

As part of the AKAM celebrations, IPR has been conducting a series of scientific outreach activities in rural schools of different districts of Gujarat. The fourth such event was conducted during 11-13 July, 2022 at the **Seth Khemji Ramdas Kanya Vidyalaya, Mandvi**. This is a Gujarati medium girls' school with over 600 students studying in classes 1-12.

The 3-day event consisted of popular talks on plasma and its applications and exhibition of over 15 working models. Over 400 students and teachers from this school as well as nearby schools and general public visited the exhibition. Principals of schools in Mandvi and Bhuj also visited the exhibition and explored the possibilities of having similar events at various schools in the region in the near future. Students of class 10 & 11 from the host school were trained to explain the exhibits to the visitors.

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 visiting students and teachers. Students from the school were trained to explain the exhibits to visitors. 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 Bhavnagar and Porbandar Districts of Gujarat in the coming months. For more details click [HERE](#).



Inauguration of the event



Introducing plasma to students



The plasma exhibition

Under the auspices of “Azadi Ka Amrut Mahotsav”, The National Exhibition & Seminar on Plasma Physics (NESPP-2022) was organized by CPP-IPR and IPR in association with the University Of Science & Technology, Meghalaya (USTM) during 1-5 August, 2022 at the USTM campus at Baridua, Meghalaya. The Outreach team of IPR transported over 20 working and non-working models, posters, comic book on plasma etc. to Meghalaya to set up this exhibition on plasma, which is unique in the sense that it is for the first time that such an exhibition was being held in the North Eastern part of the country.

The event was inaugurated by the Honorable Education Minister of Meghalaya, Shri. Lakhmen Rymbui, who also inaugurated the CPP-IPR exhibition on plasma and its applications. The Minister spent a considerable amount of time at the exhibition with the various exhibits on plasma and its applications. He was also eager to know more details about the Plasma Pyrolysis system for waste management.

During the event, a popular talk on Plasma was also delivered by Dr. Ravi Kumar (Head Outreach Division, IPR) to the students of USTM on 2<sup>nd</sup> August, 2022. Over the 5 days, more than 1000 students from USTM as well as over 800 students and teachers from various schools in Guwahati as well as rural areas in the state of Assam visited the exhibition.

PhD Scholars from CPP-IPR as well as MSc Physics students from USTM who were trained by experts from IPR and CPP-IPR explained the exhibits to the visitors.

The Honorable Health & Forest Minister of Meghalaya, Shri. James K. P. Sangma presided over the concluding session of the event. He also visited the exhibition and interacted with the students. Click [HERE](#) for detailed report.



(L) The inauguration of the event (M) The H’ble Minister for Education, Meghalaya, (R) Prof. B. K. Saikia, Center Director, CPP-IPR addressing the gathering



(L) The inauguration of the plasma exhibition by Shri. Lakhmen Rymbui, Hon’ble Education Minister, Meghalaya





Images from the Plasma Exhibition at USTM



The Honorable Health & Forest Minister of Meghalaya, Shri. James K. P. Sangma during the concluding session and his visit to the IPR Plasma exhibition



PhD scholars of CPP-IPR and student volunteers of USTM with IPR Team at the Plasma Exhibition at USTM.

**Azadi Ka Amrit Mahotsav (AKAM)** is a country-wide campaign, dedicated to the people of India for their contribution to India's evolutionary journey. **The Ministry of Culture** has allotted an **ICONIC** week (August 22-28, 2022) to DAE to conduct special events during this week to showcase the activities and achievements of DAE.

IPR celebrated the **ICONIC** Week by conducting a week long celebrations from 22-28 August, 2022. In addition to organizing various events at IPR campus, a week-long program entitled "*Plasma Gyan*", an exhibition on plasma, its applications and nuclear fusion was organized by IPR Outreach division at the Dept. of Physics, BIT (Mesra), at their Jaipur campus.

The following events and activities were also organized at the IPR main campus during the week.

22/08/2022: Commencement of Iconic week by tree plantation campaign at IPR Campus;

23/08/2022: Visit of 70 students from Deaf and Dumb School, Ahmedabad to IPR;

24/08/2022: Visit of 64 students from Deaf and Dumb School, Ahmedabad to IPR;

25/08/2022: Visit of 55 students from SSIT Engineering college, Gandhinagar to IPR;

25/08/2022: AKAM Lecture on "*Towards centenary celebrations*", by Dr. Indira Nityanandam, Director, Bharatiya Bhasha Sanskriti Sansthan, Gujarat Vidyapith;

26/08/2022: AKAM Webinar on "*AtmaNirbhar Bharat: Indian GNSS Paradigm and international trends*", by Dr. Surendra Pal, Retired Vice-Chancellor of Defense Institute of Advanced Technology (DIAT), Pune, DRDO

Various competitions like Essay and Slogan writing and Poster were also organized on the subject of Azadi Ka Amrit Mahotsav and Atmanirbhar Bharat for IPR staff and their family members.



Tree planting campaign at IPR campus during the AKAM Iconic week



Two groups of around 134 students from the School for Deaf Mutes Society, Ahmedabad visited IPR along with their teachers during two days of the Iconic week. These students were shown the various plasma exhibits in the Outreach Hall as well as SST and Aditya tokamaks. Prior to that, these students were also given a brief introduction to plasma which was translated into sign language by their accompanying teachers. The students also gave a feedback of what they saw during the visit. Director IPR also addressed the group speech and hearing disabled students.



Director IPR interacting with the deaf & mute students



Deaf & mute student giving his feedback of the visit to IPR



A group of 55 students of engineering from the SSIT College of Engineering, Gandhinagar visited IPR during the Iconic week. They were given an introductory talk in plasma and its applications and then were shown the various exhibits in out-reach hall. They were also taken to visit Aditya and SST-1 tokamaks. Popular talks by **Dr. Surendra Pal** (Former Vice-Chancellor of Défense Institute of Advanced Technology, Pune) as well as **Dr. Indira Nityanandam** (Director, Bharatiya Bhasha Sanskriti Sansthan, Gujarat Vidyapith) were also arranged during the Iconic week.

The AKAM DAE Iconic week was celebrated with great enthusiasm and the relevant details of the events conducted by IPR were uploaded to the AKAM website by DAE.

Under the auspices of "Azadi Ka Amrut Mahotsav", IPR organized a scientific outreach programme entitled "Plasma Gyaan" at the Birla Institute of Technology (Mesra), Jaipur campus during 22-26 August, 2022. This programme was part of the DAE AKAM Iconic Week which was celebrated from 22-28 August, 2022 by the Department of Atomic Energy.

The programme was inaugurated by Mrs. Mugda Sinha, IAS, Secretary, Department of Science & Technology, Government of Rajasthan. During her address, she stressed the need to take science outreach to the rural areas of the state and extensively use interactive resource materials to engage the students more effectively.

As part of this programme an exhibition on plasma and its applications and nuclear fusion was set up at BIT Jaipur and students and teachers from several schools in Jaipur as well as students from BIT campus also visited the exhibition. An introduction-cum-training programme on plasma and its applications for science teachers was also organised on 26th August, wherein 10 teachers were trained.

Over 1000 students and teachers from 16 schools and colleges in Jaipur participated in this event. As part of the programme, around 30 students of engineering from BIT as well as +2 science students from a local school were trained to explain the plasma exhibits to the visitors.

The valedictory function was presided over by Sri Ashutosh Vajpei (IAS), Joint Secretary, (Economic Affairs Department), Govt. of Rajasthan. For more details click [HERE](#).



Inauguration of the event



Mrs. Mugda Sinha visiting the exhibition



The plasma exhibition





Images from the event at BIT (Mesra), Jaipur campus

As a part of *Azad ka Amrit Mahotsav*, series of events and activities were organized during 5-15 Aug, 2022. A *Freedom Walk* was organized with a theme "*Tiranga in Hand and India in Heart*" on 10<sup>th</sup> Aug, 2022 from 10:00 am onwards the IPR campus. The walk was flagged off by Dr. Shashank Chaturvedi (Director, IPR) by handing over the flag to Dr. P K Atrey (Dean R&D, IPR) and Shri Niranjn Vaishnav (Chief administrative Officer, IPR). More than 250 members participated in this event cheering "*Vande Mataram*" and "*Jai Hind*" during the walk from the New office building to IPR Guest house.



Images from the "Tiranga Yatra" organized at IPR on 10th August, 2022

## Superannuation Function

IPR Staff Club organized a Superannuation function for Shri. N C Patel at IPR Seminar Hall on 30<sup>th</sup> September 2022. Over 100 of staff members attended this function including his team members and family members. Dr. Ritesh Sugandhi presented important contributions and achievements of Shri. N C Patel. Dr. Subroto Mukherji (Dean Administration, IPR) offered a felicitation gift as a token of appreciation on behalf of the Institute. Smt. Chhaya K Chavda, Shri Niranjn Vaishnav, Shri Govind Lokhande, Shri Kanubhai Parmar, Smt. Ranjana Manchanda, Shri Rakesh Tanna, and other colleagues shared their experiences, memories and contributions of the superannuating colleague and conveyed their best wishes for a happy and healthy retired life.

Shri. N.C. Patel has been largely involved with various activities of ADITYA Tokamak like Gas Fueling Control System of ADITYA Upgrade Tokamak and single pulse generator etc. for Aditya Tokamak. The Executive Staff Club Committee also presented them a booklet of collected messages (soft copy).

On behalf of IPR, the Newsletter wishes Shri N C Patel a healthy and happy retired life!



(L) Dr. Subroto Mukherji felicitating Shri. N C Patel (R) Dr. S Mukherji, Shri. N C Patel along with his daughter and wife, Shri Niranjn Vaishnav and Dr. Ritesh Sugandhi

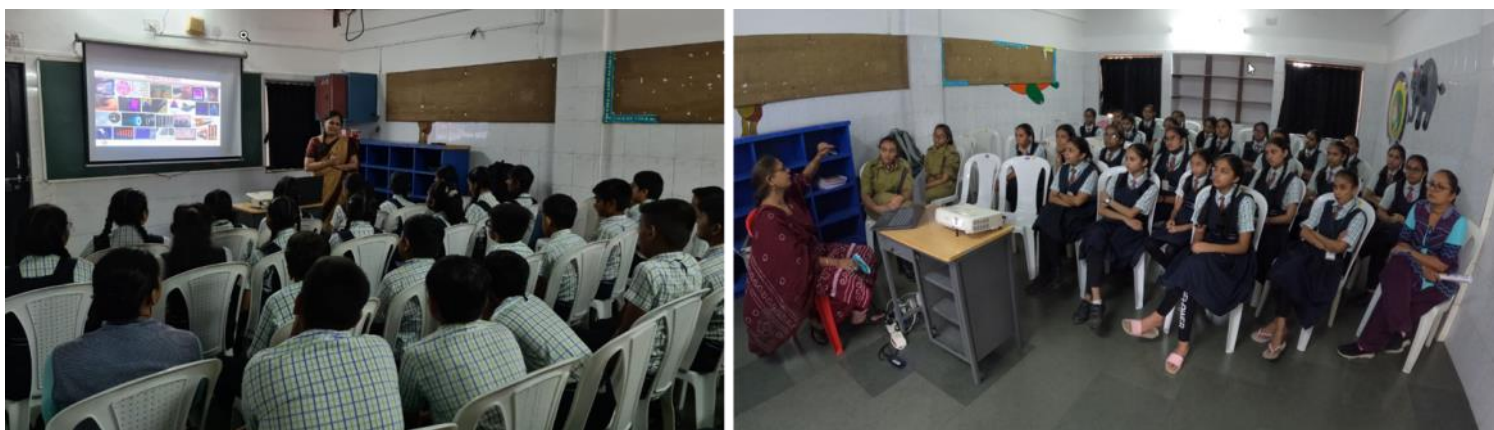
## AKAM Rural Outreach Programme @ Vav, Surat (Dt)

As part of the AKAM celebrations, IPR has been conducting a series of scientific outreach activities in rural schools of different districts of Gujarat. The second such event was conducted during 22-29 April, 2022 at the **Vasishtha Vidhyalaya**, Vav Village, Kamrej Taluka, Surat (Dt). This is a Gujarati /English medium school with over 7000 students studying in classes 1-12. The IPR exhibition on plasma was visited by students from classes 8-12 of both English and Gujarati medium sections.

The 4-day event consisted of a popular talk on plasma and its applications and exhibition of over 15 working models related to plasma and its applications. Over 1000 students of the host school as well as students from nearby schools in this taluka visited the exhibition. 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 Bhuj and Banaskantha districts in the coming months. Click [here](#) for detailed report.



360 images of the event (click on image to view)



Images from the event



Images from the event



Images from the event

## Cryogenic Thermal Insulation on LN<sub>2</sub> Lines of Cryopump Integrated with SST-1

IPR has developed cryo sorption cryo pump using liquid Nitrogen (LN<sub>2</sub>). Recently, this cryo pump has been installed at the radial port of SST-1 Vacuum Vessel (VV) as part of evacuation of huge gas load during baking operation in SST-1.

To feed the liquid nitrogen into the cryopump, SST-1 cryo division has designed and installed cryo lines distribution along with valves. To prevent the condensation and frosting on bare LN<sub>2</sub> lines, cryogenic grade flexible elastomer thermal insulation was used to overcome the issues of frosting on these lines.

The thermal performance and validation test of installed insulation has been validated by operating the cryopump in operational condition, no ice frosting and leakage of LN<sub>2</sub> fluid was observed over the cold lines.

Flexible Elastomer Thermal Insulation on Cryo Pump LN<sub>2</sub> Lines



## Successful Testing of 100kW Plasma Torch System for 120 Hours

IPR is developing a 5 Tons/day plasma-pyrolysis based biomedical waste disposal plant for deployment at the Homi Bhabha Cancer Hospital, Varanasi. This fully-indigenous, environment-friendly plant, making use of three 100 kilowatt graphite-electrode based plasma arcs, is a contribution to *Atmanirbhar Bharat*. This is the first time that such high-power arcs have been developed in the country for 24 x 7 operation. In a major milestone, these arcs and associated power supplies have been tested continuously for 120 hours. In this testing, the refractory lining were also tested which could maintain the inner wall refractory temperature at 1100 degree C and outer wall temperature of the chamber remains at less than 80 degree C. The plasma arc system was operated using voltage-controlled feedback and current-controlled feedback. This plasma arc system does not require water cooling for electrodes and hence, it has very high electro-thermal efficiency. Demonstration of long duration operation of the plasma arc system with high electro-thermal efficiency (>90% observed during this testing) is very important for its application in high capacity plasma pyrolysis/gasification for environment friendly disposal of organic waste.



(L) The plasma arc as seen through the viewport (R) Plasma arc using graphite electrodes



As part of the Azadi Ka Amrut Mahotsav, IPR and the L. D. College of Engineering, Ahmedabad jointly organized a 2-day event during 5-6 May, 2022 to celebrate the National Technology Day. The event was organized by the "Prakalpa" Science Club of LDCE, at the EC Department, LDCE Ahmedabad and had the following competitive events;

- ◆ Poster Competition
  - ◆ Skit Competition
  - ◆ Circuit design
- Technology Quiz  
Science/Technology models by UG students of engineering colleges  
Circuit debugging competition

Apart from the above mentioned competitions, the event also has two popular talks, "Technologies from Plasma Science: Present day and Future" delivered by Dr. Shashank Chaturvedi and "Immersive and interactive visualization" delivered by Shri. Kandrap Pandya, SAC-ISRO, Ahmedabad on 5th and 6th May respectively.

IPR Outreach also organized an exhibition on plasma, its applications and nuclear fusion which was organized by Outreach Division. Selected members of Prakalpa Science Club were trained by IPR Outreach staff to explain all the exhibits to the visitors during the event. Over 67 UG engineering students from 9 engineering colleges across Gujarat participated in the various competitive events and over 2000 students from LDEC and other engineering colleges in Ahmedabad visited the IPR exhibition over the two days. Click [here](#) for a detailed report.



Images from the NTD-2022 event

## CPP-IPR's Outreach Activity at Assam State Science Fair - 2022

CPP-IPR participated in the State Science Fair and State Level Children's Science Congress (NCSC) - 2022 held at the premises of Government Higher Secondary School, Tezpur from 16-19 December, 2022. National Children's Science Congress is a nationwide programme of National Council for Science and Technology Communications, Department of Science and Technology, Govt. of India. In Assam, it is also supported by Science, Technology and Climate Change Department, Government of Assam. Around 300 projects from different districts of Assam were presented and around 1000 delegates, including students, teachers and scientists of schools, colleges and national institutes from various parts of North East India participated in the programme.

In the CPP-IPR stall, a working model of glow discharge plasma was exhibited as well as posters on various aspects of plasma physics. Comics and articles on plasma physics were also distributed to visiting students and teachers. The stall was visited by around 400 visitors, including students, teachers, guardians and local public of Tezpur. Dr. Rakesh Moulick also delivered a talk on plasma physics in the activity corner of the fair, attended by around 100 students and teachers from various parts of Assam.



Images from the CPP-IPR participation in the Assam State Science Fair -2022



Under the auspices of "Azadi Ka Amrut Mahotsav", IPR organized a scientific outreach programme entitled "Aurorae-2022" at the Bhavan's Adarsha Vidyalaya, Kakkanad, Kochi (Kerala) during 19-24 September, 2022.

The programme was inaugurated by Prof V. P. N. Nampoori, Emiritus Professor, International School of Photonics, Cochin University of Science & Technology. Sri. Venugopal. C. Govind, Chairman, Bharatiya Vidya Bhavan, (Kochi Kendra) was the Guest of Honor for the event.

As part of this programme, an exhibition on plasma and its applications and nuclear fusion was set up at Bhavan's Adarsha Vidyalaya and over 60 students of 11th std (science stream) were trained to explain the exhibits to the visitors. Students and teachers from several schools in Kochi as well as students from 7 other schools of Bhavan's Vidya Mandir attended the exhibition. In the introduction-cum-training programme on plasma and its applications conducted for science teachers, over 70 teachers in the CBSE stream participated.

An inter-school quiz competition was also organized by IPR outreach as part of the event in which teams from 7 schools participated. Over 2000 students and teachers from 17 schools and colleges in Kochi visited the event.

While the event was coordinated by Shri. Suresh K. (Principal) and Ms. Jyothi Pradeep (Vice Principal), organization of the event was led by Ms. Sandhya K V (Head, Physics Dept) and other staff members of the Physics Department of Bhavan's Adarsha Vidyalaya. Details of the event can be seen [HERE](#).





Images from the scientific outreach programme conducted at Kochi, Kerala

CPP-IPR's Outreach Cell conducted a **"One Day Workshop on Plasma Physics and its Applications"** on 26<sup>th</sup> April, 2023 at Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya (PDUAM), Tulungia, in Bongaigaon district of Assam. PDUAM is a Model College established under the co-venture of the Central Government and the Government of Assam. The programme was attended by 22 teachers and 55 students of various departments of the college. 2 teachers and 10 students from Abhayapuri College, Abhayapuri also attended the programme. During the technical session, 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 and a talk on fusion technology by Dr. B. J. Saikia. After the talks, the participants were shown a glow discharge plasma and a plasma globe, and the role and working principle of the various components of the set-ups were explained to them.



Images from the one-day workshop on plasma conducted by CPP-IPR at Bongaigaon (Assam)

Under the auspices of "Azadi Ka Amrut Mahotsav", IPR participated in the exhibition "Vision Rajasthan-2022" which was organized at the Mahatma Gandhi School, Sirohi, Rajasthan during 1-3 November, 2022. Several Departments of the Government of India participated in this 3-day exhibition.

The programme was organized by Friendz Exhibitions & Promotion Pvt. Ltd. (New Delhi) as part of the "Aspirational District Programme Initiative of the Hon'ble Prime Minister of India", at Sirohi as Sirohi is one of the Aspirational Districts listed under the Niti Aayog.

As part of this exhibition, IPR participated under the banner of DAE and exhibited several working models of plasma, its applications as well as tokamaks.

Over 5000 students and general public from Sirohi and neighboring districts visited the IPR stall in this exhibition.

The IPR stall also received the award for the "Stall With The Best Exhibits" from Shri Devji Patel, (MP, Jalore-Sirohi), who earlier visited the IPR stall and interacted with the IPR staff. Details can be seen [HERE](#).



Shri Devji Patel, MP, Jalore-Sirohi visiting the IPR stall.

