



The Author



Surendra Vikram

About him:

Dr. Surendra Vikram is Post Doctoral Fellow at Atomic Molecular & Optical Physics Division.



Complex structures synthesized in shock processing of nucleobases – implications to the origins of life

(V S Surendra, V Jayaram, M Muruganatham, T Vijay, S Vijayan, P Samarth, H Hill, A Bhardwaj, N J Mason, B Sivaraman)

Nucleobases are nitrogenous bases composed of monomers, a major constituent of RNA and DNA, which are an essential part of any cellular life on Earth. The search for nucleobases in the interstellar medium remains a major challenge. However, the recent detection of nucleobases in meteorite samples and laboratory synthesis in simulated analogue experiments have confirmed their abiotic origin and a possible route for their delivery to the Earth. Nevertheless, cellular life is based on the interacting network of complex structures, and there is a substantial lack of information on the possible routes by which such ordered structures may be formed in the prebiotic environment. We present the evidence for the synthesis of complex structures due to the shock processing of nucleobases. The nucleobases were subjected to the reflected shock temperature of 3500–7000 K (estimated) and pressure of about 15–34 bar for over ~2 ms timescale. Under such extreme thermodynamic conditions, the nucleobases sample experiences superheating and subsequent cooling. Electron microscopic studies of shock processed residue show that nucleobases result in the spontaneous formation of complex structures when subjected to extreme conditions of shock. These results suggest that impact shock processes might have contributed to the self-assembly of biologically relevant structures and the origin of life.

Reference: <https://doi.org/10.1017/S1473550421000136>

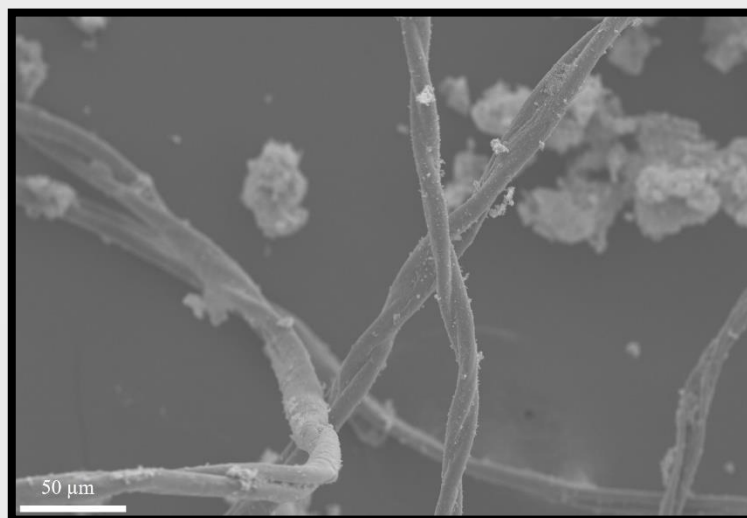


Figure : SEM micrograph of shock processed mixture of four nucleobases with ribose showing long twisted filaments.

The Author



Anil Patel

About Him:

Dr. Anil Patel is Post Doctoral Fellow at Geosciences Division.

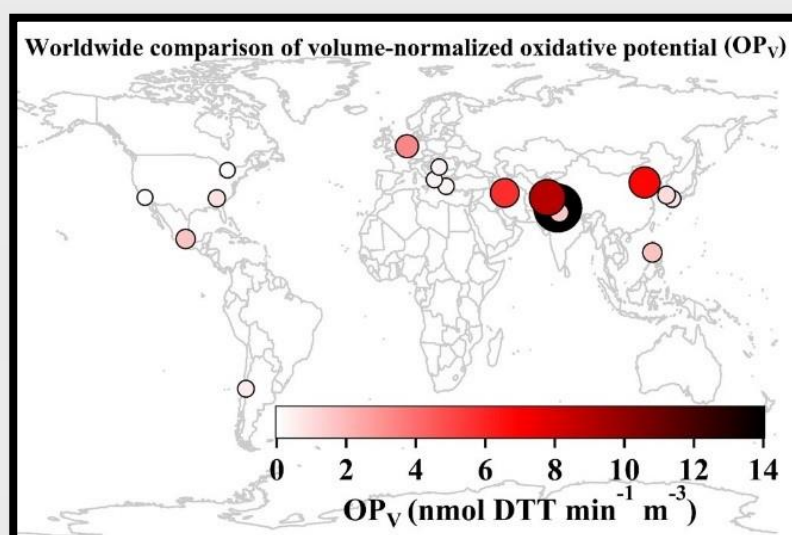


Remarkably High Oxidative Potential of Atmospheric PM_{2.5} Coming from a Large-Scale Paddy-Residue Burning over the Northwestern Indo-Gangetic Plain

(Anil Patel, Rangu Satish, and Neeraj Rastogi)

High PM_{2.5} (particulate matter with an aerodynamic diameter 2.5 μm or less) concentrations are known to cause severe chronic cardiovascular and respiratory diseases. The present study assesses the dithiothreitol (DTT)-based oxidative potential (OP) measured on PM_{2.5} filters extracted with a mixture of water and methanol. PM_{2.5} samples were collected during paddy-residue burning that occurs every year in the northwest Indo-Gangetic Plain (IGP) during October–November. The entire study period was classified into four categories: pre-intense burning, Diwali, intense burning, and post-intense burning. On average, the PM_{2.5} mass concentrations were 154 ± 59, 340 ± 74, 271 ± 122, and 156 ± 19 μg m⁻³; volume-normalized OP (OP_V) values were 7.6 ± 2.8, 9.4 ± 1.1, 14 ± 5.1, and 12 ± 1.9 nmol DTT min⁻¹ m⁻³; and mass-normalized OP (OP_M) values were 51 ± 18, 29 ± 7, 55 ± 12, and 78 ± 9 pmol DTT min⁻¹ μg⁻¹ during pre-intense burning, Diwali, intense burning, and post-intense burning periods, respectively. The intense burning period was associated with a relatively high mass fraction of organic aerosols compared to Diwali that was associated with a relatively higher fraction of inorganic aerosols. It likely caused higher OP_V during the intense burning period compared to Diwali, which highlights the role of chemical composition in PM_{2.5} OP. The observed OP_V value during the intense burning period is the globally highest reported value (average 14 nmol DTT min⁻¹ m⁻³). Biomass burning markers, such as organic carbon/elemental carbon (OC/EC) and K⁺/EC, correlated significantly with OP_V during the intense burning period, attesting the effect of burning emissions on the observed OP. The relationship of OP_{OC} (ratio of OP_V and OC mass concentration) with specific brown carbon chromophores during the post-intense burning period indicates the plausible link between atmospheric ageing of redox-active organic aerosols and their optical properties. Development of a mitigation strategy for such high DTT-active PM_{2.5} is important to avoid a wide array of possible health effects on the inhabitants of the study and downwind regions.

Reference: <https://doi.org/10.1021/acsearthspacechem.1c00125>



The Author



Arghajit Jana

About Him:

Dr. Arghajit Jana is
Post Doctoral
Fellow at
Astronomy &
Astrophysics
Division.



Exploring the Changing-look AGN NGC 1566 from Broadband X-ray Observation

(Arghajit Jana, Neeraj Kumari, Prantik Nandi, Sachindra Naik, Arka Chatterjee, Gaurava K. Jaisawal, Kimitake Hayasaki, Claudio Ricci)

Changing-look AGNs (CLAGNs) are subject to switch between type-1 and type-2, with the appearance and disappearance of broad emission lines. CLAGNs are rare; only a few dozen have been detected so far. NGC 1566 is a nearby ($z=0.005$) active galaxy that shows changing-look events in June 2018. NGC 1566 was in a low luminosity state ($L \sim 1041$ ergs/s) over a decade. In June 2018, NGC 1566 went into an outburst when the X-ray intensity increased by ~ 25 -30 times compared to the low-luminosity state. Simultaneously, broad emission lines appeared as NGC 1566 transitioned to type-1 from type-2.

We studied NGC 1566 between 2007 and 2020, using the data obtained by Swift, XMM-Newton and NuSTAR in broad energy of 0.5-70 keV. We studied the source in the pre-outburst, outburst and post-outburst phases. We studied the timing and spectral properties in detail using various phenomenological and physical models.

We find that the outburst is caused by the instability in the accretion disk. This is supported by the hardness-intensity diagram (HID) that is observed during the outburst. We also observed three more small flares after the main outburst. This can be explained by a tidal disruption event of a star by a binary supermassive black hole.

Reference: <https://doi.org/10.1093/mnras/stab1231>

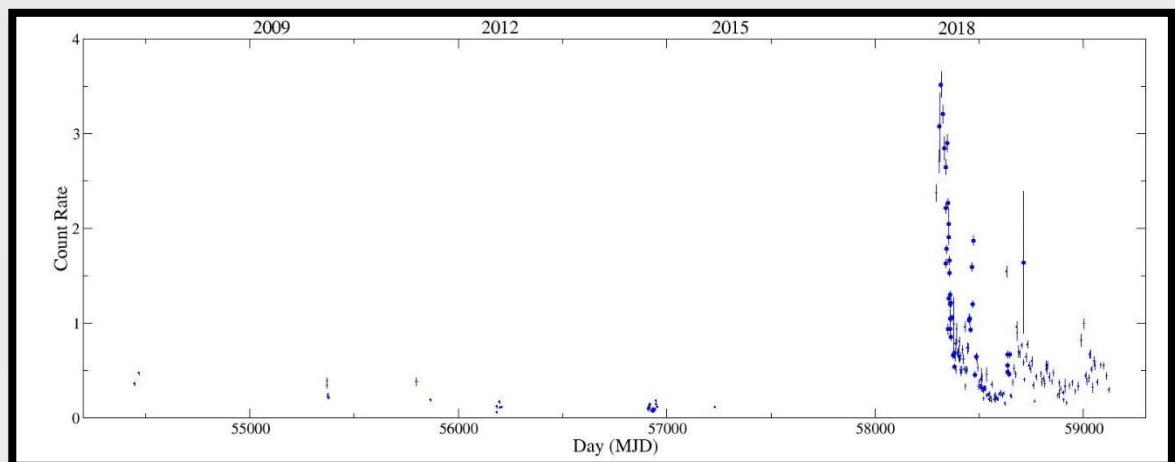


Figure : The 0.3-10 keV Swift/XRT lightcurve of NGC 1566 between 2007 and 2020.

The Author



Ramakant R.
Mahajan

About Him:

Mr. Ramakant R. Mahajan is a Senior Scientist in Planetary Sciences Division with expertise in Noble Gas Mass Spectrometry.



Noble gases and nitrogen in CV3 chondrite Bukhara

(Ramakant R. Mahajan, Shuhrat A. Ehgamberdiev, Sekhar Naik)

The primitive material in our solar system is preserved in the form of rocky asteroids. Few of these asteroids remain unaltered throughout their geological timeframe. The collisional events or disruption of the orbits of asteroids end up in the ejection of rocks from them, called ‘meteorite’ once it fell on the Earth’s surface. These meteorites host the records of the earliest history of nebular events and solar system formation. On 9th July 2001, one such meteorite fell at place Bukhara, Uzbekistan, classified as carbonaceous chondrite. The meteorite is named at the place where it fell or was found. Carbonaceous chondrites are one of the most auspicious rocks for deconvoluting the physico-chemical processes that occurred in the proto-planetary disk. Trapped noble gas isotopic signatures in this meteorite reveal their origin in two ways, one from implantation of solar wind and second from phase-Q (known to present in chondrites). Elemental ratios of argon, krypton and xenon also support it. The presence of solar gases places constraints on the chondritic material history. The most viable mechanism for the solar gas implantation in the rocky material is on the asteroid, which requires its presence on the surface for a considerable duration. It implies the residence of the meteoritic material in the regolith of the asteroid. Nitrogen isotopic ratios in the bulk meteorite define the gas input to the ingredient of rocky objects during their formation. It, therefore, provides constraints of the formation location and/or time of the main constituents of the meteorite in the solar nebula. The nitrogen isotopic ratio in Bukhara is distinct from earlier studied CV chondrites. It suggests that there is more than one parent body from which the CV chondrites originated. Material from one parent body, here unprocessed asteroid is thought to be homogeneous in the bulk scale. Combining the cosmic ray exposure age, trapped nitrogen isotope ratio, and oxygen isotope for bulk aliquot measurement confirms that there are distinct parent asteroids from which CV chondrites originated.

Reference: <https://doi.org/10.1016/j.pss.2021.105334>



Figure : Fragment of the Bukhara CV3 chondrite.

Future Exploration of Venus

Debabrata Banerjee

Venus is similar to Earth in size, composition, and distance from the Sun; however, the evolution of Venus took a very different path to that of Earth. A greenhouse climate has resulted in surface temperatures of 740 K, yet whether similar conditions as found on Earth existed in its early stages is unclear, and an unresolved question concerns whether significant water might have been present during the first 1-2 billion years of Venus's history. Thus, Venus exploration is necessary to understand general processes that govern inner planets, and its evolution. A major technological requirement is establishment of aerial platforms for measurement of atmospheric characteristics, including the possibility of deploying balloon payloads at 50-60 km altitude. This article presents perspectives of recent and new missions to Venus, and some major science questions to be addressed by these missions.

Atmospheric Composition

Venus' atmospheric composition is important for understanding how Venus's climate evolved and our understanding of the runaway greenhouse effect. Abundances and isotope ratios of noble gases and stable isotopes are not well known. Major questions remain regarding altitude profiles of key minor atmospheric species, formation of clouds and their compositions, and composition of Venus' haze. Orbital measurements (e.g., those made by Venus Express) are incomplete and hence future orbital measurements should determine space-time variability of minor species mainly above the cloud tops and vertical profile measurements by a probe/lander making a single descent.

Detection of phosphine (PH_3) in Venus's atmosphere (50-60 km above surface) as proposed by researchers from Cardiff University has been questioned in the literature. Phosphine can be produced by microbes existing in environments depleted of oxygen, and could be a biosignature of life. Concentrations of 1 ppb of phosphine are too large to be produced by volcanic eruptions at surface or by lightning in the atmosphere. However, recent work suggests the spectral signature came from SO_2 rather than phosphine. A sample return mission which collects organic material from cloud layers and returns to Earth would resolve this issue.

Atmospheric Structure and Circulation

The dense, super-rotating atmosphere of Venus is important in respect of understanding the formation and evolution of planetary atmospheres. Floating platforms, as well as Earth-based Doppler spectroscopic measurements from visible to sub-millimeter, and inferences from the global distribution of airglow measurements suggest super-rotation of the atmosphere below ~ 75 km. Key questions remain regarding the 3D structure of the global atmospheric circulation from the surface to upper ionosphere, processes sustaining the circulation, nature and temporal variations of the circulation.

Surface Composition and Morphology

The compositions of terrestrial planets can be used to infer their evolutionary history. Venera and Vega landers have estimated the major element composition of the Venus surface previously and synthetic aperture radar (SAR) has been used to determine the morphology of plains. The mean crater age for the surface is about 1 Ga or less. It is not well known whether resurfacing continues in Venus. Venus Express Visible and Infrared Thermal Imaging Spectrometer (VIRTIS) data provided compositions for the tesserae on Venus, and recent volcanism has been inferred. Characteristic rates of surface processes and weathering, particularly at < 100 m scales, are not well known. Improved measurements

Missions

Several space agencies have announced missions to Venus during the two years. Presently, JAXA's Akatsuki spacecraft is the only one orbiting Venus, and has six payloads investigating atmosphere's stratification, dynamics and cloud physics. NASA proposes to launch two new missions, DAVINCI+ and VERITAS between 2028 and 2030. NASA's VERITAS mission will investigate the geological evolution of Venus, and the possibility of existence of water during its early history. Russia has proposed Venera-D mission which may be launched in 2025. Subsequently, ESA has proposed the "Envision" orbiter mission to Venus in early 2030s.

DAVINCI+ (Deep Atmosphere Venus Investigation of Noble Gases, Chemistry and Imaging) will study Venus' atmosphere with an orbiter along with an hour-long probe based transect through the atmosphere to its surface, with measurements of how the atmosphere changes with depth. The probe will have a quadrupole mass spectrometer which aims at in-situ measurements of noble and trace gases, a tunable laser spectrometer (D/H measurement), whereas a 1-micro near IR band camera will image Venus and may provide compositional information.

The VERITAS mission (Venus Emissivity, Radio Science, InSAR, Topography and Spectroscopy) has an objective of global mapping of the topography of Venus. VISAR, an interferometric X-band SAR will produce a global DEM with a 5 m height accuracy and will image Venus at 30 m resolution (global) and 15 m resolution for targeted areas. The VEM instrument will map surface emissivity in six near-IR bands in five atmospheric windows. It will also make water vapour measurements using other atmospheric bands.

Another mission from ESA, EnVision will be launched later in the 2030s and will orbit Venus; it includes a radar sounder to investigate layers within the planet, spectrometers to analyze gases (sulphur species) in Venus' atmosphere and surface composition, a radar (S-band) instrument to map the planet's surface, and a radio science experiment for probing interior structure and gravity field. These missions and new missions by other space agencies should significantly enhance our knowledge of the evolutionary history of Venus, and will provide new insights into the past and future of the terrestrial planets.

References

1. Smrekar, S.E. et al., LPSC 2021, Abstract No 2211.
2. Garvin, J. et al., LPSC 2020, Abstract No 2599.

EVENTS @ PRL

Vikram Sarabhai Jayanti in PRL Campuses

To celebrate the 102nd birth anniversary of Prof. Vikram Sarabhai, father of Indian space Programme and founder of PRL, a function was organised in his remembrance at all campuses of PRL. Garlanding and tree plantation in the presence of family members of Sarabhai and other dignitaries from Ahmedabad and Gandhinagar were conducted on 12th August, 2021.

The function started with garlanding by Sarabhai family members along with the dignitaries invited and other members of PRL. Owing to Covid-19 restrictions and keeping all the prevailing Covid guidelines, PRL staff were invited to attend the function in the open area. Anecdotes were shared related to Prof. Vikram Sarabhai and his passion for the development of society through space science. Thereafter, a tree plantation drive at all PRL campuses was organised. The retirees, new joinees including students participated in the function with great zeal. PRL’s moto this time in conjunction with Prof. Vikram Sarabhai’s birth anniversary celebration was to plant double the number of trees which were destroyed during the Tauktae cyclone.

Glimpses of the event:



“An Evening in PRL”

To celebrate the Independence Day and 75th year of PRL, a special program ‘an evening in PRL’ was organized on 15th August 2021. PRL Main campus was beautifully illuminated with lights. On this evening, family members of PRL employees were allowed to visit the otherwise restricted campus. The families were encouraged to take a car ride inside the campus on a designated path. They were also allowed to take a walk, if they preferred. During the trip, they were fervently welcomed by our director Dr. Anil Bhardwaj. He interacted with almost all the families along with the employees with great zeal and inquired about their experience and views. The whole program lasted for almost 5 hours. For the families and colleagues who could not attend the program in person, the program was also telecasted live on YouTube. A special care was taken to follow the Covid appropriate behaviour during the program.

Glimpses of the event:





PRL ka Amrut Vyakhyaan

India will be celebrating the 75th anniversary of independence on 15th August 2022. To mark this milestone, the Government of India has launched 'Azadi ka Amrit Mahotsav', a 75-week long mega-festival to celebrate her glorious history, culture, and achievements. This also coincides with the 75th year of the foundation of the Physical Research Laboratory (PRL). As part of the celebrations, PRL is organizing "PRL Ka Amrut Vyakhyaan," a series of weekly vyakhyaan (colloquia) delivered online by eminent speakers from academia, arts, literature, business, and law. This series of vyakhyaan was inaugurated on 04 August 2021 by Dr K Radhakrishnan, former Secretary, Department of Space, Government of India and former Chairman, ISRO.

Each Vyakhyaan is of one hour duration, followed by discussions and interactions at the end. This event is streamed live on PRL's YouTube channel. Following are the details of the vyakhyaan delivered so far.

S.No	Date	Title	Speaker	Affiliation
1	04-08-2021	OSIRIS-REx: Sample science and the geologic context for the return regolith from active asteroid Bennu	Prof. Harold C. Connolly Jr	Rowan University, NJ, USA
2	11-08-2021	REACHING THE SKY: INDIAN LAUNCH VEHICLES	Shri S. Somanath	Vikram Sarabhai Space Centre (VSSC), ISRO, Thiruvananthapuram
3	18-08-2021	Confined water: Many surprises	Prof. Prabal K Maiti	Department of Physics, Indian Institute of Science, Bangalore
4	25-08-2021	Our immunity and emerging diseases	Prof. Chandrima Shaha	Indian National Science Academy, New Delhi
5	01-09-2021	Floods in a Changing Climate	Prof. P P Mujumdar	Interdisciplinary Centre for Water Research, Indian Institute of Science, Bangalore
6	08-09-2021	Safety of nanomaterials: A journey from research to policy	Prof. Alok Dhawan	Centre of Biomedical Research, Lucknow, India

Fire Safety & Security

Fire safety awareness is an important aspect of fire safety risks at any work space/organization. Fire prevention planning & training to all staff members/ students/human resources available at various Campuses of PRL, thus is an important aspect and should be periodically taken care of.

In this connection, the following activities were conducted by us in co-ordination with CISF: -

- Special PRL@75 Lecture on Fire Safety through ONLINE MODE on 23/08/2021 (Monday) at 02.30 PM.
- PRL@75 Live Demo on Fire Safety on Friday, August 27, 2021 at PRL main campus at 10.30 am, at second gate.
- PRL@75 Live Demo on Fire Safety on Monday, August 30, 2021 at PRL Thaltej campus on, at 2.30 pm, opposite old building.

An online lecture on Fire Safety was attended by 240 participants through online mode including 40 contractual staffs (at all campuses i.e. PRL Main & Thaltej Campus, MIRO and USOOB) attended through live telecast mode to them, at a common place, at respective campuses.

The Fire Safety demo at PRL Main Campus was attended by 155 participants in Physical presence including gardeners, catering and daily-wages persons on Friday, August 27, 2021. The event was aired via WEBEX to MIRO and USOOB. The Fire Safety demo at PRL Thaltej Campus was attended by 145 participants including gardeners, catering and daily-wages persons on Monday, August 30, 2021. The co-operation and co-ordination by CISF team is acknowledged on records. The Fire Safety demonstration conducted with interactive and well-participated manner by our staff members.



Sadbhavana Diwas

As per the Government of India, Department of Space directive, the 20th August – the birth anniversary of Late Shri Rajiv Gandhi – is observed as ‘SADBHAVANA DIWAS’ to promote national integration and communal harmony among people of all religions, languages and regions. In PRL, Staff members observed the Sadbhavana Diwas at one’s own work place on Friday, the 19th August, 2021 at 1100 hours following the COVID appropriate behaviour.



Creche Inauguration

In the present scenario, it is increasingly difficult to provide a nest to the children round the clock as most families now rely on two breadwinners to stay above water. Moreover, mothers are more likely than fathers to take time away from paid work to care for a child, which can exacerbate mothers’ lifetime earnings gap. This crisis makes clear the need for increased investment in high-quality pre-K and child care.

Further, obtaining affordable, quality-assured creche is a major concern for many parents. As the need for child day care has increased, the child day care services industry began to fill the need of non-relative child care. In PRL, also being most of the employees both working parents, there was a demand of creche facility at working place.

As a welfare measure, the Director, PRL constituted a Committee for Creche facility at PRL Navrangpura Colony. The residential quarter of PRL Navrangpura Colony was earmarked for the Creche facility as it is nearby the PRL Main campus and the Dispensary, also safe for kids from security point of view.

The various Committees worked out on the modalities for the operations of creche facility. CMG team has put their best & time-bound efforts & renovated the building, which looks stunning after the makeover. Thereafter, a separate Committee was formed to finalize the bare minimum requirement for creche. Technical Sub-Committee members worked for CCTV installation at the building. Further Purchase Committee did market survey and procured and placed the items by the February 2020 however, due to the rise of COVID-19 pandemic, the inauguration and operational aspect of the creche facility were delayed.

Thereafter, the Creche Operational Committee worked out on functioning aspects of the facility. A warm Inaugural was organized on the auspicious occasion of Vikram Sarabhai Jayanti on 12th August, 2021. A Mangal Pravesh was done following some rituals by the Director, PRL alongwith kids. Kids were made to cut the ribbon alongwith the Director, PRL and they were full of childish enthusiasm which filled the premises with the fervor of smileys and joys. The decoration for the welcome of children had every warmth and care and left the onlookers awestruck. The kids enjoyed to their heart at their new nest and so did the officials who attended the function. The creche facility was announced to be functional from 16th august, 2021 and willing staff members were encouraged to take its benefit.

Further, the Director, PRL distributed goodies to kids. Tree-plantation was done by the Director, PRL and staff member opposite to the creche building to earmark the opening of the creche.



Independence Day 2021

The 75th Independence Day of India, which coincides with the 75th anniversary of the establishment of the Physical Research Laboratory, was celebrated with great zeal and enthusiasm. The flag was hoisted by Dr. Anil Bhardwaj, Director, PRL which was followed by the National Anthem. In his address to the audience, the Director remembered the sacrifices of brave martyrs and paid tribute to them and discussed the activities of the institute in the scientific field and related subjects.

In order to attract the interest of the young minds in Science and Scientific Research, Director, PRL launched a welfare scheme named as “Vikram A. Sarabhai Protsahan Yojana – Vikas”. This is a scholarship for class 9 and 10 students of Gujarat state. In this scheme, scholarship will be given to a total of 10 students, out of which fifty percent will be specially for girl students. A distinctive Logo marking India's independence and PRL’s institution was launched as a series of the Platinum Jubilee celebration year. The logo was designed by PRL employee Mr. Shashank Urmalia.

This was followed by merit and service awards to CISF Cadets and PRL Employees who have completed 25 years of services in PRL. A cultural programme was conducted by PRL Staff member on this occasion. The Director gave away merit awards to the children of staff members for securing highest marks in Hindi in class X and XII. Other prizes related to Official Language were also announced and distributed.

Trees and plants are the fundamental life support of living beings. To make this a sustainable resource, a tree plantation program was also organized in our office premises. Small children along with their parents, guardians took part in this campaign. After this, tricolour balloons were released by the small children to mark this day of Independence. This signifies peace for the country and the Earth, the prosperity and greenness of our Department and Institute.

The 75th Independence Day of India was also celebrated at Udaipur Solar Observatory / Physical Research Laboratory (USO/PRL) with the hoisting of the flag by Prof. Nandita Srivastava followed by the National Anthem. The event was attended by all the staff and their family members, research scholars, contractual staff and security personnel. The security personnel also participated in the Flag march and parade on this occasion. The winners of the online essay competition organized on Vishwa Hindi Diwas were also awarded.



Inauguration Ceremony of USO Hostel Building

The newly constructed Hostel building at USO/PRL was inaugurated by Dr. Anil Bhardwaj, Director, PRL on 22nd August 2021 in presence of staff members, research scholars, PDFs, contractual staff, security personnel, retirees and their family members. The Hostel building, equipped with all basic facilities, was a long time requirement for the research scholars at USO/PRL.

Following the inauguration of the USO/PRL Hostel, Director, PRL handed over the keys and the room allotment letter to all the research scholars. As the inauguration of Hostel building coincided with the auspicious festival of Rakshabandhan, Director, PRL tied Rakhi to all PhD students, PDFs, and children of the staff members and guests. A massive tree plantation drive was also carried out with nearly 40 plants being placed around the Hostel campus. In view of COVID-19 the programme were organized by adhering to all COVID protocols.



Lecture on "Sexual harassment of women at work place"

A Special [PRL@75](#) online Lecture on "Sexual harassment of women at work place" by Ms Sowmya Bhat was organised by ICC and Women-cell on Tuesday, 24 August 2021.

Ms Sowmya Bhat is a socially conscious lawyer who is keen on addressing human rights issues which affect the socially disadvantaged. She has been litigating in Bangalore, and has been involved in matters related to gender equality, family law, property law and the rights of the urban poor and marginalised communities. Apart from her litigation practice, she has extensive experience in legal awareness and gender sensitisation training. She has been effective in sensitising employees, Internal Committee members, and senior management employees across the country on issues related to sexual harassment.

More than 250 PRL staff and students attended it. The talk brought clarity to the many grey areas associated with sexual harassment at workplace. It was very well received and appreciated.

**FOR A SAFE AND
HARASSMENT FREE
WORKING
ENVIRONMENT**

**EMPLOYEE AWARENESS
PROGRAM
PRL, Ahmedabad**



राजभाषा सम्मान

केंद्रीय सरकार के देश भर में फैले हुए कार्यालयों/उपक्रमों/बैंकों आदि में राजभाषा के प्रगामी प्रयोग को बढ़ावा देने और राजभाषा नीति के कार्यान्वयन के मार्ग में आ रही कठिनाइयों को दूर करने के लिए एक संयुक्त मंच की आवश्यकता महसूस की गई ताकि वे मिल बैठकर सभी कार्यालय/उपक्रम/बैंक आदि से चर्चा कर सकें। फलतः नगर राजभाषा कार्यान्वयन समितियों का गठन हुआ। इन समितियों के गठन का प्रमुख उद्देश्य राजभाषा नीति के कार्यान्वयन की समीक्षा करना, इसे बढ़ावा देना और इसके मार्ग में आई कठिनाइयों को दूर करना है। भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद नगर राजभाषा क्षेत्र के अंतर्गत है एवं उनके तत्वावधान में वर्ष भर विभिन्न प्रोत्साहनलक्षी कार्यक्रमों का आयोजन करती है। हमारे कार्यालय में सभी सदस्य संपूर्ण निष्ठा के साथ हिंदी के प्रचार-प्रसार के कार्य में योगदान देते हैं। भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद के निदेशक, **डॉ. अनिल भारद्वाज** के नेतृत्व में नियमित हिंदी कार्यों के अतिरिक्त भी समय-समय पर हिंदी में मौलिक पुस्तक लेखन, गृह पत्रिका के रूप सज्जा में नित्य नए कलेवर का सृजन, स्टाफ सदस्यों द्वारा हिंदी के कार्यों एवं गतिविधियों में अधिकाधिक प्रतिभागिता के लिए निरंतर प्रयत्न जारी है। हमारे स्टाफ सदस्य के परिवार-जनों की सृजन प्रतिभा को भी हिंदी के माध्यम से उजागर करने का सुअवसर प्रदान किया जाता है। इन सभी गतिविधियों से भौतिक अनुसंधान प्रयोगशाला राजभाषा को शीर्षस्थ आसन पर आसीन करने की अपनी प्रचेष्टा में सजग है।

हमारे संकाय एवं वैज्ञानिक/तकनीकी/प्रशासन के सदस्यों के अथक चेष्टा एवं मंथन द्वारा कार्यालय नित्य नए उपलब्धि की ओर अग्रसर हो रहा है। सभी के साझा प्रयास के फलस्वरूप ही भारत सरकार की राजभाषा नीति के श्रेष्ठ कार्यान्वयन हेतु नगर राजभाषा कार्यान्वयन स्तर पर भौतिक अनुसंधान प्रयोगशाला (पी.आर.एल.) को वर्ष 2020-2021 के लिए द्वितीय पुरस्कार प्राप्त हुआ है। संयोगवश हमारे संस्थान के संस्थापक एवं भारतीय अंतरिक्ष कार्यक्रम के जनक डॉ. विक्रम ए. साराभाई के जन्म-जयंती 12 अगस्त 2021 के दिन एक आधिकारिक बैठक में अहमदाबाद नगर राजभाषा क्षेत्र के अध्यक्ष, डॉ. रवीन्द्र कुमार के कर-कमलों से निदेशक, **डॉ. अनिल भारद्वाज** को शील्ड एवं प्रशस्ति-पत्र प्रदान किया गया। आशा नहीं पूर्ण विश्वास है कि आप सभी अवश्य हिंदी के विस्तार एवं संभावनाओं पर निरंतर मंथन करेंगे एवं राजभाषा हिंदी को विश्व के परिप्रेक्ष्य में नई पहचान दिलाएंगे।

न.रा.का.स. अध्यक्ष, डॉ. रवीन्द्र कुमार से पुरस्कार प्राप्त करते हुए पी.आर.एल. के निदेशक **डॉ. अनिल भारद्वाज**



Monthly Publications Digest of PRL

1. Rajpurohit, K., Vazza, F., van Weeren, R. J., Hoeft, M., Brienza, M., Bonnassieux, E., Riseley, C. J., Brunetti, G., Bonafede, A., Brügger, M., Formann, W. R., Röttgering, H. J. A., Drabent, A., Rajpurohit, A. S., Domínguez-Fernández, P., Wittor, D., Andrade-Santos, F., 2021, [Dissecting nonthermal emission in the complex multiple-merger galaxy cluster Abell 2744: Radio and X-ray analysis](#), *A&A*, *Date of Publication: 23/08/2021*
2. Arghajit Jana, Neeraj Kumari, P. Nandi, Sachindra Naik, A. Chatterjee, G. K. Jaisawal, K. Hayasaki, C. Ricci, 2021, [Broad-band X-ray observations of the 2018 outburst of the changing-look active galactic nucleus NGC 1566](#), 2021, *Monthly Notices of the Royal Astronomical Society*, 507, 687-703, *Date of Publication: 18/08/2021*
3. Rishikesh Sharma, Abhijit Chakraborty, 2021, [Precision wavelength calibration for radial velocity measurements using uranium lines between 3800 and 6900 Å](#), *Journal of Astronomical Telescopes, Instruments, and Systems*, *Date of Publication: 18/08/2021*
4. Sujay Mate, Tanmoy Chattopadhyay, Varun Bhalerao, E. Aarthy, Arvind Balasubramanian, Dipankar Bhattacharya, Soumya Gupta, Krishnan Kutty, N. P. S. Mithun, Sourav Palit, A. R. Rao, Divita Saraogi, Santosh Vadawale, Ajay Vibhute , 2021, [The AstroSat mass model: Imaging and flux studies of off-axis sources with CZTI](#), *Journal of Astrophysics and Astronomy*, 42, 93, *Date of Publication: 02/08/2021*
5. Partha Sarathi Jena, Ravi Bhushan, Shivam Ajay, Nisha Bharti, A.K. Sudheer, 2021, [10Be depositional flux variation in the central Indian Ocean during the last 43 ka](#), *Science of the Total Environment*, *Date of Publication: 21/08/2021*
6. Anil Patel, Rangu Satish, and Neeraj Rastogi, 2021, [Remarkably High Oxidative Potential of Atmospheric PM2.5 Coming from a Large-Scale Paddy-Residue Burning over the Northwestern Indo-Gangetic Plain](#), *ACS Earth and Space Chemistry*, *Date of Publication: 18/08/2021*
7. Y.-H. Hsueh, K. -F. Li, L. -C. Lin, S. K. Bhattacharya, Amzad H. Laskar, M. -C. Liang, 2021, [East Asian CO2 level change caused by Pacific Decadal Oscillation](#), *Remote Sensing of Environment*, *Date of Publication: 10/08/2021*
8. Midhila Varna, Arvind Singh, Deepika Sahoo, and Debasis Sengupta, 2021, [Strengthening of basin-scale ocean currents in winter drives decadal salinity decline in the eastern Arabian Sea](#), *Geophysical Research Letters*, doi:///10.1029/2021GL094516, *Date of Publication: 06/08/2021*
9. Sivadas S. K., GVM Gupta, Sanjeev Kumar, B. S. Ingole, 2021, [Trait-based and taxonomic macrofauna community patterns in the upwelling ecosystem of the southeastern Arabian Sea](#), *Marine Environmental Research*, *Date of Publication: 02/08/2021*
10. Milan Sil, Satyam Srivastav, Bratati Bhat, Sumar Mondal, Prasanta Gorai, Rana Gosh, Takashi Shimonishi, Sandip Chakrabarti, Bhalamurugan Sivaraman, Amit Pathak, Naoki Nakatani, Kenji Furuya, Ankan Das, 2021, [Chemical complexity of phosphorous-bearing species in various regions of the interstellar medium](#), *The Astronomical Journal*, *Date of Publication: 25/08/2021*

Monthly Publications Digest of PRL

11. William Ward, Annika Seppälä, Erdal Yiğit, Takuji Nakamura, Claudia Stolle, Jan Laštovička, Thomas N. Woods, Yoshihiro Tomikawa, Franz-Josef Lübken, Stanley C. Solomon, Daniel R. Marsh, Bernd Funke, Duggirala Pallamraju, 2021, [Role Of the Sun and the Middle atmosphere/thermosphere/ionosphere In Climate \(ROSMIC\): a retrospective and prospective view](#), Progress in Earth and Planetary Science, *Date of Publication: 18/08/2021*
12. Imran A. Girach, Narendra Ojha, S. Suresh Babu, 2021, [Ozone chemistry and dynamics at a tropical coastal site impacted by the COVID-19 lockdown](#), Journal of Earth System Science, *Date of Publication: 09/08/2021*
13. Oliver Atkinson, Akanksha Bhardwaj, Christoph Englert, Vishal S. Ngairangbam and Michael Spannowsky, 2021, [Anomaly detection with convolutional Graph Neural Networks](#), Journal of High Energy Physics volume 2021, Article number: 80 (2021), *Date of Publication: 17/08/2021*
14. Jaidev Sharma, Brajesh Kumar, Anil K Malik, Hari Om Vats, 2021, [Differential rotation of the solar transition region from STEREO/EUVI 30.4-nm images](#), Monthly Notices of the Royal Astronomical Society, Volume 506, Pages 4952-4959, *Date of Publication: 09/08/2021*



Follow PRL on Social Media



<https://twitter.com/PRLAhmedabad>



<https://www.facebook.com/PhysicalResearchLaboratory>



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

PRL Contact



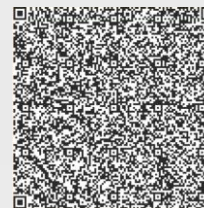
<https://www.prl.res.in/prl-eng/home>



website-Hindi



website-English



PRL-Contact

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

(भारत सरकार, अंतरिक्ष विभाग की यूनिट)

नवरंगपुरा, अहमदाबाद - 380009

दूरभाष: (079) 26314000

फैक्स: (079) 26314900

ई - मेल: director@prl.res.in

Compiled, Designed and Published by



The Newsletter Team
Physical Research Laboratory



Previous issues available at: <https://www.prl.res.in/prl-eng/newsletter>



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