure 2, we plotted the photometric observations using different filters, such as B (Blue), V (Green), R (Red), and I (Black). We also display the expected magnitude and comet availability from NASA's JPL Horizons for both the Northern (purple) and Southern (orange) hemispheres. With the observed datasets, we calculated the colours of the comet and found that they were close to the median DNC and LPC colours. We also checked the variations in the colours with time. To avoid contamination from molecular emissions, we used the spectrum and traced its continuum, calculating the colours, which were found to be similar to those obtained with the photometric filters. Hence, we conclude that the volatile emissions are not affecting the comet's colours, confirming that the coma has a heterogeneous dust distribution, resulting in colour variation. We also used the water production rate, as determined by the TRAPPIST OH filter, to calculate the radius of comet V2, which is very challenging with photometry, and found that it is 1.1 ± 0.1 km.

Source/Reference of the Work: <https://doi.org/10.1093/mnras/staf1528>

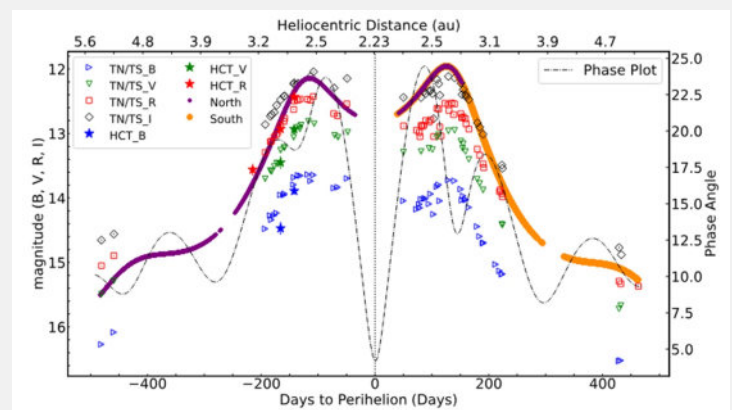
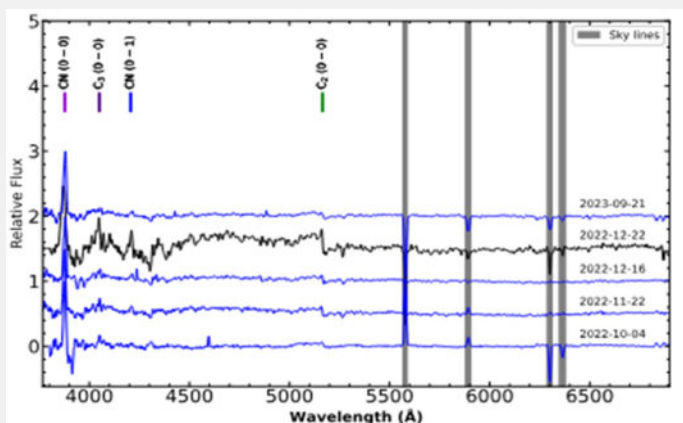


Figure Caption: Fig. [Left] Calibrated spectra from Indian telescopes 1.2m PRL (in black) and 2m HCT (in blue). [Right] Photometric observations using 2m HCT, Hanle, and 60 cm TRAPPIST-North, Morocco, and 60 cm TRAPPIST-South, Chile, shown with different symbols.

The Author



S. Natrajan

Thermo-temporal constraints on CM parent body via spectroscopic study of insoluble organic matter

(S. Natrajan, K.K. Marhas, V.J. Rajesh, A. Mitra)

How warm did the early building blocks of our Solar System get and for how long? That's the central question our study explored by examining insoluble organic matter (IOM) from 16 carbonaceous meteorites (CM and CI types), some of the most primitive materials known. These meteorites preserve carbon-rich compounds that act like tiny "fossil thermometers" of their parent asteroids. This study investigates the thermal and temporal history of these carbon rich compounds called insoluble organic matter. Using FTIR and Raman spectroscopy, the research establishes alteration temperatures between ~35 °C and 90 °C, values consistent with low-temperature hydrothermal processes on their parent bodies. By combining Raman-derived temperatures with FTIR-based kinetic modeling, the study introduces a new approach to estimate alteration durations, revealing timescales ranging from less than 100 years to about 2 million years. These results distinguish rapid, possibly impact-driven heating events from prolonged aqueous alteration. Comparison with thermal models suggests that most CM-like materials likely formed in small (~20 km radius) planetesimals or within rubble-pile aggregates of such bodies. The evolution of organic matter appears governed primarily by temperature rather than duration, as higher temperatures drive the transformation between soluble and insoluble fractions. Functional group analyses further differentiate open-system and closed-system alteration environments, offering insights into the geochemical diversity among CM meteorites. Ryugu samples show comparable thermal signatures, implying preservation of primordial organics in localized closed-system pockets. Together, these findings provide new constraints on the thermal evolution and parent-body structure of carbonaceous chondrites.

Source/Reference of the Work: <https://doi.org/10.1016/j.chemgeo.2025.122880>

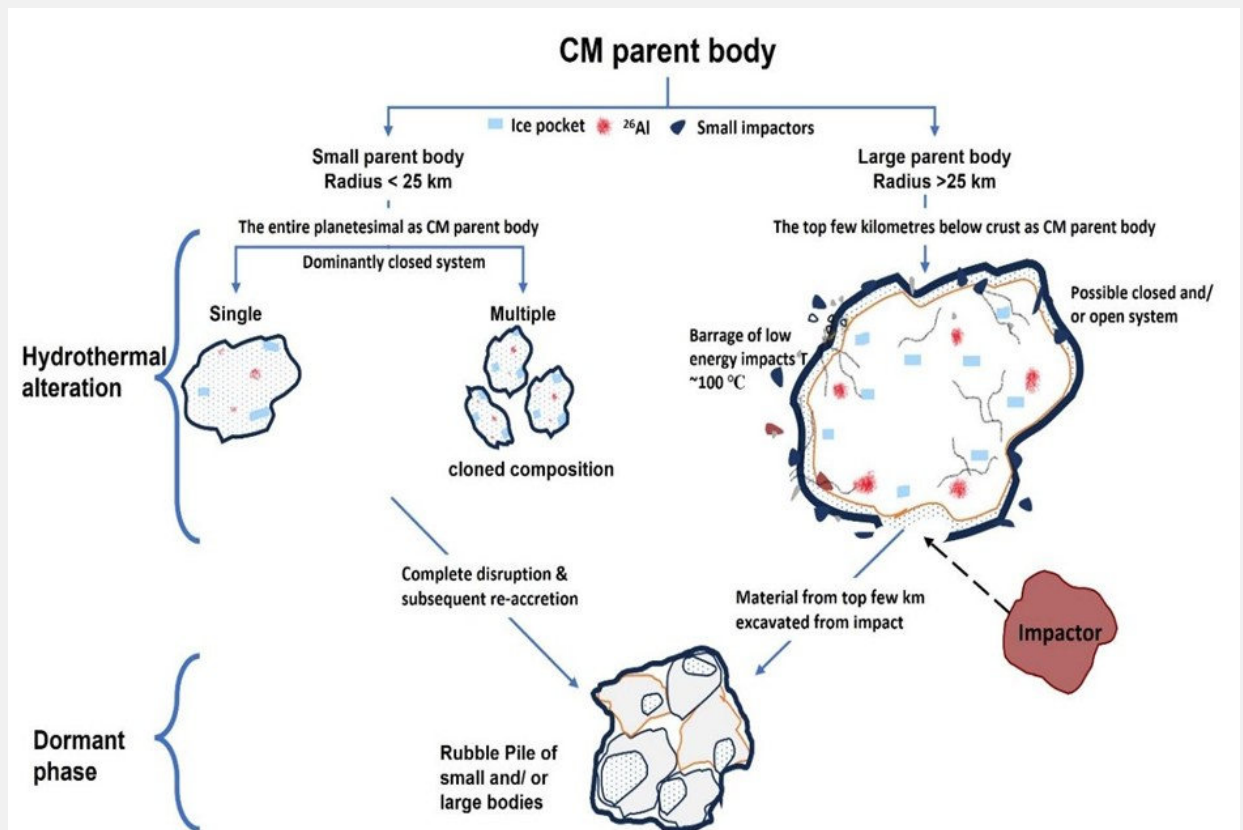


Figure Caption: Conceptual model illustrating possible evolutionary pathways of the CM parent body. Small asteroids (<25 km radius) likely experienced widespread hydrothermal alteration throughout their interiors in a dominantly closed system, either as single or multiple “cloned” bodies. These could later break apart and reassemble into rubble-pile structures. In contrast, larger parent bodies (>25 km radius) underwent alteration mainly within the upper few kilometers beneath the crust, where repeated low-energy impacts (~100 °C) and ^{26}Al heating shaped open and/or closed system conditions. Impact events subsequently excavated material from these shallow layers, contributing to the CM meteorites we find today.

The Author



Neha

Spectroscopic investigation of insoluble organic matter in aubrites and enstatite chondrites

(Neha, S. Natrajan, K.K. Marhas)

This is the first comprehensive investigation into the nature and existence of insoluble organic matter (IOM) within aubrites, a scarce group of meteorites formed under highly reducing conditions, similar to those on Mercury. The occurrence of these organics in differentiated bodies is rare, and, if present, they are generally thermally processed or altered, resulting in lower abundances. Using spectroscopic and microscopic analyses of IOM from eleven aubrites and five enstatite chondrites, we reveal bimodal temperatures ($\sim 200^{\circ}\text{C}$ and $\sim 1000^{\circ}\text{C}$) and a high resolution transmission electron microscopy of the diverse carbon structures, ranging from amorphous carbon to highly graphitic lamellar phases, indicate pronounced structural heterogeneity of organic matter and the unprecedented observation of nanoglobules in an aubrite, a feature typically associated with chondritic meteorites. The presence of these nanoglobules suggests an exogenous source for the organic matter, likely delivered by impacts from primitive chondritic projectiles after the aubrites had undergone high-temperature processing.

Together, these observations indicate that aubrites host organic matter of both exogenous and indigenous origins, intricately linked to the formation and evolution of their parent bodies. Overall, this study provides crucial insights into the organic inventory of aubrites and offers valuable perspectives on the evolution of the parent body in the early solar system.

Source/Reference of the Work: <https://doi.org/10.1029/2025JE009101>

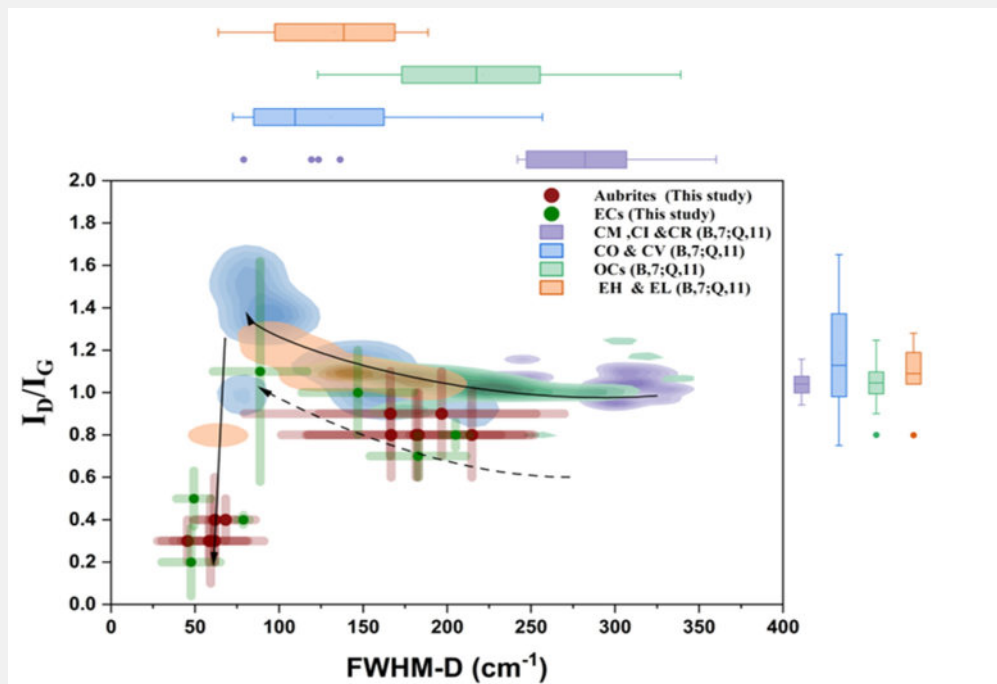


Figure Caption: Plot of I_D/I_G (intensity) ratio versus FWHM-D, derived from Raman spectra of insoluble organic matter (IOM) from this study, compared with literature data (Busemann et al., 2007; Quirico et al., 2011). The trend toward lower I_D/I_G and narrower FWHM-D indicates higher graphitization in aubrites and enstatite chondrites.

The Author



Wafikul Khan

Irradiation of condensed CO reveals a new pathway for the formation of aromatic molecule in the astrochemical ices

(Wafikul Khan, R Ramachandran, S Gupta, J K Meka, V Venkataraman, B N Rajasekhar, P Janardhan, Anil Bhardwaj, N J Mason, B Sivaraman)

CO is the second most abundant molecule in gas and ice phase in the interstellar medium (ISM). Being one of the important molecules in the ISM, condensed CO has been extensively studied under energetic particle irradiation, and the resulting dissociation products have been investigated for nearly four decades. Although numerous studies using infrared spectroscopy have reported the formation of various products following electron or ions or photon irradiation on CO ice, our understanding on the physical and chemical nature of the refractory residue was limited, to-date. To address this, we simulated the interstellar conditions in the laboratory by depositing CO molecules on an LiF substrate at 10 K and irradiated the frozen CO with 2 keV electrons for 10 hours. The ice was probed (from 110 nm to 320 nm) in-situ using vacuum ultraviolet/ultraviolet (VUV/UV) spectroscopy. Before irradiation the characteristic peaks of CO were observed in the VUV region. Whereas in the VUV/UV spectra of irradiated ice a new band with a peak near 240 nm appeared, an indication of carbon rich compounds at 10 K. After irradiation, the ice was heated to room temperature and the subsequent spectral recording revealed the presence of the refractory residue as the 240 nm peak remained. The substrate was removed from the chamber for ex-situ analysis using high resolution transmission electron microscopy (HR-TEM). The HR-TEM images revealed the presence of ordered carbon structures, including graphene, graphite and graphitic quantum dots. These features indicate the ring closure from carbon atoms, at 10 K, that are released from CO. The direct ring closure from carbon atoms released from CO reveal a new and efficient pathway to be considered in the bottom-up formation pathway of polycyclic aromatic hydrocarbon (PAH) molecules, via graphene hydrogenation, on cold dust in the ISM. The result obtained brings a paradigm shift in our understanding of PAH formation in the ISM.

Source/Reference of the Work: <https://doi.org/10.1016/j.issr.2025.09.007>

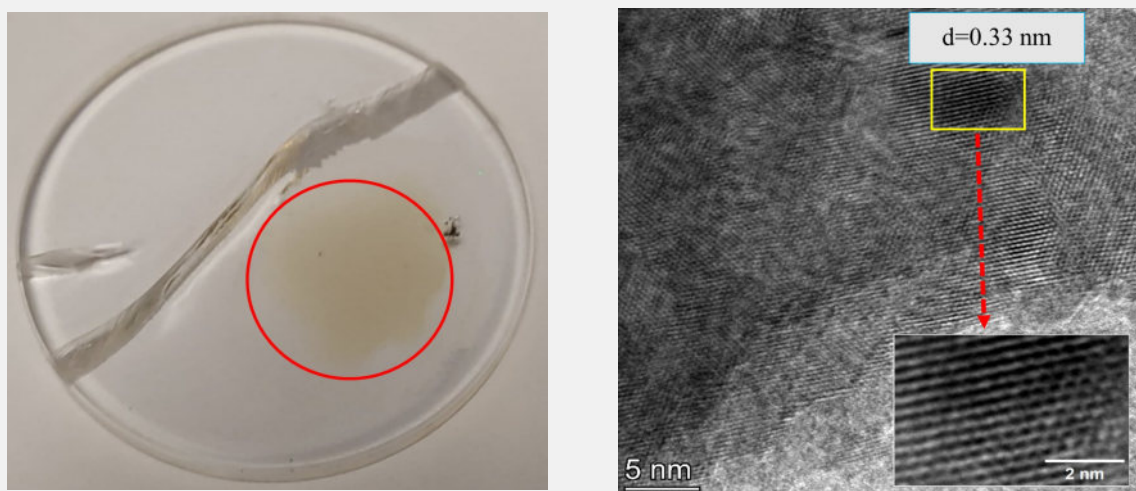


Figure Caption: Figure caption- Graphitic (002 plane) features of the residue observed using HR-TEM

A New Meteorite Fall from Khalwat-Limgaon: A Fresh Arrival from Space

The Author

(**Aditya Das**, Bhalamurugan Sivaraman, Dwijesh Ra1*, Kuljeet K. Marhas, Anil D. Shukla and Anil Bhardwaj



Aditya Das

On March 3, 2025, a meteorite fall fragment (weighing 350 g) was recovered from Khalwat-Limgaon village, located in the Wadwani taluka of Beed District, Maharashtra (19°06'19.2"N, 76°04'55.1"E). The petrographic and microanalytical analyses were performed on this specimen in order to determine its mineralogical and textural characteristics. The Back Scattered Electron (BSE) imaging of the meteorite revealed a silicate-rich matrix containing well-defined chondrules that exhibit barred, porphyritic, and cryptocrystalline glassy textures, where some chondrules also exhibit metallic rims. The dominant mineral phases, which comprise approximately 75% of the specimen volume, are olivine and low-calcium pyroxene. The accessory mineral phases include silicates (Na-feldspar, high-calcium pyroxene), Fe-Ni metal alloys (kamacite and taenite), sulphides (troilite), chromite, and phosphates (apatite). The Fe-Ni phases display a bimodal nickel distribution, ranging from 4 wt% in kamacite to 32 wt% in taenite. Chromite grains that occur as euhedral to subhedral crystals have high Cr# (~86) and Fe# (~90) values and are often observed forming sharp interfaces with troilite. Weak shock features, such as undulatory extinction and minor fracturing in silicate minerals, indicate a low shock stage (S3). Based on mean compositions of olivine, chromite, and the low Ca-pyroxene, the meteorite belongs to an L-group ordinary chondrite and petrologic type 4/5.

Source/Reference of the Work: <https://doi.org/10.17491/jgsi/2025/174277>

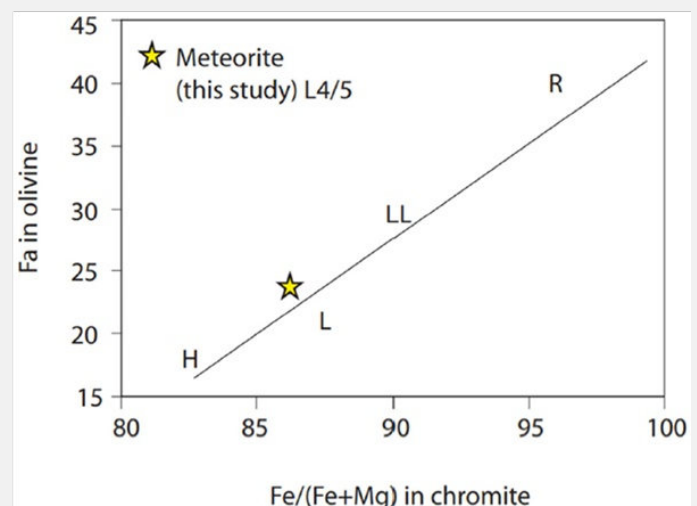
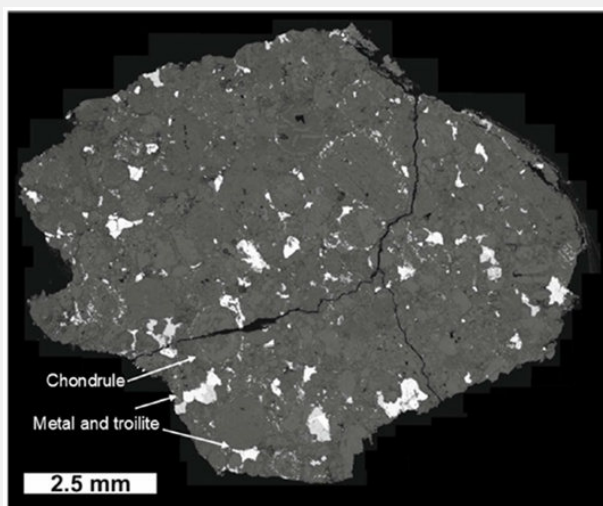


Figure Caption: Left: BSE mosaic of polished mount of the meteorite. Right: Petrological classification of meteorite (L4/5) based on fayalite (Fa) in olivine and Fe/(Fe+Mg) in chromite

106th Vikram Jayanti Celebration and 79th Independence Day celebration 2025 at PRL Mount Abu

The Physical Research Laboratory (Mount Abu Observatory) celebrated the proud occasion of 106th Vikram Jayanti on 12th August, and 79th Independence day on 15th August, 2025.

On this auspicious occasion, it is worth recalling that on 12th August 2025, PRL Mount Abu Observatory celebrated the 106th Vikram Jayanti, commemorating the birth anniversary of Dr. Vikram Sarabhai, the Founder of PRL and the Father of the Indian Space Programme. The celebration included inspirational talks, interactive sessions, and a campus-wide tree plantation drive, with enthusiastic participation from staff, students, and visitors. The event not only honored Dr. Sarabhai's visionary contributions but also reflected PRL's enduring commitment to sustainability and scientific inspiration.

The celebration began on the morning of 12th August at 9:00 a.m. with the ceremonial lighting of the lamp and the garlanding of Dr. Vikram Sarabhai's portrait at the PRL Hill View campus, Mount Abu. On this occasion, Head of Astronomy & Astrophysics Division, Prof. Abhijit Chakraborty, along with the staff, graced the garlanding ceremony following the lamp lighting, which was subsequently followed by a tree plantation in the PRL Hill view campus. Prof. Chakraborty addressed and enlightened the gathering through his speech on the life and visions of Dr. Sarabhai.

The 79th Independence Day was also celebrated by PRL Mount Abu with a flag-hoisting ceremony, reflections on India's progress in science and technology, and extensive plantation activities at the Hill View campus, promoting national pride and environmental awareness. The celebrations concluded with a friendly volleyball match organized at the Hill View campus.



Glimpse of Vikram Jayanti (2025)



Glimpse of tree plantation drive



Glimpse of Independence Day (2025)

Physical Research Laboratory Mount Abu Observatory campus celebrated the 2nd National Space Day (NSPD) on 23rd August 2025

As per guidance of our headquarter office and with an intention to reach maximum number of students and educators, Mt Abu teams reached out to various schools, colleges and universities with several themed lectures and hands-on sessions. The associated events started on 13th August with volunteers visits to several schools of Mt Abu and extended up-to 20th August with its last event at Madhav university, Abu Road with a grand success.

As part of these events, three different teams conducted a series of outreach programs at 17 educational institutions across Sirohi district, covering 11 schools, 4 colleges, and 2 universities. Every session started by playing a video message from ISRO Chairman and Secretary DOS, Dr. V. Narayanan followed by themed lectures and interactions. The events engaged a total of 2010 participants, comprising 1880 students and 130 teachers.

The events were energetically conducted by three teams including 13 staff members (5 experts, 7 TOTs, and 1 JRF).

From the 14th August, Throughout the series of outreach sessions, the teams reached various schools early in the morning, beginning each visit with highly interactive and engaging discussions. The sessions started with fundamental concepts of cosmic ray physics, gradually progressing toward atmospheric and space physics, space science, and finally astronomy and astrophysics, thereby giving students a complete perspective of PRL's diverse research domains.

Each session was designed for about an hour, but the student's enthusiasm, curiosity, and eagerness to learn often extended them well beyond the scheduled time, sometimes lasting up to two hours or more. The experts from PRL conducted these sessions in an interactive and inspiring manner, using real examples from India's space missions and PRL's contributions to ignite scientific curiosity.

The students were deeply driven and highly responsive, asking thought questions and showing genuine excitement to explore topics beyond the syllabus. The sessions became even more lively and memorable through active participation, discussions, and demonstrations. For instance, at Ajit Vidya Mandir, a one-hour session stretched to nearly two hours due to the overwhelming interest and involvement of students. Similar enthusiasm was witnessed at Sofiya Convent School, Vedic Kanya Senior Secondary School, and others, where the interactions created an energetic learning atmosphere. The highlight of the program came on the final day on 20th of August at Madhav University, where the session lasted about two and a half hours, marked by captivating discussions and a remarkable exchange of ideas between students and PRL experts.



Glimpse of Sofiya Convent School, Mount Abu



Glimpse of Adarsh Vidya Mandir, Mount Abu



Royal Rajasthan School, Abu road



HG International School, Abu road



Madhav University, Abu road



St. John's school, Abu road

Training on Storage Infrastructure of PASS project for CNIT Colleagues

A two half-day technical training session on “NetApp FAS 9500 Storage Infrastructure” was conducted at the Physical Research Laboratory (PRL), Ahmedabad, on 2nd-3rd September 2025 under the PRL PASS Project. Mr. Gaurav Mishra, Account Technology Specialist from NetApp, who brings over five years of expertise in building storage and data management solutions was invited to enlighten the concepts of Netapp storage technologies at PRL.

Designed for all CNIT staff members, the training aimed at updating their professional technical skills of system administration on modern storage technologies. The sessions covered both foundational and advanced aspects of enterprise storage systems, including unified storage, data management, performance optimization, and security. Through a blend of lectures, live demonstrations, and interactive discussions, participants gained valuable practical exposure alongside theoretical insights.

This initiative reflects CNIT’s continued emphasis on strengthening its technical capabilities and equipping its team members to meet evolving IT infrastructure management challenges. Following are few snaps taken during live training sessions:



Basic Training on Space Weather and its Impacts

PRL conducted a training program on “Space Weather and its Impacts” to the nominated personnel of the Defence Space Agency (DSA) during 15 to 26 September 2025. A total of 20 participants from DSA, Indian Air Force, Indian Army and Indian Navy had undergone the training program. This course was specially curated to provide a fundamental and holistic understanding of the origin of space weather disturbances, evolution, interactions as well as impacts on ground and space-based technological systems so as to make the content relevant for defence applications.

The training program comprised of a series of lectures on focussed topics pertaining to fundamental processes in the Sun-interplanetary medium-magnetosphere-ionosphere-thermosphere system, transient phenomena (like Interplanetary Coronal Mass ejections, Stream / Co-rotating Interaction Regions) and their characterization, space weather effects on ground and space based technological systems, interpretation of space weather data and modelling, etc. Besides lectures, practical sessions have been conducted with specially designed exercises, to provide basic knowledge on space weather phenomena and assessment of their impacts using data from ground and space-based experiments. More than seventy percent of the lectures/sessions have been delivered by PRL faculty and the remaining lectures were delivered by faculty from outside PRL.

A two-day academic trip to Udaipur Solar Observatory (USO) of PRL was organized, during which, participants visited the Multi Application Solar Telescope (MAST) facility along with an overview on e-Callisto and GONG facilities. Laboratory visits have also been arranged at PRL Main and Thaltej campuses with demonstrations on the in-house built state-of-the-art ground- and space- based experiments and payloads developed at PRL for ISRO’s space missions.

The training program ended with a formal evaluation and certificate distribution. Participants were very enthusiastic throughout the course and expressed their delight for the knowledge gained and learning experience at PRL. Events of this kind showcase PRL’s intent and efforts in contributing to the space weather dependent strategic applications in the country.



Group photo of the participants and PRL members during the inauguration of the “Basic Training on Space Weather and its Impacts” on 15 September 2025

पीआरएल हिंदी तकनीकी संगोष्ठी 2025

भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद में 19 सितंबर 2025 को एकदिवसीय हिंदी तकनीकी संगोष्ठी का आयोजन किया गया। इसी दिन पीआरएल में हिंदी माह समारोह 2025 का उद्घाटन समारोह भी संयुक्त रूप से किया गया। इस तकनीकी संगोष्ठी में उदयपुर सौर वेधशाला (यूएसओ), माउंट आबू वेधशाला एवं अंतरिक्ष उपयोग केंद्र (सैक), अहमदाबाद ने प्रतिभागी के रूप में शामिल हुए। 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। ऐसे कार्यक्रमों से छात्रों, शोधकर्ताओं और शोध क्षेत्रों से जुड़े सभी को अपने अनुभव, शोध और नवीनतम तकनीकी जानकारी साझा करने का अवसर प्राप्त हुआ, जिससे ज्ञान का अद्भुत सुदूरप्रसारी प्रभाव पड़ा। पीआरएल हिंदी तकनीकी संगोष्ठी का विषय था "वैश्विक परिप्रेक्ष्य में मूलभूत एवं अनुप्रयोगात्मक अनुसंधान- आवश्यकताएं एवं संभावनाएं"। पीआरएल द्वारा पहली बार हिंदी तकनीकी संगोष्ठी में पोस्टर सत्र के स्थान पर फ्लैश टॉक विकल्प रखा गया। आज के गतिमान समय में ऐसी संक्षिप्त प्रस्तुतियों को बहुत ही लाभकारी माना जाता है। इस संगोष्ठी में 85 पेपर (54 फ्लैश टॉक एवं 31 मौखिक) प्रस्तुत किए गए।

A one-day Hindi Technical Seminar was held at Physical Research Laboratory, Ahmedabad, on 19 September 2025. The same day also marked the joint inauguration of the Hindi Month Celebrations 2025 at PRL. Udaipur Solar Observatory (USO), Mount Abu Observatory, and Space Applications Centre (SAC), Ahmedabad, participated in this technical Seminar. While this Hindi technical Seminar facilitated discussions, deliberations, and knowledge exchange on topics related to technology, science, and innovation, it served not only as a medium for sharing technical knowledge but also as an effort to develop technical terminology glossary and expressions in the Hindi language. Such programs provided students, researchers, and those involved in research fields with the opportunity to share their experiences, research, and the latest technical information, leading to a significant dissemination of knowledge. The theme of PRL Hindi Technical Seminar was "Basic and Applied Research in a Global Perspective - Needs and Prospects." For the first time, PRL introduced Flash Talk in a Hindi technical Seminar in place of poster session. In today's fast-paced world, such brief presentations are considered very beneficial. Eighty-five papers (54 flash talks and 31 oral) were presented at the Seminar.

विभिन्न कार्यालयों, अहमदाबाद नराकास से आए हुए आमंत्रित गण एवं प्रतिभागियों ने समग्र आयोजन एवं व्यवस्था की प्रशंसा की।

The invitees and participants from various offices, Ahmedabad TOLIC praised the overall organization and arrangements.



ग्रुप फोटो: हिंदी तकनीकी संगोष्ठी 2025

28th PRL Amrut Rajbhasha Vyakhyaan (PARV)



"पीआरएल अमृत राजभाषा व्याख्यान (पर्व)" का 28वां व्याख्यान 24 सितंबर, 2025 को आयोजित किया गया था। इस अवसर के प्रख्यात वक्ता श्री प्रियदर्शन, वरिष्ठ कार्यकारी संपादक, एनडीटीवी इंडिया थे।

The 28th lecture of "PRL Amrut Rajbhasha Vyakhyaan (PARV)" was held on 24 September 2025. The eminent speaker for the occasion was Shri Priyadarshan, Senior Executive Editor, NDTV India.



श्री प्रियदर्शन का जन्म 24 जून, 1968 को रांची में हुआ था। उन्होंने 1993 में अंग्रेजी में एमए किया, पत्रकारिता में स्नातक भी किया। 1985 से 1987 के बीच 'न्यू मेसेज' नामक पाक्षिक में काम किया। 1993 में दिल्ली आए और अगले तीन साल स्वतंत्र पत्रकारिता की। जनसत्ता के संपादकीय पृष्ठ और रविवारीय संस्करण का संपादन करने के बाद, वे 2003 में एनडीटीवी में शामिल हो गए। वे पिछले 22 वर्षों से इसी संस्थान में कार्यरत हैं। वर्तमान में वे वहाँ वरिष्ठ कार्यकारी संपादक के पद पर कार्यरत हैं।

Shri Priyadarshan was born in Ranchi on 24 June 1968. He has done MA in English in 1993 and a bachelor's degree in journalism. Between 1985 and 1987, he worked for the fortnightly "New Message." From 1987 to 1993, In 1993, he moved to Delhi and spent the next three years as a freelance journalist. After editing the editorial page and Sunday edition of Jansatta, he joined NDTV in 2003. He has been working at the same organization for the past 22 years. He currently serves there as Senior Executive Editor.

व्याख्यान का शीर्षक था/ The vyakhyaan was titled "फैलता विज्ञान सिकुड़ती वैज्ञानिक दृष्टि।"

व्याख्यान में श्री प्रियदर्शन ने चर्चा की कि हमारा विज्ञान प्रगति कर रहा है, लेकिन हमारा वैज्ञानिक दृष्टिकोण पिछड़ रहा है। यहाँ तक कि जब हम मनुष्यों को अंतरिक्ष में भेजते हैं, तो उनकी सुरक्षित वापसी सुनिश्चित करने के लिए तुरंत अनुष्ठान शुरू कर देते हैं। विज्ञान के तर्कवाद और आस्था के कर्मकांडों के बीच हमेशा से ही संघर्ष रहा है, लेकिन इस आधुनिक समय में – इक्कीसवीं सदी में – यह संघर्ष जारी है, और इस पर तार्किक रूप से विचार करने की आवश्यकता है।

In the Vyakhyaan, Shri Priyadarshan discussed that our science is progressing, but our scientific outlook is lagging behind. Even when we send humans into space, we immediately begin performing rituals to ensure their safe return. There has always been a conflict between the rationalism of science and the rituals of faith, but in this modern time - the twenty-first century - the fact that this conflict continues, and that needs to be looked into rationally.

व्याख्यान के बाद एक रोचक प्रश्नोत्तर सत्र हुआ, जिससे श्रोताओं को विषय के बारे में नई और अधिक जानकारी प्राप्त हुई।

Following the lecture, there was an engaging Q&A session that gave the audience fresh insights and more details about the subject.

Youtube Link : <https://www.youtube.com/live/sdEfKMzRLsA?si=OhUztV9JWctiuxOD>

PRL Ka Amrut Vyakhyaan - 108



The 108th PRL Ka Amrut Vyakhyaan was delivered on 25th September 2025 by the distinguished planetary scientist, Prof. Wing-Huen Ip, Professor at the Institute of Astronomy, National Central University (NCU), Taiwan. The Vyakhyaan, titled “Tracing Cosmic Dust: From Zodiacal Clouds to Venus’ Cloud Deck”, offered an intriguing exploration of interplanetary dust dynamics, planetary atmospheres, and emerging ideas linking space missions to astrobiological hypotheses.

Prof. Ip began the Vyakhyaan with an overview of the distribution and sources of interplanetary dust within the inner Solar System, tracing their connection to meteor streams that continually interact with Earth’s atmosphere. He explained the major observational methods to study these particles and threw light on the results obtained from past measurements. Further, he also emphasized on how the detection and characterization of such meteoroid populations provide critical insights into the physical and dynamical processes shaping the Solar System’s dust environment. He also touched upon the ablation of meteors in planetary atmosphere and how it affects the atmosphere and ionosphere. He noted that while the near-Earth region is relatively well studied through radar and spacecraft observations, the dust environment around Venus remains poorly understood, presenting a frontier for future exploration. He explained the current understanding of meteor layers in Venusian atmosphere base on the observations made till now.

Transitioning from this context, Prof. Ip discussed recent observations and hypotheses related to the Venusian atmosphere, particularly the possibility of biologically significant processes occurring in the cloud layers of Venus. He outlined how the CO₂-rich and sulfuric acid-laden atmosphere of Venus poses extreme challenges to life as we know it, yet retains certain altitudinal regions with moderate temperatures and pressures that have sparked discussions about the potential existence of microorganisms. He traced the historical and scientific roots of this hypothesis to modern space missions—including data from Venus Express, Akatsuki, and renewed analyses inspired by the detection of anomalous atmospheric signatures such as phosphine—highlighting how these findings have reignited interest in astrobiological investigations within the inner Solar System.

Prof. Ip emphasized the interdisciplinary nature of this research domain, where planetary science, atmospheric chemistry, and astrobiology converge. He also discussed how future missions, including DAVINCI, EnVision, VOICE and VOM, could decisively test these hypotheses by directly probing Venus’ middle atmosphere and analysing meteoric inclusions, aerosol composition, isotopic ratios, and photochemical processes.

Toward the end of the Vyakhyaan, Prof. Ip placed the discussion in a broader philosophical and scientific perspective, emphasizing the search for life beyond Earth as one of humanity’s most profound quests. He encouraged continued participation from young researchers in this rapidly

evolving field, highlighting how upcoming missions and new-generation observatories could illuminate the origins of life and the evolution of planetary environments across the Solar System. Altogether, Prof. Ip's Vyakhyaan offered a thought-provoking journey through the realms of interplanetary dust, planetary atmospheres, and astrobiology, illustrating how modern space exploration continues to expand our horizons and challenge our understanding of life's potential beyond Earth.

Via | webex
by CISCO

Venus Science Conference (Venus-SC 2025)



Why It Matters for Planets

- Dust flux provides boundary condition for meteoric input.
- Determines delivery rates of metals, smoke particles, and organics.
- Visual: Schematic of dust spiraling inward under PR drag.




Youtube Link : <https://youtu.be/1cRwzmsVjjs>

Venus Science Conference 2025

Planetary scientists have been exploring various planets like Venus, Mars, Jupiter, Saturn etc. for many decades and made a good progress in the field. Though, Venus, the sister planet of Earth, has been explored for a long duration, it is yet not understood fully. Many open research problems exist like evolution of Venusian surface, unknown UV absorber, lightning, super-rotation, meteoroid layer in lower ionosphere and space weather on Venus. The observations on Venusian science has been from the time of Venera in 1960s and many missions like Mariner, Pioneer Venus, Vega, Magellan, Venus Express, Akatsuki, IKAROS have provided lots of data to the community. In addition, other unintended missions like Galileo, Cassini, MESSENGER, Parker Solar Probe, BepiColombo and Solar Orbiter have also given flyby observations of Venus. The data analysis from the missions bring different scientific outcomes related to planet Venus and appear in the literature. Some conferences are organized over the globe to discuss the Venusian science, either within a planetary conference or as a dedicated conference.

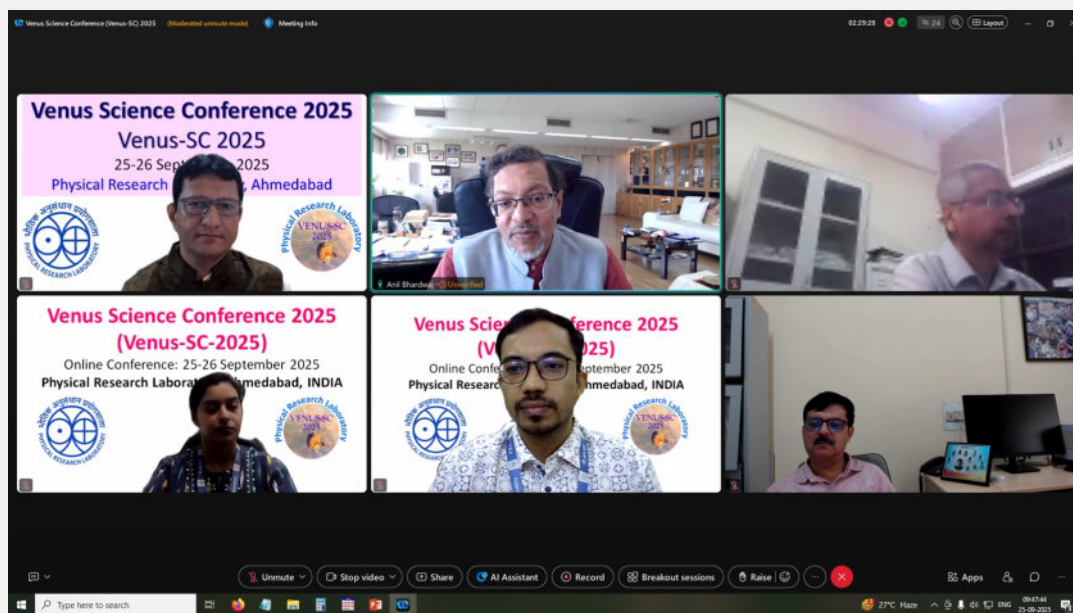
Recently, the Physical Research Laboratory (PRL) has organised the FIFTH conference on Venus Science, Venus-SC 2025 (online) during 25-26 September 2025 IST. It focused on modelling, observations, data analysis, conceptual instrument design and scientific experiments for Venus exploration. The major research areas covered in the conference were surface, atmosphere, lightning, ionosphere, interplanetary dust, and solar wind interaction with the planet. Such gathering provides an opportunity to interact among the community over the globe and also, collaborate with people working in similar fields over a period of time.

Formally 231 delegates had registered for the conference, which included speakers for oral presentations, short oral presentations and other attendees. The oral presentations had 24 talks from universities/institutes within and outside India. The short oral presentations have 26 talks from India and outside institutions. A few examples of the talks are Major outstanding questions on geology, geochemistry, geophysics, atmospheric and thermal evolution, Mapping to develop geological history, Mafic dyke swarms, Planetary lightning detection and network, Interplanetary dust environment near Venus, Life on Venus, Atmospheric superrotation, Venus aerosols, Venus Express ASPERA-4 findings and Akatsuki radio occultation. This year, we have introduced a special session of Planetary Lightning and Network to bring the stakeholders on a common platform. The objective of this special session is to collectively make use of the data for research and also for societal aspects. We have also included dedicated time slot for the scientific discussions among the domain experts. The panellists have suggested different science questions which should be addressed by future Venus Orbiter mission.

The outside India included universities/institutes from places like US, Canada, UK, Taiwan, Japan, Sweden etc. The centres/institutes from within India covered NESAC, SPL, PRL, IIST, Cambridge Institute of Technology, Tripura University, IITM, IMD, NCESS, Amity University, BHU, CUSAT, IIA, St Joseph's University, Anna University, IITB, Bharata Mata College, CHARUSAT etc. The Venus Science Conference included speakers spanning 4 time zones.

Honourable Distinguished Professor Anil Bhardwaj (Director, PRL) had graced the inaugural session. There were five sessions covering all mentioned research areas. The session chairs were well experienced in the domain and they were from various ISRO/Non-ISRO centres.

This year, we have included a plenary talk and also a special talk, PRL ka Amrut Vyakhyaan as a part of Venus-SC 2025. There was a concluding session at the end of the conference. Many people including Honourable Distinguished Professor Anil Bhardwaj (Director, PRL), Prof. D. Pallamraju (Dean, PRL), the SOC and LOC members, IT team, electrical team and other members had helped as and when needed for the conference.



In Memoriam : Prof. Satya Prakash



Padma Shri Prof. Satya Prakash, a distinguished alumnus of PRL and a protégé of Prof. Vikram A. Sarabhai left for heavenly abode on 24 September 2025.

Professor Satya Prakash (born 01 July 1929, Najibabad, Uttar Pradesh) was a pioneering Indian plasma physicist and a former PRL faculty member who joined in 1953 and superannuated as Senior Professor in 1989. He was a renowned scientist known for noteworthy contributions to space and plasma sciences, particularly in the development of Langmuir probes, neutron counters for cosmic ray studies, and indigenous technology for India's initial space research program. He played a central role at the Physical Research Laboratory, Ahmedabad, and his work influenced research on the upper atmosphere and ionospheric phenomena.

Professor Prakash is well known for the solar time variation studies of cosmic ray neutrons and in-situ measurements in the equatorial ionospheric regions using rocket-borne instruments. He developed innovative instruments, including neutron detection systems and modified Langmuir probes, and contributed to the scientific payloads for India's first satellite, Aryabhata. In particular, he developed a high frequency Langmuir probe which was capable of providing reliable 1-m resolution measurements for the study of small-scale ionospheric irregularities. The experiments confirmed the gradient drift instability (crossed field) operating in the equatorial electrojet region. Further, he developed a number of plasma probes, like dual probe for ac electric field, impedance probe, retarding potential analyzer, etc. His research extended to gravity wave-induced ionospheric phenomena and theoretical modeling of plasma density irregularities.

Professor Satya Prakash was an elected fellow of the Indian Academy of Sciences, the Indian National Science Academy, the National Academy of Sciences, India, and the Gujarat Science Academy. Professor Prakash was the first recipient of the Hari Om Ashram Prerit Vikram Sarabhai award (1975). Government of India conferred the Padma Shri (1982) on him for his contributions to Indian science. He mentored several research scholars and published widely in national and international journals.

Professor Satya Prakash's scientific leadership, innovation in instrument development, and dedication to advancing India's capabilities in space and atmospheric research established him among the foremost physicists of his generation. His work enabled groundbreaking research in plasma science and paved the way for advancements in space science instrumentation and atmospheric studies.

Professor Satya Prakash's passing is mourned by the scientific community, especially PRL, where his legacy of science, integrity, curiosity, and mentorship continues to inspire present and future generations of scientists.

May his soul attain Sadgati.
OM Shanti Shanti Shanti

PRL Monthly Publications Digest

Atomic, Molecular and Optical Physics [02]

1. Ephraim Anto, Rituparna Das, Vinitha Nimma, Madhusudhan P, Pranav Bhardwaj, Pooja Chandravanshi, Rajesh Kumar Kushawaha and Koushik Saha, 2025, Strong-field induced ionization and dissociation of cis- and trans-1,2-dichloroethylene: Cl⁺ and HCl⁺ fragments, Physical Chemistry Chemical Physics, Date of Publication: 30/09/2025, Impact Factor:
2. Wafikul Khan, R Ramachandran, S Gupta, J K Meka, V Venkataraman, B N Rajasekhar, P Janardhan, Anil Bhardwaj, N J Mason, B Sivaraman, 2025, Irradiation of condensed CO reveals a new pathway for the formation of aromatic molecules in astrochemical ices, Life Sciences in Space Research, Date of Publication: 20/09/2025, Impact Factor: 2.8

Astronomy & Astrophysics Division [03]

1. Grouffal, S.; Santerne, A.; Bourrier, V.; Kunovac, V.; Dressing, C.; Akinsanmi, B.; Armstrong, C.; Baliwal, S.; Balsalobre-Ruza, O.; Barros, S. C. C.; Bayliss, D.; Crossfield, I. J. M.; Demangeon, O.; Dumusque, X.; Giacalone, S.; Harada, C. K.; Isaacson, H.; Kellermann, H.; Lillo-Box, J.; Llama, J.; Mortier, A.; Palle, E.; Rajpurohit, A. S.; Rice, M.; Santos, N. C.; Seidel, J. V.; Sharma, R.; Sousa, S. G.; Thomas, L.; Turtelboom, E. V.; Udry, S.; Wheatley, P. J., 2025, The star HIP 41378 potentially misaligned with its cohort of long-period planets, Astronomy & Astrophysics, Date of Publication: 15/09/2025, Impact Factor: 5.8
2. Aravind, K., E. Jehin, S. Hmimidouch, M. Vander Donckt, S. Ganesh, P. Rousselot, P. Hardy, D. Sahu, J. Manfroid, Z. Benkahldoun, 2025, Ionic emission from and activity evolution in comet C/2020 F3 (NEOWISE): Insights from long-slit spectroscopy and photometry, Astronomy & Astrophysics, Date of Publication: 12/09/2025, Impact Factor: 5.8
3. Ahuja, Goldy, K Aravind, Shashikiran Ganesh, Said Hmimidouch, Mathieu Vander Donckt, Emmanuel Jehin, Devendra Sahu, T Sivarani, 2025, Long-term monitoring of a dynamically new comet C/2020 V2 (ZTF), Monthly Notices of the Royal Astronomical Society, Date of Publication: 12/09/2025, Impact Factor: 4.8

Planetary Sciences Division [01]

1. Kishan Tiwari, Sujoy Ghosh, Masaaki Miyahara & Dwijesh Ray, 2025, Olivine–ringwoodite transformation in Katol meteorite: implications for localized superheating of chondritic melt and seismic attenuation, Progress in Earth and Planetary Science, Date of Publication: 15/09/2025, Impact Factor: 3.8

Space and Atmospheric Sciences Division [02]

1. Fontes, P. A., Muella, M. T. A. H., Resende, L. C. A., de Jesus, R., Fagundes, P. R., Mitra, G., Pillat, V. G., Batista, P. P., Buriti, R. A., Correia, E., & Muka, P. T., 2025, Effects of planetary wave oscillation on E-sporadic (Es) layers during the rare Antarctic sudden stratospheric warming of 2019, *Advances in Space Research*, Date of Publication: 02/09/2025, Impact Factor: 2.8
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Geosciences Division [02]

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2. Helen S. Findlay, Richard A. Feely, Kalina Grabb, Elizabeth B. Jewett, Elise F. Keister, Gabby Kitch, Yuri Artioli, Punyasloke Bhadury, Jeremy Blackford, Odile Crabeck, Anwesha Ghosh, Yaru Li, Kaitlyn B. Lowder, Shreya Mehta, Bryce Van Dam, Houda Beghoura, Noam Karo, Andrij Z. Horodysky, Sebastian Hennige, Sally M. Salaah, Federica Ragazzola, and Liza Wright-Fairbanks, 2025, Perspectives on Marine Carbon Dioxide Removal from the Global Ocean Acidification Observing Network, *Oceanography*, Date of Publication: 05/09/2025, Impact Factor: 3.2

Theoretical Physics Division [03]

1. Chee Sheng Fong, Ketan M. Patel, 2025, Electroweak triplet scalar contribution to SO(10) leptogenesis, *Journal of High Energy Physics*, Date of Publication: 17/09/2025, Impact Factor: 5.5
2. Jincheng An, Ajit C. Balram, Udit Khanna, Ganpathy Murthy, 2025, Anomalous transport gaps of fractional quantum Hall phases in graphene Landau levels are induced by spin-valley entangled ground states, *Physical Review B*, Date of Publication: 12/09/2025, Impact Factor: 3.7
3. Anupam Ghosh, Partha Konar, Sudipta Show , 2025, Collider fingerprints of freeze-in dark matter produced during the fast expansion phase of Universe, *Phys. Rev. D* 112, 055012 (2025), Date of Publication: 08/09/2025, Impact Factor: 5.3

Awards & Honours

(1) Dr. Narendra Ojha, Assistant Professor, Space and Atmospheric Sciences Division, PRL, has been selected as a member of the editorial board of the journal Geoscientific Model Development (GMD) published by the European Geosciences Union (EGU).

(2) Ms. Shreya Mehta, Senior Research Fellow, Geosciences Division, has received an Honorable Mention for the poster presentation in the theme "Biochemistry and Climate" at the 15th International Conference on Palaeoceanography (ICP 15), held at the Indian Institute of Science (IISc), Bangalore, India.

(3) Mr. Rahul Kumar Agrawal, Senior Research Fellow, Geosciences Division, PRL has Won The Young Polar Scientist Award in the theme Climate Change and Variability at the "National Conference on Polar Sciences-2025", organized by the National Center for Polar and Ocean Research (NCPOR), Goa, during 16-18 September 2025.

(4) PRL faculty affiliates are listed in the top 2% scientists in the world in their respective fields as compiled by Stanford University for the end of citation year 2024 (Calculation were performed using all Scopus author profiles as of 01 August 2025)*.

Top 2% for a single recent year data pertain to citations received during calendar year 2024 are:

- 1) Prof. D. P. K. Banerjee
- 2) Prof. B.K Sahoo

Top 2% for career-long data as updated up to the end of citation year 2024 are:

- 1) Prof. D. P. K. Banerjee
- 2) (Late) Prof. N. N. Rao
- 3) Prof. Anjan S. Joshipura,
- 4) Prof. B.K Sahoo
- 5) Prof. V. K. B. Kota

Visitors

1. Dr. Felipe Fantuzzi Soares, Lecturer from University of Kent, U.K. visited Physical Research Laboratory, Ahmedabad on 03.09.2025 in connection with scientific discussions on collaborative works in Astrochemistry Research.
2. Three students and one PDF visited PRL and PRL's USO for interaction with our faculty under programs, such as, ISRO-RESPOND and COSPAR Capacity building.
3. Dr. Manibrata Sen, Assistant Professor of Indian Institute of Technology, Bombay visited Physical Research Laboratory, Ahmedabad from 17.09.2025 to 19.09.2025 for research collaboration and to give a talk.
4. Mr. Arcana Alexis, Sales & Marketing Manager from M/s.Symetrie France visited Infra-Red Observatory, Physical Research Laboratory, Mount Abu on 22.09.2025 in connection with discussions on scientific equipment High Precision Hexapod installed at 1.2m Telescope.
5. Mr. Endo Tomoya from JOEL India Pvt. Ltd., New Delhi has visited Physical Research Laboratory, Ahmedabad on 22.09.2025 for scientific discussion on Technical details and application of FE-EPMA at PRL Thaltej Campus.
6. During September 2025, the following have visited Udaipur Solar Observatory (USO), PRL, Udaipur for various scientific facilities at USO: -
 - Eighteen (18) participants of the Basic Training programme on Space weather and its impacts as a part of their training session.
 - Mr. Umakant, IFS from Ahmedabad alongwith 3 others.
 - Mr. Narendra, Assistant Engineer, Watershed, Udaipur.
 - Four (4) General Public from Ahmedabad.
7. During September 2025, the following have visited Infra-Red Observatory, PRL, Mount Abu: -
 - Seven (7) Officials from other DOS/ISRO Centres/Units.
 - Five (5) VIPs, which include four from the office of the IG, CRPF, Mt. Abu, and one DFO, Mt. Abu.
 - Fifteen (15) Defense Personnel
 - Twenty Four (24) General Public

OBITUARY



Late Prof. Satya Prakash
Senior Professor

Date of Birth	01.07.1929
Date of Joining PRL	01.06.1953
Date of Retirement	30.06.1989
Date of Death	24.09.2025

Teary Eyes for our Departed Member

Hearty welcome to our new members



Name: DR.SRIMANTA MAITY

Designation: DST-INSPIRE FACULTY

Date of Joining: 09.09.2025

Division: ATOMIC, MOLECULAR & OPTICAL PHYSICS



Name: MR. HADI MUHAMMED RAHIL KK

Designation: JUNIOR RESEARCH FELLOW-ANRF

Date of Joining: 12.09.2025

Division: GEOSCIENCES DIVISION



Name :MISS. PURVI GIRI

Designation: JUNIOR PERSONAL ASSISTANT

Date of Joining: 19.09.2025

Division: THEORETICAL PHYSICS DIVISION

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