The 4th State
Newsletter of the Institute for Plasma Research, Gandhinagar, Gujarat (India)
Issue 148, November 2025

India Fusion Day at ITER Organization

India Fusion Day was held on 7 October 2025 at ITER Organization on the theme "**Celebration of Indian Contributions**". Padma Bhushan Dr. Vijay Kumar Saraswat, a distinguished Indian scientist and member of NITI Aayog visited the ITER Organization in France to commemorate the event.

During the visit, Dr. Saraswat engaged in in-depth discussions with Mr. Pietro Barabaschi, Director General of the ITER Organization, and other leading scientists. The dialogue focused on the progress of the ITER Project and India's contributions to this landmark international collaboration in fusion energy.

Dr. Saraswat was accompanied by Mr. Ujjwal Kumar Baruah, Project Director of ITER-India.

Dr. V. K. Saraswat (4th from left) with Mr. Pietro Barabaschi, DG ITER Organization (3rd from left) and other participants

(Left) Dr.V. K. Saraswat visiting the Vacuum vessel Assembly hall at ITER site France, is on the background

(Right) Dr. V. K. Saraswat being felicitated by Mr. Pietro Barabaschi, DG ITER Organization

LI-VISTA Facility Setup in IPR

LI-VISTA is acronym for **L**IGO **I**ndia – **V**acuum **I**ntegrated **S**ystem and **T**est **A**ssembly. LIGO Division has setup LI-VISTA facility in LIGO Lab at IPR, Gandhinagar. This setup comprises of two major vacuum equipment – 80K Cryopump and 20 m long Integrated Vacuum Vessel (IVV). These vacuum equipment are fabricated as part of LIGO India project prototype development activities covered in the Technology Development and Capacity Building phase of the LIGO-India project. 80K Cryopump is one of the major constituent vacuum equipment of LIGO India Vacuum System layout. In LIGO 80K Pump is installed at both the ends of each 4 km beam tube arm and Large size gate valve to isolate Chambers (containing optical installations) from the beam tube arms. Main function of 80K Cryopump is to capture water molecules and prevent them from entering 4 km long beam tube layout. 20 m long vessel represent beam tube (cross-section wise). 1:1 scale prototype manufacturing of these equipment helped LIGO-India project to assess manufacturing feasibility, establish the manufacturing process and associated quality assurance plan.

LI-VISTA Setup in LIGO Lab at IPR

Subsequently it was planned to integrate 80K Cryopump and 20 m IVV through a 1250 mm Large Gate valve to setup LI-VISTA facility to take up experiments. One among few major experiments proposed in LI-VISTA facility is to evaluate operational performance of 80 K Cryopump and find out the efficiency in capturing water molecules during vacuum pump-down.

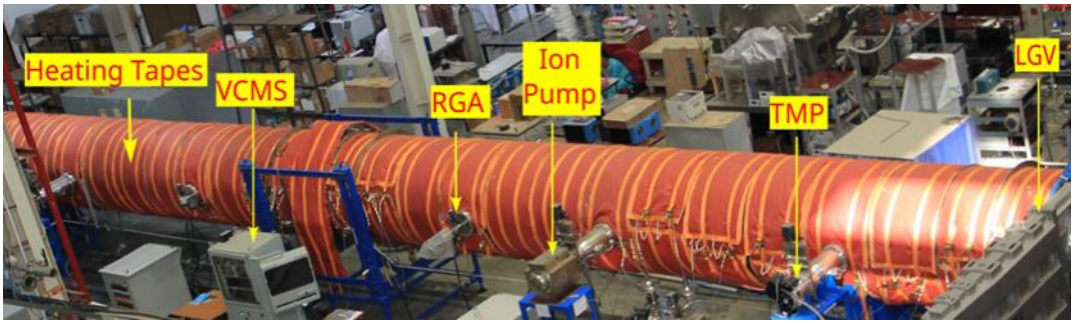
Integrated Vacuum Vessel is assembly of two 1.24 ID x 10m long vessels connected through expansion joint (Bellows) and installed on support structure resembling structure used to support beam tube layout along its 4 km length at the project site.

LI-VISTA facility is equipped with set of vacuum equipment comprising of Roughing pumps, Turbo-molecular pumps, Ion pumps and set of other vacuum accessories like the Combination gauges, cold cathode gauges and residual gas analysers. This facility is operational now and vacuum pump-down is in progress to get desired ultimate vacuum in individual systems (IVV and 80K Cryopump) and subsequently in integrated system.

LIGO division is preparing list of to specific experiments in consultation with the collaborating institutes to understand vacuum pumpdown scenarios of large volumes to ultra-high vacuum regime, commissioning aspects, assess cryopump efficiency in capturing water molecules and few other operational aspects related to LIGO India vacuum system –

- Challenges in demonstration of vacuum < 1 x 10^{-9} mbar
- Demonstration of 80k Cryopump having trapping efficiency of 97% for water vapour
- Assess large volume vessel vacuum performance, with varying bake-out cycles up to 150^{0}C
- Evaluate large size (1250 mm) gate valve (LGV) performance in UHV environment
- Estimate location and magnitude of leak with the aid of RGA's by introducing measured leak
- Integrate the individual systems controls into one central control to monitor the LI-VISTA facility operation remotely.

The overall experience gained during prototype activities together with the outcome of operational runs of proposed experiments will aid LIGO India project team to enter procurement phase of LIGO India project with necessary understanding and knowledge to manage fabrication, assembly and installation at site and subsequent commissioning of vacuum infrastructure.



Integrated Vacuum Vessel (IVV) post assembly

80 K Cryopump

Off-target gradient driven flows in 3D simulations of ADITYA-U Tokamak scrape-off layer plasma transport

A sharp and narrow boundary layer is formed in tokamak plasmas where magnetically confined hot plasma is scrapped-off by a heat-withstanding limiter target. The behavior of plasma flow in this scrape-off layer (SOL) is an indicator as well as a sensitive knob controlling the interior core of the tokamak. The flows hit the target after accelerated to supersonic speed along the magnetic field by the steep pressure gradients which even extend to far upstream locations away from the targets. The flows can reverse the direction if gradients turn negative and are often strongly asymmetric, despite the apparent symmetry of the plasma. They are amplified in the interior to cause violent rotation of the core, often endangering the confinement. While plasma flow speeds are difficult to measure directly, the signatures of their asymmetries are captured in the frequency shift of radiations emitted by the Carbon impurities which act like tracers in the flow.

Extensive 3D computer simulations on high performance supercomputer have reconstructed plasma flows to interpret recent observations in Aditya-U tokamak where the asymmetries undergo a radial profile inversion at higher densities. Besides full 3D flow distributions, the simulation results help identifying SOL flows as trigger for plasma rotation based on the wave kinetics model. The cascade driven large scale structures triggering the plasma rotation in the model are replaced by the asymmetric standing pattern of the target bound plasma transport which show radial inversion of profiles upon marginal shift of the plasma center with density.

The paper is authored by Arzoo Malwal, Bibhu P. Sahoo, Devendra Sharma and Yühe Feng, published in Nuclear Fusion Journal, 64 (2024), 096024

Full-Text: https://iopscience.iop.org/article/10.1088/1741-4326/ad5e95

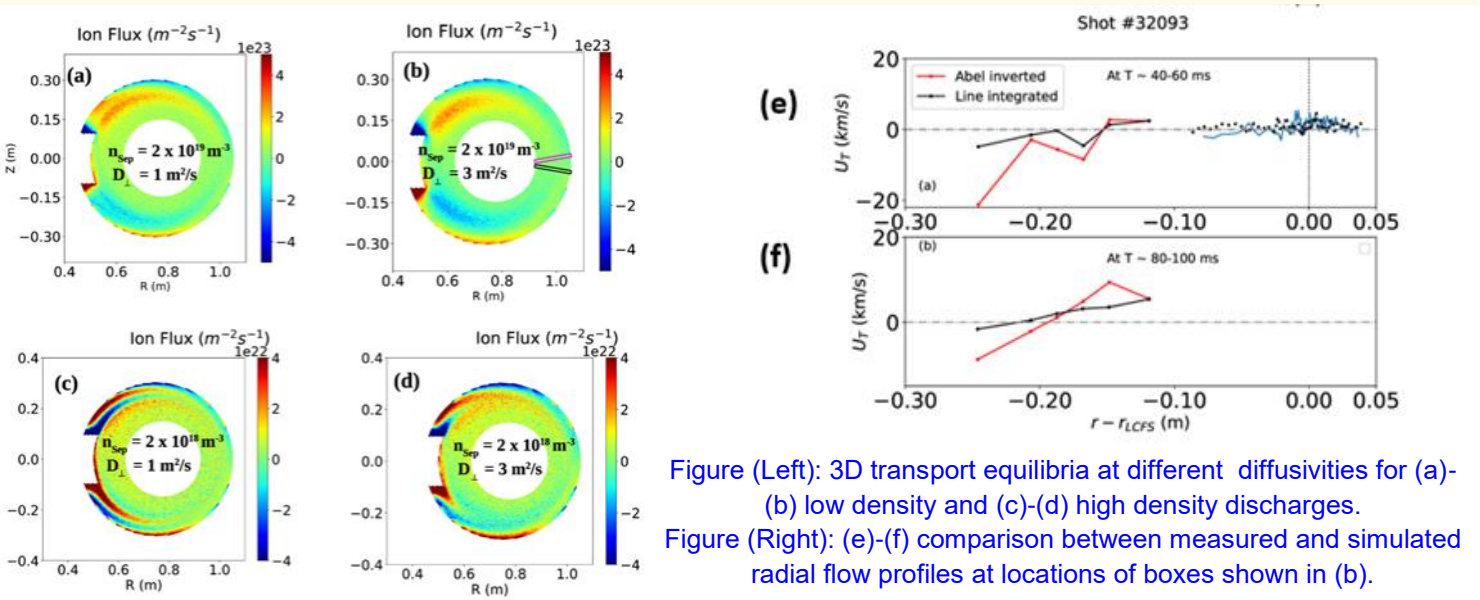


Figure (Left): 3D transport equilibria at different diffusivities for (a)-(b) low density and (c)-(d) high density discharges.
Figure (Right): (e)-(f) comparison between measured and simulated radial flow profiles at locations of boxes shown in (b).

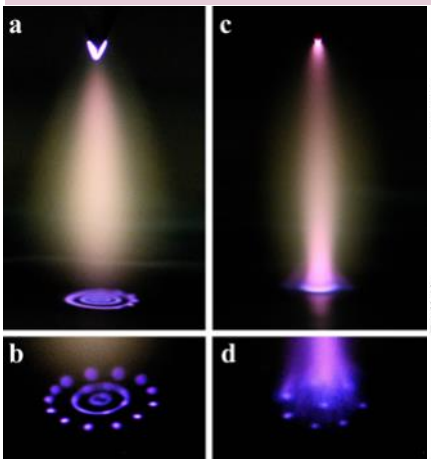
Efficient treatment of synthetic dyes through a cost effective plasma setup: A step towards industrial application

This work reports results on treatment of various types of synthetic dyes by a simple and cost effective non-thermal plasma setup, to evaluate the possibility of use of such devices for treatment of wastewater from textile industries through advanced oxidation process. The setup is a pin-to-liquid electrode system, operated with a neon transformer and produces an Atmospheric Pressure Glow Discharge plasma, that interacts with dye solutions and operates in open air without any gas supply. UV–visible spectrophotometer, COD removal rate and ion chromatography were used to study the degree of degradation. In treating nine different dyes (70 ml of 50 ppm), it was found that the plasma setup was capable to efficiently degrading all dyes, with a degradation efficiency (D%) reaching more than 87 % for all and to almost 100% for five of them after 40 min of treatment. It was also able to efficiently treat the mixture of these dyes, even in the presence of salt. Considering the effectiveness of the treatment and the simplicity of the setup used, this system has the potential for use in wastewater treatment on a large scale.

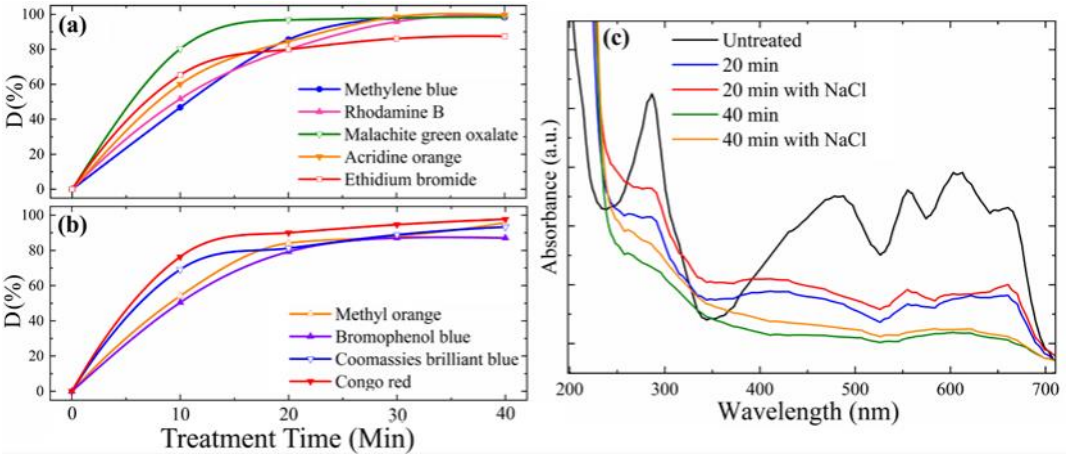
The paper is authored by Flossie Marak, W. Joychandra Singh and Ngangom Aomoa, published in the Journal of Environmental Chemical Engineering, 13 (2025), 119623

Full-Text: https://doi.org/10.1016/j.jece.2025.119623

Efficient treatment of synthetic dyes through a cost effective plasma setup: A step towards industrial application



Plasma interacting with water in liquid anode (a and b) and liquid cathode (c and d) mode.



Degradation efficiencies of plasma treated (a) cationic, (b) anionic and (c) dye mixture.

Execution of Incubation agreement between Redero Trionics LLP and AIC-IPR Plasmatech Innovation Foundation

AIC-IPR Plasmatech Innovation Foundation is delighted to welcome a new startup, Redero Trionics LLP (Redero Trionics). Redero Trionics is a startup funded by our own students, Mr. Satya Prakash Reddy K (Founder) & Mr. Rosh Roy (Co-Founder). This collaboration marks a proud moment as it reflects the growing spirit of innovation and entrepreneurship within our campus community.

Under the incubation agreement, the startup will gain access to the IPR's state-of-the-art infrastructure, technical mentorship, business development guidance, and networking opportunities. This comprehensive support system is designed to help the startup refine its technology, strengthen its business model, and accelerate its journey from concept to market.

Redero Trionics LLP is a deep tech start-up involved into the design engineering services and prototyping/fabrication of plasma based systems and products and allied fields. Redero Trionics aims to provide specialized engineering design services and end to end solution for design and development of technologies which may include simulations, modelling and fabrication of prototypes and systems.

This initiative also reaffirms our IPR's commitment to fostering student entrepreneurship and creating an enabling ecosystem for deep-tech and innovation-driven ventures for development of fusion and plasma technologies. We look forward to witnessing the growth and success of this student-led enterprise in the coming months.

From Left to right: Mr. Rosh Roy (Co-founder), Dr. Tapas Ganguli (Director, IPR), Prof. U. Kamachi Mudali (Vice Chancellor, HBNI), Mr. Satya Prakash Reddy K (Founder), Prof. Naveen Kumar (Associate Dean, HBNI)

Doctoral Research Spotlight

Development of Machine Learning based Technique for Disruption Control and Prediction in ADITYA-U by Ramesh B Joshi

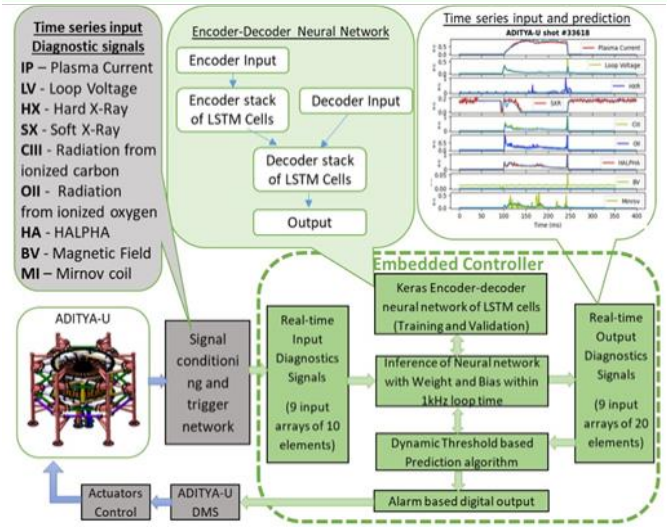
This research focused on plasma disruption, highlighting the necessity of employing deep learning techniques for disruption prediction. The goal was to develop deep learning models that can predict plasma disruptions (where plasma particles and energy suddenly lose confinement) with sufficient warning time to enable mitigation strategies.

Ramesh Joshi

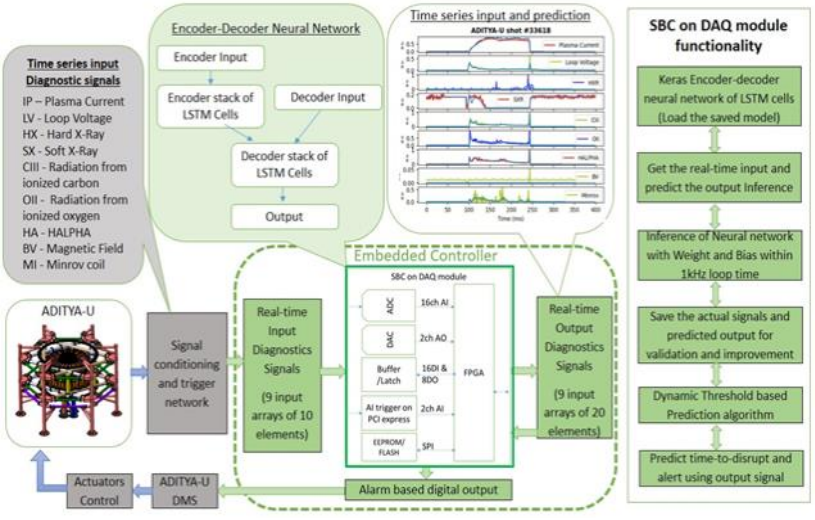
The capacity of deep learning techniques to learn from complex data-driven approaches positions them as ideal tools for forecasting disruptions. We finalized an auto-encoder multivariate LSTM model analysing 9 diagnostic signals after assessment of various time series neural network techniques [1]. The model was trained on data from approximately 8,000 valuable plasma shots out of 30,000 available [2] and aimed to forecast disruptions at least 10 milliseconds before they occur [3]. We converted the Keras model in to c convertible code using keras2c for optimization (achieving 1200× speed improvement) [4].

The process of reading inputs and generating predictions within a frequency rate of 1 kHz has been validated, and the results have been benchmarked with prototype development.

The prototype was validated using a univariate model to establish the scanning ADC input with various embedded hardware and infer the prediction output using different methodologies. The solution was integrated with high-speed embedded data acquisition hardware and deployed for real-time predictions at a 1 kHz frequency rate. Transfer learning techniques were used to avoid retraining the model to update the model with new plasma discharge data [5]. The system has successfully forecast the prediction over 600 plasma discharges in real-time operations, providing warning times between 3-25 milliseconds for disruption control.



Architecture of the experimental set-up



Architecture of the real-time implementation scheme

Publications:

1] R Joshi et al. Assessment of stacked LSTM, Bidirectional LSTM, ConvLSTM2D, and Auto encoders LSTM time series regression analysis at ADITYA-U Tokamak, IEEE Transactions on Plasma Science (2024)

2] Ramesh Joshi, Joydeep Ghosh, Nilesh Kalani, RL Tanna and ADITYA/ADITYA-U Teams, 3rd International Conference on Paradigms of Communication, Computing and Data Sciences (PCCDS 2022), Artificial Intelligence and Communication Technologies, SCRS (2023)

3] R Joshi et al. Disruption Prediction on ADITYA/ADITYA-U using future sequence based time series Neutral Network, IAEA 29th FEC (2023)

4] R Joshi et al. Analysis of different inference implementations for deep learning model on ADITYA-U Tokamak, Proceedings of the 12th International Conference on Soft Computing for Problem Solving (SocProS 23) (2024)

5] R Joshi et al. On-the-fly training architecture for time series neural network on ADITYA/ADITYA-U data, Radiation Effects and Defects in Solids, (2024)

Vigilance Awareness Week 2025

Vigilance Awareness Week (VAW) 2025 is being observed at IPR during 27 Oct—02 Nov 2025. As part of the VAW and strong commitment to honesty and integrity, effective code of conduct, and good ethical practices, the staff members took the Integrity pledge on 27 October 2025.

The Integrity pledge was administered by the Director and the Chief Vigilance Officer (CVO), in Hindi and English respectively.

The CVO also urged the staff to take online integrity pledge on the Govt. of India's Central Vigilance Portal

CVO, Dr. N. Ramasubramanian (L), Director, Dr. Tapas Ganguli (C) and ACAO, Ms. Supriya Nair (R)

IPR Staff members taking the Integrity pledge

Vigilance Awareness Week 2025 - Expert Talk

As a part of the Vigilance Awareness Week -2025, Shri V V Lakshmi Narayana IPS (Retd), former Joint Director, CBI Hyderabad and former ADGP, Mumbai gave a talk on "Integrity and vigilance in scientific research: safeguarding national assets and public trust" on Tuesday, 14th October 2025 at IPR.

He emphasized the importance of maintaining high integrity and ethical values, especially for the scientific community as they are the role models for the society at large.

Dr Anitha (L) introducing the speaker Shri V V Lakshmi Narayana

Vigilance Awareness Week 2025 - Expert Talk

Shri V. V. Lakshmi Narayana delivering his talk (L). Audience attending the talk (R)

Vigilance and Cyber Security Awareness Talks

As part of the Vigilance and Cyber Security Awareness, special talks on the topics of “Ethics and Cyber Security” were organized at IPR on 16 October 2025. The session was aimed to enhance awareness and understanding of ethical practices and cyber security measures essential for maintaining integrity and data safety in the workplace.

Shri Neeraj Kumar Dwivedi, Chief Manager & Faculty, Bank of Baroda gave a talk on Ethics and the POSH Act 2013.

IPR CISO, Ms. Kirti Mahajan introducing the speaker (Top L); Dr. Raj Singh welcoming the guest speaker (Bottom L); Shri Dwivedi delivering his talk (C); Audience attending the talk (R)

The second talk was delivered by Shri Tamanna Arif, Chief Manager & Faculty, Bank of Baroda. His talk focused on Cyber Security. He presented case studies on digital arrest and cyber frauds, government initiatives for cyber hygiene and portals for reporting cybercrimes.

Shri Tamanna Arif delivering his talk (L); Shri Amit Kumar Srivastava, Head Computer Division, felicitating the speaker (R)

हिंदी पखवाड़ा 2025

प्लाज़्मा अनुसंधान संस्थान (आईपीआर) में दिनांक **16 सितंबर 2025 से 26 सितंबर 2025** तक **हिंदी पखवाड़ा समारोह 2025** का आयोजन उत्साहपूर्वक किया गया। इस दौरान विभिन्न प्रतियोगिताओं एवं विशेष व्याख्यानों का आयोजन किया गया, जिनमें वैज्ञानिक, तकनीकी एवं प्रशासनिक कर्मियों ने सक्रिय रूप से भाग लेकर हिंदी के प्रति अपनी अभिरुचि और प्रतिबद्धता को प्रदर्शित किया।

पखवाड़े की शुरुआत **16 सितंबर 2025** को एक विशेष व्याख्यान से हुई, जिसका विषय था – *"आइए परमाणु ऊर्जा विभाग को जानें"*। यह व्याख्यान परमाणु ऊर्जा विभाग, मुंबई के निदेशक (राजभाषा) **श्री अचलेश्वर सिंह** द्वारा दिया गया। उन्होंने परमाणु ऊर्जा विभाग की संरचना, कार्यप्रणाली, उपलब्धियों तथा हिंदी के प्रचार-प्रसार में इसकी भूमिका पर अत्यंत प्रभावशाली रूप से प्रकाश डाला।

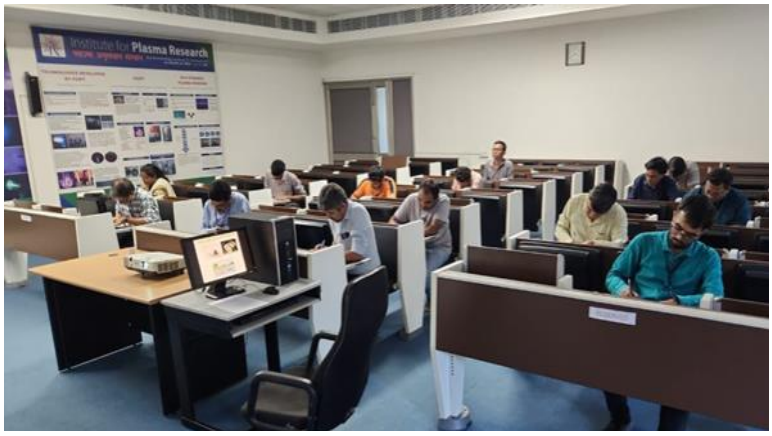
16 सितंबर 2025 को संस्थान के सेमिनार हॉल, एफसीआईपीटी एवं ईटर-भारत कार्यालयों में **टिप्पण, पत्र लेखन एवं अनुवाद प्रतियोगिता** आयोजित की गई, जिसमें कुल **75 प्रतिभागियों** ने भाग लिया। इस प्रतियोगिता में प्रतिभागियों को विभिन्न प्रशासनिक कार्यों पर आधारित टिप्पण, पत्र लेखन तथा हिंदी-अंग्रेजी अनुवाद संबंधी प्रश्नों पूछे गए। यह प्रतियोगिता प्रतिभागियों के कार्यालयीन हिंदी लेखन कौशल को परखने और निखारने का एक प्रभावी माध्यम सिद्ध हुई।

17 सितंबर 2025 को *"चित्र देखो कहानी लिखो"* प्रतियोगिता आयोजित की गई, जिसमें **86 प्रतिभागियों** ने उत्साहपूर्वक भाग लिया। इस प्रतियोगिता में प्रतिभागियों को एक चित्र दिखाकर उसके आधार पर कल्पनाशील एवं रचनात्मक हिंदी कहानी लिखने का अवसर दिया गया। प्रतिभागियों ने अपनी कल्पनाशक्ति और लेखन कौशल का उत्कृष्ट प्रदर्शन किया।

18 सितंबर 2025 को हिंदी **निबंध लेखन प्रतियोगिता** का आयोजन हुआ, जिसमें कुल **69 प्रतिभागियों** ने हिस्सा लिया। इस प्रतियोगिता में प्रतिभागियों ने दो विषय दिये गये – 'वैश्वीकरण के युग में हिंदी का महत्व' और एआई का हमारी सृजनशीलता पर प्रभाव'। प्रतिभागियों ने इन दोनों में से किसी एक विषय पर प्रभावी रूप से अपने विचार व्यक्त किए। इस प्रतियोगिता का उद्देश्य प्रतिभागियों में हिंदी में विचार अभिव्यक्ति की प्रवृत्ति को प्रोत्साहित करना था।

19 सितंबर 2025 को श्रुत लेखन प्रतियोगिता आयोजित की गई, जिसमें कुल 108 प्रतिभागियों ने उत्साहपूर्वक भाग लिया। इस प्रतियोगिता में प्रतिभागियों को हिंदी के कुछ कठिन शब्द एवं एक पैराग्राफ लिखने के लिए बोले गये।

22 सितंबर 2025 को हिंदी **प्रश्नोत्तरी प्रतियोगिता** आयोजित की गई, जिसमें कुल **185 प्रतिभागियों** ने भाग लिया। यह प्रतियोगिता *Quizizz* ऐप के माध्यम से ऑनलाइन आयोजित की गई, जिसमें हिंदी, सामान्य ज्ञान-विज्ञान आदि से संबंधित कुल 40 प्रश्न पूछे गए। प्रतिभागियों ने अपने मोबाइल के माध्यम से निर्धारित समय में प्रश्नों के उत्तर दिए। तकनीकी माध्यम से आयोजित यह प्रतियोगिता सभी के लिए रोचक एवं ज्ञानवर्धक रही।



एफसीआईपीटी, ईटर-भारत एवं आईपीआर कैंपस में आयोजित विभिन्न हिंदी प्रतियोगिताओं में भाग लेते हुए प्रतिभागी

आईपीआर कैंपस में आयोजित विभिन्न हिंदी प्रतियोगिताओं में भाग लेते हुए प्रतिभागी

23 सितंबर 2025 को हिंदी पखवाड़ा के अंतर्गत एक और विशेष कार्यक्रम — **"हिंदी कार्यशाला – विशेष व्याख्यान"** आयोजित किया गया, जिसका विषय था *"रवैया: सहयोग, संवाद और सफलता"*। इस कार्यशाला में वक्ता के रूप में **सुश्री प्रीति पाठक**, ग्लोबल ट्रेनिंग लीडर, मोटिवेशनल स्पीकर एवं कहानीकार उपस्थित रहीं। उन्होंने कार्यस्थल पर संवाद, सहयोग एवं सकारात्मक दृष्टिकोण के महत्व पर प्रेरक व्याख्यान प्रस्तुत किया। इस व्याख्यान में बड़ी संख्या में संस्थान के कर्मी उपस्थित रहें ।

वक्ता का परिचय और उन्हे सम्मान देते हुए डॉ. संध्या दवे एवं डॉ. अनीता

सुश्री प्रीति पाठक व्याख्यान प्रस्तुत करते हुए

व्याख्यान में उपस्थित श्रोतागण

पखवाड़े का समापन **दिनांक 6 अक्टूबर 2025** को एक विशेष कार्यक्रम *"चाय पर चर्चा"* एवं **पुरस्कार वितरण समारोह** के साथ किया गया। इस अवसर पर "भारत, पावर ग्रिड में फ्यूजन पावर डालने वाला विश्व का पहला देश कैसे बन सकता है?" विषय पर एक **पैनल चर्चा** आयोजित की गई, जिसमें **डॉ. जॉयदीप घोष**, **डॉ. रंजना गंगराडे**, **डॉ. इंद्रनील बंधोपाध्याय**, श्री**. अनिल भारद्वाज** तथा **डॉ. मैनाक बंधोपाध्याय** ने पैनल सदस्य के रूप में सहभागिता की एवं अपने विचार व्यक्त किये। इस चर्चा के दौरान वक्ताओं ने आई.पी.आर. की भावी योजनाओं, फ्यूजन ऊर्जा के अनुसंधान क्षेत्र में भारत की भूमिका तथा ऊर्जा आत्मनिर्भरता की दिशा में किए जा रहे प्रयासों पर विस्तृत चर्चा की। यह सत्र ज्ञानवर्धक, प्रेरणादायक और संवादपूर्ण रहा। पैनल सदस्यों के अतिरिक्त अन्य वरिष्ठ वैज्ञानिकों एवं युवा वैज्ञानिकों ने इस महत्वपूर्ण विषय पर अपने विचार रखें।

चाय पर चर्चा के पैनल सदस्यों का स्वागत करते हुए डॉ. राज सिंह

हिंदी पखवाड़ा 2025

(बाएं - दाएँ) डॉ. जॉयदीप घोष, श्री. अनिल भारद्वाज, डॉ. इंद्रनील बंधोपाध्याय, डॉ. रंजना गंगराडे एवं डॉ. मैनाक बंधोपाध्याय विचार व्यक्त करते हुए

इसके पश्चात हिंदी पखवाड़ा समारोह के समापन सत्र का आयोजन किया गया। इस सत्र के आंरभ में संस्थान के निदेशक डॉ.तापस गांगुली ने माननीय गृहमंत्री जी के संदेश का वाचन किया एवं श्री राज सिंह, सह अध्यक्ष, राभाकास ने डॉ. अजित कुमार मोहान्ती, अध्यक्ष, पऊआ एवं सचिव, पऊवि के संदेश का वाचन किया। निदेशक महोदय ने संस्थान में आयोजित हिंदी गतिविधियों की सराहना की एवं सभी श्रोताओं को भविष्य में भी राजभाषा कार्यान्वयन में सक्रिय और उल्लेखनीय योगदान देने के लिए प्रेरित किया। इस समारोह में केन्द्रीय हिंदी प्रशिक्षण संस्थान द्वारा आयोजित हिंदी परीक्षा के उत्तीर्ण कर्मचारियों को निदेशक महोदय द्वारा प्रमाण पत्र प्रदान किये गये।

राजभाषा में उत्कृष्ट कार्यान्वयन के लिए वर्ष 2024-25 के लिए प्रशासन अनुभाग-1 को अंतर अनुभागीय चल राजभाषा शील्ड प्रदान की गई एवं सिविल इन्फ्रास्ट्रक्चर परियोजना प्रभाग को प्रोत्साहन पुरस्कार प्रदान किया गया।

सुश्री प्रतिभा गुप्ता, वैज्ञानिक अधिकारी-एफ को राजभाषा के क्षेत्र में उत्कृष्ट योगदान देने के लिए राजभाषा सम्मान प्रदान किया गया।

कार्यक्रम के अंत में विभिन्न प्रतियोगिताओं के विजेताओं को पुरस्कृत किया गया तथा पखवाड़े के सफल आयोजन में सहयोग देने वाले सभी अधिकारियों एवं कर्मचारियों को धन्यवाद ज्ञापित किया गया।

हिंदी पखवाड़ा समारोह 2025 के अंतर्गत आयोजित सभी कार्यक्रमों ने संस्थान में हिंदी भाषा के प्रयोग, अभिव्यक्ति और रचनात्मकता को प्रोत्साहित किया। कर्मचारियों की उत्साही भागीदारी एवं सकारात्मक दृष्टिकोण से यह पखवाड़ा अत्यंत सफल एवं प्रेरणादायक रहा।

डॉ.तापस गांगुली श्रोताओ को संबोधित करते हुए

प्रशासन अनुभाग-1 राजभाषा शील्ड प्राप्त करते हुए

सिविल इन्फ्रास्ट्रक्चर परियोजना प्रभाग प्रोत्साहन पुरस्कार प्राप्त करते हुए

उपस्थित श्रोतागण

Academic Visits to IPR

Date	Institution	Visitors
03 Sep 2025	Swaminaryan Dham International School, Gandhinagar	29 Students, Class 11 & 12 (Science)
04 Sep 2025	Institute of Technology, Nirma University, Ahmedabad	73 Students, B.Tech, Sem 3, ECE
08 Sep 2025	Pandit Deendayal Energy University, Gandhinagar	73 Students, B.Tech, Sem 5, ICT
10 Sep 2025	Pandit Deendayal Energy University, Gandhinagar	73 Students, B.Tech, Sem 5, ICT
11 Sep 2025	Pandit Deendayal Energy University, Gandhinagar	73 Students, B.Tech, Sem 5, ICT
15 Sep 2025	Gujarat Technological University, Ahmedabad	20 Students, B.E.(CS) Sem 5, ME (CS) Sem 3
15 Sep 2025	Monark University, Ahmedabad	99 Students, Dip Mech & Civil
17 Sep 2025	Shivaji Eng.medium School & Jr. College, Saswad, Maharashtra	29 Students, Class 11 & 12 (Science)

Students and Teachers from Swaminaryan Dham International School, Gandhinagar visiting IPR on 03 Sep 2025

Students and faculties from Nirma University, Ahmedabad visiting IPR on 04 Sep 2025

Students and faculties from PDEU, Gandhinagar visiting IPR on 08 Sep 2025

Academic Visits to IPR

Students and faculties from PDEU, Gandhinagar visiting IPR on 10 Sep 2025

Students and faculties from PDEU, Gandhinagar visiting IPR on 11 Sep 2025

Students and faculties from GTU, Ahmedabad visiting IPR on 15 Sep 2025

Students and faculties from Monark University, Ahmedabad visiting IPR on 15 Sep 2025

Students and Teachers from Shivaji Eng.medium School & Jr. College, Saswad, Maharashtra visiting IPR on 17 Sep 2025

नराकास, गांधीनगर की 25वीं छमाही बैठक का आयोजन

नगर राजभाषा कार्यान्वयन समिति (नराकास) गांधीनगर की 25वीं छमाही बैठक का आयोजन 29 सितंबर, 2025 को बड़ौदा एपैक्स अकादमी में किया गया। यह बैठक श्री हरीश सिंह चौहान, उप निदेशक कार्यान्वयन, गृह मंत्रालय, राजभाषा विभाग 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 एवं 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 एवं डॉ. संध्या दवे ने इस बैठक में भाग लिया।

अध्यक्ष महोदय ने 14 सितंबर को गांधीनगर में आयोजित पांचवें अखिल भारतीय राजभाषा सम्मेलन में नराकास गांधीनगर को प्राप्त द्वितीय पुरस्कार के लिए सभी सदस्य कार्यालयों को बधाई दी एवं इस भव्य कार्यक्रम को पूरी सफलता के साथ आयोजित करने में सदस्य कार्यालयों के योगदान की सराहना की। इस बैठक में नराकास सदस्य कार्यालयों के सेवानिवृत्त होने वाले अधिकारीगण जिन्होंने अपने संस्थानों में राजभाषा के सुचारू रूप से कार्यन्यवयन के लिए उल्लेखनीय योगदान दिया है, उन्हें सम्मानित किया गया। प्लाज़्मा अनुसंधान संस्थान के डॉ. राज सिंह को इस अवसर पर उनके विशिष्ट योगदान के लिए सम्मानित किया गया।

नराकास गांधीनगर के अध्यक्ष श्री सुनील सिंहा द्वारा डॉ. राज सिंह को पुस्तक भेंट कर सम्मानित किया गया।

नराकास गांधीनगर को प्राप्त द्वितीय पुरस्कार शील्ड के साथ सम्मानित अधिकारियों की स्मृति-चित्र।

Hindi Pakhwada at CPP-IPR

Centre of Plasma Physics – Institute for Plasma Research (CPP-IPR) organized Hindi Pakhwada from 15th to 26th September 2025. The programme commenced on 15th September 2025, with a talk by Dr. Achyut Sharma, Guahati University on the topic “The Universal Voice of Unity and Cultural Pride.” On 18th September 2025, Prof. Subroto Mukherjee, Dean administration, IPR gave a talk on the topic “Plasma Pradyogikiyaan – Urja Se Le Kar Samajik Anuprayogon Tak”. Various competitions like quiz, essay writing, dictation, slogan writing and Hindi poem recitation were held as part of the programme. The programme concluded on 26th September 2025, with prize distribution and a talk by Mrs. Divya, Assistant Director, Hindi Shikshan Yojana, Maligaon (Guwahati) on the topic “History, Development, and Current Status of the Official Language Hindi.”

Dr. Achyut Sharma, Guahati University giving his talk

Dr. Subroto Mukherjee giving his talk. Audience attending the talk (R)

Mrs. Divya (L) giving her talk and distributing prizes to the winners of various competitions

हिंदी व्याख्यान

भारतीय खान ब्यूरो द्वारा दिनांक 26 सितंबर 2025 को हिंदी कार्यशाला का आयोजन किया गया, जिसमें संस्थान की हिंदी अधिकारी डॉ. संध्या दवे ने ''हिंदी शब्द सिंधु एवं बहुभाषी अनुवाद सारथी'' विषय पर कार्मिकों को प्रशिक्षण प्रदान किया गया।

राजभाषा विभाग द्वारा कार्यालयों में हिंदी भाषा के प्रभावी कार्यान्वयन के साथ-साथ देशभर की भारतीय भाषाओं को आपस में जोड़ने और उनमें पारस्परिक सामंजस्य स्थापित करने के उद्देश्य से इन टूल्स को अत्यंत उपयोगी बताया गया है तथा इनके सक्रिय उपयोग की अनुशंसा की गई है।

हिंदी कार्यशाला में व्याख्यान देते हुए डॉ. संध्या दवे

क्षेत्रीय खान नियंत्रक श्री पुष्पेंद्र गौड़ से गमला प्राप्त करते हुए डॉ. संध्या दवे

Execution of MoU between Homi Bhabha National Institute (HBNI) and IIT Gandhinagar

In a significant step toward fostering innovation and academic excellence, Homi Bhabha National Institute (HBNI) has signed a Memorandum of Understanding (MoU) with Indian Institute of Technology, Gandhinagar (IIT-Gn), a renowned academic institution, to promote cooperation in research and academic activities of the Constituent Institutes (CIs)/Off Center Campus (OCCs) of HBNI and IIT-Gn.

This collaboration opens up new opportunities for faculty and students from both institutes to participate in joint research projects and academic programs in areas of mutual interest. Faculty members will also have the chance to be part of doctoral committees, while students from CIs/OCCs of HBNI can now take coursework at Institute IIT-Gn, gaining valuable exposure and learning experiences.

This partnership is expected to foster innovation, skill development, and research excellence, while paving the way for long-term collaboration between the two institutions. This MoU was signed at Institute for Plasma Research by Prof. U. Kamachi Mudali, Vice Chancellor of HBNI and Prof. Rajat Moona, Director, IIT-Gn in the presence of Dr. Tapas Ganguli, Director, IPR, Dr. Paritosh Chaudhuri, Dean R&D, IPR, Dr. Raju Denial, Dean Academic, Prof. Subroto Mukherjee, Dean Administration, IPR, Prof. Naveen Kumar, Associate Dean, HBNI and other officials from IPR and IIT-Gn. Both organizations expressed enthusiasm about the synergy that this MoU will bring and its potential to contribute meaningfully to national and global research initiatives.

Teams from IPR, HBNI and IIT-Gn during the execution of MoU at IPR

Plasma Exhibition at DAE Convention Centre, Anushaktinagar, Mumbai

IPR Outreach Division (ORD) conducted Plasma Exhibition at the DAE Convention Center, Anushaktinagar, BARC Mumbai from 6-11 October 2025. It was hosted jointly by the DAE Outreach and the Atomic Energy Central School-3. The exhibition was inaugurated by the guest of honour Shri K. Jayakumar (Controller BARC) where Dr. G. Sugilal (Associte Dir. Nuclear recycle Group) presided over inauguration function. IPR Dean R&D Dr. Paritosh Chaudhuri delivered the introductory speech. Head ORD, Dr. N. Ramasubramanian detailed the outreach activities and structure of plasma exhibition event. More than 30 exhibits, which included live plasma gadgets, posters and models were displayed and local students were trained to explain about the them to the visiting school students, teachers as well as the families of DAE employees staying in Anushaktinagar. General knowledge quiz for the school students and plasma orientation lectures for about 40 school teachers were also organized. These lectures were delivered by the IPR ORD team. The exhibition was open from 9:00 am - 8:00 pm, especially to facilitate the DAE/BARC/HBNI/NPCIL employees and their families to visit the exhibition. More than two thousand visitors visited and found the exhibition very exciting. DAE has put the inauguration function and the highlights of the plasma exhibition on their social media handles.

(L-R) Shri K. Jayakumar, Dr. G. Sugilal and Dr. Paritosh Chaudhuri delivering speech during the inaugural ceremony

Past Events @ IPR

- ***Mr. Alli Amardas,*** gave a talk on "Comparison of Performance Efficiency of Different Types of RF Antennas for Permanent Magnet-based Helicon Plasma Source via Finite Element Simulations" at 21st International Conference on Ion Sources (ICIS 2025), Oxford, United Kingdom, 8-12 September 2025
- ***Mr. Uday Kumar,*** gave a talk on "Effect of surface treatments on the thermal emissivity of AISI 304L stainless steel" at International Mechanical Engineering Congress & Exposition® India (IMECE), Hitech City, Hyderabad, 10-13 September 2025
- ***Ms. Gayathri Devi,*** gave a talk on "Rapid Resolution of Low-Concentration Hydrogen Isotopes and Spin Isomers at 77.4 K for Fusion Fuel Cycle Applications" at 14th International Conference on Tritium Science and Technology (Tritium-2025), Ottawa, Canada, 21-26 September 2025
- ***Ms. Rupali Paul,*** gave a talk on "Stochastic dust charging in multicomponent plasmas: Impact of energetic electron populations on charge fluctuations" at 9th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP2025), Fukuoka International Congress Center, Japan, 21-26 September 2025
- ***Dr. Sarveshwar Sharma,*** gave a talk on "Plasma Dynamics in VHF Capacitive Discharges Operated in the Kilovolt-Regime at Sub-Millitorr Pressures" on 07th October 2025
- ***Dr. Komal Shekhawat,*** Malaviya National Institute of Technology (MNIT), Jaipur, gave a talk on "Post-Deposition Engineering of Crystallinity, Bandgap, and Luminescence in Ge Thin Films and Multilayers" on 9th October 2025
- ***Shri V V Lakshmi Narayana,*** Retired IPS Official, has held positions such as Joint Director, CBI Hyderabad, ADGP (Admin), ADGP (Planning & Coordination), Mumbai, gave a talk on "Integrity and Vigilance in Scientific Research: Safeguarding National Assets and Public Trust" on 14th October 2025
- ***Dr. Jayanta Dutta,*** gave a talk on "Plasma characteristics in partially ionised and magnetised plasma discharge in Double Plasma Device (DPD)" on 16th October 2025
- ***Dr. Sanju Rani,*** gave a talk on "Studies of the enhancement in the Alcohol vapor sensing capability of Zinc ferrite-based Sensor with Plasma etching and Ion Beam Irradiation" on 27th October 2025
- ***Dr. Navin Kumar Sharma,*** gave a talk on "Investigation of Atmospheric Pressure Dielectric Barrier Discharge Plasma for Synthesis of Nitrogen based Fertilizer in Water" on 30th October 2025

Upcoming Events

- Nuclear Science Symposium, Medical Imaging and Room-Temperature Semiconductor Conference (NSS/MIC/RTSD), Yokohama, Japan, 1-8 November 2025; https://nssmic.ieee.org/2025/
- FuseNet PhD Event 2025, ITER Organization, St. Paul-lez-Durance, France, 4-6 November 2025; https://indico.fusenet.eu/event/57/overview
- 16th International Symposium on Fusion Nuclear Technology (ISFNT-16), Knoxville, USA, 9-14 November 2025; https://isfnt-16.ornl.gov/
- Short-Term Hands on Training Programme on Recent Advances in Mutation Breeding for Crop Improvement, Assam Agricultural University, Assam, 10-19 November 2025; https://www.barc.gov.in/symposium/broucher_AAU.pdf
- 28th International Conference on Numerical Simulation of Plasmas (ICNSP 2025), University of California, California, USA, 12-14 November 2025; https://www.icnsp28.com/
- 2nd INFN School and Workshop on High Power Lasers for Fundamental Science and Applications (HPLA2025), Catania, Italy, 17-19 November 2025; https://agenda.infn.it/event/44832/
- 67th Annual Meeting of the APS of Plasma Physics (APS-DPP 2025), California, USA, Nov. 17- 21 November 2025; https://www.aps.org/events/2025/67th-dpp
- 2nd Visualizing Offline and Live Data with AI (VOLDA) for Workshop, CIEMAT Research Center, Madrid, Spain, 18-20 November 2025; https://agenda.ciemat.es/event/4923/
- IAEA Technical Meeting on Experience in Codes and Standards for Fusion Technology, Vienna, Austria, 18-21 November 2025; https://conferences.iaea.org/event/425/
- Magnets Technology Mapping Workskop hosted by CERN, Fusion for Energy, and EUROfusion, Geneva, Switzerland, 26-27 November 2025; https://app.swapcard.com/event/magnets-mapping-workskop

Index of Newsletter Issue 148, November 2025

Know Your Colleague

Dr. Rakesh Moullick

Dr. Rakesh Moulick is a computational plasma physicist working as a Scientific Officer-D at CPP-IPR. He completed his masters from the Tezpur University and PhD from CPP-IPR, awarded by Gauhati University.

He started his career as an Assistant Professor at Lovely Professional University, Punjab. Later, he joined Rangapara College as the Head of the Department of Physics and thereafter joined CPP-IPR. He is also an Assistant Professor at the Homi Bhaba National Institute (HBNI). His current research interest is using the particle-in-cell simulation to simulate phenomena in both space and laboratory plasma.

He is a member of the CPP's Outreach Cell and is actively involved in the popularization of plasma physics in Northeast India. He also writes essays about popular science and enjoys playing the tabla.

Quote of the Month

"There is a higher court than the courts of justice and that is the court of conscience. It supersedes all other courts." —Mahatma Gandhi

Newsletters from IPR

GANANAM (गणनम्)

High Performance Computing Newsletter

प्लाज़्मा समाचार

PLASMA PROCESSING UPDATE

The IPR Newsletter Team

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