The 4th State

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

Issue 143, June 2025

Observance of Fire Service Week-2025 at IPR

The Fire Service Week 2025 was observed across IPR, ITER-India, FCIPT from April 14th to 20th April 2025 as per the directives of the DGFS, CD & HG (Fire Cell), Ministry of Home Affairs, Govt. of India to observe Fire Service Week 2025 in a meaningful manner so that fire safety sensitization and awareness could be spread among the public as much as possible. The Fire Service Week was focused on fostering a collective approach towards fire safety awareness and preparedness among employees.

This year's theme was "**Unite to Ignite, a fire safe India**". The Institute has organized various competitions to create fire safety awareness among its employees. Competitions were organized for the employees of IPR, FCIPT & ITER-India on Slogan in Gujarati, Hindi & English and Essay Writing in Gujarati, Hindi & English based on the decided theme. Overwhelming response was received from the employees for various competitions.

Slogan Writing Competition at IPR

During the week, demonstration of firefighting equipment was conducted at IPR for the employees. Also, a Safety Awareness Talk was organised on Fire Alarm & Detection System for Security Team by Shri Devendra Modi.

Shri Devendra Modi giving a Safety Awareness Talk on Fire Alarm & Detection System to the IPR Security Team (R)

Safety Officer, Shri Devendra Modi giving Demonstration of firefighting equipment (Top Left). Staff members getting hand-on demonstration of the firefighting equipment (Bottom)

Observance of Fire Service Week-2025 at IPR

During the concluding session, Dean (R&D), Dr. Paritosh Chaudhuri distributed prizes to the winners of various competitions.

List of Winners of various Competitions

Competition	Winners (First)	Winners (Second)	Winners (Third)
Gujarati Slogan	Murtuza Vora	Hemant Kumar Hadiel	Rasesh J Dave
Hindi Slogan	Krishna Mohan Kumar	Ashvini Bhardwaj	Ayush Mani Tripathi
English Slogan	Pradipkumar N Raval	Aditya Naugraiya	Pooja Rathva
Gujarati Essay Writing	Keyursinh Vaghela	Jaimesh Saxena	K.G. Parmar
Hindi Essay Writing	Arvind Singh Patel	Sunil Misal	Vikas Gaur
English Essay Writing	Ashish	Suman Aich	Sunil Kumar Gurjar




Dean (R&D), Dr. Paritosh Chaudhuri giving prizes to the winners of various competitions

Group photo of the participants, winners and the Safety Division

Completion of Assembly of Small Scale Spherical Tokamak (SS-ST)

To explore the advantages of Spherical Tokamak (ST), a small scale spherical tokamak (SS-ST) has been designed and constructed at IPR.

Based on successful factory acceptance tests, machine components including SS-ST vacuum vessel and various support structures were delivered and assembled at IPR.

The vacuum vessel was assembled in the SS-ST Lab in new R & D building along with integration of coils (TF, OT, TR & PF Coils), gate valves and turbo-molecular pumps. Baking, leak tests pre & post-baking, dimensional checks etc. were carried out successfully as part of Site acceptance Tests at IPR.

This is the first Spherical Tokamak indigenously designed and constructed at IPR to perform basic plasma experiments and generate database to support future spherical tokamak based volumetric neutron source.

At present the SS-ST machine is in the commissioning phase.

Figure: SS-ST Machine Vacuum Vessel integrated with Support Structure and Coils

ISO 27001:2022 Certification for IPR's DeepCXR Technology

ISO 27001 & ISO 13485 certificates are highly recommended for 'Artificial Intelligence as a Medical device'. These ISO certifications are being acquired for DeepCXR as a Screening & diagnostic Tool in India /other countries. Obtaining these ISO certifications will further help IPR to obtain licence to commercialize DeepCXR for AI as medical device in accordance with international standards.

About ISO 27001:2022 Certification for MRD LAB: Achieving certification means MRD LAB has successfully undergone an audit by a recognized certification body, confirming that it's Information Security Management System (ISMS) meets the standard's requirements. ISO 27001 certification emphasizes continuous improvement of the ISMS, ensuring it remains effective and relevant. ISMS built according to ISO 27001 states the policies and procedures & how they manage information. It provides assurance to stakeholders (customers, clients, etc.) that the organization has implemented a robust Information Security Management System that meets international standards. It demonstrates a commitment to protect sensitive data and mitigating security risks.


DGCS

CERTIFICATE

MRD LAB

INSTITUTE FOR PLASMA RESEARCH

Bhat Village, Near Indira Bridge, Gandhinagar – 382428, Gujrat, India

This is to certify that the Management system of the above organization has been assessed and found to comply with the requirements of the management system & standards detailed below

ISO/IEC 27001:2022

(INFORMATION SECURITY MANAGEMENT SYSTEM)

Scope of Activities

Secure Development, Testing and Maintenance of Chest X-ray Software (DeepCXR)

(SOA DOC NO. IPR 1.1, REV 00, ISSUE DATE 01.02.2025)

Certificate Number - DGCS/IS/0150/IN25

Initial Registration Date: 27.04.2025 Date of this Certificate: 27.04.2025

Date of 1st Surveillance: 26.04.2026 Date of 2nd Surveillance: 26.04.2027

Recertification Date: 26.04.2028

Validity of the certificate is subject to successful completion of surveillance audit on or before due date, in case surveillance audit not conducted this certificate shall be suspended/cancelled.

NABCB IS 011

IAF

Director

CERTIFICATE*CERTIFICATE*CERTIFICATE*CERTIFICATE

X-Ray Digitizer

MRD Team (L-R) Mr. Bhanu Parashar, Mr. Agraj Abhishek, Ms. Manika Sharma, Mr. Abhishek Sharma, Mr. Satish Patel

Synthesis and application studies of Ti_3AlC_2 MAX phase material by Mr Vyom Desai

Vyom Desai

MAX phases, such as Ti_3AlC_2, exhibit a unique combination of metallic and ceramic properties, including high fracture toughness, thermal/electrical conductivity, and oxidation resistance. While traditional synthesis methods like hot pressing are costly, pressureless sintering offers a cost-effective alternative for bulk production. This study explores the synthesis, characterization, and application of Ti_3AlC_2 as a reinforcement material in aluminum alloys and graphite composites.

Synthesis and Characterization of Ti_3AlC_2

High-purity Ti_3AlC_2 was synthesized via pressureless sintering using TiH_2, Al, and TiC powders. XRD and Raman spectroscopy confirmed phase purity, while SEM revealed lamellar grains with elemental composition (Ti: 58.88%, Al: 11.60%, C: 29.52%). XPS confirmed covalent Ti-C and electrostatic Al-Ti_3C_2 bonding. Thermal analysis (DSC, HT-XRD) showed stability up to 1400°C, though Al oxidation led to protective Al_2O_3 formation.

Phase transformation studies indicated Ti_3AlC_2 formation at 1250°C, with intermediate Ti-Al and Ti_2AlC phases.

Reinforcement in Aluminum Alloys via Friction Stir Processing (FSP)

Ti_3AlC_2-reinforced Al 6061 and Al 7075 composites were fabricated using FSP, resulting in:

1. Grain refinement and uniform particle distribution in the stirred zone.
2. Enhanced microhardness:
   - Al 6061: Base (65 $HV_{0.2}$) → FSPed (85 $HV_{0.2}$) → Composite (135 $HV_{0.2}$).
   - Al 7075: Base (100 $HV_{0.2}$) → FSPed (180 $HV_{0.2}$) → Composite (350 $HV_{0.2}$).
3. Improved wear resistance:
   - Al 6061: ~10x lower wear rate (adhesive-abrasive mechanism).
   - Al 7075: ~6x lower wear rate (abrasive-dominated mechanism).

Preliminary Study on Ti_3AlC_2-Metallized Graphite Composites

Spark Plasma Sintering (SPS) was used to fabricate Cr-coated graphite-Ti_3AlC_2 composites. XRD revealed TiC formation alongside Ti_3AlC_2, suggesting partial phase transformation. Microhardness ranged from 1100–2200 HV, attributed to TiC and MAX phase contributions, indicating potential for high wear resistance.

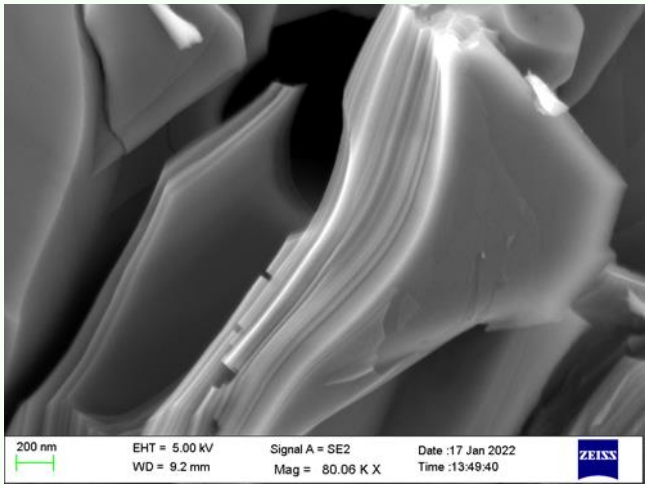


Fig.1 SEM image of the Ti_3AlC_2 MAX phase synthesised at 1400 °C

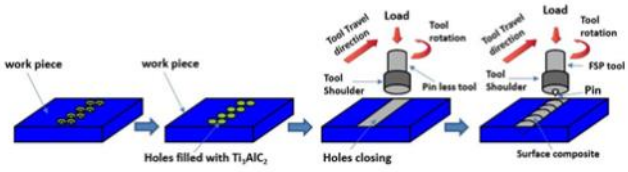


Fig.2 Schematic of the FSP process to form surface MMCs

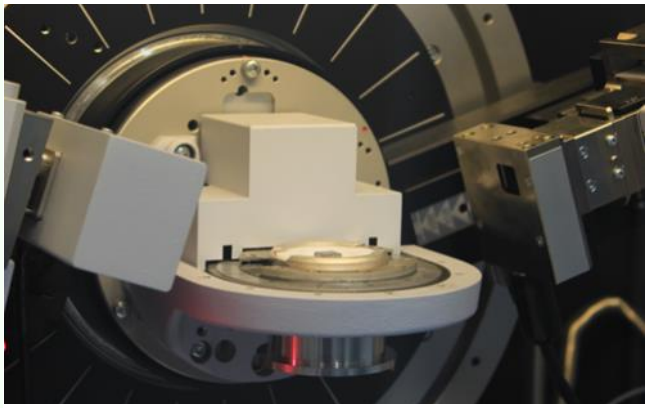


Fig.3 X-ray Diffraction machine at FCIPT, IPR

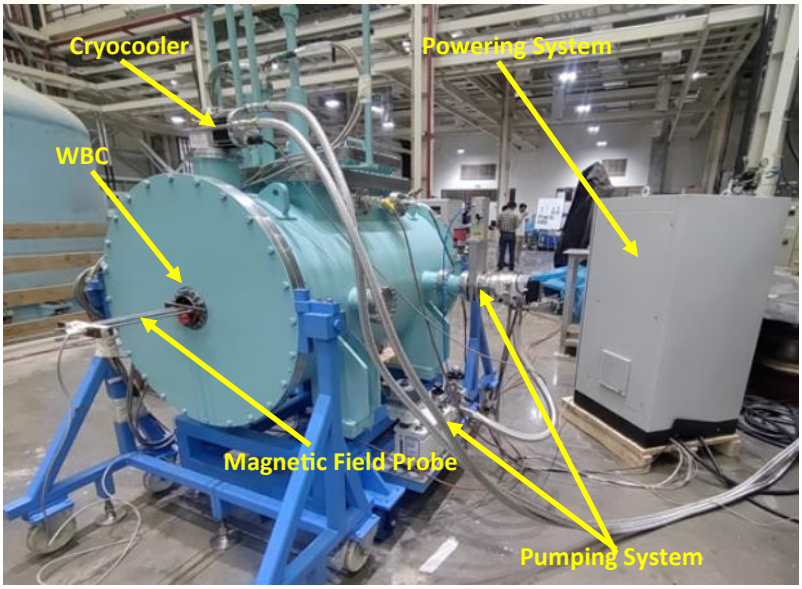
Publications:

[1] **Vyom Desai**, Aroh Srivastava, Arunsinh B. Zala, Tejas Parekh, Surojit Gupta, N.I. Jamnapara, "*Pressureless manufacturing of high purity Ti3AlC2 MAX phase material: Synthesis and characterisation*" Vacuum 214 (2023) 112221 (DOI: 10.1016/j.vacuum.2023.112221).

[2] **Vyom Desai**, Vishvesh Badheka, Arunsinh B. Zala, Tejas Parekh, N.I. Jamnapara , "*Fabrication of Al6061/Ti3AlC2 MAX phase surface composite by friction stir processing and investigation of wear properties*" Tribology International 195 (2024) 109594 (DOI: 10.1016/j.triboint.2024.109594).

Warm Bore Cryostat for HTS magnets

IPR's Magnet System Division has successfully developed and commissioned a Warm Bore Cryostat (WBC) to test High-Temperature Superconducting (HTS) Magnets at temperature around 30K using liquid nitrogen(LN_2). This system consists of a vacuum chamber of volume 0.62 m^3 with end flanges, thermal shields, and a LN_2 chamber of 0.13 m^3 for housing the solenoid HTS magnet with warm bore diameter of ~ 100 mm. It is equipped with a two-stage GM Cryocooler, vacuum system, cryogenic safety devices, sensors & instrumentations, power feedthroughs, and a PXI-based DAQ system to monitor the magnet parameters during operation. A HTS magnet capable of producing a 3.5 T @ 4.2K at its centre is installed inside the LN_2 chamber with temperature sensors and voltage taps. This system achieved a minimum magnet temperature of 29K by solidifying liquid nitrogen, which has high dielectric strength and specific heat using the Cryocooler, maintaining vacuum vessel pressure of 2×10^{-8} mbar and thermal shield temperature ~92K. Superconducting magnet was also charged ~2.5 T at the operating temperature of ~29-30K. This successful demonstration of low temperature using liquid nitrogen marks a key milestone towards this system readiness for various applications, including lab scale high-field HTS solenoid magnets, space propulsion systems such as plasma thrusters, and magnetic resonance imaging (MRI). The warm bore cryostat with auxiliary sub-systems and magnet temperature profile during cooldown are shown in figure below.



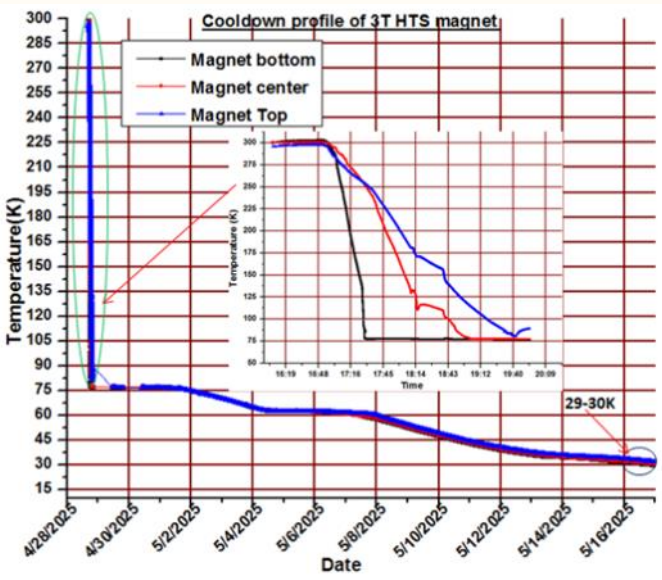


Figure: WBC and HTS magnet temperature profile

Plasmatech Talk at NAMTECH, IIT-Gandhinagar

An invited talk on "**Plasmatech Innovations: Perspectives for students and Startups**" by Dr. Nirav Jamnapara was organized by New Age Makers Institute of Technology (NAMTECH) (an educational initiative of Arcellor Mittal and Nippon Steel) at IIT Gandhinagar campus on 23 April 2025. The talk showcased an overview about plasmas, activities of IPR and fusion technologies followed by Plasmapreneurship ideas involving the spin-off potential of plasma technologies for industry and society. The talk was attended by over 50+ students and more than 12 professionals including faculties and industry representatives. A number of students expressed their interest to pursue academic projects with IPR on topics of mutual interest supporting IPR's objective on advancing fusion technology. A number of students also expressed their keen interest about the incubation possibilities at IPR's Atal Incubation Centre which was appropriately addressed by the speaker.

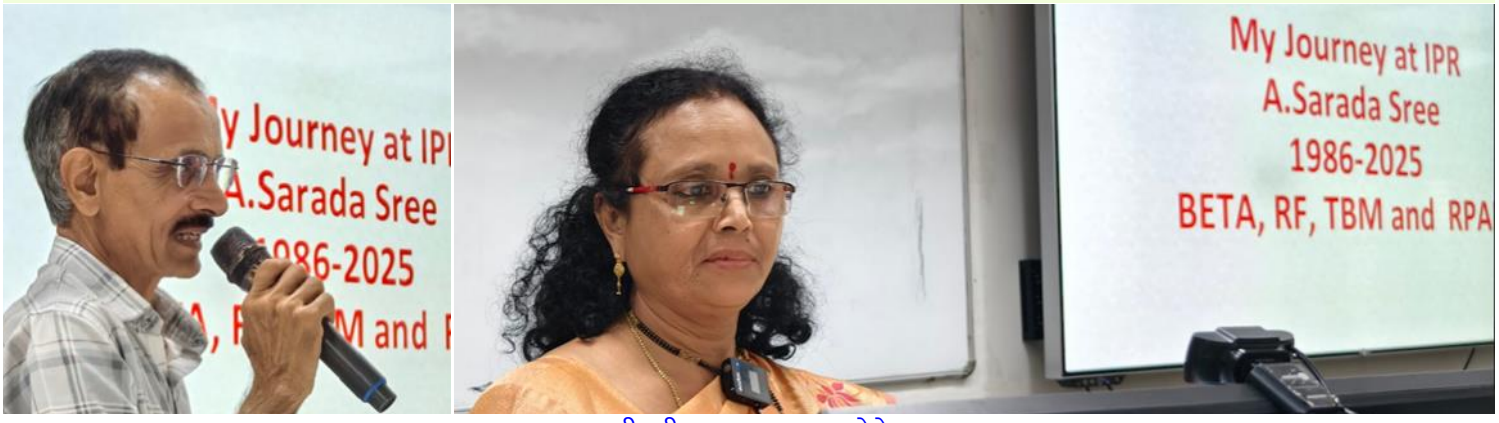
Dr. Nirav Jamnapara giving an invited talk at NAMTECH. IIT-Gandhinagar

सेवानिवृत्त हिन्दी व्याख्यान

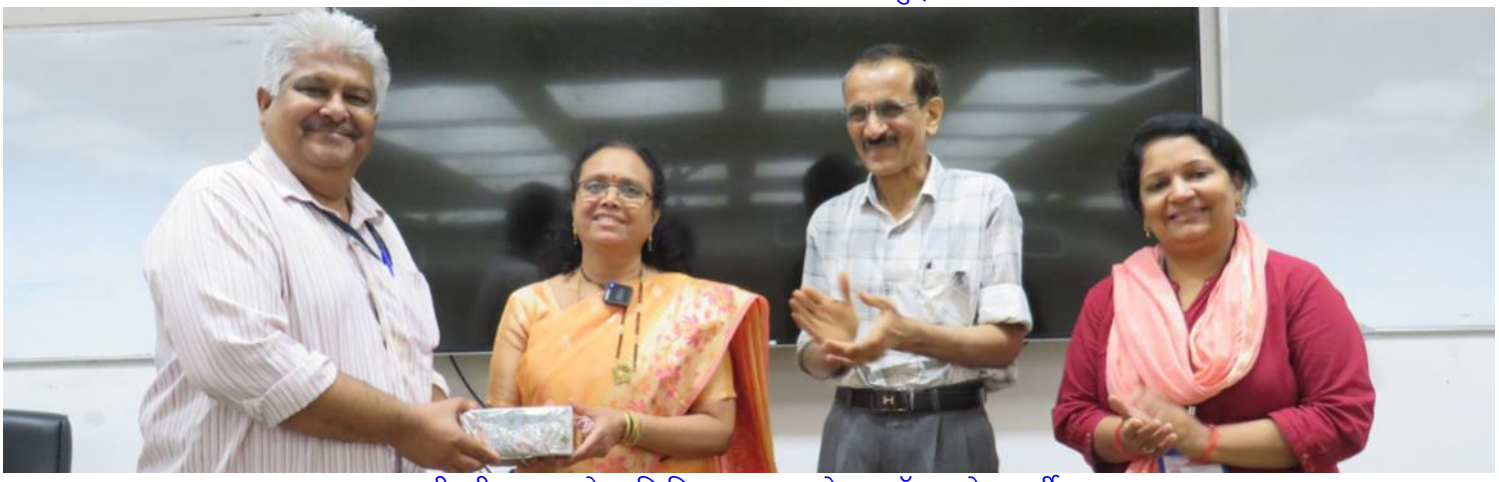
दिनांक 19 मई 2025 को श्रीमती शारदा श्री, वैज्ञानिक अधिकारी-एफ द्वारा संस्थान में अपनी 39 वर्ष की यात्रा को साझा करते हुए एक व्याख्यान दिया गया। श्रीमती शारता श्री 30 मई 2025 को सेवानिवृत्त हो रही है। अपनी सेवाकाल के दौरान उन्होंने विभिन्न तकनीकी विभागों—बीटा, आरएफ, टीबीएम एवं आरपीएड में कार्य किया है। उन्होंने इस व्याख्यान में आईपीआर में 39 वर्षों की लंबी यात्रा के अनुभवों को साझा किया।

श्रीमती शारदा श्री ने आईपीआर में अपने प्रारंभिक अनुभव और सहयोगियों के समर्थन से मिली सफलता की यात्रा का उल्लेख किया। उन्होंने एसएसटी -1 के आरएफ ऐंटिना के लिए थर्मल इमेजिंग सिस्टम परियोजना में कार्य करते हुए उच्च सटीकता वाले प्रकाशीय (ऑप्टिकल) घटकों की स्थिति निर्धारण की प्रक्रिया पर विस्तारपूर्वक चर्चा की, जिसमें 20 मिलीसेकंड की सामयिक विभेदन क्षमता (टेम्पोरल रेज़ोल्यूशन) तथा 90% संचरण दक्षता (ट्रांसमिशन एफिशिएंसी) प्राप्त की गई। इसके साथ ही, उन्होंने लातविया के आईपीयूएल (रिगा) संस्थान के साथ मिलकर कोरोसन लूप (Corrosion Loop) संबंधी भारत-लातविया सहयोग परियोजना में अपनी भूमिका का उल्लेख किया, जहाँ उन्होंने अंतर्राष्ट्रीय वैज्ञानिकों के साथ समन्वय करते हुए संयुक्त अनुसंधान किया। इस परियोजना के अंतर्गत उन्होंने आईएन-आरएएफएम (IN-RAFM) धातु नमूनों (सैंपल्स) पर 550 डिग्री सेलसियस तापमान पर 9000 घंटे की अवधि तक स्थैतिक प्रणाली में कोरोसन अध्ययन (कॉरोज़न स्टडीज़) संपन्न किए। इस दौरान उन्होंने डेटा विश्लेषण, व्याख्या तथा वैज्ञानिक रिपोर्ट लेखन एवं प्रकाशन जैसे सभी कार्य स्वनिर्देशित रूप से पूर्ण किए। इसके अतिरिक्त, उन्होंने फ्यूज़न ऊर्जा सम्मेलन—सैन डिएगो, कैलिफोर्निया में भारत का प्रतिनिधित्व करते हुए अपना शोधपत्र प्रस्तुत किया। रक्षा अनुसंधान के क्षेत्र में भी उनका योगदान उल्लेखनीय रहा, जहाँ उन्होंने राजस्थान के बाड़मेर स्थित सैन्य शिविर में लवणीय जल एंटीना (Salt Water Antenna) का सफल प्रदर्शन किया, जिससे रक्षा अनुसंधान के क्षेत्र में आईपीआर की उपस्थिति दर्ज हुई। उन्होंने लवणीय जल कॉलम द्वारा वीडियो संचरण (Video Transmission with Saline Water Column) तथा पम्प संचालित कोरोसन लूप (Pump Driven Corrosion Loop) जैसी विशिष्ट परियोजनाओं में भी सक्रिय भूमिका निभाई।

यह व्याख्यान न केवल श्रीमती शारदा श्री की व्यावसायिक यात्रा को रेखांकित करता है, बल्कि संस्थान की वैज्ञानिक उपलब्धियों की झलक भी प्रस्तुत करता है। यह आयोजन युवाओं के लिए प्रेरणा स्रोत सिद्ध हुआ।



श्रीमती शारदा व्याख्यान देते हुए



श्रीमती शारदा को स्मृति चिन्ह प्रदान करते हुए डॉ. सुब्रतो मुखर्जी

सभागार में उपस्थित श्रोतागण

Summer School Program 2025 - Introduction

IPR Summer School Program (SSP) 2025 started on 26 May 2025. 23 Students from various universities across the country joined the six weeks program. SSP Coordinator, Dr. Devendra Sharma gave a detailed introduction to the students. Dr. Vipul Tanna gave a motivating speech to the students. After the introductory session, Mr. Saroj Das, Head SIRC gave a talk on the activities and services of the library, including various aspects of scholarly publishing. The students were also given an orientation with a tour of the IPR library.

Ms. Jyoti Agarwal (L), Dr. Devendra Sharma (C) and Dr. Vipul Tanna (R) welcoming and giving introduction to the students

Group Photo of the Students with the IPR SSP-2025 Coordinating team along with Dean Administration, Dr. S. Mukherjee

Students engaged in the Library membership process

Mr. Saroj Das giving a talk

Group photo of the Students during the Library Orientation Tour

One-Day Training Workshop on Plasma at SP University

A one-day workshop and training session on the topic “Plasma: The Fourth State of Matter” was organized on 24th April 2025 by the District Community Science Center, Sardar Patel University, Vallabh Vidyanagar, with support from GUJCOST, Gandhinagar, and in collaboration with IPR, Gandhinagar.

The objective of this special program was to provide guidance and hands-on training to students and researchers on plasma science.

The event began with a welcome address by Dr. Vibha Vaishnav, Honorary Director of the Community Science Center, who introduced the guests and outlined the goals of the workshop. The inauguration session was graced by Professor P. C. Vinodkumar, Former Head of the Department of Physics, Sardar Patel University, and President, IAPT RC07 who was the Chief Guest.

The workshop concluded with a hands-on training session, where participants were engaged in practical demonstrations and observed plasma models.

The event was attended by around 29 participants, including teachers, trainees, students, and science enthusiasts, all of whom gained valuable knowledge and inspiration for future research and career in plasma science.

Glimpses of the Training Workshop at District Community Science Center, Sardar Patel University, Vallabh Vidyanagar

अखिल भारतीय हिंदी संगोष्ठी में प्रतिभागिता

परमाणु खनिज अन्वेषण एवं अनुसंधान निदेशालय (AMD), हैदराबाद द्वारा दिनांक 8-9 अप्रैल 2025 को ''विकसित भारत @ 2047 – परमाणु ऊर्जा'' विषय पर अखिल भारतीय हिंदी संगोष्ठी का आयोजन किया गया। इस संगोष्ठी में पऊवि की विभिन्न इकाईयों, संगठनों, संस्थानों ने संगोष्ठी के विभिन्न उप-विषयों के अंतर्गत अपनी प्रस्तुति दी। दो दिवसीय संगोष्ठी में कुल 21 अमंत्रित व्याख्यान, 14 मौखिक प्रस्तुति एवं 36 पोस्टर प्रस्तुत किये गये।

इस अखिल भारतीय हिंदी संगोष्ठी में हमारे संस्थान की ओर से निम्नलिखित तीन अधिकारियों ने ऑनलाइन माध्यम से भाग लिया एवं संगोष्ठी के विषय के अनुरूप अपनी प्रस्तुति दी:

डॉ. राज सिंह, वैज्ञानिक अधिकारी-एच	विश्व संदर्भ में फ्यूजन ऊर्जा की वर्तमान स्थिति
सुश्री प्रतिभा गुप्ता, वैज्ञानिक अधिकारी-एफ	नाभिकीय ऊर्जा: ऊर्जा की असीम संभावनाएँ
श्री राजीव शर्मा, वैज्ञानिक अधिकारी-ई	नाभिकीय संलयन- एक नई दिशा भविष्य अक्षय ऊर्जा स्रोत्र की ओर, अतिसुचालक चुम्बक टोकामॅक संलयन मशीन

प्रस्तुति देते हुए डॉ. राज सिंह, सुश्री प्रतिभा गुप्ता एवं श्री राजीव शर्मा

राजभाषा - उपलब्धि

नगर राजभाषा कार्यान्वयन समिति (नराकास) गांधीनगर की 24वीं छमाही बैठक का आयोजन 28 अप्रैल, 2025 को बड़ौदा एपैक्स अकादमी में हुआ। यह बैठक श्री प्रमोद सांगोले, सहायक निदेशक गृह मंत्रालय, राजभाषा विभाग, पश्चिम कार्यान्वयन कार्यालय के मार्गदर्शन में संपन्न हुई। इस बैठक की अध्यक्षता नराकास, गांधीनगर के अध्यक्ष श्री सुनिल सिन्हा ने की। उन्होंने बैठक में उपस्थित विभिन्न केंद्रीय कार्यालयों, संगठनों और बैंकों के प्रमुखों, राजभाषा अधिकारियों और प्रतिनिधियों को संबोधित किया। इस अवसर पर सदस्य कार्यालयों द्वारा प्रस्तुत छमाही प्रगति रिपोर्ट की समीक्षा की गई। साथ ही, राजभाषा के लक्ष्यों को प्राप्त करने के लिए विस्तृत चर्चा हुई और आवश्यक दिशा-निर्देश दिए गए। प्लाज्मा अनुसंधान संस्थान से डॉ. सुब्रतो मुखर्जी, डॉ. राज सिंह, डॉ. संध्या दवे एवं विभिन्न प्रतियोगिताओं के विजेता प्रतिभागियों ने इस बैठक में भाग लिया। बैठक का एक महत्वपूर्ण आकर्षण गांधीनगर की हिंदी पत्रिका "गांधीनगरी" के चौथे अंक का विमोचन रहा, जिसे मंचासीन अतिथियों द्वारा किया गया। यह गौरव की बात है कि इस अंक में प्लाज्मा अनुसंधान संस्थान के वैज्ञानिक अधिकारियों की दो रचनाएँ भी प्रकाशित हुई हैं।

बैठक के समापन समारोह में वर्ष 2024-25 के लिए राजभाषा शील्ड पुरस्कार वितरित किए गए। यह पुरस्कार नराकास, गांधीनगर के सदस्य कार्यालयों को राजभाषा के प्रभावी कार्यान्वयन में उनके उत्कृष्ट योगदान के लिए प्रदान किए गए। स्वायत्त संस्थान/शैक्षणिक संगठन की श्रेणी में प्लाज्मा अनुसंधान संस्थान ने वर्ष 2024-25 का प्रतिष्ठित राजभाषा शील्ड प्रथम पुरस्कार प्राप्त किया। इसके अलावा कार्यपालक श्रेणी के अंतर्गत डॉ. राज सिंह, वैज्ञानिक अधिकारी-एच को नराकास, गांधीनगर राजभाषा गौरव पुरस्कार प्रदान किया गया।

इस विशेष अवसर पर साहित्य जगत की जानी-मानी हस्ती श्री विजय रंचन, आईएएस को भाषा सम्मान से अलंकृत किया गया। इसके अतिरिक्त, अक्टूबर 2024 से मार्च 2025 के दौरान नराकास, गांधीनगर द्वारा आयोजित विभिन्न प्रतियोगिताओं के विजेताओं को भी पुरस्कृत किया गया, जिसमें प्लाज्मा अनुसंधान संस्थान के निम्नलिखित स्टाफ सदस्यों ने कई पुरस्कार जीतकर संस्थान को गौरवान्वित किया।

राजभाषा शील्ड पुरस्कार प्राप्त करते हुए डॉ. सुब्रतो मुखर्जी

राजभाषा गौरव पुरस्कार प्राप्त करते हुए डॉ. राज सिंह

राजभाषा - उपलब्धि

कर्मचारी का नाम	प्रतियोगिता का नाम	पुरस्कार	आयोजक कार्यालय
श्री डिकेंस क्रिश्चियन	चित्र लेखन प्रतियोगिता (ऑनलाइन)	प्रोत्साहन	इंडियन ओवरसीज बैंक, अहमदाबाद
सुश्री प्रतिभा गुप्ता	ग्लेशियर संरक्षण पर चर्चा सत्र	पुरस्कार	केंद्रीय जल आयोग, गांधीनगर
श्री कनुभाई जी परमार	निबंध लेखन प्रतियोगिता (ऑनलाइन)	तृतीय	इंडियन ओवरसीज बैंक, मुख्य शाखा
श्री गौरव पुरवार	राजभाषा संबंधी प्रश्नावली प्रतियोगिता	पुरस्कार	केंद्रीय लोक निर्माण विभाग
श्री तुषार कुमार गुप्ता	मीम्स डिज़ाइन प्रतियोगिता	द्वितीय	बैंक ऑफ इंडिया, क्षेत्रीय कार्यालय







विभिन्न प्रतियोगिताओं के लिए पुरस्कार प्राप्त करते हुए संस्थान के स्टाफ सदस्य

Academic Visits to IPR

Date	Institution	Visitors
08 April 2025	PDEU, Gandhinagar	32 students of Civil Engg. VI Sem
15 April 2025	Global Indian International School, Ahmedabad	16 students of class XI (PCM)
17 April 2025	Ganpat University, Mehsana	49 students of BSc. & MSc.
21 April 2025	Amrutam International School, Ahmedabad	43 students of class XII (PCM)
22 April 2025	Shivashish World School, Ahmedabad	55 students of class XI (PCM)

Group Photos of the Students from PDEU, Gandhinagar

Group Photos of the Students and Teachers from Global Indian International School, Ahmedabad

Group Photos of the Students and Faculty from Ganpat University, Mehsana

Academic Visits to IPR

Group Photos of the Students and Teachers from Amrutam International School, Ahmedabad

Group Photos of the Students and Teachers from Shivashish World School, Ahmedabad

Superannuation

Ms. A. Sarada Sree superannuated from services on 31st May 2025. She has served the Institute for more than 39 years.

IPR newsletter team wishes her a Happy and Healthy retired life.

CPP-IPR at the 39th Annual Congress of the Assam Academy of Mathematics

CPP-IPR's Outreach Cell participated at the 39th Annual Congress of the Assam Academy of Mathematics, organized at Department of Mathematics, Dibrugarh University on 17th May 2025. Plasma devices, namely glow discharge plasma, Jacob's ladder, plasma globe and plasma thruster were exhibited. Two posters demonstrating the use of mathematics in plasma physics were also displayed. The stall was visited by around 100 participants (students from various schools and research scholars of Dibrugarh University).



Special Guest at the event, Prof. Prasanta Chatterjee, Visva-Bharati University, West Bengal at CPP-IPR stall (L-C). Students excited to experience the plasma globe (R)

Group photo of the teams from Dibrugarh University and CPP-IPR

IP Day talk at GTU

Dr. Nirav Jamnapara delivered a talk on "Plasmatech Innovations @ IPR: Opportunities for students & startups" at the Gujarat Technological University (GTU) on 28 April 2025 at GTU-VGEC campus, Chandkheda, Ahmedabad.

The talk was attended by more than 75 participants including faculties and students. The talk emphasized about recent innovations in plasma technology domain and how intellectual property can be leveraged in protecting and commercializing these innovations


MoU between IPR and GTU

Institute for Plasma Research (IPR) and Gujarat Technological University (GTU) has executed Memorandum of Understanding (MoU) for Collaboration on Academic areas of mutual interest. This partnership marks a significant step toward promoting knowledge exchange, joint research initiatives, and academic enrichment.

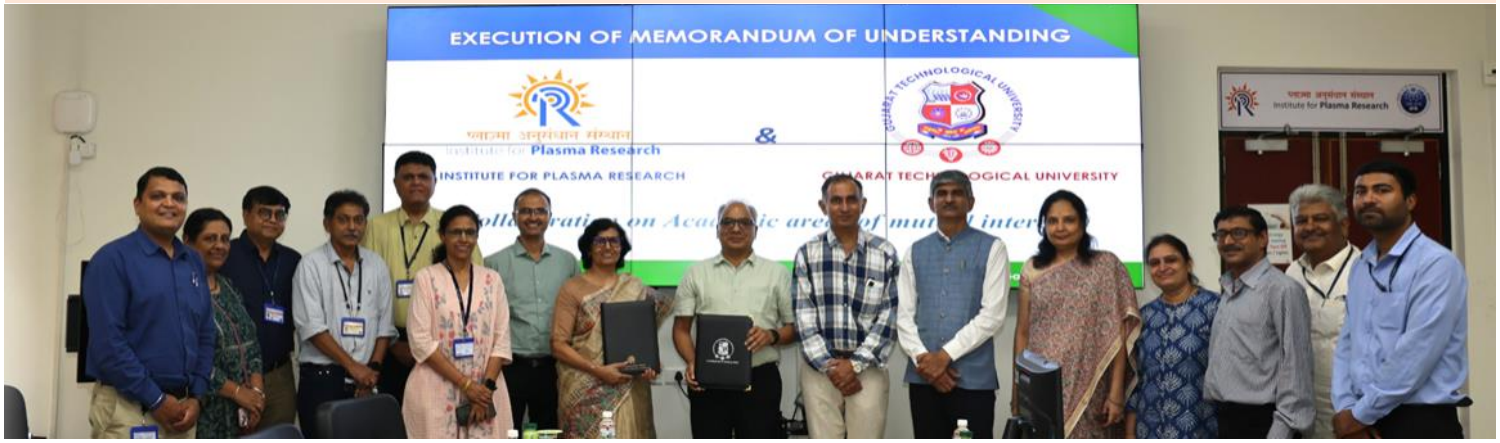
The MoU was formally signed on 09th May 2025, in the presence of senior representatives from both institutions. The MoU aims to leverage the strengths and expertise of each organization to pursue collaborative programs including:

- Academic collaboration for higher education of staff members
- Joint scientific research
- Incubation and startup related activities

Speaking on the occasion, Dr. Dinesh K Aswal, Director, IPR and Dr. Rajul K. Gajjar, Vice Chancellor, GTU expressed enthusiasm about the potential of this collaboration to catalyze innovation and academic growth and also mentioned the importance of inter-institutional cooperation in addressing complex challenges and advancing knowledge.

This MoU reaffirms the shared commitment of both institutions to contribute meaningfully to the academic community and to create an ecosystem where learning, research, and innovation thrive together.

Signing of MoU



Teams from IPR and GTU during the execution of MoU

IP Utsav

Ministry of Education Innovation Cell (MEI) organized the IP Utsav during 21-26 April 2025. IPR coordinators of HBNI Institute Innovation Council (HIIC) members, Dr. Mukesh Ranjan (Innovation ambassadors) and Dr. Sudhirsinh J Vala (Innovation ambassadors) coordinated the IP Utsav activity. Various talks about Design registration, copyright, trademark, patenting, commercialization etc. were arranged both at IPR, FCIPT and CPP campus. Students, Dean Academic, Academic committee members, HBNI faculties and Postdoctoral fellows participated in the event.

IP Utsav being attended at IPR and CPP-IPR

Appreciation of work under MoU between IPR and ISRO

Anode Liner Material Erosion Studies for the indigenous development of Anode liner material and it's testing under various plasma thruster operating conditions, carried out under an MoU between IPR and VSSC/ISRO has been recognized and appreciated at the occasion of Innovation day celebration at ISRO.

Dr. Remya and Dr. Ajith from VSSC and Dr. Mukesh Ranjan from IPR being felicitated for their work

Past Events @ IPR

- ***Prof. Lee William Packer,*** United Kingdom Atomic Energy Authority, Oxfordshire, U.K, gave a talk on "Perspectives and challenges within the development of nuclear fusion energy" on 23rd April 2025 ***(Colloquium #343)***
- ***Dr. Zara Aftab,*** gave a talk on "Study of Cross-Section Measurement of Tin Isotopes with Covariance Analysis" on 30th April 2025
- ***Dr. Gajendra Singh,*** gave a talk on "Evaluation of the electron impact excitation cross-sections of H atom upto 1 MeV incident electron energies" on 1st May 2025
- ***Dr. P S Naga Sai Raghavendra Srikar,*** Indian Institute of Technology, Tirupati, gave a talk on "Spectroscopic Diagnostics and Machine Learning for Optimizing Nonthermal Atmospheric Pressure Plasma Jets" on 02nd May 2025
- ***Dr. Darpan Dubey,*** University of Allahabad, Uttar Pradesh, gave a talk on "Compositional Analysis of the Pyrotechnic materials using spectroscopic techniques" on 09th May 2025
- ***Dr. B Anil Babu,*** gave a talk on "Design and Development of Reconfigurable Intelligent Surface for Dynamic Control of Electromagnetic Wave" on 13th May 2025
- ***Dr. Hardik Vyas,*** gave a talk on "Characterization and integrity assessment of friction-welded joints between copper and stainless steel for ion extractor grid fabrication" on 15th May 2025
- ***Dr. Ruchi Mishra,*** gave a talk on " Degradation of pesticide molecules by Cold Atmospheric Plasma: Reactive molecular dynamics insights" on 16th May 2025
- ***Dr. Mohit Aggarwal,*** Barkatullah University, Bhopal, gave a talk on "Development of advance coatings for UV and IR radiation absorption for potential applications in stray light suppression in optical system" on 16th May 2025
- ***Dr. Manoj Kumar,*** gave a talk on "Thermo-hydraulic performance characterization and development of straight and curved hydroformed panel experimental test set-up" on 22nd May 2025
- ***Mr. Kaushlender Singh,*** gave a talk on "Effect of plasma-driven magnetohydrodynamic activity and pulsed gas-injection on edge plasma turbulence in ADITYA-U tokamak" on 23rd May 2025

Upcoming Events

- 16th International Particle Accelerator Conference (IPAC25), Taipei, Taiwan, 1-6 June 2025; https://ipac25.org/
- 12th International Workshop on the Mechanisms of Vacuum Arcs (MeVArc 2025), Sweden, 1-6 June 2025; https://indico.cern.ch/event/1424597/
- 6th Summer School of Plasma Diagnostics (PhDiaFusion 2025), Poland, 9-13 June 2025; https://phdia2025.ifj.edu.pl/
- 15th Serbian Conference on Spectral Line Shapes in Astrophysics, Serbia, 9-13 June 2025; http://servo.aob.rs/scslsa/
- 9th International Conference on Advancements in Nuclear Instrumentation Measurement Methods and their Applications (ANIMMA), Valencia, Spain, 9 - 13 June 2025; https://animma.com/registration
- 4th International Fusion and Plasma Conference (iFPC 2025), Daejeon, Korea, 9-13 June 2025; https://i-fpc.org/2025/
- 2025 ANS Annual Conference, Chicago, 15-18 June 2025; https://www.ans.org/meetings/cfp/view-ac2025/
- 25th IEEE Pulsed Power Conference (PPC) and the 52nd IEEE International Conference on Plasma Science (ICOPS), Berlin, Germany, 15-20 June 2025; https://www.ppps2025.kit.edu/
- 26th International Symposium on Plasma Chemistry (ISPC26), Minnesota, United States, 15-20 June 2025; https://www.ispc-conference.org/
- 2025 IEEE Symposium on Fusion Engineering (SOFE 2025), Cambridge, Massachusetts, 23-26 June 2025; https://plasmafusion.eventsair.com/sofe2025
- 14th ITER International School: Integrated Modelling of Magnetic Fusion Plasmas (IIS2025), Aix-en-Provence, France, 30 June 2025 - 4 July 2025; https://iis2025.sciencesconf.org/

Winning Slogans of Fire Service Week 2025

First Prize

"ચાલો એક થઈને એક ચીંગારી જગાવીયે
ભારતને એક અગ્નિ-સુરક્ષિત રાષ્ટ્ર બનાવીયે."

-Murtuza Vora

"आपातकालीन दुर्घटना के लिए एक जुट हो,
भारत अग्नि सुरक्षा की और अग्रेसर हो"

-Krishna Mohan Kumar

"Join Hands, Prevent Fires,
Save Lives, Save India."

-Pradipkumar N Raval

Introducing the new IPR Staff Club Executive Committee

The new Staff Club Executive Committee (SCEC) has been formed for the year 2025-26.

The IPR Newsletter Team Congratulates the new SCEC and wishes a very successful and eventful tenure.

(L-R) Mr. Pravin Kumar Sharma (Joint Sports Secretary, Mr. Ashlesh Shah (Joint Treasurer), Dr. Gaurab Bansal (General Secretary, Dr. Raj Singh (President), Mr. Jatin Patel (Treasurer), Mr. Rasesh Dave (Cultural Secretary), Mr. Kartik Mohan (Sports Secretary), Mr. Ravish Chokshi (Joint Cultural Secretary-ITER-IN), Mr. Hiteshkumar Kavad (Joint Cultural Secretary) and Mr. Rajnikant Bhatasana (Joint Cultural Secretary)

Rare Turtle rescued at CPP-IPR

A rare turtle, black pond turtle (Geoclemys hamiltonii), was rescued at CPP-IPR campus by the security personals on 12th May, 2025. The turtle had strayed into the campus after heavy rain.

The species is endemic to South Asia and its conservation status is 'endangered' as per the International Union for Conservation of Nature's (IUCN) Red List of Threatened Species (https://www.iucnredlist.org/). Considering the rarity of the species, the turtle was handed over to the Wild Life wing of Assam Forest department.

Photo of the rare turtle (Top Right). The turtle being handed over to the Assam Forest Department

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Know Your Colleague

Mr. Jagabandhu Kumar did his M.Sc. Physics from the Indian Institute of Technology (IIT) Bombay, Mumbai, in 2013. He joined the institute in 2014 as a Technical Trainee through the Technical Training Program (TTP). After completion of TTP, he joined as Scientific Officer-C in 2015. He began his scientific career with the conceptual design of a Passive-Active Multijunction (PAM) antenna for the ADITYA-U tokamak upgrade. Currently, he is serving as a Scientific Officer-E in the High Power Lower Hybrid Current Drive (LHCD) Division at IPR. His work focuses on the development, operation, and maintenance of LHCD systems for the ADITYA-U and SST-1 tokamaks. His research interests include modelling, heating and current drive experiments in tokamak plasmas, studying ECR plasmas in spherical tokamaks, and developing plasma diagnostic techniques such as fast electron Bremsstrahlung tomography, edge profile X-mode reflectometry and Langmuir probes. He is pursuing Ph.D. at IPR through HBNI. He enjoys participating in sports activities and loves playing cricket, volleyball, football and badminton. He also enjoys reading books.

Winning Slogans of Fire Service Week 2025

Second Prize

"સાથે મળીને કરીએ, સુરક્ષા નિયમોના પાલનનું આહવાન, અગ્નિ સુરક્ષિત દેશનું, ભારત ને મળે સમ્માન." -Hemant Kumar Hadiel

"सभी भारतीयो का ये हो नारा, एकजुट होकर अग्नि सुरक्षित भारत बनाये सारा" -Ashvini Bhardwaj

"Think fast, act safe, unite for safe India:

Fire doesn't wait." -Aditya Naugraiya

Third Prize

"રાખિયે અગ્નિ સુરક્ષિત કાર્યક્ષેત્ર,
રહે પ્રજ્વલિત ભારત ક્ષેત્ર." -Rasesh J Dave

"जन-जन का हो एक ही नारा
अग्नि सुरक्षित देश हो हमारा" -Ayush Mani Tripathi

"Unite to Ignite, Keep Fire Safety Tight,

Make India Safe and Bright." -Pooja Rathva

Quote of the Month

"Collaboration allows teachers to capture each other's fund of collective intelligence."

--Mike Schmoker

The IPR Newsletter Team

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

Rohit Anand | **Sandhya Dave** | **Saroj Das** | **Shravan Kumar** | **Supriya A Nair** | **Suryakant Gupta** | **Tejas Parekh**

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