Issue 138
January 2025

The 4th State

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

Happy New Year 2025

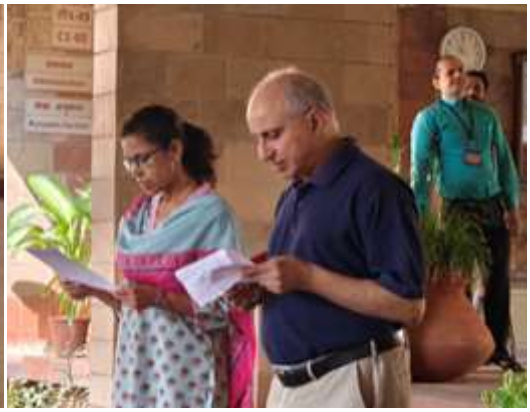
Constitution Day Celebration

On the occasion of Constitution Day, on 26th November 2024 a pledge was taken by the employees of the institute. The pledge was administered by Dr. Shashank Chaturvedi, IPR Director, in Hindi, followed in English by Mrs. Supriya Nair, Acting Chief Administrative Officer.

With the aim of making employees well acquainted with the Constitution of the country, a workshop cum quiz competition was organized in the seminar hall on 28 November 2024. Through this, Shri Raj Singh highlighted the importance of the Constitution of India, the time and challenges required in its formation and had a meaningful discussion on important rules. Along with this, a quiz competition was also organized, in which the employees of the institute participated with great enthusiasm.

During the Q&A session, the importance of the Constitution of India was highlighted and each question was discussed in detail, mentioning its rules. This enhanced the knowledge of the participants about the Constitution. At the end of the program, prizes were given to the winners of the quiz.

In order to make the employees aware of the important points and facts of the Constitution, these rules were displayed on the TV installed in the canteen of the IPR & FCIPT.



IPR Staff taking pledge (L) being administered by Ms. Supriya Nair, ACAO and Dr. Shashank Chaturvedi, Director IPR (R)

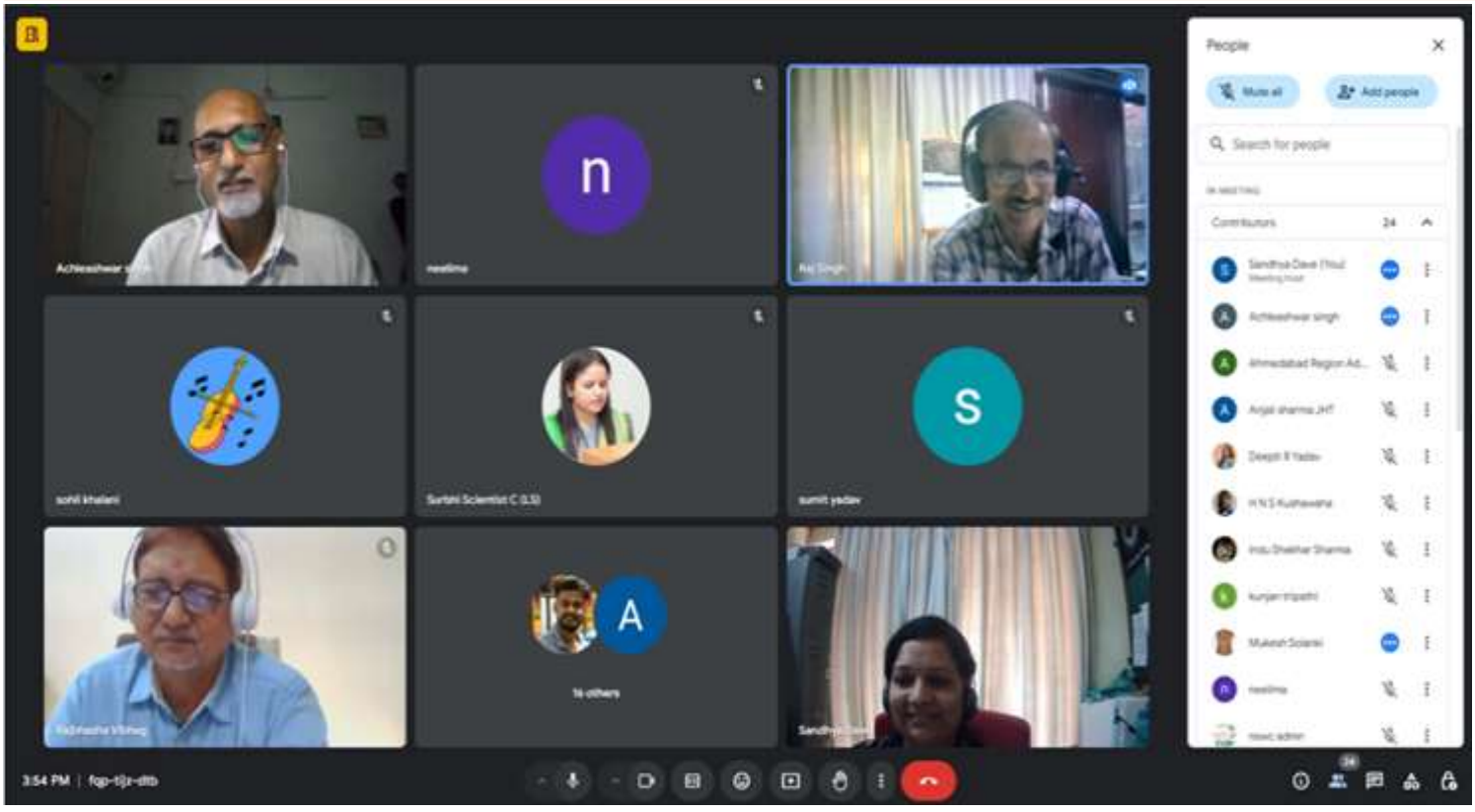
Mr Raj Singh conducting the workshop cum quiz competition

Constitution Day Celebration

Constitution Day pledge taken by the Staff and Research Scholars at CPP-IPR, Guwahati

नगर राजभाषा कार्यान्वयन समिति के तत्त्वाधान में संसदीय राजभाषा समिति निरीक्षण प्रश्नावली पर हिंदी कार्यशाला

दिनांक 1 अक्टूबर 2024 को, नगर राजभाषा कार्यान्वयन समिति के तत्त्वाधन में, प्लाज़्मा अनुसंधान संस्थान द्वारा संसदीय राजभाषा समिति निरीक्षण प्रश्नावली को सही तरीके से भरने एवं अधिकारियों के मार्गदर्शन के लिए एक ऑनलाइन कार्यशाला आयोजित की गई, जिसमें गांधीनगर न.रा.का.स के विभिन्न कार्यालयों के हिन्दी अधिकारियों/अनुवादकों/हिंदी प्रभारियों ने भाग लिया। इस कार्यशाला में श्री अचलेश्वर सिंह, निदेशक (राजभाषा),परमाणु ऊर्जा विभाग, मुंबई ने संसदीय राजभाषा समिति निरीक्षण प्रश्नावली पर प्रशिक्षण दिया। उन्होंने प्रश्नावली के प्रत्येक पृष्ठ, भाग और उप-भाग का विस्तृत विवरण प्रदान किया। गांधीनगर के विभिन्न केंद्र सरकार के कार्यालयों का नजदीकी भविष्य में होने वाले निरीक्षण को ध्यान में रखते हुए, उन्होंने पूर्व तैयारी के महत्व पर जोर दिया और कार्यालयों से समय पर विभिन्न अनुभागों से डेटा एकत्र करने का सुझाव दिया। परिचर्चा के दौरान कार्यशाला के प्रतिभागियों द्वारा कई प्रश्न पूछे गये। श्री अचलेश्वर सिंह ने सभी प्रतिभागियों के संदेहों का निवारण किया। उन्होंने सीमित समय सीमा के भीतर प्रश्नावली को पूरा करने के लिए कुशल तरीकों की भी व्याख्या की तथा सटीकता और दक्षता बढ़ाने के लिए सुझाव दिए। इस कार्यशाला से प्रतिभागियों को संसदीय समिति निरीक्षणों के लिए पूरी तैयारी और अनुपालन के महत्व को समझने में मदद मिली। कार्यशाला के अंत में श्री राज सिंह, सह अध्यक्ष, राभाकास ने इस महत्वपूर्ण विषय पर प्रशिक्षण देने के लिए श्री अचलेश्वर सिंह जी को हार्दिक धन्यवाद दिया।



ऑनलाइन कार्यशाला

Application of cryogenics in developing pellet injectors for fueling and plasma control in magnetically confined fusion devices

Plasma fueling and disruption mitigation (DM) are critical issues that demand significant attention for the successful operation of high-temperature fusion devices. In this context, pellet injection has emerged as an effective method for addressing these issues. A pellet is an ice form of gases frozen at cryogenic temperatures below their triple point, and is injected into the plasma using high-pressure helium propellant gas. While ice pellets made of H_2 and its isotopes are used for plasma fueling, shattered pellets of Ne and Ar are utilized in disruption mitigation studies. To address these issues a pellet injector that can adopt different launching techniques has been developed. The injector consists of a cryostat that operates over a wide temperature range from 4 K to 70 K to freeze H_2 and Ar pellets. The cryostat employs a Gifford-McMahon cycle refrigerator to reach the target temperature. The temperature control over the application head has been accomplished with two heaters of power 110 W and 27 W, installed to the first and second stages of the cryostat, respectively. For freezing H_2 gas, the cold block-freezing cell arrangement is directly anchored to the 2nd stage of the cryocooler. Similarly for Ar pellets, a multiple-column type arrangement is adopted, which connects the freezing cell to the 1st stage of the cryocooler. This arrangement provides the flexibility of achieving the desired temperature and cooling power without employing the heating power significantly.

The injector uses high pressure helium propellant gas to inject the pellets. In order to reduce the propellant gas consumption, a solenoid valve assisted pneumatic piston driven mechanical pellet launcher (MPL) has been developed and applied to inject cryogenic pellets. The MPL is designed to launch pellets having diameter (d) ≤ 7 mm [Length/diameter (l/d) =1.5]. It has been successfully applied on the hydrogen pellets. Currently, cylindrical hydrogen pellets of d =4.2 mm, and l/d = 1 to 1.5 having speed 100 to 600 m/s have been successfully injected. The application of MPL has significantly reduced the propellant gas requirement and hence the gas load on the vacuum pumping system. In addition, the MPL can also be used for low-speed pellet injection which is difficult to achieve by using only the pneumatic acceleration.

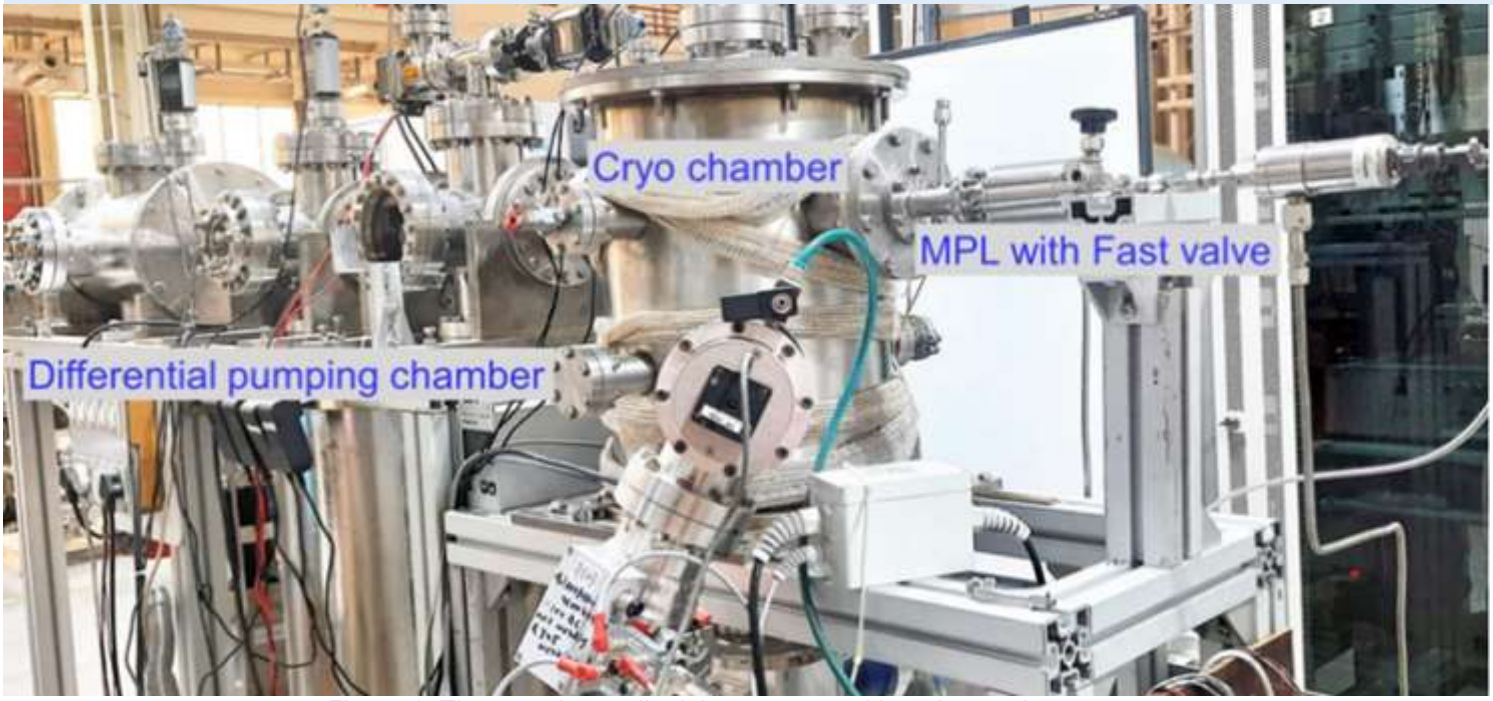


Figure 1: The complete pellet injector setup with various sub-systems

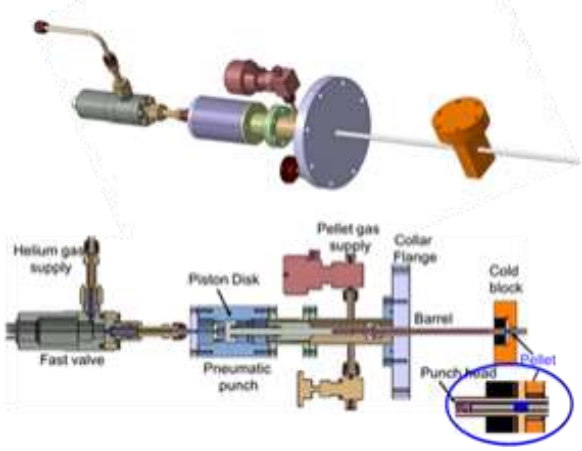


Figure 2: 3D CAD view of the MPL, and its sub-components

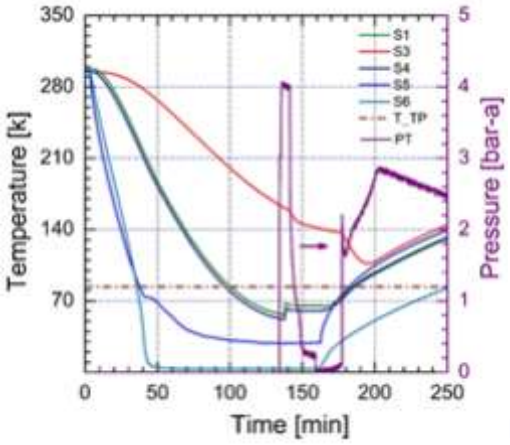


Figure 3: Cryostat cooldown curve and signature Argon pellet formation

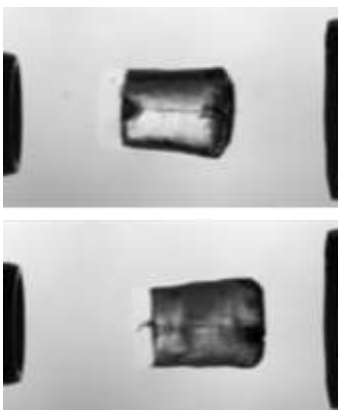


Figure 4: Image of the hydrogen pellet (L:~ 6.0 mm and D: ~4.2 mm) injected by using the MPL

A Comprehensive Training on Industrial Automation Systems

A two-day intensive training session was conducted for newly joined SO-C/TO-C/SA-B personnel from the Instrumentation, Electronics, and Computer Science disciplines. The first day (Day-1), held on 4th October 2024, delved into the core concepts of Industrial Automation Systems, Programmable Logic Controllers (PLCs), Industrial Sensors, and SCADA systems. These technologies are integral to numerous experimental projects within the Institute. The second day involved hands-on experience through visits to IPR's laboratories: SST-1 Cryogenics Lab, EHCL Lab, Large Cryogenics Plant Control (LCPC) Laboratory and NBI Laboratory in IPR. These visits provided participants with a first-hand look at various Industrial Automation Systems in action. This collaborative in-house training initiative was a joint effort by the LIGO-India, SST-1 Cryogenics, and Data Acquisition and Control divisions of IPR, and was directed by the Dean R&D.

Shri Hitesh Gulati (LIGO-India Division) delivering on Introduction to Industrial Automation System

Shri Rakesh Kumar Patel (SST-1 Cryogenics Division) delivering on Introduction to SCADA

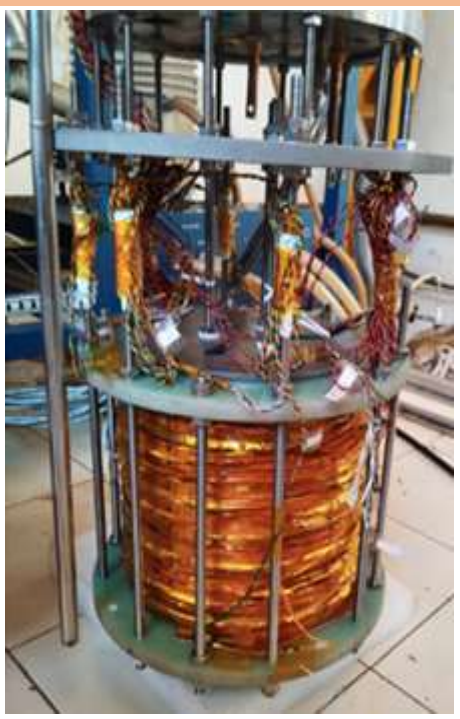
Shri Dasrath Sonara (SST-1 Cryogenics Division) delivering on Sensors in Industrial Automation

Shri Vishnu Patel (DAC Division) delivering on Programmable Logic Controller in Industrial Automation

Group Photo of the participants and instructors

High Temperature Superconducting (HTS) Magnet for fusion: an R&D update

The High Temperature Superconducting (HTS) magnets are very attractive option for compact and economical tokamak devices, where the space available at the inner bore is very much limited. As an R&D initiative, 2nd Generation HTS based magnets are considered for the high toroidal field and medium aspect ratio fusion reactor at IPR. The development of stacked cables, compact solenoid, D-shaped coil, nano-Ohm joints, Quench detection and protection along with testing are the main ongoing R&D components. Recently, IPR has realized HTS solenoid magnets up to 3.5 T. The fabrication of a medium size D-shape coil of 1.17 m x 0.78 m with peak magnetic field of 0.1 T, is also completed after realizing various technical challenges, such as long length HTS cable, coil winding, leads with coil terminals, coil protection and electrical characterization of integrated system down to 77 K at self-field.



3.5 T HTS Solenoid Coil

D-Shape HTS Coil

In house development of B-metallic seal for cryogenic application

In-house development activity of a metallic seal joint of dissimilar materials has been initiated and is progressing at the cryogenic division. The developed seal is fabricated of stainless steel 304 L with filler material flexible graphite by winding technique. The same material of inner, outer ring and filler of the seal are selected to prevent the corrosion and overcome the differential thermal contraction and expansions. The outer ring prevents the radial flow of filler material. This seal can be easily removed from the assembly due to its non-adhesive quality. 2" NB 150 class seal has been fabricated as per ASME B16.20. The developed seal have been undergone testing at 300 K and liquid nitrogen temperature in WNRF flanges assembly. The helium leak tightness of the seal has been found in acceptable limit at 300 K and 77 K. The other sizes fabrication and testing is under progress for repeatability of acceptance and reliability of the product. The seal can be used as demountable type in LN2 cryogenic transfer line to prevent welding.

Salient Features:

- Materials grade: SS 304 L + flexible graphite
- Temperature and pressure: -196 to 500°C, 150-200 bar (g)
- Fabricated size: 2" NB, ASME B16.20, # 150 class
- Helium leak tightness (i) at 300 K: 8.3 E^{-09} mbar-l/s (ii) after thermal shock at 77 K: 7.8 E^{-09} mbar-l/s

Developed seal

Thermal cycle test at 77 K

Helium leak test

Superannuation Talks

Dr. Pramod Kumar Sharma superannuated from services on 31st Dec 2024 after a service spanning more than 30 years. On the occasion of her retirement, he gave a talk "**Reflections on my three decades at IPR: A journey from BETA lab to ITER**", reminiscing his professional journey, on 11th December 2024.

IPR newsletter wishes him a Happy and Healthy retired life.

Dr. P. K. Sharma giving talk (L). Being felicitated by Dr. Shishir Deshpande (R)

IPR Colleagues (L) attending the talk by Dr. P. K. Sharma

Shri. Arun Kumar Chakraborty superannuated from services on 31st Dec 2024 after a service spanning more than 30 years. On the occasion of her retirement, he gave a talk "**Snippets from 3+ decades of experiences that embeds an everlasting aura!**", reminiscing his professional journey, on 13th December 2024.

IPR newsletter wishes him a Happy and Healthy retired life.

Shri A. K. Chakraborty giving talk (L). Being felicitated by Dean Admin, Dr. Subroto Mukherjee (R)

IPR and ITER-IN Colleagues attending the talk by Shri A. K. Chakraborty

Superannuation Talk

Dr. Shishir Deshpande superannuated from services on 31st Dec 2024 after a service spanning more than 30 years. On the occasion of her retirement, he gave a talk "**Hymn to Agni: Stoking the Primordial Fire**", reminiscing his professional journey, on 12th December 2024.

IPR newsletter wishes him a Happy and Healthy retired life.

Dr. Shishir Deshpande giving talk (L). Being felicitated by Dr. Sudhir Kumar Nema (R)

IPR and ITER-IN Colleagues attending the talk by Shri A. K. Chakraborty

Academic Visit to FCIPT

Faculties and under training doctors from Karnavati School of Dentistry, Adalaj visited the FCIPT/IPR on 03/12/24. Plasma applications in medical science in relevance to Dentistry were primarily focused during the visit.

4th A K Sundaram Memorial Lecture

The 4th A K Sundaram Memorial Lecture was delivered by **Prof. Archna Bhattacharyya**, Former Director, Indian Institute of Geomagnetism, Mumbai on 10th December, 2024 on "**Evolution of equatorial plasma bubbles as seen through ionospheric scintillation observations**"

About the Speaker: After completing B.Sc (Honours) and M.Sc. in Physics from the University of Delhi, Archana Bhattacharyya received her Ph.D. degree from Northwestern University, USA, in 1975, working in the area of theoretical condensed matter Physics. She returned to India and joined the Indian Institute of Geomagnetism (IIG) in 1978. She was introduced to the topic of ionospheric scintillations in 1980, when she started working with the first digital data of scintillations recorded in India, on radio signals transmitted from the NASA satellite ATS-6. At that time, there was no theoretical work being done in India in this area. So she started working on the theoretical aspects of scintillations along with analysis of data. During 1986-87, she worked on the theory of strong scintillations to better utilize the data, with Prof. K. C. Yeh's group in the University of Illinois at Urbana-Champaign, in USA. Interest in this area was revived when the Global Positioning System (GPS) constellation became operational in 1993. She was a National Research Council Senior Resident Research Associate at the Air Force Research Laboratory in USA, during 1998 – 2000. She was appointed the Director of IIG in 2005 and served in that position until 2010. After that that she has continued to work in IIG as a J.C. Bose National Fellow, INSA Senior Scientist (with two years at IIT, Bombay), and currently as an INSA Honorary Scientist. Her more recent work has been concerned with the spatio-temporal evolution of the electron density irregularities in the equatorial ionosphere, which is of particular interest in regions of low geomagnetic latitude such as India.

Prof Abhijit Sen giving an introduction about the A K Sundaram Memorial Lecture Series





Glimpses of the 4th A K Memorial Lecture

Plasma Exhibition @ B. C. Roy Engineering College, Durgapur, WB

IPR Gandhinagar in association with B. C. Roy Engineering College, Durgapur, (West Bengal), organized an exhibition on Plasma, "The Fourth State of Matter" during 12-14 November, 2024. This program is part of IPR's scientific outreach activity in various states of India under the auspices of "70 years of DAE" celebrations.

The programme consisted of an exhibition on plasma, its applications as well as introductory talks on plasma for visiting students and teachers. Over 1000 students and teachers from over 12 schools and colleges in and around Durgapur visited the exhibition.

IPR ORD Team at the Plasma Exhibition at Durgapur

Plasma Exhibition @ Rani Durgavati Vishwavidyalaya, Jabalpur, MP

IPR Gandhinagar in association with Rani Durgavati Vishwavidyalaya, Jabalpur (Madhya Pradesh), organized an exhibition on Plasma, "The Fourth State of Matter" during 18-21 November, 2024. This program is part of IPR's scientific outreach activity in various states of India under the auspices of "70 years of DAE" celebrations. The event was inaugurated by Member of Parliament (Jabalpur), Shri Ashish Dubey.

The programme consisted of an exhibition on plasma, its applications as well as introductory talks on plasma for visiting students and teachers. Over 1600 students and teachers from over 40 schools and colleges in and around Jabalpur visited the exhibition.

IPR ORD Team at the Plasma Exhibition at Jabalpur

State Level Workshop on Plasma Physics at CPP-IPR

CPP-IPR's Outreach Cell conducted a "State Level Workshop on Plasma Physics" at Morigaon College, Morigaon, Assam on 26th November, 2024 in collaboration with Physics and Mathematics department of the college. The workshop was attended by the principal, vice principal, 8 faculties and 91 students of the college. During the workshop, Dr. Rakesh Moulick gave a talk on introduction to plasma physics, followed by a talk on basics of experimental plasma physics by Dr. Ngangom Aomoa. Thereafter, the participants were shown glow discharge plasma, arc plasma, DBD plasma, Jacob's ladder and a plasma globe. The working principle of these plasmas and their applications were explained to the participants

Group photos of the workshop participants at Morigaon College, Morigaon, Assam

CPP-IPR's participation at the India International Science Festival (IISF) 2024

CPP-IPR participated in the Science-Technology-Defence-Space Exhibition of India International Science Festival (IISF 2024) organized from 30 November – 03 December 2024 at IIT Guwahati, Assam. India International Science Festival (IISF) is an initiative of the Ministry of Science and Technology and the Ministry of Earth Science of Government of India in association with Vijnana Bharati. Various plasma devices exhibiting different production mechanisms and plasma applications were shown. In addition to these, posters on various activities of CPP-IPR were also displayed with posters. The stall was visited by around 500 visitors including students, teachers, scientists from other institutes and common visitors and was well appreciated for the demonstration of various plasma production mechanisms.

Academic Visits to CPP-IPR

Date	Institution	Visitors
19-Nov-2024	Sankardeb Shishu Bidya Niketan, Malaybari, Assam	44 students of Class 11 & 12 and 3 faculty
21-Nov-2024	Department of Physics, Rangia College, Assam	9 students of BSc and 1 faculty

Students from Sankardeb Shishu Bidya Niketan in the outreach exhibition hall

Group photograph of students from Sankardeb Shishu Bidya Niketan

Students from Rangia College in the seminar and outreach exhibition hall

Group photograph of students from Rangia College

As part of **DAE Platinum Jubilee Celebrations** the following talks were organized at Institute for Plasma Research

Colloquium # 339, Date: 06th December 2024

Title: Data-constrained magnetohydrodynamic simulation of solar coronal transients

Speaker: Professor Ramit Bhattacharyya

Udaipur Solar Observatory, Physical Research Laboratory, India

Professor Ramit Bhattacharyya is a renowned plasma physicist working at the Physical Research Laboratory, Ahmedabad, India. Professor Bhattacharyya has obtained his PhD in Physics from Jadavpur University, Kolkata on his work carried out at the Saha Institute of Nuclear Physics, Kolkata, India.

Over the years, Professor Bhattacharyya has contributed immensely in the field of magnetohydrodynamics of solar corona through state-of-the-art numerical simulations. His research interests include understanding the solar coronal heating problem and the underlying physics of various solar eruptions using computational means. He has identified the cause for the coronal heating occurring through the Ohmic dissipation of spontaneously developed current sheets: two dimensional ribbons of intense current. He has established the role of plasma relaxation towards understanding the fundamental physical processes involved in solar eruptive events using computer simulations. He has contributed significantly in constructing the coronal magnetic field from photospheric observations, which are important for understanding the near-Earth space-weather, as no reliable direct measurements of the coronal magnetic field are available. Professor Bhattacharyya has authored more than 50 publications in International journals and has guided several PhD students

Abstract: The solar coronal transients are events which are sudden and can vary from coronal jets to large solar flares giving rise to coronal mass ejections. The magnetic reconnection is believed to be the underlying mechanism for these transients. A workflow can be developed to explore the mechanisms of these reconnections by extrapolating the coronal magnetic field using photospheric magnetograms and subsequently use the extrapolated field for magnetohydrodynamic simulations. These are often called data-constrained simulations which, have open a new avenue to understand magnetic reconnection at the solar corona and consequently, the coronal transients. The presentation will explore these simulations in terms of their objectives, outputs and limitations

Colloquium # 340, Date: 10th December 2024

Title: Interactions with trapped ions

Speaker: Prof. Sadiq Rangwala

Raman Research Institute, Bangalore, India

After completing the bachelor's in physics in 1991 from St. Xaviers College, Mumbai, Prof. Sadiq did his Master of Science (MSc) from IIT, Mumbai in 1993 and joined for PhD (1993-1999) at TIFR, Mumbai under the supervision of Prof. E. Krishnakumar.

Prof. Sadiq did his Post-doctoral work from, Institut d'Optique, France from 1999-2001 and worked at Max Planck Institute of Quantum Optics, Garching, Germany as a postdoc from 2001 to 2004. He is holding Faculty Position since 2004 at Raman Research Institute, Bangalore, India in Light and Matter Physics division. In 2014, he was awarded Shanti Swarup Bhatnagar Award for his outstanding contributions on collisionally cooled ions with trapped atoms leading to new ultracold ion-atom physics. Recently, he has been working ultracold trapped charged Calcium ions and various ideas on scalable quantum computing architectures. His areas of expertise are ultra-cold molecules, trapped ions, quantum computing and quantum optics

Abstract: Laboratory physics with ions is done over the largest energy range of human endeavor, from high energy physics (TeV) to ultra cold and trapped ions (neV), which spans orders of magnitude of energy. This system is therefore a foundational system in Science and responsible for path breaking advances. The reason this vast range is fruitfully accessed is because of our precise control over electromagnetic (EM) fields and forces and the strong coupling of the ion's charge to EM fields. In the very low energy limit of this vast domain we encounter physics with trapped ions, which is the subject of this talk. Here I will discuss the problems which motivate us to work with trapped ions and then describe the recent experiments with trapped calcium ions, at mK temperatures. I will present new classes of ion crystals, which have never been seen before, describe the transitions between them and link these transitions to a variety of phase transitions in condensed matter physics. Aspects of crystal dynamics will also be touched upon. I will conclude with a description of the upcoming experiment for scalable quantum computing with trapped ions and briefly touch upon prospects with this system. I will close with possible future directions for our experiments and the field .

Conference Presentations

29th National Conference on Cryogenics and Superconductivity held at the Inter University Accelerator Centre, New Delhi during 27-29 Nov 2024.

Mr Atul Garg gave an oral presentation on "**Conceptual design of current leads for liquid nitrogen cooled copper coils in SST-1**"

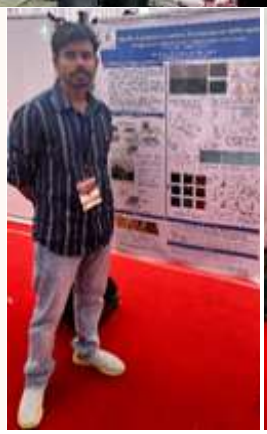
Mr Upendra Prasad gave an oral presentation on "**High temperature superconducting magnet for magnetic fusion: R&D update and plan"**

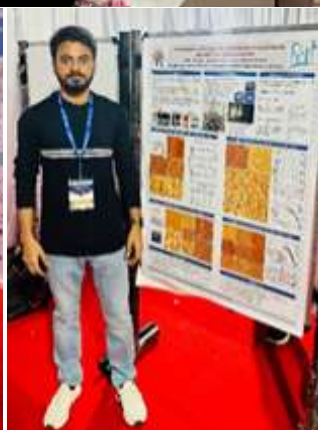
Dr. Jyoti Shankar Mishra gave an oral presentation on **"Application of Cryogenics in developing pellet injectors for fuelling plasma control in magnetically confined fusion devices"**

International Union of Materials Research Societies-International Conference in Asia (IUMRS-ICA-2024), Indore, Madhya Pradesh during 03-06 December 2024.

Dr. Mukesh Ranjan gave and invited talk "**Growth dynamics of metal nanoparticles arrays and their optical properties**" at International Union of Materials Research Societies-International Conference in Asia (**IUMRS-ICA-2024)**, held from December 3rd to 6th, 2024, in Indore, Madhya Pradesh, India**.** This conference was organized by the UGC-DAE Consortium for Scientific Research (UGC-DAE CSR), Indore, in collaboration with Devi Ahilya Vishwavidyalaya (DAVV), Indore. Raja Ramanna Centre for Advanced Technology (RRCAT), Indore, and the Indian Institute of Technology (IIT) Indore.

IPR Post Doctoral Fellows, Dr. Radhe Shyam and Dr. Rohit Sharma also presented their work in the form of poster presentation.





ITER visit of IPR PhD students

Under IPR-ITER PhD student exchange program three PhD students from IPR (Tarundeep Kaur, Trivesh Kant, Sagar Chaudhary) were sent to ITER, France. They have been shown various ITER facilities. Currently they are doing research work at ITER in their respective fields.

Past Events @ IPR

- ***Mr. Pradip Panchal,*** gave a talk on "Recent Performance Results of Cryocooler based Helium Circulation System at 55 K" at 4th International Workshop on Cooling Systems for HTS Applications (IWC-HTS 2024), Matsue, Japan, 23-25 October 2024
- ***Ms. Arzoo Malwal,*** gave a talk on "Plasma transport study with 3D shaped first wall for limiter start-up phase of ITER" at Conference on Plasma Simulation (CPS-2024), Indian Institute of Geomagnetism, Navi Mumbai, 11-13 November 2024
- ***Talks presented at 14th Biennial Conference of Physics Academy of the North-East (PANE-2024), Tezpur Unversity, Assam, India, 12 -14 November 2024***
  - ***Dr. Ngangom Aomoa,*** gave a talk on "Exploring plasma–liquid interactions for diverse applications"
  - **Dr. Ngangom Aomoa,** gave a talk on "Experimental studies on the decomposition of CO2 gas in non-thermal plasmas"
  - ***Dr. Ngangom Aomoa,*** gave a talk on "Efficient and cost effective treatment of methylene blue dye by a non-thermal plasma"
  - ***Dr. Rakesh Moulick,*** gave a talk on "Particle-in-cell simulation of radio-frequency plasma discharges"
- ***Mr. Ankit Gandhi,*** gave a talk on "Design and Commissioning of Experimental Helium Cooling Loop (EHCL)" at 8th QST International Symposium, Aomori, Japan, 14-15 November 2024
- ***Mr. Rasesh Dave,*** gave a talk on "Development of Anode Power Supply for Gyrotron" at National Conference on Emerging Trends in Vacuum Electronic Devices and Applications (VEDA-2024), CSIR-CEERI, Pilani, Rajasthan, 18-20 November 2024
- ***Talks presented at 9th International Symposium on Negative Ions, Beams and Sources (NIBS2024), ITER-India, Institute for Plasma Research, Gandhinagar, 19-22 November 2024***
  - ***Mr. Sidharth Dash,*** gave a talk on "Probing into Space Charge Interactions of Negative Ion Beams through Imaging Diagnostics"
  - ***Mr. K. Pandya,*** gave a talk on "Neutral Beams in ROBIN: Present status and future plans"
- ***Talks presented at 29th National Conference on Cryogenics and Superconductivity (NCCS-29), Inter-University Accelerator Centre, New Delhi, 26 -29 November 2024***
  - ***Mr. Upendra Prasad,*** gave an invited talk "High temperature superconducting magnets for magnetic fusion: R&D update and plan"
  - ***Mr. Bhargav Choksi,*** gave a talk "Performance results of upgraded Cryogenic System with 4 Cryo-Condensation pumps during 0.2 to 0.7 MW Positive Neutral beam Operation"
  - ***Dr. Nitin Bairagi,*** gave a talk on "Study of MgB2 based superconducting current feeders system for fusion devices"
  - ***Mr. L.N.Srikanth,*** gave a talk on "Periodic testing of liquid nitrogen storage vessels"
  - ***Mr. Atul Garg,*** gave a talk on "Conceptual design of current leads for liquid nitrogen cooled copper coils in SST-1"
- ***Dr. Kousik Makur,*** Indian Institute of Technology, Hyderabad, gave a talk on "Fast electron transport in the laser-plasma interaction: Studies of the ion acceleration and X-rays" on 29th November 2024
- ***Dr. Yogita Dahiya,*** Malaviya National Institute of Technology, Jaipur, gave a talk on "MOF-derived Transition Metal Compounds as Anode Materials for All-Solid-State Lithium-Ion Batteries" on 29th November 2024
- ***Dr. Salim Hassan Siddiki,*** gave a talk on "Development of Ti3C2Tx-MXene quantum dot and Ni-loaded nitrogen-doped carbon sheets-based X-Band Microwave Absorber" on 02nd December 2024
- ***Dr. Margi Jani,*** gave a talk on "In-house Preparation and Optimization of Dip Coating Solution for Er2O3 Thin Film Development for Hydrogen Permeation Barrier Application" on 03rd December 2024

Past Events @ IPR

- ***Dr. Shaikh Zubin Abdulfarid,*** gave a talk on "Experiments on the plasmas confined by Multi-pole line cusp Plasma Device (MPD)" on 03rd December 2024
- ***Mrs. Purvi Dave,*** gave a talk on "Surface Modification of Silicone Catheters to Mitigate Bacterial Adhesion and Biofilm Formation" on 05th December 2024
- ***Dr. Aadil Rashid,*** Aligarh Muslim University, Uttar Pradesh, gave a talk on "Atomic Structure studies of ionized mercury atoms: Hg III - Hg VI" on 05th December 2024
- ***Dr. Prashant Sharma,*** gave a talk on "Effects of radiation on Ceramic Composite: Activation Analysis and structural stability" on 06th December 2024
- ***Dr. Neelam Kumari Arya,*** Aligarh Muslim University, Uttar Pradesh, gave a talk on "Spectral Studies of Moderately Ionized Bismuth Atoms: Bi (III-VI)" on 06th December 2024
- ***Prof. Ramit Bhattacharyya,*** Physical Research Laboratory, Ahmedabad, gave a talk on "Data-constrained magnetohydrodynamic simulation of solar coronal transients" on 06th December 2024 ***(Colloquium #339)***
- ***Dr. Rohit Jain,*** High Temperature Superconductors Inc., California, gave a talk on "Metalorganic Chemical Vapor Deposition of REBCO on various substrates and correlation of its superconducting properties for high frequency and functional applications" on 09th December 2024
- ***Prof. Archana Bhattacharyya,*** Former Director, Indian Institute of Geomagnetism, Mumbai, gave a talk on "Evolution of equatorial plasma bubbles as seen through ionospheric scintillation observations" on 10th December 2024
- ***Prof. Sadiq Rangwala,*** Raman Research Institute, Bengaluru, gave a talk on "Interactions with trapped ions" on 10th December 2024 ***(Colloquium #340)***
- ***Dr. Manoj Kumar,*** CSIR-National Physical Laboratory, New Delhi, gave a talk on "Exploring Tin-Selenide for Optoelectronic and Thermoelectric Applications" on 13th December 2024
- ***Dr. Prince Kumar,*** gave a talk on "Study of collective excitations in Strongly Coupled Coulomb Systems" on 23rd December 2024
- ***Dr. P.N. Maya,*** gave a talk on "Physics and Engineering Considerations for a Gross Electricity Producing Pilot Plant" on 23rd December 2024

Upcoming Events

- 24th DAE-BRNS Symposium on Thermal Analysis (THERMANS-2024), Anushaktinagar, Mumbai, 16-18 January 2025; https://www.itasindia.org/thermans2024/
- International Conference on Trailblazing Trends in Sustainable Climate-Resilient Precision Agriculture through Artificial Intelligence and Remote Sensing, Junagadh Agricultural University, Junagadh, Gujarat, 23-24 January 2025; https://www.ictpairs.in/
- 5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Education, Engineering & Technology (ICAKMPET-2025), Cebu, Philippines, 24-25 January 2025; https://www.icakmpet.com/
- 2nd International Conference on Recent Advances in Engineering and Computer Applications (ICRAECA-2025), Lok Jagruti Univerisity, Ahmedabad, 24-25 January 2025; https://www.iferp.in/icraeca/
- 35th IARP National Conference -2025 (IARPNC-2025), Mangalore University, Mangaluru, 29-31 January 2025; https://iarpnc2025.co.in/

Congratulations!!

Mr. Kedar Bhope, HTTD, received **Best Poster Presentation** award for his paper titled "***Eddy Current Thermography Technique for He cooled Plasma Facing Components***" at the **34th Annual Conference and Exhibition on Non-Destructive Evaluation and Enabling Technologies (NDE-2024)** held in Chennai, India during 12-14 December 2024. Hosted by the ISNT Chennai chapter.

Many Congratulations to him for this achievement!

Index of Newsletter Volume 138, January 2025

Know Your Colleague

Mr. Vishwarishi Maurya completed his diploma in Civil engineering from the Institute of Engineering and Rural Technology (I.E.R.T.) Allahabad in 2010. Prior to joining IPR, he worked in Simplex Infrastructures Limited. He worked in Campus Infrastructure Project Division (CIPD) from 2013-2019. He was working with the Engineer-In-Charge in new project related activities of civil construction work of additional office buildings, New R & D Building, Auxiliary building, New pump house building and Neutronics lab building, shifting of services line, security watch towers, checking measurements, billing works and other miscellaneous civil works at IPR campus. Vishwarishi is currently working in Campus Maintenance Section (CMS) from 2019. In CMS he checks online E- tickets at IPR- Intra regarding civil maintenance related complains raised by users and takes necessary actions for completion of E- ticket related works for IPR and FCIPT campus. He also takes site measurements and prepares preliminary cost estimate, tender documents, tender drawings on Auto-CAD, Cost comparison statements, site supervision, checks measurements and process bills for assigned works. He completed his B.E. in Civil Engineering from L.D. College of Engineering, Ahmedabad in the year 2022. He was sports secretary of IPR Staff club during the financial year 2023-24. He is actively involved in the activities of Staff Club.

Congratulations!!

Dr. Jyoti Shankar Mishra, Scientific Officer-E received the **Best Paper Presentation Award** for his paper titled "***Application of Cryogenics in developing pellet injectors for fuelling plasma control in magnetically confined fusion devices***" at the **29th National Conference on Cryogenics and Superconductivity** held at the Inter University Accelerator Centre, New Delhi during 27-29 Nov 2024.

Many Congratulations to him for this achievement!


NCCS-29

BEST PAPER PRESENTATION AWARD

This is to certify that the Paper presented by Dr. Jyoti Shankar Mishra titled "Application of cryogenics in developing pellet injectors for fuelling plasma control in magnetically confined fusion devices" has been selected for the Best Paper presentation in the 29th National Conference on Cryogenics and Superconductivity held at Inter-University Accelerator Centre, New Delhi on November 27-29, 2024.

Quote of the Month

"Coming together is a beginning. Keeping together is progress. Working together is success."

--Henry Ford

Institute for Plasma Research
Bhat, Near Indira Bridge
Gandhinagar 382 428,
Gujarat (India)

प्लाज्मा अनुसंधान संस्थान
Institute for Plasma Research

Web : www.ipr.res.in
E-mail : newsletter@ipr.res.in
Tel : 91-79-2396 2000
Fax : 91-79-2396 2277