The 4th State

Newsletter of the Institute for Plasma Research, Gandhinagar, Gujarat (India)

Issue 144, July 2025

Felicitation ceremony for IPR Director on his retirement

A Felicitation ceremony for IPR Director, **Dr. D K Aswal,** was organized on 26 Jun 2025. He gave an inspirational retirement speech to the staff. IPR wishes him a very Happy and Healthy Retired Life.

Glimpses of Felicitation ceremony



Send-off to the Director by the IPR Security Staff

International Day of Yoga (IDY) 2025 at IPR

IPR celebrated International Day of Yoga (IDY) 2025 on 21 June 2025 with energy and enthusiasm. Going with the theme “Yoga for One Earth, One Health”, IPR employees enthusiastically participated in the IDY-2025 celebration, showing their spirit and commitment to promote holistic health and well-being through the practice of yoga.

The certified yoga instructors conducted a guided yoga session, which included asanas (postures), pranayama (breathing exercises) and meditation techniques.







Glimpses of the IDY-2025

International Day of Yoga (IDY) 2025 at IPR









Glimpses of the IDY-2025

Development of 3D Image Correction Diagnostic System for in-situ thermal strain and displacement analysis of Plasma Facing Components

The development of a novel, cost-effective three-dimensional Digital Image Correlation (3D-DIC) diagnostic system at the IPR marks a significant advancement in the in-situ thermal strain and displacement analysis of Plasma-Facing Components (PFCs) under extreme heat loads. This innovative system, utilizing a single camera, a four-mirror adapter, and open-source software, enables precise and accurate full-field measurement of thermally induced strain and deformation on tungsten-armoured PFCs during high heat flux testing in the High Heat Flux Test Facility (HHFTF).

Its compact design for a 90mm viewing aperture for large PFCs, capability for transient strain data acquisition, and sensitivity to measure thermal strains as low as 50 microstrain will provide crucial insights into the thermal-mechanical behaviour of PFCs. This capability is essential for evaluating the performance of various divertor and First-Wall component designs, ultimately contributing to the development of more robust materials for future nuclear fusion reactors.

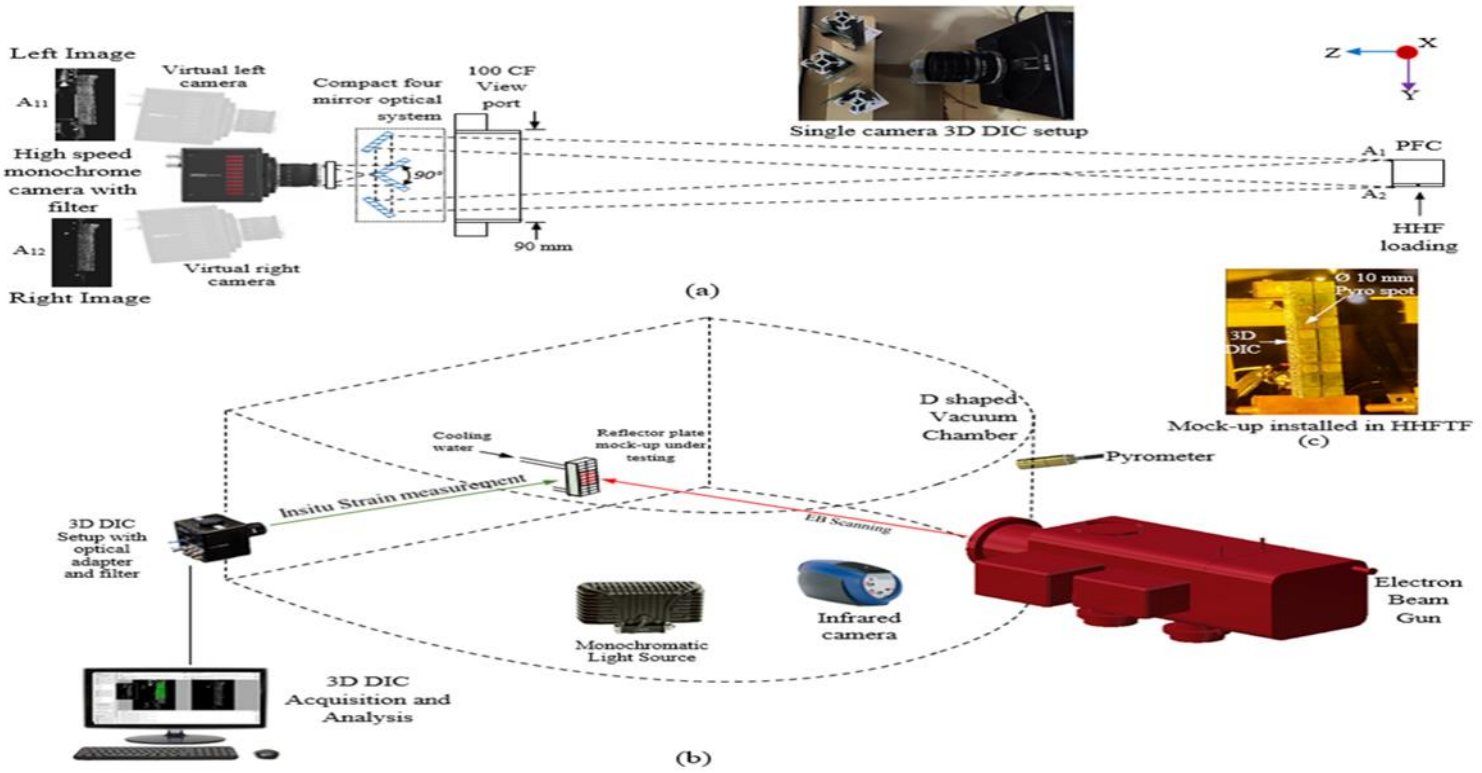


Figure 1: Schematic diagram of 3D DIC setup implemented in HHFTF (a) Optical (b) experimental arrangements and (c) mock-up installation in HHFTF.

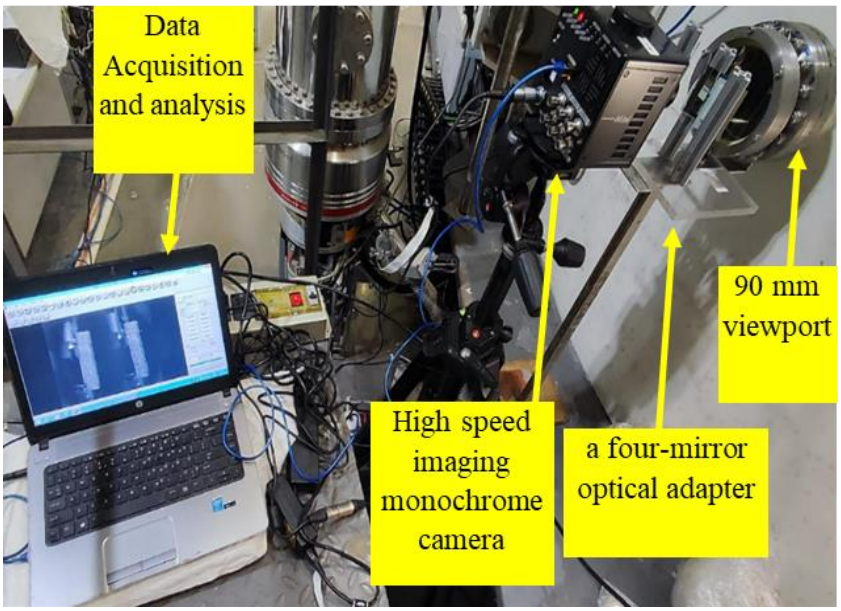


Figure 2: 3D DIC setup showing the Data Acquisition and analysis, High speed imaging monochrome camera, a four mirror optical adapter and the 90 mm viewport

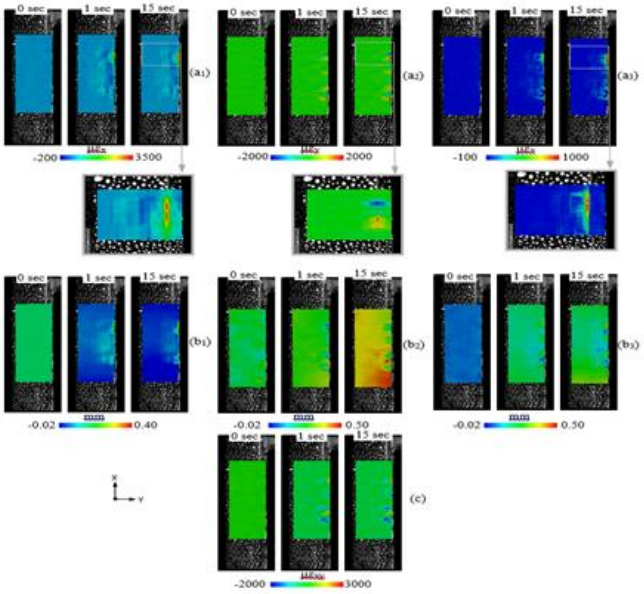


Figure 3: Measured full field surface thermal strain in (a1) vertical εx (a2) horizontal εy (a3) out-of-plane εz with magnified view of de-bonded W tile, displacement in (b1) X (b2) Y (b3) Z direction and (c) shear strain of the reflector mock-up at 7MW/m^2

Doctoral Research Spotlight

Study of Process Parameters affecting Secondary Phase Formation and Grain Size in Cu_2ZnSnS_4 Thin Film for Solar Cell Application by Sagar Agrawal

The present thesis is motivated by the need for understanding the factors affecting solar cell efficiency especially those related to Cu_2ZnSnS_4 (CZTS) absorber material based thin-film solar cells (TFSCs). The qualities of CZTS material, such as optimum bandgap (1.4-1.6 eV), high absorption coefficient (10^4-10^5 cm^{-1}), non-toxic and earth-abundant constituent elements, and long-term durability, identify it as a suitable candidate for future TFSCs. The preparation of the CZTS layer in the present work involves a two-step process, starting with magnetron co-sputtering of Cu, Zn, and Sn (thin film precursor) followed by sulfurization (*i.e.*, annealing in S + N_2/Ar environment). The issue of formation of secondary phases [1], such as ZnS, SnS, SnS_2, CuS, Cu_2S, Cu_2SnS_3, Cu_3SnS_4, etc., which affect the absorber layer's electrical and optical properties and hence the efficiency of solar cell devices, is addressed. Understanding the formation mechanism of these secondary phases during the growth of CZTS thin film, including its grain growth, is crucial for creating high-efficiency solar cells. The thesis explores the influence of various process parameters on CZTS layer properties, secondary phase formation, and grain size, demonstrating their impact on device efficiency through the fabrication of a multilayer solar cell device (SLG/Cr/Mo/CZTS/CdS/i-ZnO/ZnO:Al as shown in the Figure and simulation studies. One key obstacle to understanding, how process factors affect secondary phase formation, is the inability to quantitatively estimate secondary phases in the CZTS layer because of the limitations encountered in commonly used XRD and Raman spectroscopy methods. XANES spectroscopy is extensively employed in the current work to estimate the secondary phases in CZTS layer for a tangible, decisive analysis.

Sagar Agrawal

Following points highlight the key findings of the Research Work:

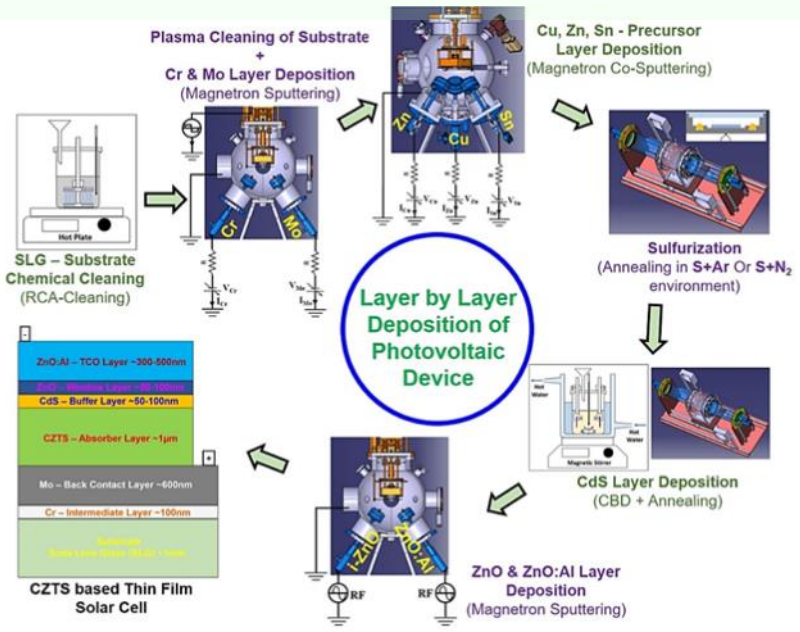
• Although all the process parameters like sulfurization pressure, heating rate, etc., affect the secondary phase formation, the elemental composition of the precursor is observed to be the most dominant factor affecting the secondary phase formation and hence the efficiency of device.
• The secondary phases having a bandgap close to the CZTS (like Cu_2SnS_3) are found to be more efficiency-deteriorating compared to the secondary phases with a much higher bandgap than the CZTS (like ZnS) [2], which is one of the novel findings of the thesis.
• Another unique finding of the thesis is the effect of ambient gas (N_2/Ar) of the sulfurization process on the grain size of the absorber layer and hence, on the efficiency of the device [3].

Publications:

[1] **S. Agrawal**, C. Balasubramanian, S. Mukherjee, R. Kanani, K.K. Madapu, S. Dhara, Effect of heating rate and precursor composition on secondary phase formation during Cu_2ZnSnS_4 thin film growth and its properties, Thin Solid Films, 741 (2022) 139029.

[2] **S. Agrawal**, D.O. De Souza, C. Balasubramanian, S. Mukherjee, Effect of secondary phases controlled by precursor composition on the efficiency of CZTS thin film solar cell, Solar Energy Materials and Solar Cells, 267 (2024) 112719.

[3] **S. Agrawal**, Effect of ambient gas on grain growth of CZTS layer : study on device efficiency, Journal of Materials Science: Materials in Electronics, 1387 (2023) 1–10.



Schematic of layer-by-layer deposition process for the preparation of solar cell device

Summer School Program 2025 - Interaction session with the Director

IPR Director, Dr. Dinesh K. Aswal had an interactive session with the IPR Summer School Program (SSP) students on 29 May 2025. Director in his motivated speech encouraged the students towards taking up challenging scientific avenues. The students interacted with the Director and asked many queries. The session was also attended by the Dean (R&D), Dr. Paritosh Chaudhuri, Dean (Admin), Dr. Subroto Mukherjee and the IPR SSP coordination team.

Director, Dr. D. K. Aswal (L) interacting and motivating the SSP students

SSP students and SSP coordinating team attending the interactive session with the Director

Group photo of the SSP Students with IPR Director

Summer School Program 2025 - Visit to SAC, ISRO, Ahmedabad

Photos of the SSP Students visit to Space Application Centre (ISRO), Ahmedabad on 03 Jun 2025

IPR Director's Talk at GTU

IPR Director, Dr. D. K. Aswal gave an invited talk on "**Radiation, Nuclear Energy and Environment**", organized by the Research and Development Cell (RDC), Gujarat Technological University (GTU), Ahmedabad, on 30 May 2025. The session was attended by the students and faculties of GTU. IPR Dean (R&D), Dr. Paritosh Chaudhuri also attended the session. Dr. Pankajray Patel, Director, School of Management Studies, GTU felicitated Dr. Aswal.

Photos of IPR Director, Dr. D. K. Aswal inaugurating, giving his talk and being felicitated at GTU, Ahmedabad

Igniting India's Fusion Future

Nuclear fusion, the process powering stars, holds immense potential as a sustainable energy source with minimal radioactive waste. In a recent article "***Igniting India's fusion future***" by **D. Raju, I. Bandyopadhyay and D. K. Aswal**, published in Current Science, outlined India's fusion roadmap, emphasizing key challenges in plasma confinement, tritium breeding and reactor materials. With its strong foundation in nuclear fission, India is strategically advancing fusion research through tokamak experiments (ADITYA-U, SST-1) and major contributions to the international fusion energy project (ITER). IPR, in a phased approach, proposes to build and operate a Steady-State Deuterium-Tritium fusion reactor called **SST-Bharat** as an intermediate fusion device, whose primary objective would be to demonstrate fusion power production with a net energy gain in steady-state power plant-like scenarios. Subsequently, IPR shall launch the project to construct an indigenous DEMO reactor, to be commissioned by 2060 for net energy supply to the grid. Authors further suggests that, by prioritizing innovation, policy support and international collaboration, India can transition from experimental fusion research to scalable power generation, aligning with its Net Zero 2070 commitment. The time to ignite India's fusion energy future is NOW.

Read the full article in Current Science, Volume 128 - Issue 11: 10 Jun, 2025

ADITYA-U (L) and SST-1 (R)

Talk at the i-Hub Faculty Development Programme

A Faculty Development Programme (FDP) on "**Empowering Educators through Research and Incubation Experience and NEP Insights**" was organized jointly by i-Hub Gujarat, Commissionerate of Technical Education (CTE) - Govt. of Gujarat. The event was organized and hosted by i-Hub Gujarat, a leading incubation centre of Gujarat on 6th June 2025.

Dr. Nirav Jamnapara, was invited to deliver a talk on the topic "**Translating Deeptech Research into Innovation & Startups**" based on the experience and expertise available through the translation of plasma technologies to field deployable knowhow. The talk was attended by more than 160 faculties from all across the state of Gujarat. The valedictory function at the end of the programme included dignitaries such as Commissioner of Technical Education Shri B. H. Talati, IAS; CEO of i-Hub Gujarat, Shri Hiranmay Mahanta, and Head of NITTTR extension centre Ahmedabad, Professor Nishith Dubey. The event concluded with generation of new interest on how plasma technologies could be brought to the students and more startups could be sensitized. More programmes are being planned in association with i-Hub Gujarat involving plasma technology with IPR's Atal Incubation Centre: AIC-IPR.

Dr. Nirav Jamnapara giving his talk

Group photo of the Faculty Development Programme at i-Hub, Ahmedabad

Special Talks in memory of Prof P K Kaw

On the 8th Death Anniversary of Prof. P.K. Kaw, Founder-Director, IPR, Special Talks by Prof Abhijit Sen and Prof Sudip Sengupta were organized at IPR Seminar Hall on 18 Jun 2025.

Prof Abhijit Sen, Emeritus Professor of HBNI, delivered a commemorative talk, "**Remembering Prof. Kaw**". He paid a heartfelt tribute to Prof. Kaw, reflecting on his profound influence on the field of plasma physics and his foundational role as the Director, in the growth of the Institute for Plasma Research (IPR). Under his guidance, IPR grew into a leading institution involved in Tokamak research, including the development of India's ADITYA and SST-1 Tokamaks, and his efforts to build global collaborations, such as India's participation in the ITER project.

Prof. Abhijit Sen

Prof. Sen recalled their early association, highlighting Prof. Kaw's visionary leadership and his tremendous passion for science and immense curiosity. He reflected on Prof. Kaw's mentorship, noting his ability to inspire young scientists, foster a culture of academic freedom, and create an environment conducive to creative work with free flow of ideas and open interaction with scientists across the world.

Prof. Sen concluded with a personal note, remembering Prof. Kaw as a brilliant scientist, a kind mentor, and a visionary leader whose contributions laid the foundation for India's current standing in fusion research. His legacy lives on through IPR and the many scientists he inspired.

Dean (Admin), Dr. Subroto Mukherjee sharing his thoughts on Prof. Kaw (L). Prof Sen delivering his Talk

Audience attending the Talk

Special Talks in memory of Prof P K Kaw

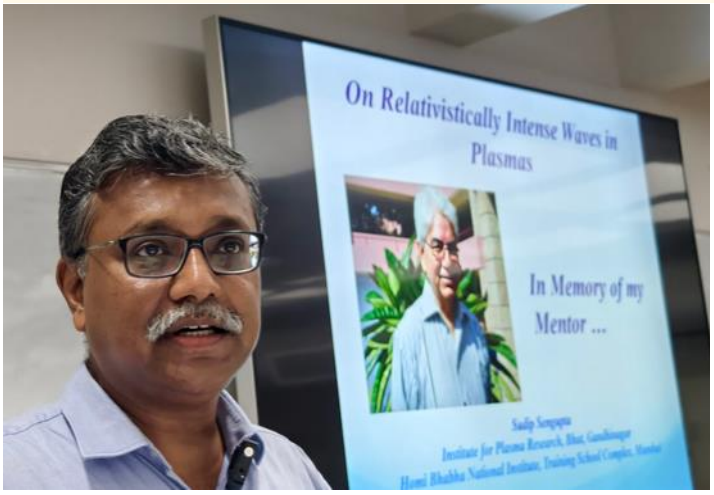
Prof Sudip Sengupta, Senior Professor IPR, delivered a talk, "**On Relativistically Intense Waves in Plasmas**". Honoring the legacy of Prof. Predhiman K. Kaw, he reviewed some of his collaborative work carried out in the area of relativistically intense waves in plasmas. Additionally, he also acknowledged the recent passing of Prof. Kunioki Mima, a distinguished plasma physicist known for the Hasegawa-Mima equation and a close collaborator of Prof. Kaw. The talk was presented in two parts:

Prof. Sudip Sengupta

Part 1: Relativistically intense longitudinal waves, focusing on spatio-temporal evolution of space charge waves, their breaking etc. and their relevance to particle acceleration, which was studied in collaboration with Prof. Kaw.

Part 2: Relativistically intense transverse waves, focusing on Whistler waves and their relevance to the mechanism of ion heating and thermonuclear fusion, which was inspired by Prof. Mima's recent work.

In addition, he also shared personal anecdotes from his interactions with Prof. Kaw and Prof. Mima, to complement the technical discussion.



Prof Sudip Sengupta delivering his talk. A section of the audience attending the talk

Audience attending the talk

Recording of the Special Talks in memory of Prof Kaw on his 8th Death Anniversary is available on the PSSI YouTube Channel. Click Here

Awards and Achievements

Dr. Ajay K Pandey (former Research Scholar at IPR) has been awarded the prestigious **HBNI Outstanding Doctoral Student Award 2024** for his Ph.D. work titled "***Guided and Leaky Modes Characteristics Of Dielectric Loaded Helix Structure***" under the guidance of Dr. Surya Kumar Pathak.

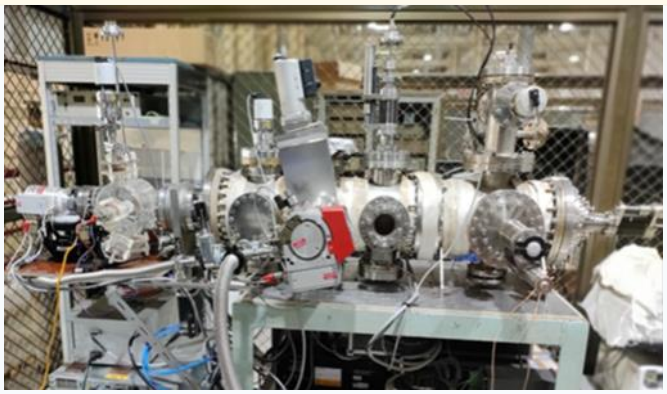
Congratulations!

Dr. Ajay Pandey receiving the award

A brief Summary of Dr. Pandey's Ph.D. thesis work: The electromagnetic characteristics of helical structure, owing to its skewed boundary condition, which supports hybrid modes as well as circular rotation of the field, find various applications ranging from microwaves to optical communications. In microwave spectrum, helix is widely used in traveling wave tubes (TWTs) and wide bandwidth and moderate gain antennas. The guided and leaky mode characteristics for planar as well as circular rod-type dielectric structures are relatively well known. However, the investigation into the leaky mode characteristics coupled with guided modes for a dielectric loaded Helix structure is not explored at all, despite the fact that the helix structure exhibits unique characteristics. The present work addresses these critical issues both analytically and experimentally. A generalized analytical and computational numerical theory, for both the guided and leaky modes, has been developed to investigate the dispersion and radiation properties of dielectric loaded helix with and without radial thickness. Furthermore, the antenna prototypes designed and fabricated, optimized for both end-fire and leaky mode radiation, can be directly adapted for integration into compact, broadband communication modules and beam-steering systems. The research contributes significantly to the advancement of indigenous antenna and electromagnetic wave technologies, which are essential for enhancing communication systems, surveillance, and sensing capabilities across various sectors. The development of novel guided and leaky mode analysis techniques for dielectric-loaded helix structures leads to more efficient and compact antenna designs, enabling applications in wireless communication, satellite systems, and radar technologies that are increasingly important in modern society.

Dr. Milaan V. Patel (former Research Scholar at IPR) has been awarded the prestigious **J.B. Joshi Endowment Innovation Award for 2024** for Ph.D. work titled **"*Development of Pulsed Supersonic Beam System for Tokamak Edge Diagnostics and Other Applications*"** under the guidance of Dr. Jinto Thomas and Dr. P. Chaudhuri.

Congratulations!

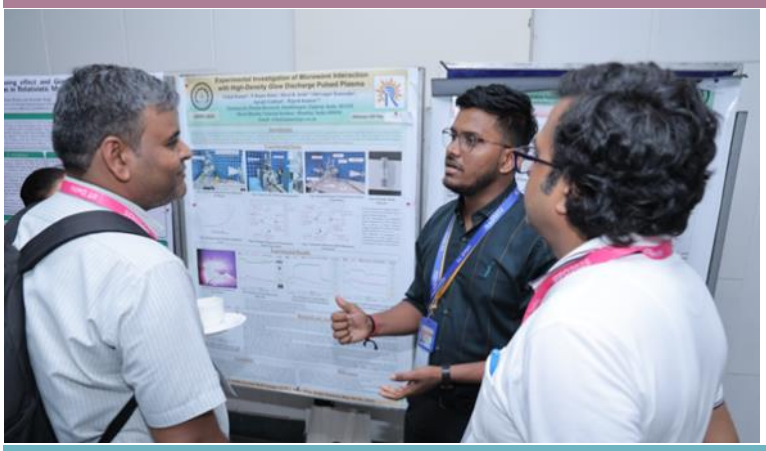


Indigenously developed SMBI System

Dr. Milaan Patel

A brief Summary of Dr. Patel's Ph.D. thesis work: The research resulted in prototyping an indigenously developed pulsed Supersonic Molecular Beam Injection (SMBI) system for tokamak edge diagnostics, achieved through experimental characterization of supersonic jet and beam behaviour. While the generation of molecular beams has been demonstrated previously, the detailed physical processes of beam extraction under realistic conditions were not understood due to non-existing measurement techniques. The research addresses this gap by conducting a comprehensive analysis of supersonic rarefied jets to enable efficient molecular beam extraction. Because no prior characterization tools were available, entire bespoke instruments, like Time-of-Flight (ToF) probe and the Shielded Ionization Discharge (SID) probe, were developed to account for the realistic flow dynamics of gas expansion. These devices operate beyond the physics of gas dynamics, employing ion-neutral interactions (ToF probe) and plasma discharge phenomena (SID probe). This multi-disciplinary approach, integrating fluid and particle dynamics with instrumentation, resulted in a flexible system that can be adapted to both fundamental research and industrial applications. The research has led to a deeper understanding of gas dynamics, enabling precise control over parameters critical to molecular beam generation, impacting diagnostic technologies far beyond fusion.

Awards and Achievements



Mr. Vishal Kumar, presented a poster on "***Experimental Investigation of Microwave Interaction with High-Density Glow Discharge Pulsed Plasma***" at 2nd Global Forum and International Conference on Industrial Plasma Processes and Diagnostics 2025 (IPPD 2025), Indian Institute of Technology, Delhi, 18-20 May 2025. He has received the **IPPD 2025 Best Poster Presentation Award** which included a cash award of ₹5000.

Congratulations!

In the Picture (C): Mr. Vishal Kumar during his poster presentation

Emittance Properties of Multilayer Insulation Used in Cryogenic Applications

Multilayer insulation (MLI) plays a critical role in cryogenics for controlling the parasitic heat-in-leak through radiation. It is a well-established product used in cryogenics for nuclear fusion-grade machines, such as ITER, particle accelerators, space technology, and other mega-science projects. MLI consists of alternative layers of aluminized reflective surface separated by low thermal conductivity spacers. The thermal emissivity of the reflective layer plays a critical role in minimizing the radiative heat transfer through its layers. However, the formation of a native oxide layer on the aluminized surface can affect the emittance of the reflective layer. The exact microstructure and elemental composition of the native aluminium oxide is highly uncertain. Due to the exposure to atmospheric oxygen and moisture, the native oxide layer can vary in nature and thickness. In the context of nuclear fusion, facility regulators require traceability and qualification of materials for their intended function before their actual use. Currently, users rely on catalogue information provided by MLI suppliers, as there are no standardized procedures for testing MLI materials. This work aims to establish a method for assessing the structural and functional quality of MLI before its application in cryogenic components. The approach developed through this work addresses two key aspects: (1) compliance with nuclear regulator requirements regarding the materials used in MLI, and (2) evaluation of the actual condition of MLI before its use in cryogenic components, to prevent any degradation of its functional performance.

The work was presented at the ICEC29-ICMC2024 and published in IOP Conf. Series: Materials Science and Engineering 1327 (2025) 012225

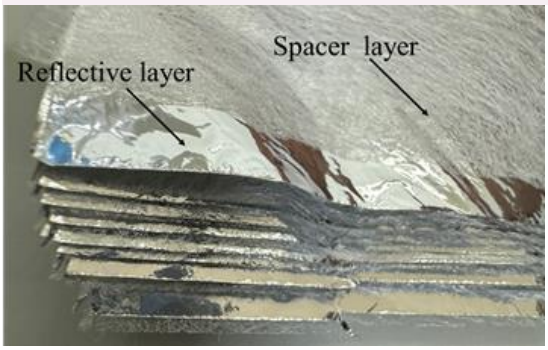


Figure 1 Configuration of MLI

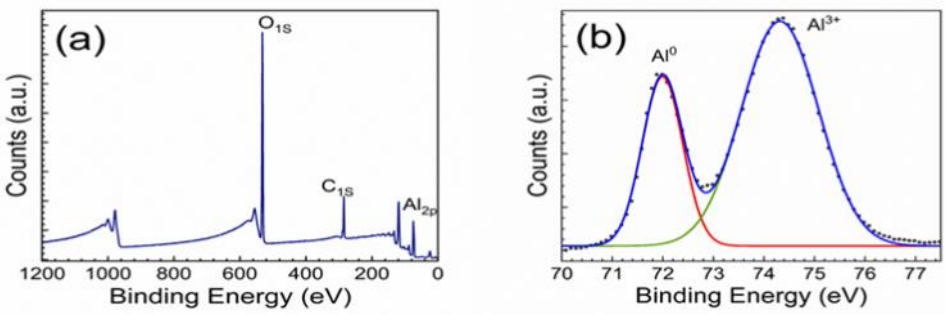


Figure 2 (a) X-ray Photoelectron Spectroscopy scan of the reflective layer of MLI, (b) Al 2p core level spectra at the surface

For the on Multilayer Insulation in Cryogenic applications, **Mr. Uday Kumar**, ITER-IN, has been has recognized and featured as one of the **Outstanding Young Professionals under 40** by the Cryogenic Society of America in their latest issue of Cold Facts, Volume 41, Number 2, 2025.

Congratulations!!

Academic Visits to IPR

Date	Institution	Visitors
21 May 2025	St. Xavier College, Ahmedabad	27 students of Adv. BSc. and 4 Faculty

Group Photos of the Students from St. Xavier College, Ahmedabad

Sun Observation Week

Institute for Plasma Research (IPR), Gandhinagar (Gujarat) conducted Sun Observation Week (SOW) between during 27-30 May 2025. Students and teachers were introduced to the Sun and its features through a presentation by Outreach Division members. Students were taken at Observatory site in IPR.and shown the features of Sun by live streaming the telescope's output. Students and teachers were also introduced to basics of plasma and its applications. Exhibits at outreach hall were also demonstrated to the visitors.

Date	Institution	Visitors
27 May 2025	M. G. Science Institute	24 students of BSc. and 1 Faculty
28 May 2025	M. G. Science Institute	24 students of BSc. and 1 Faculty
29 May 2025	St. Xavier College, Ahmedabad	27 students of BSc. and 1 Faculty

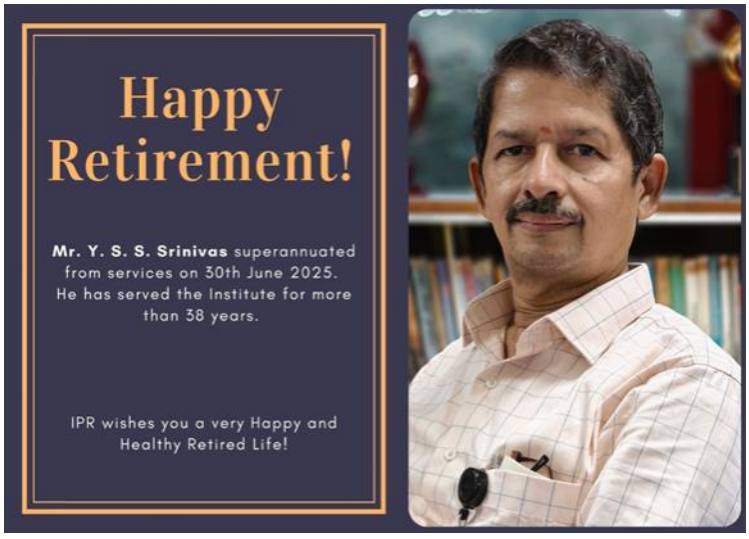
Outreach Division giving SOW presentations to the M.G. Science Institute students on 27 May 2025

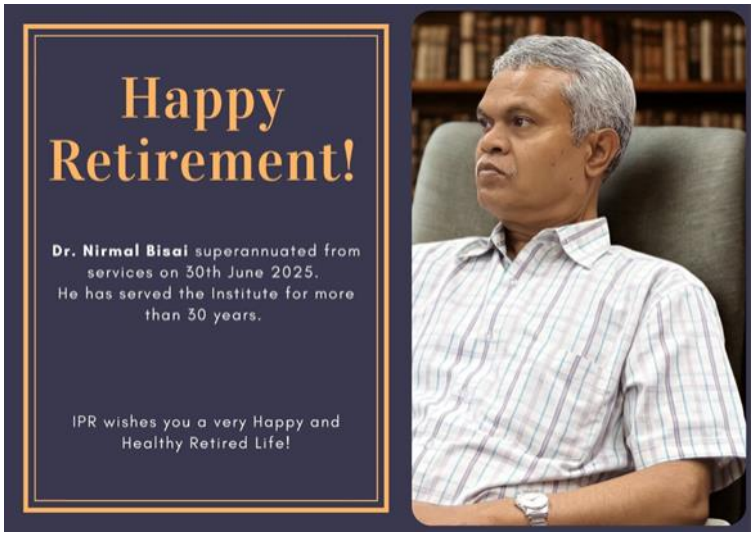
Sun Observation Week

Group photo of the M.G. Science Institute students with Outreach Division during SOW on 28 May 2025

Group photo of the St. Xavier College students with Outreach Division during SOW on 29 May 2025

Superannuation





World Environment Day 2025

IPR Staff Club celebrated the World Environment Day by planting sapling in the campus on 06 Jun 2025. Staff members enthusiastically participated in the plantation drive.

Glimpses of the plantation drive on the World Environment Day

हिंदी कार्यशाला

दिनांक 13 जून, 2025 को प्लाज़्मा अनुसंधान संस्थान, गांधीनगर में प्रशासनिक वर्ग के कर्मचारियों के लिए हिंदी कार्यशाला आयोजित की गई। इस कार्यशाला का संचालन संस्थान की हिंदी अधिकारी, डॉ. संध्या दवे द्वारा किया गया। कार्यशाला का प्रमुख विषय था – "**राजभाषा नीतियाँ, योजनाएँ एवं राजभाषा कार्यान्वयन हेतु कंप्यूटर पर हिंदी प्रयोग हेतु उपयोगी टूल्स**।"

कार्यशाला के दौरान प्रतिभागियों को राजभाषा अधिनियम 1963 की धारा 3(3), राजभाषा नियम 1976 के 12 नियमों की विस्तृत जानकारी प्रदान की गई। इसके अतिरिक्त, राजभाषा वार्षिक कार्यक्रम 2025-26 के तहत लागू किए जा रहे आवश्यक बिंदुओं, तिमाही प्रगति रिपोर्ट का संशोधित प्रारूप तथा अटॉलिस प्रोत्साहन योजना पर चर्चा की गई। राजभाषा विभाग की वेबसाइट पर उपलब्ध विभिन्न टूल्स जैसे ई-महाशब्दकोश, ई-सरल वाक्य कोश, शब्द सिन्धु आदि से अवगत कराया गया। प्रतिभागियों को कंप्यूटर पर हिंदी कार्य के लिए उपयोगी टूल्स, जैसे यूनिकोड के विभिन्न फॉन्ट को डाउनलोड करना, विभिन्न कीबोर्ड लेआउट, वॉइस टाइपिंग, कंठस्थ 2.0 अनुवाद सहित विभिन्न अनुवाद टूल्स तथा अन्य AI आधारित अनुवाद टूल्स का व्यावहारिक परिचय दिया गया। कार्यशाला में हिंदी प्रकाशन हेतु एमएस वर्ड, पब्लिशर, इनडिज़ाइन आदि सॉफ़्टवेयर का उपयोग तथा मोबाइल आधारित हिंदी टूल्स का भी उल्लेख किया गया।

इस कार्यशाला के माध्यम से कर्मचारियों को राजभाषा नियमों से सुपरिचित कराने एवं प्रशासनिक कार्यों में हिंदी के अधिकाधिक प्रयोग को सरल और व्यावहारिक रूप से उपयोगी बनाने पर विशेष ध्यान दिया गया। कुल 3 अधिकारियों एवं 19 कर्मचारियों ने इस कार्यशाला में भाग लिया। कार्यशाला के अंत में हिंदी प्रश्नोत्तरी प्रतियोगिता का आयोजन किया गया, जिसमें राजभाषा नीति, व्याकरण, अनुवाद आदि से संबंधित प्रश्न पूछे गये। सभी प्रतिभागियों ने इस प्रतियोगिता में उत्साहपूर्वक भाग लिया।

Past Events @ IPR

- ***Talks presented at 2nd Global Forum and International Conference on Industrial Plasma Processes and Diagnostics 2025 (IPPD 2025), Indian Institute of Technology, Delhi, 18-20 May 2025***
  - ***Dr. S.R. Mohanty,*** gave an invited talk on "Inertial Electrosatic Confinment Device: A versatile radiation source for various applications"
  - ***Dr. Ramkrishna Rane,*** gave an invited talk on "Low-pressure plasma surface modification of polymeric material for various biomedical application"
  - ***Dr. Mukesh Ranjan,*** gave an invited talk on "Plasma Surface Engineering for Sensing and Wettability Application"
  - ***Ms. Savita Pannu,*** gave a talk on "Synthesis of Mixed Phase Iron Oxide Nanoparticles by Thermal Plasma in a Magnetic Field Environment"
- ***Ms. Ruchi Varshney,*** gave a talk on "Development of Gas Puff Imaging Diagnostic on ADITYA-U Tokamak" at Joint ICTP-IAEA Fusion Energy School (ICTP-IAEA), Trieste, Italy, 12-23 May 2025
- ***Dr. Bhargav Soni,*** M S University of Baroda, Vadodara, gave a talk on "Study of nuclear reactions for structural materials and investigation of reactor shielding" on 30th May 2025
- ***Dr. Rohit Kumar Srivastav,*** gave a talk on "Excitation of Terahertz Surface Magnetoplasmons by Laser on Graphene–n-InSb Semiconductor Surface" on 06th June 2025
- ***Dr. Ekta Joshi,*** Nirma University, Ahmedabad, gave a talk on "Optimizing Biofertilizers: Understanding Sugar-Mediated Phosphate solubilization in Rhizobium spp." on 06th June 2025
- ***Dr. Bharti Malvi,*** gave a talk on "Studies on the Use of Nano-Titania for Anti-Stain Applications" on 09th June 2025
- ***Dr. Krishnamayee Bhoi,*** gave a talk on "Exploring Cobalt Ferrite for Potential Applications in Radiation and Magnetic Field Detection" on 09th June 2025
- ***Dr. Aman Bhatia,*** Dr. B. R. Ambedkar National Institute of Technology, Jalandhar, gave a talk on "Second Harmonic Generation and Optical Guiding of Laguerre-Gaussian Laser Beam in Plasma" on 12th June 2025

Upcoming Events

- 11th Nuclear Power Plants Expo & Summit (NPPES 2025), Istanbul, Turkey, 1-2 July 2025; https://www.nuclearpowerplantsexpo.com/information/general-information/
- 2025 International Conference on Magnet Technology (MT29), Boston, United States, 1-6 July 2025; https://mt29-conf.org/
- 11th Plasma Science Society of India Plasma Scholar's Colloquium (PSSI-PSC-2025), Centre for Scientific and Applied Research, IPS Academy, Indore, 2-4 July 2025; https://event.ipr.res.in/event/15/
- PlasmaSurf+ (PlasmaSurf + an online course), Lisbon, Portugal, and virtual, 4-28 July 2025; https://plasmasurf.tecnico.ulisboa.pt/index.html
- nBHEAM 2025: Neutron Beams at High Energy: Applications and Metrology, IAEA Headquarter, Vienna, 7-8 July 2025; https://conferences.iaea.org/event/410/
- 51st EPS Conference on Plasma Physics (EPS), Vilnius, Lithuania, 7-11 July 2025; https://epsplasma2025.com/
- Culham Plasma Physics Summer School, Culham, United Kingdom, 14-24 July 2025; https://culhamsummerschool.org.uk/
- Advances in Nuclear Fuel Management (ANFM 2025), Florida, United States, 20-23 July 2025; https://www.ans.org/meetings/anfm2025/
- 36th International Conference on Phenomena in Ionized Gases (ICPIG 2025), Aix-en-Provence, France, 20-25 July 2025; https://icpig2025.sciencesconf.org/
- 22nd International Conference on Atomic Processes in Plasmas (APiP 2025), and the NIFS Conference on Atomic and Molecular Processes in Plasmas, Tokyo, Japan, 21-25 July 2025; https://yebisu.ils.uec.ac.jp/apip2025/
- Strongly Coupled Coulomb Systems (SCCS-2025), Nevada, USA, 27 July 2025 to 01 August 2025; https://event.fourwaves.com/sccs2025

Conference Presentations

2nd Global Forum and International Conference on Industrial Plasma Processes and Diagnostics 2025 (IPPD 2025), IIT Delhi, 18-20 May 2025

Dr. Mukesh Ranjan gave an invited talk titled "*Plasma Surface Engineering for Sensing and Wettability Application*".

Dr. Mukesh Ranjan also chaired a session on Fundamentals of Plasmas, Energy Conversion, Environment Technologies, Plasma Processes and Role of Diagnostics.

Dr. S.R. Mohanty, CPP-IPR, delivered an invited talk titled "*Inertial Electrostatic Confinement Device: A Versatile Radiation Source for Various Applications*"

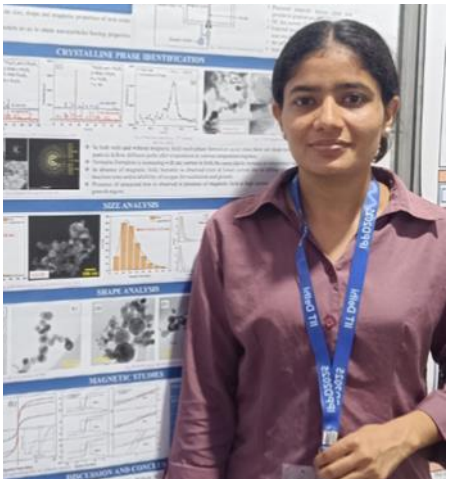
Dr. Ramakrishna Rane delivered an invited talk titled "*Low-pressure plasma surface modification of polymeric material for various biomedical application*"

Ms. Savita Pannu, Research Scholar gave a poster presentation titled "*Synthesis of Mixed Phase Iron Oxide Nanoparticles by Thermal Plasma in a Magnetic Field Environment*"



Dr. Mukesh Ranjan giving his talk (L), receiving memento (C), and Dr. S. R. Mohanty (R) giving his talk





Dr. R. Rane giving his talk (L), receiving memento (C). Ms. Savita Pannu presenting her poster (R)

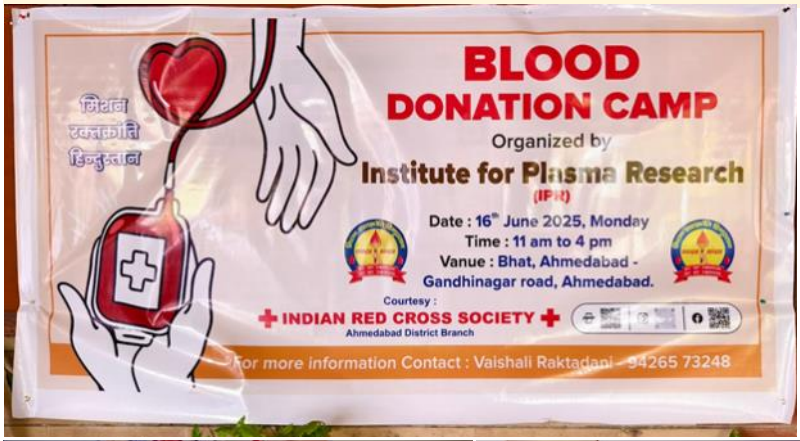
Joint ICTP-IAEA Fusion Energy school 2025, held at Trieste, Italy, 12 - 23 May 2025

Ms. Ruchi Varshney, Research Scholar, attended the **Fusion Energy School.** She gave a poster presentation titled "*Development of Gas Puff Imaging Diagnostic on ADITYA-U Tokamak*"


Ms. Ruchi Varshney presenting her poster and receiving the certificate

Blood Donation Camp at IPR

The IPR Staff Club organized a Blood Donation camp on 16 June 2025 at IPR campus, in collaboration with the Indian Red Cross Society. More than 90 IPR affiliates, including Staff, Research Scholars, and Trainees donated blood.



Photos of the Blood Donation Camp at IPR

Health Awareness Talks at CPP-IPR

Health Awareness Talks were organized at CPP-IPR in collaboration with GNRC Hospital, Guwahati on 29th May 2025. These talks were organized to enhance awareness about health issues and promote preventive healthcare practices among staffs of CPP-IPR. Dr. Ram Goyal, Senior Consultant Neurosurgeon, GNRC Hospital gave a talk on the topic “Brain Stroke: Early symptoms, treatment and management” while Dr. Shabnam Akhtar Ahmed, Medical Officer in Charge, Blood Centre, GNRC Hospital gave a talk on the topic “Blood Donation: Benefits of blood donation both for donor and recipients”.

Dr. Ram Goyal (Top Left) and Dr. Shabnam Akhtar Ahmed (Bottom Left) giving their talks. CPP-IPR staff attending the talks (R)

Floral Tribute to Prof P K Kaw on his 8th Death Anniversary

IPR Library organized a floral tribute to Prof P. K. Kaw on his 8th Death Anniversary. A large number of IPR affiliates paid their homage. A few staff members expressed their feelings and remembrance for Prof Kaw.

IPR staff paying floral tribute, reading his writings, expressing their feeling and remembrance of Prof Kaw

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Know Your Colleague

Mr. Ambati Siva Reddy completed his diploma in electrical and electronics engineering from S.V.Govt Polytechnic College in the year 2012 from Tirupati. Prior to joining IPR, he has worked for different companies based in Tirupati, Bengaluru and Chittoor in various capacities He joined IPR in the year 2021 as a Scientific Assistant-C in Atmospheric Plasma Division (APD), FCIPT. Currently, Siva Reddy is involved in projects like 5 tons per day plasma pyrolysis (RAUDRA), 50kg per hour plasma pyrolysis system, 2-5kg per hour plasma pyrolysis system, textile system and wire explosion System. He is also involved in 100kW and 320kW power supply testing along with plasma torch system in FCIPT. He has good knowledge in troubleshooting and maintenance of electrical and electronics systems. Siva Reddy was joint sports secretary of IPR staff club during the financial year 2022-23 and 2023-24. He likes to play cricket and carom and also likes to participate in various other IPR sports activities.

SSP Students at FCIPT

The IPR Newsletter Team

Dharmesh Purohit	Harsha Machchhar	Ngangom Aomoa	Pratibha Gupta	Priyanka Patel	Ramasubramanian N.
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