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The Fourth State

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



International Women's Day @ IPR

The International Women's Day was celebrated with great enthusiasm at IPR and FCIPT campuses on 8th March, 2022. The programmes at IPR began with a tribute to the legendary nightingale of India, Lata Mangeshkar who passed away on 6th Feb, 2022. This was followed by a talk on "*Women Health and Wellness*" by Dr. Nidhi Jain, eminent gynecologist and specialist doctor on IPR's CHSS panel. An exhibition of books authored by women was also kept on display. Women staff of IPR presented quotes by eminent women from various fields of life and also shared their experience of balance of work and home. At FCIPT, a similar event was organized. On this occasion, Dr. Sudhir Nema gave away gift hampers to the women housekeeping staff at FCIPT. Around 125 women staff members of IPR/FCIPT participated in the IWD event.





Images from the Women's Day functions at FCIPT (Top) and IPR (Bottom)

Test and Inspection of High Pressure Helium Gas Storage Vessels of SST-1 at IPR

IPR has several high pressure helium gas storage pressures vessels of capacities 68 m^3 (4) as well as 25 m^3 (2) installed for gas inventory of liquid helium plant of SST-1. As a part of CCOE (Chief Controller of Explosive) and safety regulation, it is a mandatory requirement to have hydrostatic pressurization test, non-destructive tests and physical inspection of these vessels as per SMPV (Static and Mobile Pressure Vessel) 19(Unfired) rule for its license approval in every five years. In order to comply the requirement, the hydrostatic tests of these vessels are being testing at IPR complying with CCOE norms. It needs special precautionary measures that the dealing of high pressure of more than 150 bar (g), helium leak tightness test at this high pressure and moisture level assurance of less than 2 ppm of the vessel are the stringent technical requirements and challenges. The hydrostatic test and associated miscellaneous activities have been carried out successfully and safely and it is nearly to completion in schedule time due to dedicated efforts, prior planning and preparedness of the test by Cryogenic crew from 1 Dec, 2021. The renewal and approval of the helium gas vessel's operational license is in process.



(L-R) : High pressure and medium pressure storage vessels; Hydro test pressure @ 203.5 bar (g) and at 23.4 bar (g)

On 28th Feb, 2022 on National Science Day, a graphic book entitled “**Meet Greet and Tweet with PlasmaToons**”, having captions both in Hindi and English languages was released by Dr. Jitendra Singh, Hon. Minister of State for the Ministry of Science & Technology, Earth Science and Minister of State for Prime Minister's Office, Personnel, Public Grievances & Pensions, Department of Atomic Energy and Department of Space at the Vigyan Bhawan New Delhi.

The book has been authored by Dr. B. S. Munjal (Ex-ISRO Scientist) and Dr. Suryakant Gupta from IPR. This pictorial representation of complex Plasma Technology was developed with the motivation to draw the attention of young minds. This graphical representation of PlasmaToons focuses on explaining some of the basic and interesting aspects of plasma to young minds using the medium of cartoons.

This publication can be viewed [here](#).



(L) A page from the published book (R) Dr. Jitendra Singh releasing the book



प्राक्कथन

श्री के. एन. व्यास
अध्यक्ष, परमाणु ऊर्जा आयोग
एवं
सचिव, परमाणु ऊर्जा विभाग



‘प्लाज्मा अनुसंधान संस्थान’ मूलभूत अनुसंधान कार्य के साथ सामाजिक उपयोग की विभिन्न प्रौद्योगिकियों के विकास में तत्परता से जुड़ा हुआ है। संस्थान की प्रौद्योगिकियों के विकास को अगली पीढ़ी तक पहुंचाने की दिशा में प्लाज्मा अनुसंधान संस्थान द्वारा इस पुस्तक के प्रकाशन के माध्यम से सराहनीय पहल की गई है। संस्थान अपनी नई प्रौद्योगिकियों के निर्माण के साथ भावी पीढ़ी यानी बच्चों में भी विज्ञान के ज्ञान का अंकुरण करने की अपेक्षा रखता है, जिसका सरल, सहज माध्यम कार्टून है। इसी दृष्टिकोण से आगे बढ़ते हुए संस्थान द्वारा प्लाज्मा विज्ञान की गतिविधियों को बच्चों में प्रचारित करने के उद्देश्य से यह कार्टून पुस्तक प्रकाशित की गई है, जो सभी आयु वर्ग के लिए उपयोगी सिद्ध होगी। संस्थान की तकनीकियों का रोचकता से साक्षात्कार कराने वाली इस पुस्तक की रचना करने के लिए मैं डॉ. भवदीप सिंह मुंजाल एवं डॉ. सूर्यकान्त गुप्ता को हार्दिक धन्यवाद देता हूँ।

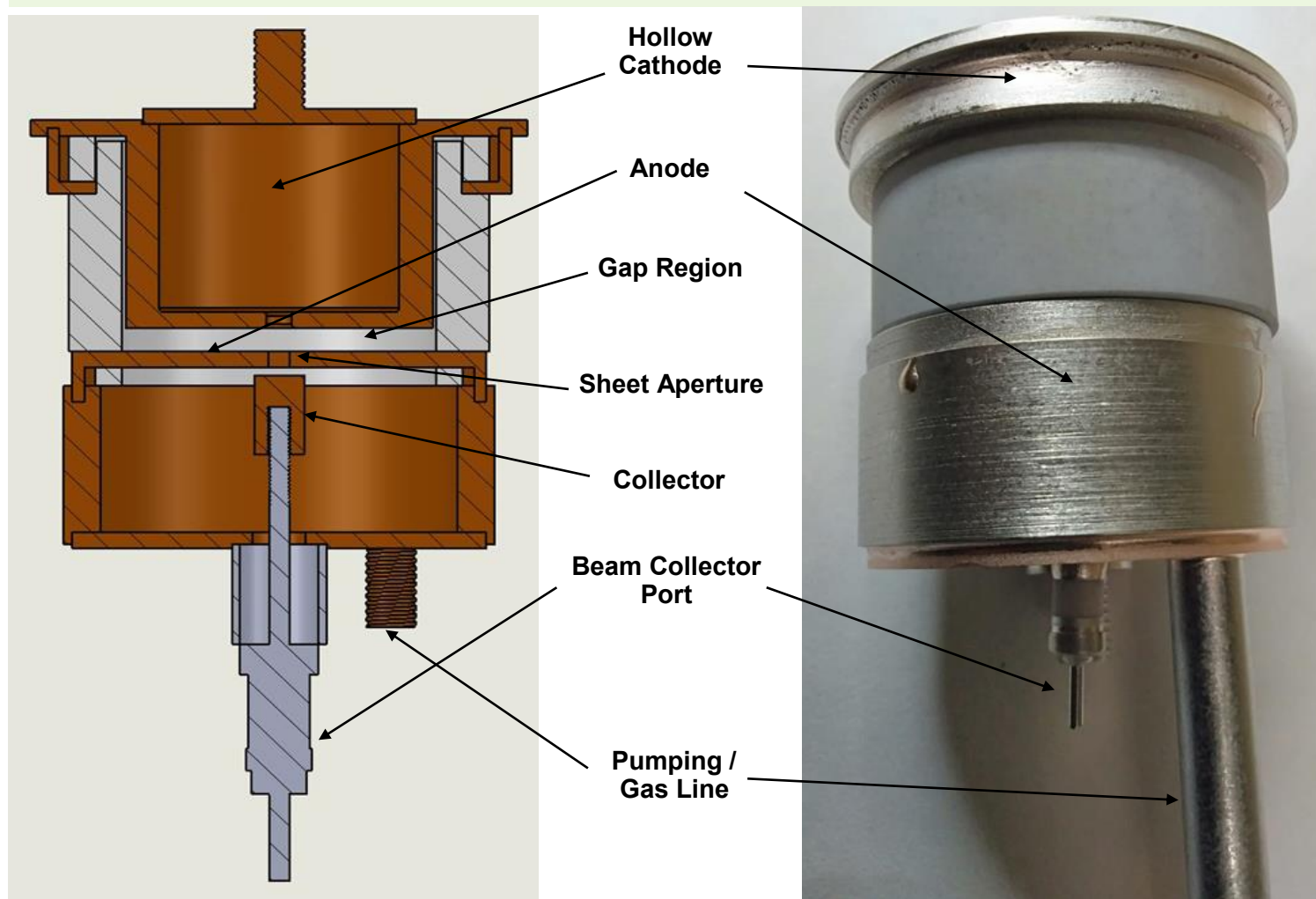
यह पुस्तक सरल सुबोध भाषा में प्लाज्मा संबंधी प्रौद्योगिकियों की जानकारी प्रदान करने के साथ विभिन्न प्रश्नों के माध्यम से पाठकों के मन में जिज्ञासा भी उत्पन्न करती है। इस प्रकार विज्ञान को गहराई से जानने की उत्सुकता पाठक वर्ग में वैज्ञानिक सोच को बढ़ावा देगी, जो भारत के आत्मनिर्भर अभियान में एक सशक्त कड़ी साबित होगी।

Design and Development of High Current Density ($>500\text{A}/\text{cm}^2$) Sheet-Beam Plasma-Cathode Electron Gun for sub-mm Microwave Sources

4

CSIR-CEERI and IPR are developing a nano second, pulsed, sub millimeter wave Backward Wave Oscillator (BWO) source of about one watt output power under a BRNS sponsored project. The sub millimeter or THz sources are being used for plasma diagnostics, high data rate communications, security threat detection, high resolution imaging, biological spectroscopy and biomedical diagnostics. In the THz band, a BWO is a promising source to produce coherent radiation at higher power. The BWO can realize broad tunable bandwidth by adjusting its operating voltage and can generate high power output without the need of a driving signal. Nevertheless, as the frequency increases it becomes increasingly difficult using conventional hot cathodes to focus and form high current density and high quality electron beams through the small size interaction region of the THz BWO. This issue can be mitigated by the presence of plasma in the interaction region. As frequency increases, the size of the interaction region becomes smaller and smaller, which limits the power handling capability of such high frequency THz sources.

The fabrication of planar interaction region is less complex than cylindrical counterpart. Also, the sheet-electron-beam has advantages in terms of reduced space charge field over cylindrical electron beam and can lead to effective conversion of its energy to radio frequency (RF) wave inside the planar interaction structure. Therefore, in the BRNS sponsored project a miniaturized plasma assisted sheet electron beam source has been designed and developed for the first time in India. Initially, the optimization study of design parameters has been performed using COMSOL Multiphysics. The experimental investigations have been performed on the evaluation of sheet electron beam current profile. The sheet electron beam has been propagated inside the drift space for more than 50 mm in ion-focusing regime. The electron gun has been operated in the self-breakdown mode.

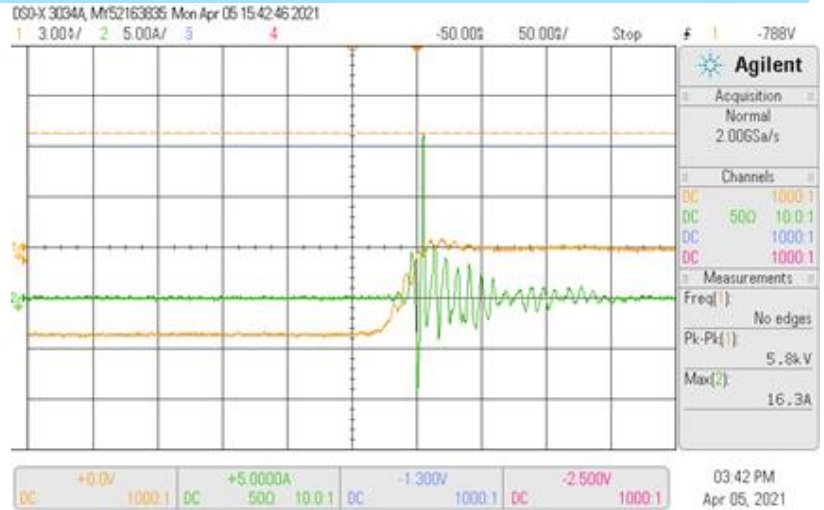


(L) Schematic of the device (R) The developed device

Parameters	Value
Hollow cathode diameter to length ratio	1
Aperture Aspect Ratio	5:1
Sheet aperture size	1.25 mm X 0.5 mm
Diameter / Length	30 mm / 30mm
Wall aperture radius	0.5 mm
Wall aperture thickness	1 mm
Beam adapter	Circular to sheet

High Current Density (Sheet-Beam Plasma-Cathode Electron Gun)

5



(L) Experimental setup to test the developed device (R) V-I characteristics of the developed source



Testing of the miniature sheet beam device at IPR



Sealed-off miniaturized sheet beam source delivered and demonstrated by the PI from CEERI and IPR collaborators

Indigenously Developed High Pressure Helium Circulator

LCPC division of IPR is developing different cryogenic test facilities for tests of different cryogenic prototype components of helium refrigerator/liquefier plant. In these test facilities, pressurized helium circulator at room temperature and at medium pressure has been useful and it has been developed few years before by this LCPC division. Considering the requirement of high pressure leak tight helium circulator requirement at different applications in the nuclear power plants an attempt has been made to develop such high pressure helium circulators. Recently, such a system has been developed and tested successfully with an operating pressure up to 35 bar and helium leak rate from circulator body being less than 5×10^{-5} mbar l/s. The cost of the indigenously developed circulator substantially lower than that of imported circulators, and hence can be a potential import substitute. A locally available air turbo-blower was modified by this team to develop the high pressure blower. It includes different instrumentations like pressure transmitters, differential pressure transmitters, flow meters, speed controller, etc. To operate it for longer duration, water cooling heat exchanger will be included in future. LCPC division of IPR has also successfully commissioned high speed cryogenic helium turbines. The three turbines were integrated into the cold box of the indigenously helium refrigerator plant. Turbines 1, 2 and 3 have design speeds of 2.2, 1.6 and 1.1 lakh RPM and their nominal inlet helium temperatures are 33, 15 and 7 K respectively.



(L) the high speed turbines integrated with the cold box (R) The indigenously developed helium circulator

AKAM Colloquium

The **Azadi Ka Amrut Mahotsav** On-line Colloquium series began in Sept, 2021. This series of popular science lectures aimed at students and general public is proposed to continue till August 2022.



The 6th talk in the series was a popular talk entitled "Extreme-UV photons from distant galaxies" delivered on 24th January, 2022 by **Prof. Kanak Saha** of the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune.



The 7th talk in the series was a popular talk entitled "*The exciting world of Materials*" delivered on 10th February, 2022 by **Prof. B. S. Murty**, Director, IIT Hyderabad.



The 8th talk in the series was a popular talk entitled "*Cold plasma approach for reduction of waste in Chemicals manufacturing*" delivered on 23rd February, 2022 by **Dr. K. S. Ganesh Prasad**, of the Institute for Advanced Research, Gandhinagar.



The 9th talk in the series was a popular talk entitled "*Design and construction of Research reactor- A perspective in Indian scenario*" delivered on 2nd March, 2022 by **Dr. Sujay Bhattacharya**, Director, Reactor Projects Group, BARC, Mumbai

The 51st National Safety Week was celebrated at IPR from 4-10 March 2022. This year's theme was "Nurture Young Minds, Develop Safety Culture". Due to COVID-19 pandemic situation, the institute organized various competitions online during this week to create safety awareness among its employees. Competitions were organized on *Slogan in Gujarati, Hindi & English, Online Quiz and Essay Writing in Gujarati, Hindi & English* based on decided topics for the employees of IPR, FCIPT & ITER-India. In addition to this, safety division also conducted an awareness program on Road Safety for contract drivers, demonstration of firefighting equipment for security personnel and a training session for safety co-ordinators during this week. The concluding session of the NSW was conducted on 10th March, with the following activities;

- Welcome address by Shri Sunil Kumar, Chairman, IPR Safety Committee
- A talk on "Periodic hydrostatic pressurization test and inspection of high pressure helium gas storage vessels at IPR" by Shri Rajiv Sharma
- Thoughts on safety delivered by Dr. S. Mukherjee, Dean (Admin.)
- Safety Pledge read out by the Dr. P. K. Atrey, Dean (R&D)
- Message on safety by Director, IPR. He emphasised the need for strong commitment towards safety and the need to improve the safety culture in the campus, keeping in mind the importance of the fact that "Nothing is of greater importance than the protection of human life"
- Vote of thanks by Shri D Modi

Competition	1st Prize	2nd Prize	3rd Prize
Gujarati Slogan	Rajnikant Amaliar	Manish Vasani	Prakash Parmar
Hindi Slogan	Manoj Kumar Gupta	Jyoti Agarwal	Rajnikant Bhatasana
English Slogan	Raj Singh	Alphonsa Joseph	Pratibha Gupta
Gujarati Essay	Murtuza Vora	Gaurang Mahesuria & Chirag Bhavsar	Nikunj Patel
Hindi Essay	Jyoti Agarwal	Sandhya Dave	-
English Essay	Bharat Doshi	Rohit Agarwal	Pramila & Pranav Barapatre
Quiz	Pratibha Gupta	Aashoo Sharma	Rajiv Sharma & Jignesh Patel



(L) Winners of various NSW competitions (R) Demonstration of fire fighting system by the security personnel



Clockwise (from Top) Welcome Address by Shri Sunil Kumar, Thoughts on Safety by Dr. S. Mukherjee, Message on Safety by the Director, Safety Pledge administered by Dr. P.K. Atrey, Distribution of prizes and talk by Shri Rajiv Sharma.

As part of the AKAM celebrations, IPR participated in the Science Exhibition organized by Gujarat University, Ahmedabad, under the "*Vigyan Sarvatra Pujiyate*" Science communication Popularization & its Extension programme supported by Ministry of Science & Technology, Government of India. This exhibition was conducted at the Computer Science Building of Gujarat University during 22-28 Feb, 2022. IPR exhibited 14 working and non-working models, posters as well as distributed resource materials related to plasma and its applications. Over 10,000 students visited the exhibition.

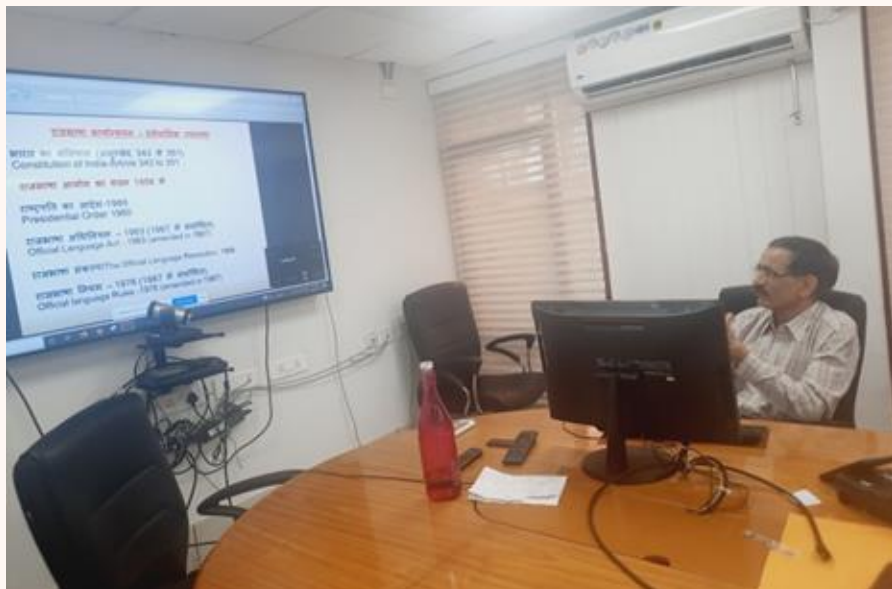


Images from the science exhibition held at Gujarat University

प्लाज़्मा अनुसंधान संस्थान द्वारा नराकास, गांधीनगर के तत्वावधान में 4 मार्च 2022 को ऑनलाइन माध्यम से हिंदी कार्यशाला का आयोजन किया गया। संस्थान के वैज्ञानिक अधिकारी श्री राज सिंह ने "क्या राजभाषा हिंदी को अपनाना वास्तव में कठिन है?" विषय पर चर्चा की, जिसमें नगर राजभाषा कार्यान्वयन समिति, गांधीनगर के सदस्य कार्यालयों के कर्मिकों ने सक्रिय रूप से भाग लिया। श्री राज सिंह ने राजभाषा नीति, अधिनियम पर प्रकाश डालते हुए सरकारी कार्यालयों में इस नीति को सफलतापूर्वक कार्यान्वित करने हेतु सभी श्रोताओं को प्रोत्साहित किया।

उन्होंने श्रोताओं को अपने मन-मस्तिष्क से राजभाषा को कठिन न मानकर, बल्कि खुले मन से इस भाषा का प्रयोग करने पर बल दिया। स्वाभाविकता से समाविष्ट होने वाले अन्य क्षेत्रीय भाषा और अंग्रेजी भाषा के मिलेजुले प्रयोग से हिचकिचाना नहीं चाहिए, बल्कि प्रचलित शब्दों को ग्रहण करना चाहिए और साहित्यिक व कठिन शब्दों के प्रयोग करने से बचना चाहिए। श

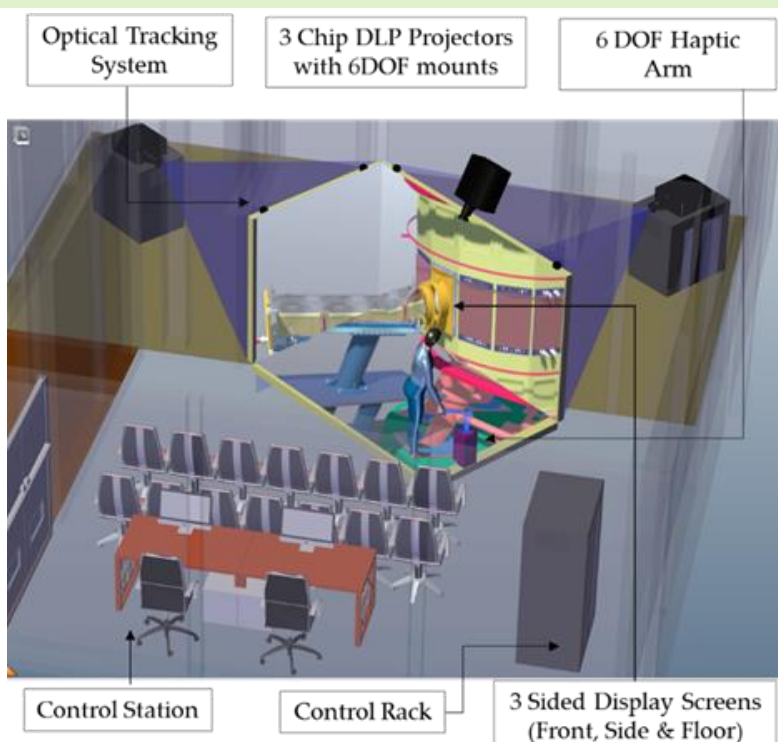
श्री राज सिंह के वक्तव्य का मूल सार यही था कि राजभाषा के कार्यान्वयन में यदि सकारात्मक दृष्टिकोण अपनाया जाए तो कोई कठिनाई नहीं होगी। इस प्रकार उन्होंने बहुत ही सरलता से राजभाषा नीति को अपनाने के लिए सभी श्रोताओं को प्रेरित किया। इस कार्यशाला में कुल 53 कर्मचारियों/अधिकारियों ने भाग लिया।



व्याख्यान देते हुए श्री राज सिंह

Interactive Virtual Reality CAVE facility at IPR

A 3 sided fully immersive Cave Automatic Virtual Environment (CAVE) VR facility has been successfully established at IPR. The remote handling and robotic operations inside challenging environments such as tokamaks require accurate perception of the dynamic working environment. The aim of this facility is to give the operators the same unrestricted knowledge of the task scene as would be available if they were physically located inside the remote environment. Using this facility, users can instantly view and interact with virtual 3D models of any machines/systems and feel as if they are fully immersed in the actual environment. With haptic arm, the users can feel the collisions and forces while carrying out virtual assembly task or while performing master slave robotic operations. The facility is extremely useful in developing 3D virtual walkthroughs of systems/ machines, design reviews, accurate virtual prototyping thereby eliminating the need for physical prototypes, system interface & integration studies, real-time monitoring and control of remote handling/robotic operations and customized operator training by developing simulated scenarios using CAD & simulation software, etc.



(L) the VR facility at IPR (R) Layout of the VR facility

As part of the AKAM celebrations, IPR will be conducting a series of scientific outreach activities in schools of rural schools of different districts of Gujarat. The first such event was conducted during 1-4 March, 2022 at the Purusharth Saikshanik Sankul, Bhanvad, Devbhumi Dwaraka District. This is a Gujarati medium residential school with over 750 students studying in classes 1-12.

The 4-day event consisted of a popular talks on plasma and its applications and exhibition of over 15 working models related to plasma and its applications. Over 500 students of the host school as well over 500 students and 70 teachers from ten other schools in Bhanvad taluka as well as several officers from district and taluka administration also visited the exhibition. The event was inaugurated by the Taluka Education Officer, Bhanvad Taluka. The event was also visited by District Education Officer, Taluka Mamlatdar, Taluka Revenue Officer, and Principals of schools and colleges in Bhanvad and neighboring taluks.

As part of the event, the Gujarati version of the children's comic book on plasma "*The Wonderful World of Plasma*" was also distributed to all the participating students and teachers. A set of 10 posters on plasma and a popular book on plasma "*Living with Plasma*" were also distributed to the visiting schools for display in their school's library.

IPR Outreach proposes to conduct such events in rural schools of Surat, Bhuj and Banaskantha districts in the coming months. [Link to videos from the event](#)



Images from the rural scientific outreach activity conducted at Bhanvad



The occasion of completion of manufacturing and dispatch milestones for Group-X cryolines of ITER was celebrated on 03-March-2022 at the storage zone of M/s Air Liquid Advanced Technologies (ALAT), Sassanage, France with the flag-off of the last consignment of these lines with in-person presence of ITER Organization, M/s ALAT and ITER site representative of ITER-India. With this last consignment, the supply part of all the ITER cryolines and warmline have been successfully completed under the procurement arrangement between ITER-India and ITER Organization.

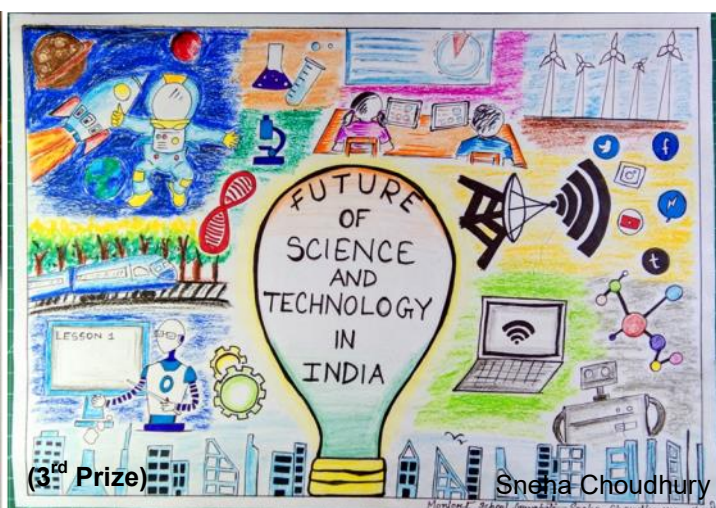
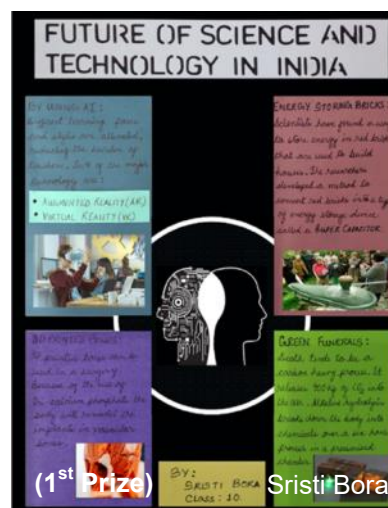
Group-X cryolines primarily connect the cold power in cryoplant building to the clients in tokamak building, having a total network of ~1.6 km in length, carry cryogenes at 4 K, 50 K and 80 K temperature level to various applications, mainly the superconducting magnets and cryopumps, at ITER. The Group-X cryolines have been designed and manufactured as per the stringent functional specifications including the nuclear safety functions (for lines crossing the secondary confinement) for some components. The challenging goal of making vacuum and super insulated cryolines having process pipes from four to seven and diameter up to DN 1000 has been successfully completed according to the ITER schedule and quality requirements. The biggest challenge to design the two main cryolines between tokamak building and cryoplant building with the seismic decoupling requirement which demands for ~150 mm relative displacement in horizontal and vertical directions has been fulfilled through a specific design using combination of expansion and gimbal joints. The manufacturing started after rigorous design reviews and the successful qualification test of prototype cryolines with 1:1 lateral scale of Torus & Cryostat Cryopump cryolines of 28 m length.

The prototype cryolines had demonstrated the heat load of $23 \text{ W} \pm 8 \%$ at 4.5 K and $123 \text{ W} \pm 8 \%$ at 80 K against the allowable limit of 36.8 W at 4.5 K and 138.6 W at 80 K. Similarly, the overall designed heat load remained within 810 W against the allowable limit of 2034 W at 4.5 K which shows a total saving of ~1.2 kW at 4.5 K. Likewise, there is around 3 kW saving on the heat load at 80 K temperature level.

All of the produced lines met the required manufacturing standard, establishing a global norm for future endeavors.



Centre of Plasma Physics - Institute for Plasma Research (CPP-IPR) observed the National Science Day, 2022 as a part of "AZADI KA AMRIT MAHOTSAV" on 24th, 25th and 28th February 2022, under the theme "Integrated Approach in Science and Technology for a Sustainable Future". Keeping in mind the Covid scenario the events have been organized online. Several competitions were conducted among students of various academic levels, including the students of schools, colleges, and universities. The competitions include Essay Writing, Drawing, Poster, Science Model, Eloquence, Quiz etc. The program concluded with a popular talk on "Harnessing Plasmas for Societal Applications" by Dr. Mukesh Ranjan, of FCIPT, IPR.



Prize winning posters for the classes 6-8 group (Top) and 9-12 group (Bottom)



(L) The eloquence competition in progress (R) The NSD-2022 team



Concluding session of NSD-2022 at CPP-IPR

- ◆ **Dr. Shwetang N. Pandya**, gave an invited talk on "*Thermal Imaging - An Introduction*" at the Webinar on Deep learning for Multi-spectral Imaging approach in Health Care Technology, SRM Institute of Sci. & Tech., Chennai & IGCAR, Kalpakkam, on 9-Feb-2022
- ◆ **Mr. Rajiv Sharma**, gave a talk on "*Vacuum, helium leak tightness and sealing aspects of high pressure helium gas storage vessels at IPR*" at DAE BRNS International Symposium on Vacuum Science and Technology and Its Applications in Accelerators, DAE Convention Centre, Anushakti Nagar, Mumbai, 16-19th February 2022
- ◆ **Ms. Sukriti Hans**, gave a talk on "*Ion Beam produced nanopatterns: Experiment and simulation*" at DAE-BRNS International Symposium on Vacuum Science and Technology and its Applications in Accelerators, on 18th February 2022
- ◆ **Dr. Pintu Bandyopadhyay**, gave a keynote talk on "*Dusty Plasma: A model system to perform multidisciplinary research*" at Sikkim Manipal Institute of Technology, Sikkim, on 18th February 2022
Talks presented at Workshop on Augmented Reality (AR)/ Virtual Reality (VR), AICTE Training and Learning (ATAL) Academy, NIT Nagaland, 21st-25th February 2022 :
 - General Overview of VR & AR Technology—History, Types, Concepts - K. K. Gotewal
 - Hardware and Software components in AR/VR - Naveen Rastogi
 - Practical applications in different industries: Robotics, Gaming, Healthcare, Entertainment, Construction, etc. - K. K. Gotewal
 - Elements in VR & AR - Haptics, Tracking, Geometry transformations, Lights, optics, Audio - Naveen Rastogi
 - Hands-on Training on VR/AR software - Naveen Rastogi
 - Visual Perception and visual rendering - Naveen Rastogi
 - VR & AR developments in IPR - Krishan Kumar Gotewal
- ◆ **Dr. K.S. Ganesh Prasad**, Institute for Advanced Research, Gandhinagar, gave a talk on "*Cold plasma approach for reduction of waste in Chemicals manufacturing*" on 23rd February 2022 (**Colloquium #311**)
- ◆ **Dr. Mukesh Ranjan**, gave an invited talk on "*Plasma for nanopatterning application*" at "Metallurgy For All-2022", Government Engineering College, Gandhinagar, on 24th February 2022
- ◆ **Mr. Rajiv Sharma**, gave an invited talk on "*Composites Material Development for Superconducting Fusion Machine System and Cryogenic Applications*" at a Webinar on "Aerospace Materials and Applications", Shiv Nadar University, Greater Noida and Indian Space Industry Exhibitors (ISIE), 25-27 February 2022
- ◆ **Prof Abhijit Sen**, Emeritus Professor and INSA Honorary Scientist, gave a Lecture on "*Remote Sensing of Space Debris using Plasma Effects*" at National Science Day 2022, GUJCOST, on 28th February 2022
- ◆ **Mr. Nitin Bairagi**, gave an invited talk on "*Superconductors: Technology towards Sustainable Goals*" at National E-conference on Sustainable Development and Environment Protection Technologies, ISBM University, Chhattisgarh, on 28th February 2022
- ◆ **Dr. Mukesh Ranjan**, gave a popular talk on "*Harnessing Plasmas for Societal Applications*" at National Science Day 2022 (NSD-2022), CPP, Sonapur, on 28th February 2022
- ◆ **Mr. Chinmoy Mallick**, gave a talk on "*Studies of cavity modes on plasma and its influence on ion beam in a microwave ion source*" on 1st March 2022
- ◆ **Dr. Sujay Bhattacharya**, Director, Reactor Projects Group, BARC, gave a talk on "*Design and construction of Research reactor- A perspective in Indian scenario*" on 2nd March 2022 (**Colloquium #312**)
- ◆ **Dr. Prabhakar Tripathi**, Indian Institute of Technology (BHU), Varanasi, gave a talk on "*Investigation of Different aspects of the Side-Coupled Cavities type Interaction Structures for the Slow Wave High Power Electron Beam Devices*" on 11th March 2022
- ◆ **Dr. Vishakha Baghel**, gave a talk on "*Droplet Motion on Wettability Gradient Surface*" on 16th March 2022
- ◆ **Dr. Sandeep Rimza**, gave a talk on "*Thermal-Hydraulics and Structure optimization Performance Analysis in a T-Junction of High Temperature Helium Cooling Loop*" on 17th March 2022
- ◆ **Dr. Nirmal Bisai**, gave a talk on "*Plasma blob formation and its experimental validation*" on 17th March 2022 (**Colloquium #313**)
- ◆ **Dr. Sheetal Punia**, gave a talk on "*Design and Analysis of Stray Radiation Detection System for ECE Diagnostic*" on 17th March 2022

Upcoming Events

- ◆ 48th Annual Plasma Physics Conference, Liverpool, UK, 11-14 April 2022; <https://www.iop.org/events/48th-annual-plasma-physics-conference>
- ◆ IOP Nuclear Physics Conference 2022, University of Surrey, Guildford, UK, 20-22 April 2022; <https://www.iop.org/events/iop-nuclear-physics-conference-2022>
- ◆ 28th International Cryogenic Engineering Conference and International Cryogenic Materials Conference 2022 (ICEC28-ICMC 2022), Virtual Conference, 25-29 April 2022; <https://www.icec28-icmc2022.com/>
- ◆ Plasma Processing and Technology International Conference (PlasmaTech 2022), Barcelona, Spain, 27-29 April 2022; <https://www.setcor.org/conferences/plasma-tech-2022>

Know Your Colleague



Mr. Vismaysinh Raulji joined IPR as Engineer-SC in 2008 and is presently working as a Scientific Officer-E in the Electronics & Instrumentation Division. His core work involves System Automation which includes PLC & SCADA programming (viz. Siemens, Schneider, Wago, Phoenix, Delta, and Exor). He has hands-on experience of LabVIEW coding for NI- c-RIO, PXI, and FPGA-based custom electronics. He is involved with the team that developed the indigenous DAQ installed in Aditya-U & SST-1.

He also developed automation applications for several systems such as Aditya-U Vacuum Vessel Baking Control System, NNP Heating, Aditya-U Automatic Capacitor Charging System, Aditya-U Horizontal Plasma Position Control System, FMCW Reflectometry System Software Integration, FPGA Based Trigger & Timing Control System for ADITYA-U, SST-1 Pellet Injection Control System and Control System for 300KV Accelerator Based 14-MeV Neutron Generator.

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Test and Inspection of High Pressure Helium Gas Storage Vessels of SST-1 at IPR	02	Interactive Virtual Reality CAVE facility at IPR	09
Meet, Greet & Tweet with PlasmaToons	03	AKAM Rural Outreach Activity @ Bhanvad	10-11
Design and Development of High Current Density (>500A/cm ²) Sheet-Beam	04-05	Flag-Off of "Group-X Cryolines" of ITER	12
Indigenously Developed High Pressure Helium Circulator	06	NSD-2022 @ CPP-IPR	13
AKAM Colloquium	06	Past and upcoming events	14
51st National Safety Week – 2022 @ IPR	07	Know Your Colleague	14
AKAM Science Exhibition @ Gujarat University	08	Science Day Talk at JNV, Gandhinagar	15

Science Day Talk at JNV, Dehgam

A popular talk was delivered to the students of Jawahar Navodaya Vidyalaya (JNV), Dehgam, Gandhinagar, on the occasion of the National Science Day on 28th Feb, 2022 by **Dr. N Ramasubramanian** as part of the Science Camp organized under the Vigyan Jyothi project of JNV. He also visited the science exhibition organized by the students of JNV and interacted with them. The programme was coordinated by **Dharmesh Purohit** of IPR.



The IPR Newsletter Team

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