Newsletter of the Physical Research Laboratory

THE SPECTRUM

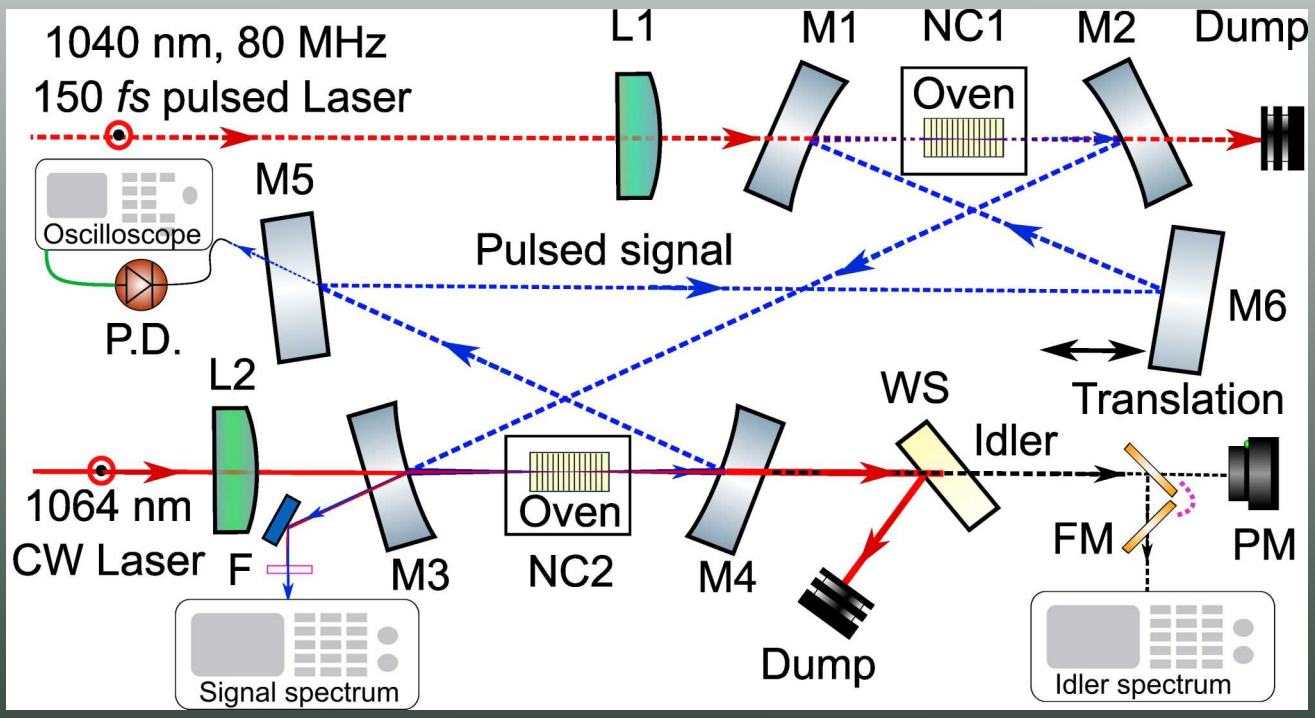


Image of the Month

Schematic of the novel laser system setup developed at PRL for generating ultra-fast mid-infrared pulses at multi-GHz repetition rates

August 2025

Table of Contents

The Author

Gourav Mitra

Imprint of a quasi-16-day period in boreal summer through modulated quasi-2-day wave: A signature of interhemispheric coupling

(***Mitra, G.,*** *Guharay, A., Batista, P. P., Buriti, R. A., Renkwitz, T.,, Conte, J. F.)*

During the boreal summer of 2019, an intriguing middle atmospheric phenomenon is observed, in which a quasi-2-day wave (Q2DW) showed a distinctive amplitude modulation with a 16-day period. Using meteor radar winds combined with global reanalysis data, we traced the origin of this modulation to the equatorial region at around 50 km altitude. The study revealed that this modulation is driven by the coupling between two planetary waves: a dominant eastward-propagating quasi-16-day wave with zonal wavenumber 2 (Q16DWE2) observed in the austral winter hemisphere, and a westward-propagating quasi-2-day wave with zonal wavenumber 3 (Q2DWW3). Although the quasi-16-day wave (Q16DW) is not significantly detected in the boreal summer middle atmosphere, the Q2DWW3 wave, reaching amplitudes up to 8 m/s, act as a carrier, effectively transferring the Q16DW's signature from the winter to the summer hemisphere. Furthermore, the appearance of the Q16DW in the upper mesosphere and lower thermosphere (90–100 km), close to where the Q2DW dissipates, supports a dynamical connection between these waves. The present study provides observational evidence of a novel mechanism of interhemispheric coupling via planetary wave modulation, deepening our understanding of the complex interactions shaping middle atmospheric dynamics across hemispheres.

Source/Reference of the Work: https://www.nature.com/articles/s41598-025-09350-y

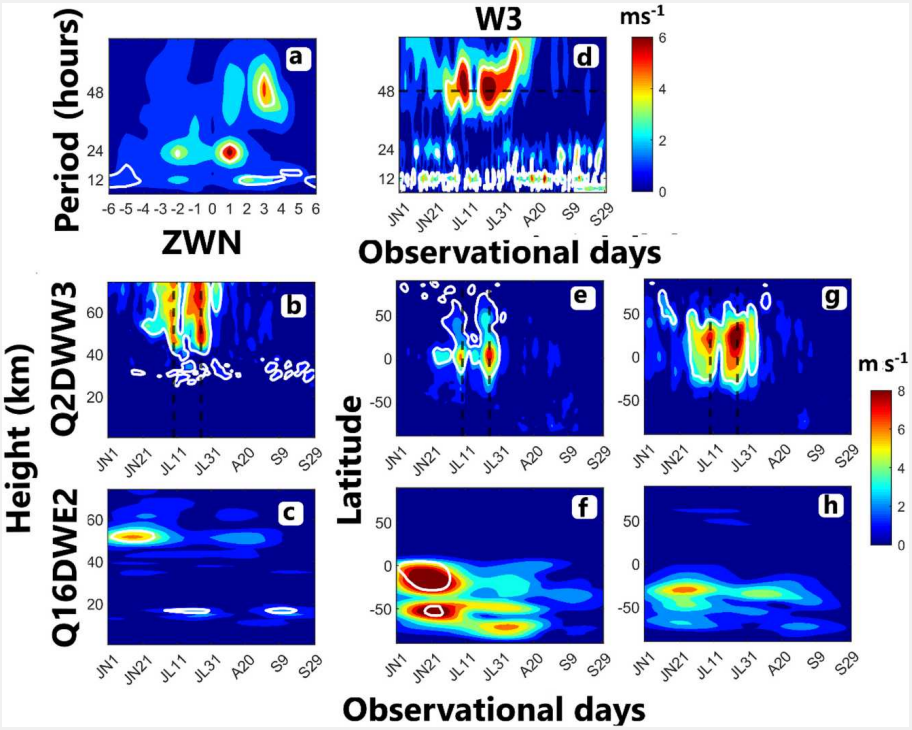


Figure Caption: Global distribution of the dominant zonal wavenumber modes associated with Q2DW and Q16DW. (a) Period (4–70 h) versus zonal wavenumber (ZWN) amplitude spectra at 75 km (0.01 hPa), 7.5° S during July. Height-time section of the (b) Q2DWW3, and (c) Q16DWE2 amplitude at the equator. Temporal variability of (d) W3 in the 4–70 h period at 0.01 hPa, 7.5° S. Latitude-time section of (e) Q2DWW3, and (f) Q16DWE2 at 50 km. (g, h) represent the same as (e, f) but at 75 km. MERRA-2 V and U data are utilized for Q2DW and Q16DW analysis, respectively. Dashed black vertical lines mark the peak amplitude day of Q2DWW3. The white curve represents the 95% confidence level.

The Author

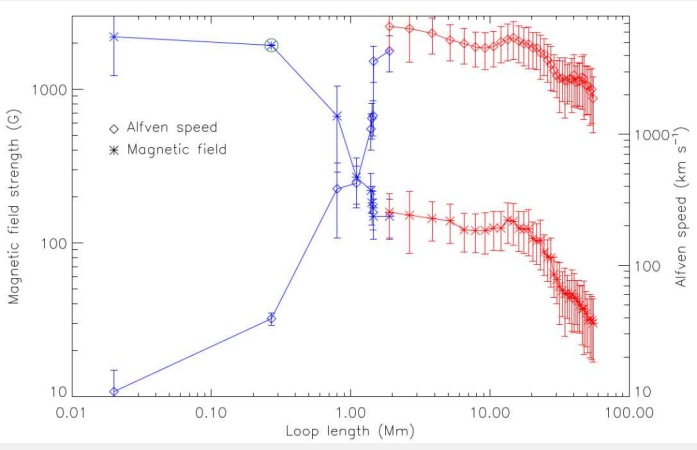
Ananya Rawat

Understanding the Magnetic Field and Plasma-β along Umbral Fan Loops Traced Using 3 Minute Slow Waves

(***Ananya Rawat***, *Girjesh Gupta, Tom Van Doorsselaere, S. Krishna Prasad, Robertus Erdélyi)*

Plasma-β is an important fundamental physical quantity in solar plasma physics, which determines the dominating process in the solar atmosphere, i.e., magnetic or thermodynamic processes. Here, for the first time, we provide variations of magnetic field and plasma-β along magnetically structured loops from the photosphere to the corona. We have selected several fan loops rooted in sunspot umbra observed simultaneously by the Interface Region Imaging Spectrograph and Solar Dynamics Observatory. Using the recently developed technique of Rawat and Gupta (2023), we traced and analyzed several fan loops with their cross-sectional areas in the lower atmosphere and located their footpoints at the photosphere using the propagating 3-minute slow waves. We find the rms magnetic field strengths in the range 1596–2269 G at the photospheric footpoints of the fan loops, which decrease rapidly to 158–236 G at the coronal footpoints (see Left Figure). We estimated the plasma-β at the photospheric and coronal footpoints in the range 0.2–0.5 and 0.0001–0.001, respectively. We found plasma-β < 1 along the whole loop, whereas the plasma-β ≈ 1 layer is found to be at subphotospheric heights (see Right Figure). We compared our findings for isolated individual fan loops with a previously established model for active regions and found an almost similar pattern in variations with height, but with different plasma-β values. Our results demonstrate the seismological potential of 3-minute slow waves omnipresent in the umbral sunspot atmosphere to probe and map isolated loops and determine magnetic field and plasma-β along these loops. The obtained parameters provide crucial ingredients for the theoretical modeling of the umbral atmosphere and wave dynamics along loops.

Source/Reference of the Work: https://iopscience.iop.org/article/10.3847/2041-8213/ade9be



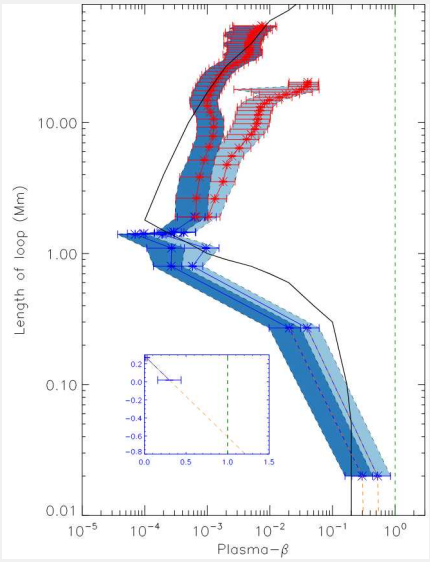


Figure Caption: [Left] Variation of magnetic field strength (left axis) and Alfvén wave speed (right axis). [Right] Variation of plasma-β along the fan loops, where the light and dark blue shaded regions are for loops 1 and 2, respectively. The black solid lines represent data points extracted from G. A. Gary (2001) for the umbral region. The vertical green dashed line indicate the plasma-β = 1 layer. The orange dashed lines are the linear extrapolation of data points to determine the plasma-β = 1 layer. The small box in the lower-left corner shows the height at which Loop 2 crosses the plasma-β ≈ 1 layer as representative example.

The Author

Anirban Ghosh

Multi-GHz repetition rate, tunable ultrafast mid-infrared source

(***Anirban Ghosh***, *Niladri Das, Chaitanya Kumar Suddapalli, Kavita Devi, Goutam K. Samanta)*

We have developed a novel laser system that generates ultrafast pulses in the mid-infrared (mid-IR) region with repetition rates tunable from 80 MHz to an impressive 100 GHz. High-repetition-rate pulsed lasers are vital for applications such as precision spectroscopy, optical frequency combs, and advanced sensing. Achieving such high rates in the mid-IR is challenging due to the lack of suitable gain media and the mechanical limits of constructing extremely short laser cavities. Our approach employs a specially designed fractional-cavity, synchronously pumped optical parametric oscillator (OPO) combined with intracavity parametric amplification. Two MgO: PPLN nonlinear crystals are used—one to generate a high-repetition-rate near-infrared signal and another, pumped by a continuous-wave laser, to convert it into mid-IR pulses. This configuration avoids the need for ultra-short cavities or complex synchronization schemes. The system delivers tunable mid-IR output from 3280 nm to 3394 nm, with power up to 63 mW and near-Gaussian beam quality. The method is adaptable to other spectral regions by selecting appropriate nonlinear crystals and pump lasers. To our knowledge, this is the first demonstration of such a widely tunable, high-repetition-rate mid-IR source, opening new opportunities in mid-IR up-conversion imaging, trace gas sensing, etc.

Source/Reference of the Work: https://doi.org/10.1364/OL.566207

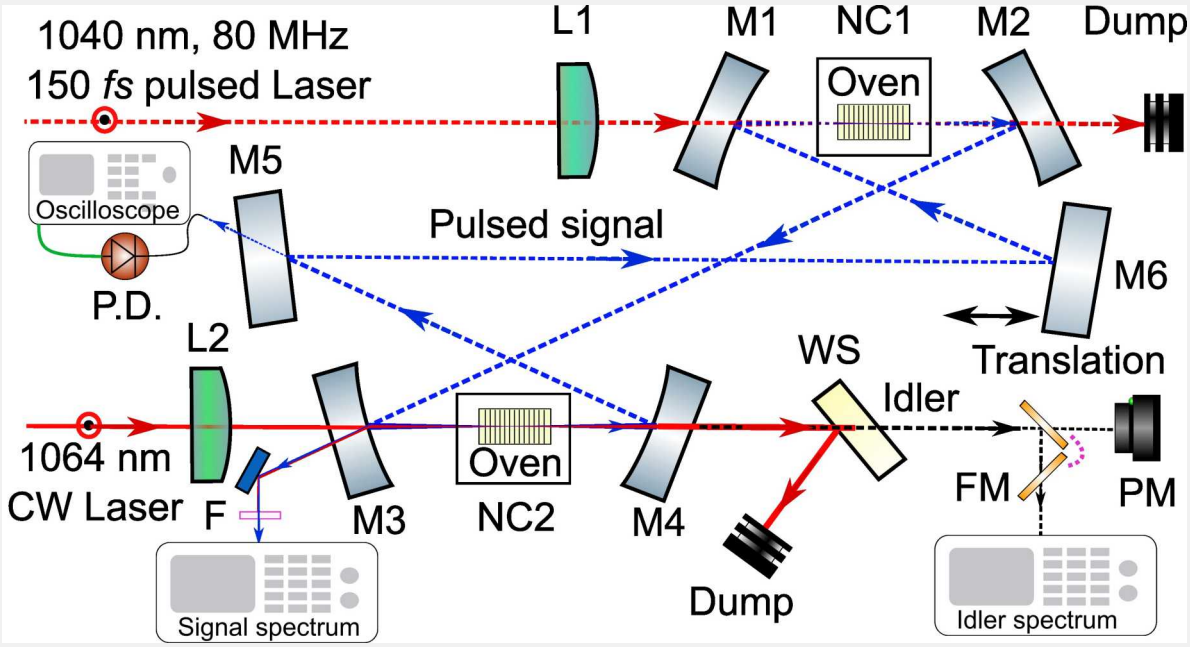


Figure Caption: Schematic of the novel laser system set-up developed at PRL for generating ultra-fast mid-infrared pulses at multi-GHz repetition rates.

The Author

Srishti Sharma

BHASHASETU: PRL's Intranet-Based Multilingual Translation Tool

(***Srishti Sharma***, *Atul Ashok Manke*)

In line with PRL's continuous commitment to digital innovation, linguistic inclusivity, and documentation efficiency, the CNIT team has successfully developed and deployed BhashaSetu – a next-generation multilingual machine translation tool built specifically for the institute's intranet. This AI-powered platform marks a significant leap forward from earlier efforts, offering seamless translation. It supports high-quality translations across all the 22 scheduled Indic languages including multiple scripts for low-resource languages like Kashmiri, Manipuri and Sindhi with improved accuracy, security, and scalability.

BhashaSetu is a new tool built independently by the CNIT team. The development began after an in-depth technical analysis and evaluation of Lipiyantra—an English-to-Hindi translation tool originally developed by the Space Applications Centre (SAC), Ahmedabad. While Lipiyantra served as a foundational concept, BhashaSetu represents a complete reengineering using modern AI models, robust backend architecture, and enhanced language support tailored for PRL's diverse linguistic needs.

From reference to Innovation: Building BhashaSetu

The CNIT team initiated the BhashaSetu project with the goal of overcoming the limitations of existing bilingual systems. Lipiyantra provided valuable insight into institutional translation workflows, but BhashaSetu expands the scope significantly. At its core lies IndicTrans2 is a state-of-the-art multilingual neural machine translation model developed specifically for Indian languages. This model enables translation between English and 22 Indian languages with remarkable fluency and contextual understanding, making BhashaSetu a robust tool for internal communication, reporting, and documentation in native languages. The translation service is accessible at: https://bhashasetu.lan.prl.res.in. It is securely deployed behind a reverse proxy using the Nginx web server. The web interface is built using the Yii 1.1 PHP framework. It accepts user input, communicates with the translation service via API calls, and displays the translated output.

Key Features

1. AI Translation Engine: BhashaSetu leverages the IndicTrans2 model to achieve advanced machine translation performance for Indian languages.
2. High Performance and High Availability: The system is built to support translation with low latency, even under concurrent access by multiple users.
3. Secure Intranet Deployment: BhashaSetu is deployed fully within PRL's secure intranet environment. This design ensures maximum data privacy and aligns with institutional cybersecurity policies.
4. HPC Visualization Node Deployment and Network Compatibility: The Bhashasetu tool is currently deployed on the Visualization Node of the High-Performance Computing (HPC) environment at PRL
5. Translation Logs: The system has provision to maintain a secure 30-day log of user translation activities, allowing users to revisit previous work while ensuring accountability.
6. User-Friendly Interface: BhashaSetu features a clean and responsive web interface that allows users to select source and target languages from the 22 supported options.
7. The tool supports translation of paragraphs of any length without restrictions on the number of characters.

Multilingual Translation in Action

BhashaSetu is now fully operational within PRL's intranet and can be accessed via the internal services portal. The tool has been adopted widely across departments for daily operational needs. Key applications include:

- - Translating internal circulars, reports, and notices
- - Preparing bilingual or multilingual documentation for meetings and outreach
- - Enabling regional language support for administrative workflows
- - Assisting with public communication drafts and technical reports

Conclusion

The successful development and deployment of BhashaSetu underscores PRL's strategic focus on in-house innovation and technological self-reliance. It empowers the institute's staff to communicate and document information across a wide array of Indian languages without compromising on quality, security, or performance.

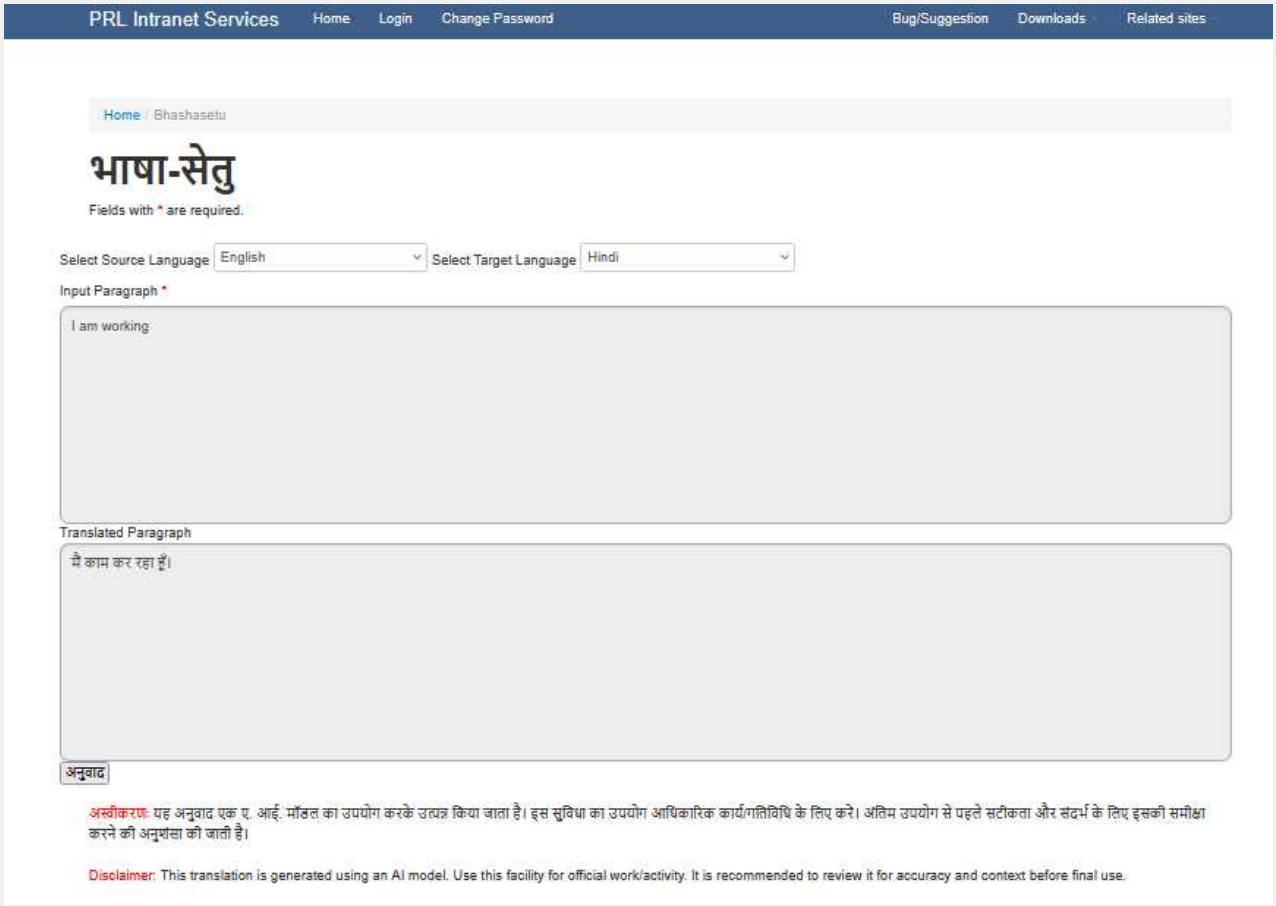


Figure Caption: User interface of BhashaSetu

अक्षर मंथन / Akshar Manthan – Where Language Meets AI

The CNIT Division organized an event titled "अक्षर मंथन / Akshar Manthan – Where Language Meets AI" on July 9, 2025, in a hybrid mode from 16:30hrs to 17:30hrs. Approximately 70 participants of different divisions/sections attended the session, with discussions conducted 70% in Hindi and 30% in English.

The event aims to:

- Unveiling SamvadAI and Lipiyantra, AI-enabled intranet web services designed to revolutionize internal communication.
- Live Demonstration of the new AI-enabled web services to showcase their capabilities and potential.
- Fostering Connections between the CNIT Division and PRL colleagues, reinforcing teamwork and mutual support.

Mr. Tejas Sarvaiya welcomed all attendees and provided an overview of the session – "अक्षर मंथन / Akshar Manthan – Where Language Meets AI", highlighting the initiative's role in fostering stronger bonds between the CNIT division and the PRL community to enhance IT services. Professor Anil Bhardwaj, Director, PRL, formally inaugurated the newly developed AI-enabled web services—"SamvadAI" and "Lipiyantra"—marking a significant milestone in PRL's journey toward digital transformation and intelligent automation. In his keynote address, Professor Bhardwaj highlighted Artificial Intelligence as a game-changer in the realm of scientific research, driving enhanced productivity and innovation. He remarked that AI has evolved from a visionary concept into a powerful tool that is actively reshaping how knowledge is generated, accessed, and applied. Reflecting on the event "SETU 2025," organized by CNIT exactly six months before i.e. January 9, 2025, he underscored the synergy between technology and collaboration. Professor Bhardwaj commended CNIT's approach to adopt the emerging technologies, for the benefit of PRL's scientific and administrative community. He highlighted SamvadAI as a pioneering step in this direction—a secure, freely available intranet-based language model built on the LLaMA architecture, designed to facilitate natural language understanding and interaction within the organization while maintaining strict data privacy. Complementing this, Lipiyantra serves as an intranet-based English-to-Hindi translation tool, promoting linguistic inclusivity and seamless communication across diverse user groups.

As part of the event, two insightful technical talks were delivered, each followed by live demonstrations that showcased the capabilities of PRL's newly launched AI-enabled web services.

1. **SamvadAI**: Mr. Vaibhav Rathore and Mr. Prashant Jangid led an engaging session on SamvadAI, the intranet-based language model built on the LLaMA architecture. They provided a comprehensive overview of the deployment architecture and live demonstration. Key highlights of their talk included:
   - The rationale for choosing the LLaMA model for internal use.
   - Privacy-preserving architecture tailored for PRL's infrastructure.
   - A live demonstration of SamvadAI responding to natural language queries with contextual accuracy and speed.
2. **Lipiyantra**: Mr. Atul Manke and Ms. Srishti Sharma delivered an insightful presentation on the development and deployment of Lipiyantra, an intranet-based English-to-Hindi translation web service. Originally, Lipiyantra engine built and provided by the Space Applications Centre (SAC), Ahmedabad, the foundational system was further enhanced by the CNIT team of PRL, who carried out extensive customization and fine-tuning to adapt the service to the unique operational and security needs of the PRL environment. Their talk focused on the technical challenges involved in adapting the tool for PRL's internal use, including integration with existing infrastructure, user

accessibility and cyber security. Key highlights of the presentation included:

- Tailoring the translation engine to accommodate PRL infrastructure need.
- Upgradation of OS from Ubuntu 22.04 to Ubuntu 24.04.
- Optimizing performance for real-time translation within a secure intranet.
- Enhancing the user interface for ease of use by PRL fraternity.
- Addressing compatibility and deployment challenges within PRL's IT ecosystem
- Real-time translation capabilities demonstrated through sample English text.

Together, these sessions not only demonstrated the technical depth behind the services but also reflected PRL's commitment to harnessing AI for enhancing internal communication, accessibility, and improving productivity.

Glimpses from the event

PRL Amrut Rajbhasha Vyakhyaan - 26

"पीआरएल अमृत राजभाषा व्याख्यान (पर्व)" का 26वां व्याख्यान 10 जुलाई, 2025 को आयोजित किया गया। इस अवसर के प्रमुख वक्ता डॉ. देवांगी एन. जोगल आयुर्वेदाचार्य, प्रोफेसर और प्रसिद्ध लेखिका, सूरत थीं।
The 26th lecture of "PRL Amrut Rajbhasha Vyakhyaan (PARV)" was held on July 10, 2025. The eminent speaker for the occasion was Dr. Devangi N. Jogal, MD (Ayurveda), Ayurvedacharya, Professor and famous writer, Surat.

डॉ. देवांगी एन. जोगल, एम.डी. (आयुर्वेद), डबल गोल्ड मेडलिस्ट है। डॉ. देवांगी एक अनुभवी आयुर्वेदाचार्या, प्रोफेसर और प्रसिद्ध लेखिका हैं, जिन्हें आयुर्वेद चिकित्सा, पंचकर्म, गर्भ संस्कार, आहार विज्ञान, और जीवनशैली सुधार जैसे क्षेत्रों में 18 वर्षों से अधिक का गहन अनुभव है। उन्होंने अब तक 6000 से अधिक रोगियों का सफल उपचार किया है और "गर्भ संस्कार" सहित कई लोकप्रिय पुस्तकों की लेखिका हैं। वर्तमान में वे तीन अस्पतालों और एक ऑनलाइन परामर्श केंद्र का नेतृत्व कर रही हैं, जहाँ उनकी टीम में 12 आयुर्वेद डॉक्टर शामिल हैं। उन्होंने दूरदर्शन हेतु एक 26-एपिसोड की टीवी श्रृंखला "आयुर्वेदिक लाइफस्टाइल" का संचालन किया है और उनका यूट्यूब चैनल JOGIAyurved लाखों दर्शकों द्वारा पसंद किया जा रहा है।

Dr. Devangi N. Jogal, M.D. (Ayurveda), is a dual gold medalist. Dr. Devangi is an experienced Ayurvedacharya, professor and renowned author, who has more than 18 years of extensive experience in the fields of Ayurveda medicine, Panchakarma, Garbha Sanskar, dietetics, and lifestyle modification. She has successfully treated more than 6000 patients so far and is the author of many popular books including "Garbha Sanskar". Presently, she is heading three hospitals and one online consultation centre, where her team comprises of 12 Ayurveda doctors. She has hosted a 26-episode TV series "Ayurvedic Lifestyle" for Doordarshan and her YouTube channel JOGIAyurved is loved by millions of viewers.

व्याख्यान का शीर्षक था "आयुर्वेद द्वारा स्वास्थ्य प्रबंधन: निवारक स्वास्थ्य सेवा के लिए एक व्यक्तिगत दृष्टिकोण"

व्याख्यान में डॉ. देवांगी ने चर्चा की कि आयुर्वेद चिकित्सा की एकमात्र प्रणाली है जो स्वास्थ्य के निवारक पहलुओं को समग्रता में संबोधित करती है। यह हमेशा स्वस्थ रहने की कुंजी के रूप में दिनचर्या (दैनिक दिनचर्या) और ऋतुचर्या (मौसमी आहार) की वकालत करती है। किसी भी बीमारी के उपचार में; आयुर्वेद सभी के लिए मानकीकृत सामान्यीकृत उपचार पद्धति के विपरीत व्यक्ति के मनोवैज्ञानिक संकुचन जिसे "प्रकृत" कहा जाता है, के आधार पर व्यक्तिवादी दृष्टिकोण अपनाता है।
In the lecture, Dr. Devangi discussed that Ayurveda is the only system of medicine that addresses the preventive aspects of health in totality. It advocates dinacharya (daily routine) and ritucharya (seasonal routine) as the key to staying healthy forever. In the treatment of any illness; Ayurveda takes an individualistic approach based on the psychological nature of the individual called "Prakriti" as opposed to a standardized generalized treatment method for all.

उन्होंने आगे बताया कि आयुर्वेद का प्रकृति की अवधारणा के साथ संपर्क करने पर स्वास्थ्य प्रबंधन की चुनौती कैसे आसान हो जाती है। है। प्रकृति के अलावा, उन्होंने निवारक स्वास्थ्य प्रबंधन के लिए दैनिक (दिनचर्या) और मौसमी (ऋतुचर्या) आहार की समय-परीक्षित अवधारणाओं के बारे में भी समझाया।
She further explained how the challenge of health management becomes easier when approached with Ayurveda's concept of nature. Knowing one's Prakruti helps one understand the specific diet, lifestyle and daily regimen for a disease-free life. Apart from Prakruti, she also explained the time-tested concepts of daily (Dinacharya) and seasonal (Ritucharya)

diet for preventive health management.

व्याख्यान के बाद एक रोचक प्रश्नोत्तर सत्र आयोजित किया गया, 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/EYiuMToHGJQ

PRL Ka Amrut Vyakhyaan - 106

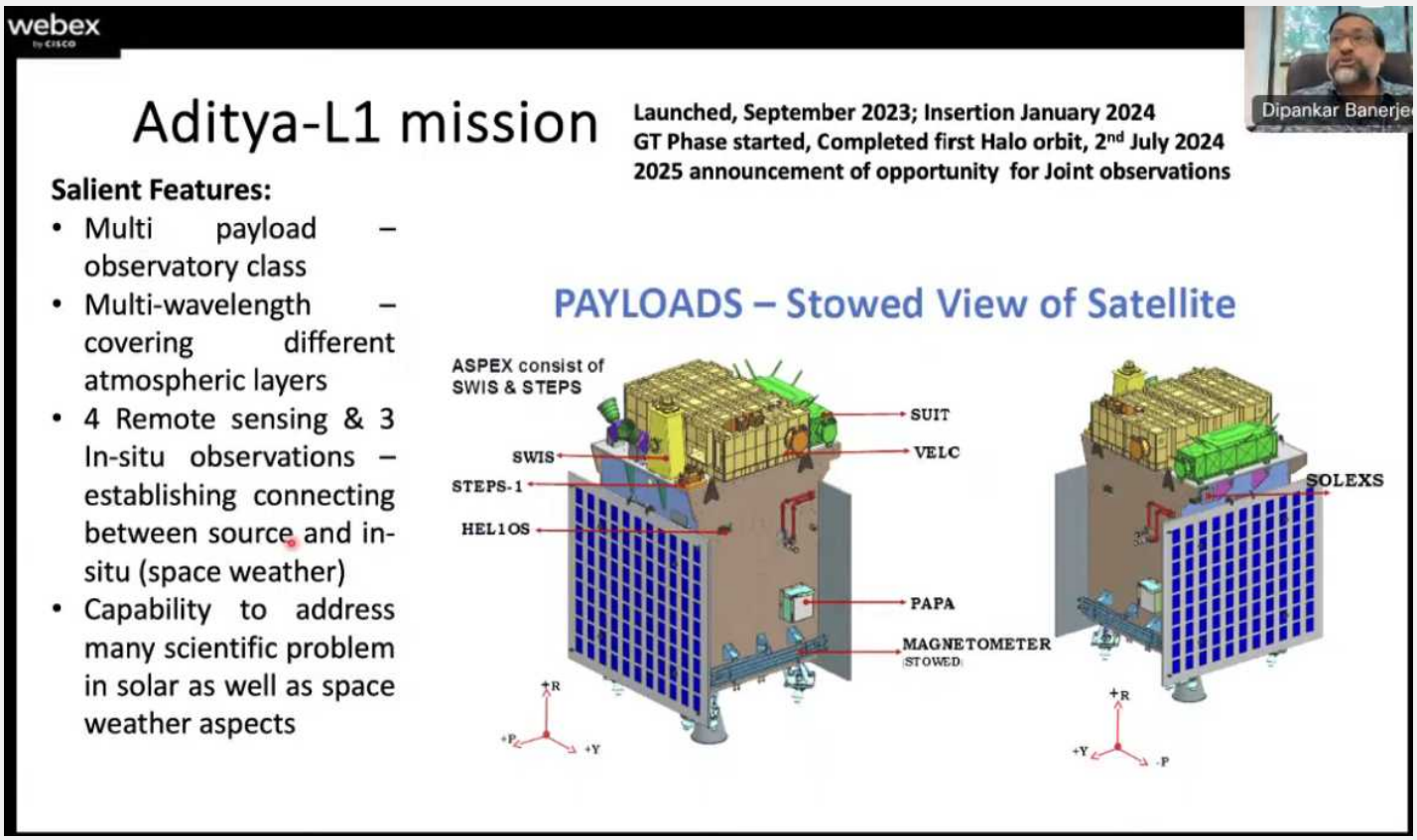
The 106th PRL Ka Amrut Vyakhyaan was delivered on 23rd July 2025 by eminent solar physicist Prof. Dipankar Banerjee, Vice Chancellor of the Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram. In this Vyakhyaan, titled "Recent Heliophysics Missions Launched Within the Last Two Years, and the Role of Aditya-L1", Prof. Banerjee provided an insightful overview of recent international solar missions, with a special emphasis on India's Aditya-L1 mission.

Prof. Banerjee began the Vyakhyaan with a comprehensive overview of the Sun, its atmosphere, and a range of dynamic solar phenomena, including solar flares, coronal mass ejections (CMEs), and solar wind. He emphasized the significant influence of these processes on the heliosphere and their critical role in shaping Earth's space weather environment. He then introduced various observational techniques used to probe the Sun's interior and atmosphere, highlighting the diverse array of space missions currently contributing to our understanding of the Sun and the heliosphere. Drawing on key findings from some of the past missions, Prof. Banerjee discussed results from the Parker Solar Probe, which has provided new insights into CME evolution, and the Ulysses mission, which revealed the variability of the solar wind across solar cycles and its interactions with CMEs. He subsequently shifted focus to India's flagship solar mission, Aditya-L1, underscoring its growing significance within the global heliophysics community. He detailed the mission's payloads—comprising four remote-sensing and three in-situ instruments—spanning X-ray, near-UV, optical, particle, and magnetic field detection capabilities. Prof. Banerjee emphasized that this suite of instruments enables Aditya-L1 to establish critical source-to-site connections within the heliosphere and to address a wide spectrum of heliophysical questions. He presented several early scientific outcomes from the mission, including the detection and monitoring of solar active regions, the evolution of X-class flares and associated CMEs, X-ray solar light curves featuring frequent high-energy flare events during the period of May 2024, and studies on the flare–CME coupling and coronal dynamics. He encouraged the research community to utilize the open-access data released by Aditya-L1, stressing its value for advancing solar physics. Additionally, Prof. Banerjee introduced complementary missions such as PROBA-3, aimed at improving our understanding of CME dynamics, and the upcoming PUNCH mission, designed to deliver 3D perspectives of the outer corona and heliospheric structures.

Toward the end of the Vyakhyaan, he advocated for coordinated, multi-mission solar observations, emphasizing the synergistic potential of Aditya-L1 in collaboration with international observatories. He also highlighted the crucial role of the Aditya-L1 Support Cell in facilitating community participation and encouraged the involvement of younger researchers to strengthen India's contribution to global solar physics research.

Altogether, Dr. Banerjee's Vyakhyaan offered a forward-looking perspective on solar science, space weather, and the transformative potential of Aditya-L1 in enhancing our understanding of the Sun–Earth connection.

Youtube Link: https://www.youtube.com/live/CB3q5wDRrOU



Glimpses from the event

PRL Monthly Publications Digest

Atomic, Molecular and Optical Physics [7]

1. Sahil Rathi, Satyendra Nath Gupta, 2025, Narrowing the Linewidth of the Plasmonic Cavities for Strong Light-Matter Coupling, Plasmonics, Date of Publication: 28/07/2025, Impact Factor: 4.3

2. Devara Anil, Monika Devi, Prabhin Sukumaran, B. V. Lakshmi, K. Deenadayalan, Sunil Kumar, Ambili Anoop, Zakir Khan, Vrushab Mahesh, Gopesh Jha, P. Ajithprasad, Naveen Chauhan, 2025, Youngest Toba Tuff (YTT) beds as a Late Pleistocene isochron in the Indian subcontinent? New geochronological and sedimentological insights, Journal of Quaternary Science, Date of Publication: 25/07/2025, Impact Factor: 2.2

3. Malika Singhal, Himela Moitra, Souvik Mitra, Aurovinda Panda, Jayant Kumar Yadav, D. Srinivasa Sarma, Devender Kumar, Naveen Chauhan, Saibal Gupta, Ashok Kumar Singhvi, 2025, Luminescence characteristics of terrestrial Jarosite from Kachchh, India: A Martian analogue, Meteoritics & Planetary Science , Date of Publication: 22/07/2025, Impact Factor: 2.4

4. Kaushik Chahat, Ghosh Anirban, Chaitanya Kumar S., Devi K., Das R., and Samanta G. K. , 2025, Non-interferometric measurement of geometric phase through stimulated second harmonic generation, Applied Physics Letters, Date of Publication: 21/07/2025, Impact Factor: 3.6

5. Shruti Sajwan, Malika Singhal, Pradeep Kumar Vishwakarma, Naveen Chauhan, Sunil Kumar Singh, 2025, Advanced Luminescent Material for Multikey Static and Dynamic Anticounterfeiting and Information Encryption, ACS Applied Optical Materials, Date of Publication: 15/07/2025, Impact Factor: 3.8

6. B. K. Sahoo, Per Jönsson and Gediminas Gaigalas, 2025, Comparative analysis of Mg+ properties using multiconfiguration Dirac-Hartree-Fock and relativistic coupled-cluster methods, Phys. Rev. A 112, 012809 (2025), Date of Publication: 14/07/2025, Impact Factor: 3.0

7. Mondal Subhajit, Sonali Das, Naveen Chauhan, Saptarshi Dey, 2025, Millennial-Scale Slip Rates Along Blind Himalayan Frontal Thrust: Findings From Chalsa-Gorubathan Recess in East-Central Himalaya, Terra Nova, Date of Publication: 06/07/2025, Impact Factor: 1.7 nate precipitation, and acid digestion, Chemical Geology, Date of Publication: 27/01/2025, Impact Factor: 3.6

Astronomy & Astrophysics Division [3]

1. Malacaria, C., A. Papitto, S. Campana, A. Di Marco, T. Di Salvo, M. Cristina Baglio, G. Illiano, R. L. Placa, A. M. Zanon, M. Pilia, J. Poutanen, T. Salmi, A. S and Manoj Mandal, 2025, Disk reflection and energetics from the accreting millisecond pulsar SRGA J144459.2−604207, Astronomy & Astrophysics, Date of Publication: 14/07/2025, Impact Factor: 5.8

2. Vineet Rawat , M R Samal , A Zavagno , Sami Dib , Davide Elia , J Jose , D K Ojha , K Srivastav, 2025, Star formation efficiency and scaling relations in parsec-scale cluster-forming clumps, Monthly Notices of the Royal Astronomical Society, Date of Publication: 06/07/2025, Impact Factor: 4.8

3. Annie Zavagno, Delphine Russeil, Paolo Suin, Siju Zhang, Ram Kesh Yadav, Miguel Figueira, Loris Berthelot, Doris Arzoumanian, Manash Ranjan Samal, Vineet Rawat, Philippe André, Michael Mattern, Hong-Li Liu, Sarah Sadavoy, Parisa Nozari, Benoît Epinat , 2025, Characterizing the interplay between Galactic star formation and ionization feedback with PRIMA, Journal of Astronomical Telescopes, Instruments, and Systems, Date of Publication: 04/07/2025, Impact Factor: 3.1

Theoretical Physics Division [2]

1. Shukla, Saurabh K., 2025, Constraining scalars of 16_H through proton decays in non-renormalisable SO(10) models, Nuclear Physics B, Date of Publication: 18/07/2025, Impact Factor: 2.8

2. Anupam Ghosh, Partha Konar, Tousik Samui, Ritesh K. Singh, 2025, Jet substructure probe on scalar leptoquark models via top polarization, Journal of High Energy Physics (JHEP) , Date of Publication: 11/07/2025, Impact Factor: 5.5

Space & Atmospheric Sciences Division [4]

1. A.J. de Abreu, E. Correia, Venkatesh, K., A. Pignalberi, M. Pezzopane, V.G. Pillat, P.R. Fagundes, M. Gende, R. de Jesus, 2025, Effects of X2.8-class solar flare on the ionosphere occurred during the recovery phase of a geomagnetic storm over South American and Antarctic sectors, Advances in Space Research, Date of Publication: 21/07/2025, Impact Factor: 2.61

2. Arora, A., H. Gadhavi, S. Ramachandran and T.A. Rajesh, 2025, Evaluation of black carbon emission inventories over Indian subcontinent: Role of open biomass burning and its representation in emission fluxes, Atmospheric Environment, Date of Publication: 17/07/2025, Impact Factor: 3.7

3. Mitra, G., Guharay, A., Batista, P. P., Buriti, R. A., Renkwitz, T., Conte, J. F., 2025, Imprint of a quasi-16-day period in boreal summer through modulation of quasi-2-day wave implying interhemispheric coupling, Scientific Reports, Date of Publication: 15/07/2025, Impact Factor: 3.9

4. Dhaka, S., Lakshmi, S., Vaishya, A., Ojha, N., Pozzer, A., Ansari, T., Deb, P., Sharma, A., 2025, Influences of regional and trans-regional anthropogenic emissions on meteorology and cloud properties over western India assessed using WRF-Chem model, Environmental Science and Pollution Research, Date of Publication: 08/07/2025, Impact Factor: 5.4

Geosciences Division [2]

1. Devaprasad, M., Rastogi, N., Das, S. K., Jena, P. S., Dabhi, A., and Bhushan, R., 2025, Inter-annual variability in sources and characteristics of carbonaceous aerosols using dual carbon isotopes over a megacity in eastern India, Atmospheric Environment, Date of Publication: 31/07/2025, Impact Factor: 3.7

2. Shaw, C., Rastogi, N., Mandal, R. and Sanyal, P., 2025, Formation pathways of particulate NO3- and sources of its precursor over the northwest India: Insights through dual isotopes, Atmospheric Environment, Date of Publication: 24/07/2025, Impact Factor: 3.7

Udaipur Solar Observatory Division [2]

1. Ananya Rawat, Girjesh Gupta, Tom Van Doorsselaere, S. Krishna Prasad, and Robertus Erdélyi, 2025, Understanding the Magnetic Field and Plasma-β along Umbral Fan Loops Traced Using 3 Minute Slow Waves, The Astrophysical Journal Letters, Date of Publication: 17/07/2025, Impact Factor: 11.7

2. Srinjana Routh, Anshu Kumari, Vaibhav Pant, Jaydeep Kandekar, Dipankar Banerjee, Mohd. Saleem Khan and Dibya Kirti Mishra, 2025, Insights into chromospheric large-scale flows using Nobeyama 17 GHz radio observations, Astronomy & Astrophysics Letters, Date of Publication: 08/07/2025, Impact Factor: 5.8

Awards & Honours

(1) Dr. Neeraj Srivastava, Associate Professor, Planetary Sciences Division, PRL has been inducted as an Associate Editor in the domain of Planetary Remote Sensing of JISRS Editorial Board.

(2) Prof. S. Ramachandran, Senior Professor, Space and Atmospheric Sciences Division, PRL, has been invited to serve as a Lead Author for Chapter 3 (Changes in regional climate and extremes, and their causes) of the IPCC Working Group I Seventh Assessment report.

(3) Prof. Santosh Vadawale, Senior Professor, Astronomy and Astrophysics Division, PRL, has been elected as a Corresponding Member for Section 1 on Basic Sciences of the International Academy of Astronautics (IAA).

(4) Dr. Anshu Kumari, Reader, Udaipur Solar Observatory, PRL, has been selected as a senior member of the Indian National Academy of Engineering (INAE).

(5) Ms. Sachna Sathyan, Senior Research Fellow (DST-INSPIRE), Planetary Sciences Division, PRL, has received The Best Poster Award in the ASI Symposium 004: Genesis and Evolution of organics in space (2nd symposium of OIS), held at GITAM deemed to be a university, Bengaluru, from 16-18 July.

(6) Prof. Jayesh P. Pabari, Professor, Planetary Sciences Division, PRL, has been selected as one of the Editorial Board Members of Nature Scientific Reports.

(7) Prof. D. Pallam Raju, Senior Professor, Space and Atmospheric Sciences Division, and Dean, PRL, has been nominated by ISRO/DOS to represent India at the Committee on Space Research (COSPAR) as its Council Member.

Visitors

1. Dr. Georgios Georgousis from Raymetrics Lidar, Greece visited Physical Research Laboratory, Ahmedabad from 07.07.2025 to 09.07.2025 in connection with the maintenance and servicing of Raman Lidar installed at PRL.

2. Mr. Tokuda Ichiro of JOEL India Pvt Ltd, New Delhi visited Physical Research Laboratory, Ahmedabad from 14.07.2025 to 20.07.2025 in connection with servicing the FE-EPMA and provide application training at PRL Thaltej Campus.

3. The following foreign nationals are attending the course on Space Atmospheric Science under CSSTEAP scheduled from 01.08.2025 to 30.04.2026 by visiting Physical Research Laboratory, Ahmedabad, Udaipur Solar Observatory, Udaipur and Infra-Red Observatory, Mount Abu from 31.07.2025 onwards: -
(i) Mr. Mansur Abul, Asst. Meteorologist, Bangladesh Meteorological Department BMD, Dhaka
(ii) Md. Imran, Asst. Meteorologist, Bangladesh Meteorological Department BMD, Dhaka
(iii) Mr. Baeva Nodira, Institute of Horticulture, Tajik Academy of Agricultural Science Tajkistan

4. Dr. Subramania Athiray, Assistant Professor, Dept. of Space Science, University of Alabama, Huntsville, USA visited Udaipur Solar Observatory, Udaipur from 30.06.2025 to 01.07.2025 for Scientific discussion and to deliver talk in USO Divisional Seminar.

5. During July 2025, the following have visited Infrared Observatory, PRL, Mount Abu:- Eight(8) Defense Personnel and Fourteen (14) General Public.

Hearty welcome to our new members

NAME: Mr. Sudhanshu Raj Singh Bhati

DESIGNATION: Junior Personal Assistant

DATE OF JOINING: 08.07.2025

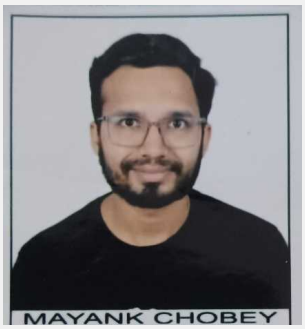
DIVISION/AREA: Dean's Office

NAME: Mr. Partha Pratim Das

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Astronomy & Astrophysics Division



NAME: Mr. Mayank Chobey

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Astronomy & Astrophysics Division

NAME: Mr. Shubham Sharma

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Atomic, Molecular & Optical Physics Division

NAME: Ms. Mahika Sharma

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Geosciences Division

NAME: Ms. Anagha SM

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Geosciences Division

NAME: Mr. Saurabh Kumar Thakur

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Theoretical Physics Division

NAME: Ms. Khushi Singla

DESIGNATION: JRF

DATE OF JOINING: 14.07.2025

DIVISION/AREA: Theoretical Physics Division

NAME: Mr. Madhak Rutvik Bharatbhai

DESIGNATION: JRF

DATE OF JOINING: 15.07.2025

DIVISION/AREA: Atomic, Molecular & Optical Physics Division

NAME: Mr. Arun Krishna BM

DESIGNATION: JRF

DATE OF JOINING: 15.07.2025

DIVISION/AREA: Geosciences Division

NAME: Mr. Apratim Nanda

DESIGNATION: JRF

DATE OF JOINING: 15.07.2025

DIVISION/AREA: Planetary Science Division

NAME: Ms. Megha

DESIGNATION: JRF

DATE OF JOINING: 15.07.2025

DIVISION/AREA: Space & Atmospheric Science Division

NAME: Mr. Sunish Prashar

DESIGNATION: JRF

DATE OF JOINING: 16.07.2025

DIVISION/AREA: Astronomy & Astrophysics Division

NAME: Mr. Nanita Satish

DESIGNATION: JRF

DATE OF JOINING: 16.07.2025

DIVISION/AREA: Atomic, Molecular & Optical Physics Division

NAME: Mr. Subham Murmu

DESIGNATION: JRF

DATE OF JOINING: 16.07.2025

DIVISION/AREA: Geosciences Division

NAME: Mr. Anurag Harsha

DESIGNATION: JRF

DATE OF JOINING: 16.07.2025

DIVISION/AREA: Geosciences Division

NAME: Mr. Shivam

DESIGNATION: JRF

DATE OF JOINING: 16.07.2025

DIVISION/AREA: Theoretical Physics Division

NAME: Mr. Adarsh VS

DESIGNATION: JRF DST-INSPIRE

DATE OF JOINING: 22.07.2025

DIVISION/AREA: Planetary Science Division

NAME: Dr. Chandrodoy Chattopadhya

DESIGNATION: Assistant Professor

DATE OF JOINING: 23.07.2025

DIVISION/AREA: Theoretical Physics Division

NAME: Mrs. Tasneem Hozefa Rangwala

DESIGNATION: Account Officer (On Deputation)

DATE OF JOINING: 28.07.2025

DIVISION/AREA: Accounts Division

NAME: Mr. Shivam Verma

DESIGNATION: Post Doctoral Fellow

DATE OF JOINING: 28.07.2025

DIVISION/AREA: Theoretical Physics Division

Compiled, Designed and Published by

The Newsletter Team

Prof. Navinder Singh	Chair
Dr. Amitava Guharay	Co-Chair
Mr. BS Bharath Saiguhan	Convener

Data Collection and Proofreading Team

Dr. Satyendra Nath Gupta	Member
Dr. Yogita Uttam Kadlag	Member
Dr. Sanjay Kumar Mishra	Member
Dr. Rohan Eugene Louis	Member
Dr. Paramita Dutta	Member
Mr. Senthil Babu T J	Member
Dr. Manash Ranjan Samal	Member

Formatting and Editing Team

Mr. A Shivam	Member
Dr. Pragya Pandey	Member
Ms. Shreya Pandey	Member
Mr. Kushagra Upadhyay	Member
Mr. BS Bharath Saiguhan	Convener
Mr. Jacob Sebastian	Member
Mr. Shivansh Verma	Member
Ms. Purvi Giri	Member
Mr. Vimlesh Kumar	Member
Ms. Jyoti Limbat	Member
Mr. Rutuj Gharate	Member
Ms. Srishti Sharma	Member
Mr. Abhishek Kumar	Member

For any suggestions or query, please contact us at: newsletter@prl.res.in

Follow PRL on Social Media

https://x.com/PRLAhmedabad

https://www.facebook.com/PhysicalResearchLaboratory

https://www.youtube.com/c/PRLAhmedabad_webinars

https://www.instagram.com/prl1947/

https://www.linkedin.com/in/prl-ahmedabad-89600122b

https://www.threads.net/@prl1947

PRL Contact

https://www.prl.res.in/prl-eng/home

Website (English)

Website (Hindi)

Physical Research Laboratory
(A unit of Dept. of Space, Govt. of India)
Navrangpura, Ahmedabad - 380009
Phone: (079) 26314000
Fax: (079) 26314900
E-Mail: director@prl.res.in

भौतिक अनुसंधान प्रयोगशाला
(अंतरिक्ष विभाग की यूनिट, भारत सरकार)
नवरंगपुरा, अहमदाबाद – 380009
दूरभाष: (079) 26314000
फैक्स : (079) 26314900
ई – मेल: director@prl.res.in