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The Fourth State

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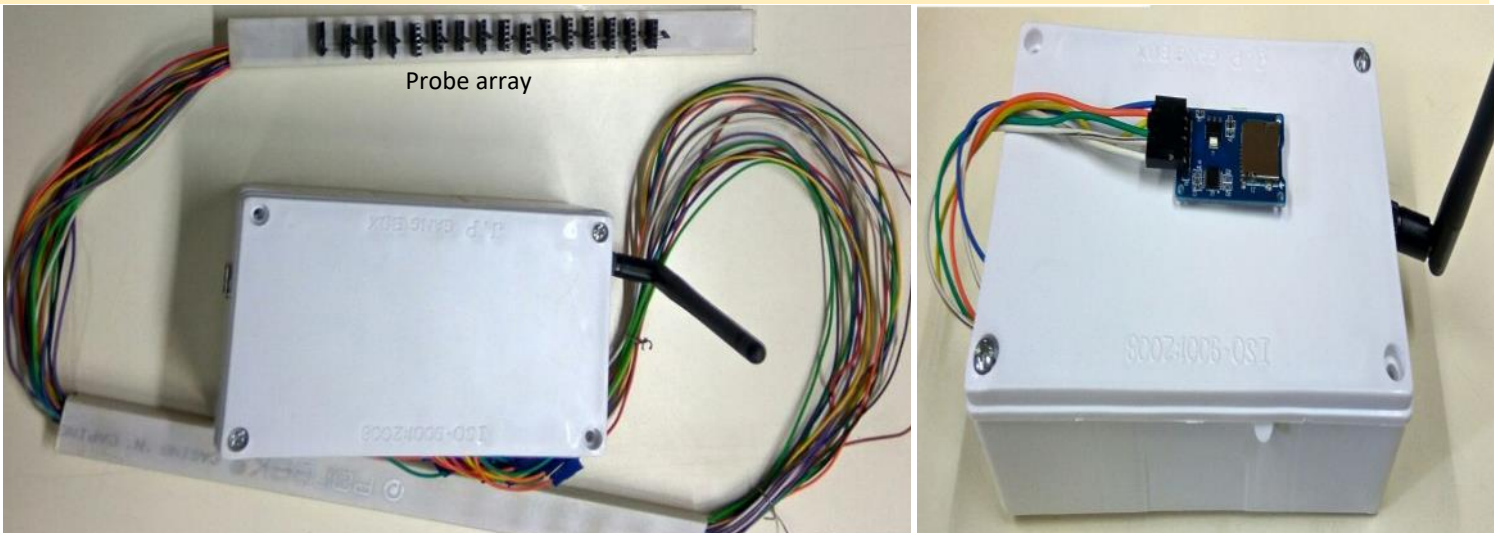
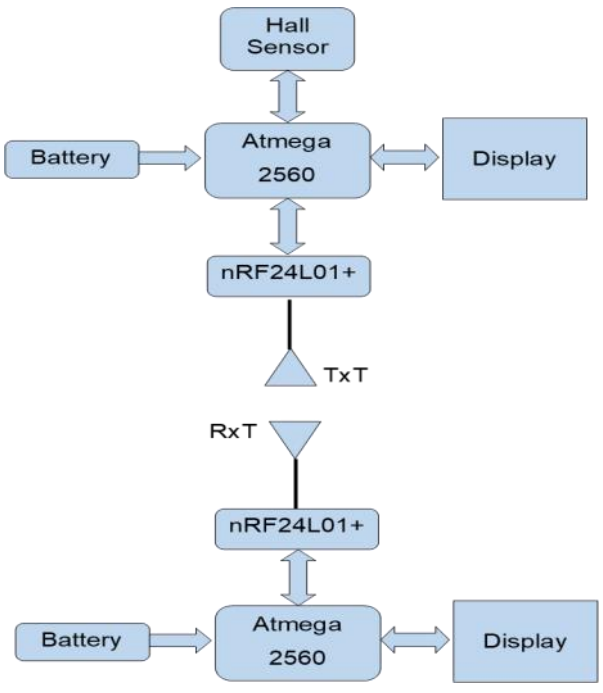
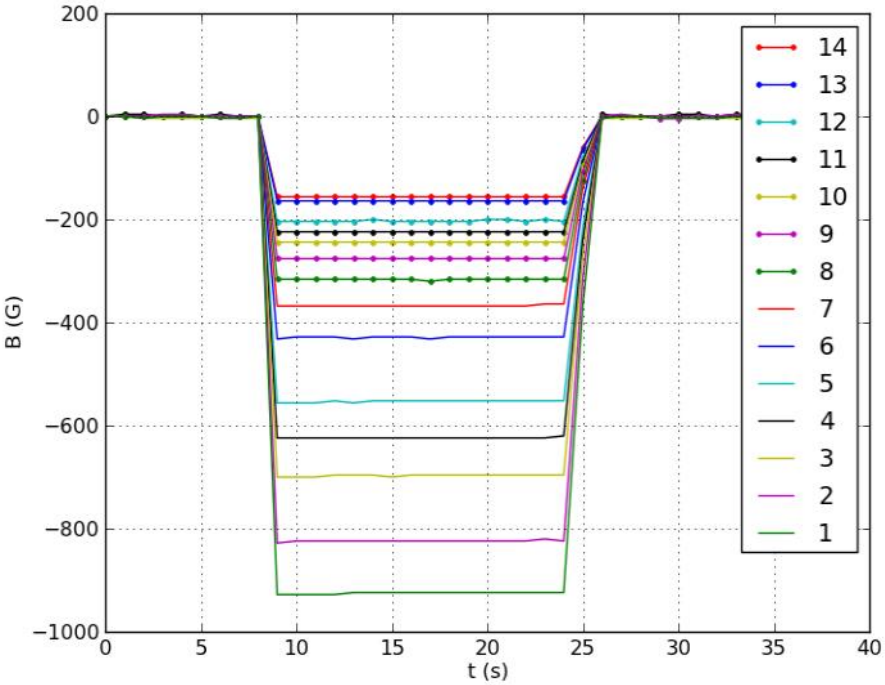
Multichannel Wireless Digitizer For Tokamak Experiments

A prototype multichannel wireless digitizer has been developed for the tokamak experiments. The purpose is to get rid of the long cables as well as the electrical isolation issues during the high frequency measurements. The wireless digitizer utilizes the integrated ADC and the SRAM of microcontrollers to transfer the multi-sensors data. The device consist of simple circuit with transceivers, having the capability of acquisition with 10-12 bit resolution at the 2.4GHz ISM band frequency and also interfaced with a LabVIEW based Graphical User Interface to operate from a distance as long as 25 meters. This prototype wireless digitizer has been tested on ADITYA–U by charging the TF coils to 5KA/turn and 7.5kA/turn using an appropriate power supply. For uniformly distributed sensors, responses seem to be non-uniform, which may be due to misalignment of a few sensors. This prototype has been developed under a BRNS-PFRC funded collaborative project.



(L) Transmitter module showing the array of probes and (R) Receiver module of the prototype wireless digitizer system





(L) Schematic of the device (R) Acquired output from the 14 channels of Hall sensors using the prototype device

राजभाषा क्षेत्र में उत्कृष्ट कार्य हेतु आईपीआर पुरस्कृत सम्मानित

परमाणु ऊर्जा विभाग का 18वाँ अखिल भारतीय राजभाषा सम्मेलन दिनांक 22 मार्च, 2018 को मद्रास परमाणु बिजलीघर, कल्पाक्कम (तमिलनाडु) में आयोजित किया गया। इस सम्मेलन में पऊवि की विभिन्न इकाइयों, उपक्रमों एवं सहायता प्राप्त संस्थानों के प्रशासनिक प्रमुखों एवं पदस्थ राजभाषा प्रभारियों ने भाग लिया। इस सम्मेलन के उद्घाटन सत्र में मुख्य अतिथि के रूप में प्रो. एम. वेंकटेश्वर, माननीय सदस्य, संयुक्त हिंदी सलाहकार समिति(पऊवि एवं अंतरिक्ष विभाग) एवं पूर्व परीक्षा नियंत्रक एवं प्राचार्य, आर्ट्स कॉलेज, उस्मानिया विश्वविद्यालय, हैदराबाद ने भाग लिया। इस अवसर पर, विशिष्ट अतिथियों के रूप में श्री शिव अभिलाष भारद्वाज, अध्यक्ष, एईआरबी, मुंबई, श्री एस. के. शर्मा, अध्यक्ष एवं प्रबंध निदेशक, एनपीसीआईएल, मुंबई, श्री अरुण कुमार भादुड़ी, निदेशक, आईजीकार, कल्पाक्कम, डॉ. कल्लोल रॉय, अध्यक्ष एवं प्रबंध निदेशक, भाविनि, कल्पाक्कम, श्री पी. वेलुमुरुगन, निदेशक, बीएआरसीसुविधा, कल्पाक्कम और श्री सत्यनारायण, केंद्र निदेशक, मद्रास परमाणु बिजलीघर, कल्पाक्कम उपस्थित थे। इस सम्मेलन के उद्घाटन सत्र की अध्यक्षता श्री ए. आर. सुले, संयुक्त सचिव (अनुसंधान एवं विकास) एवं अध्यक्ष, राजभाषा कार्यान्वयन समिति, पऊवि ने की।

इस अवसर पर आईपीआर को राजभाषा के क्षेत्र में उत्कृष्ट कार्य करने के लिए निम्न पुरस्कार प्रदान किये गये:

वर्ष 2015-16 के लिए पऊवि की सहायता प्राप्त संस्थान श्रेणी के अंतर्गत राजभाषा शील्ड

वर्ष 2015-16 के लिए पऊवि की सहायता प्राप्त संस्थान श्रेणी के अंतर्गत सर्वश्रेष्ठ राजभाषा गृह पत्रिका पुरस्कार

वर्ष 2016-17 के लिए पऊवि की सहायता प्राप्त संस्थान श्रेणी के अंतर्गत राजभाषा गृह पत्रिका के लिए प्रोत्साहन पुरस्कार

आईपीआर की ओर से श्री राजसिंह, उपाध्यक्ष, राजभाषा कार्यान्वयन समिति और डॉ. संध्या पी दवे, कनिष्ठ हिंदी अनुवादक ने इस सम्मलेन में भाग लिया। आईपीआर ने लगातार तीसरी बार राजभाषा शील्ड प्राप्त की है और सर्वश्रेष्ठ राजभाषा गृह पत्रिका (प्लाज़्मा ज्योति) पुरस्कार भी लगातार छठी बार प्राप्त किया है। सम्मेलन के उद्घाटन सत्र में मंच पर उपस्थित विशिष्ट अतिथियों द्वारा आईपीआर की वैज्ञानिकी/तकनीकी गतिविधियों पर आधारित पुस्तक 'लिविंग विथ प्लाज़्मा' का हिंदी अनुवाद 'हमारे जीवन में प्लाज़्मा' और साथ ही 'विज्ञान गतिविधियों पर आधारित कीट' का लोकार्पण किया गया।

परमाणु ऊर्जा विभाग का 18 वीं अखिल भारतीय राजभाषा सम्मेलन की तस्वीरें |

In-House Development of Electrical Insulation Breaks for Helium Services

In continuation of the work carried out under the NFP-PFRC project of in-house development of electrical insulation breaks (IB) of bigger sizes (≥ 1/2" NB), the IB have been fabricated and performance test have been carried out at IPR. The results are in an acceptable range. In this fabricated batch of component, indigenous epoxy resin system have used for bonding of SS metal and GFRP insulation material. The epoxy resin system for cryogenic application is also currently in the developmental stage. The validation and performance test of more IB in batches of same epoxy resin system will continue.

(L) Fabrication of IB (M) In-house developed IB's (R) Helium leak tightness performance test at 77 K, 10 bar (g) pressure

Indigenous Development of Cryo Compatible Vacuum Jacketed Cryo Flexible Line

Indigenous development of vacuum jacketed cryogenic flexible line has been carried out in collaboration with Indian Industry. This is commonly used for transfer of cryogens as LHe, LN_2 and in industrial low temperature applications. Also, it is convenient to use flexible vacuum insulated hoses to facilitate the transfer. However, this item is not commercially readily available in local Indian markets, and also, the cost of an imported one is vey high. Hence indigenous development of this item was taken up. The basic structure of the transfer line consists of two tubes, *ie*., the inner process tube through which the fluid flows and an outer tube with a wrapping of super-insulating material spacer. The developed line has been fabricated and tested and it was found to have the following features: (i) 1" NB, 1.2 meter size with wire braiding for high pressure use (ii) Helium leak tightness at 1.2 bar (g), 77 K: 1.3 x 10^{-9} mbar-l/s (iii) vacuum retention < $2x10^{-2}$ mbar in from 10^{-3} mbar order in 24 h (iv) a cost factor of 4-5 times as compared to similar imported component (iv) No frosting and condensation observed on outer vacuum jacket. Work is being continued to develop similar lines for different sizes and performance enhancements. (Rajiv Sharma, SST-1 Cryogenic Division)

Indigenously developed 1" NB / 1.2 m long Flexible Cryo Line

Vacuum and He leak tightness performance being carried out at 77 K

Training Programme On Plasma Science & Technology

The 1st training programme in the joint IPR-NCSTC scientific outreach series "*Awareness-Cum-Training Programme On Plasma Science & Technology and Energy from Nuclear Fusion*" funded by the National Council for Science and Technology Communication (NCSTC), DST, New Delhi for S&T popularization centered around the applications of plasma science and technology and energy from nuclear fusion was conducted at Chandigarh on 10-11 April, 2018. The programme was locally organized by the Punjab State Council for Science & Technology. 50 Physics teachers of high/senior school and junior colleges from the states of Punjab, Delhi, Haryana, Himachal Pradesh, Uttrakhand and Jammu & Kashmir attended the training programme. The meeting was inaugurated by the Principal Secretary, Dept. of Science, Technology & Environment, Govt, of Punjab, Dr. Roshan Sunkaria IAS, who showed specific interest in the medical applications of plasma as he was a medical doctor by profession. Dr. Jatinder Kaur Arora, The Executive Director, PSCST, presided over the meeting.

The Programme has popular talks, hands on plasma experiments and interactive sessions with the trainers. Books on plasma, posters as well as a science activity kit and DVD with resource materials were provided to the participants. The IPR team consisted of N Ramasubramanian, Chhaya Chavda, Harsha Machchhar, K K Mohandas, Raj Singh and Ravi A V Kumar. The participants who came to the training with very little knowledge of plasma went back with the confidence that they will be able to successfully introduce the topic of plasma to their students.

Training programme in progress

Training programme in progress

Participants of the IPR-NCSTC training programme held at Chandigarh.

Training Programme On Plasma Science & Technology.. Cont.

(L) Participants with the hands-on experiments on plasma (R) Training programme in progress

View of the hands-on plasma experiments as well as posters

Congratulations !

Dr. Arpan Doshi, son of Shri Bharat Doshi, who became youngest doctor in the United Kingdom last year, was invited by UK Government to attend the reception and a meeting with our Honorable Prime Minister, Shri Narendra Modi, Prince Charles, and other dignitaries in London on 18th April 2018 during the recent UK visit of our PM.

On behalf of IPR, we congratulate Arpan Doshi on his achievements.

Dr. Arpan Doshi with (L) Shri Narendra Modi and (R) The Prince of Wales, during the reception at London

हिन्दी सेमिनार - 2018

राजभाषा कार्यान्वयन समिति द्वारा दिनांक **17** अप्रैल, 2018 को तकनीकी/वैज्ञानिकी विषय पर हिन्दी सेमिनार का आयोजन किया गया। नार में दी जाने वाली पावर पॉइन्ट प्रस्तुतियों का विवरण निम्नलिखित है:

नाम	विषय
श्री अतुल गर्ग	एक किलो-ऐम्पियर धारा-दंडिका का पुर्जों सहित डिज़ाइन (Design of 1kA current Leads with their components)
श्री देवेन्द्र मोदी	अग्नि सुरक्षा की आवश्यकता (Need of Fire Safety)
श्री कनुभाई परमार	ई सी आर एच के लिए शक्ति आपूर्ति प्रणाली (Electrical Power System for ECRH)
सुश्री यशश्री पाटिल	वर्ष 2017 तक भारत में परमाणु ऊर्जा का विकास (India's progress in Nuclear Energy up to 2017)
श्री नितिन बैरागी	उच्च ताप अतिचालकों के अनुप्रयोग एवं क्रायोजेनिक आवश्यकताएँ (Applications of High Temperature Superconductors and associated Cryogenic requirements)
श्री राजीव शर्मा	एसएसटी-1 की द्रव नाइट्रोजन वितरण प्रणाली के थर्मल निष्पादन में वृद्धि (Thermal Performance Enhancement of Liquid Nitrogen Distribution System of SST-1)
श्री अमूल्य कुमार	व्हिस्लर तरंगें (Whistler waves)
श्री रितेश सुगंधी	मोडबस धारावाहिक संचार तकनीक (Modbus serial communication technique)

इन प्रस्तुतिकरणों के दौरान श्रोताओं के लिए प्रश्नोत्तरी प्रतियोगिता का भी आयोजन किया जिसमें सभी श्रोताओं ने उत्साहपूर्वक भाग लिया। डॉ. सूर्यकांत गुप्ता, श्री विपुल तन्ना एवं श्री भरत दोशी ने इस सेमिनार के प्रस्तुतिकरणों का मूल्यांकन किया। राजभाषा कार्यान्वयन समिति के सदस्य श्री प्रवीण कुमार आत्रेय ने प्रतिभागियों को पुरस्कार प्रदन किये। श्री अमूल्य कुमार संयासी एवं श्री नितिन बैरागी को प्रथम पुरस्कार, श्री देवेन्द्र मोदी, श्री कनुभाई परमार एवं सुश्री यशश्री पाटिल को द्वितीय पुरस्कार एवं श्री अतुल गर्ग, श्री राजीव शर्मा एवं श्री रितेश सुगंधी को तृतीय पुरस्कार प्रदान किया गया। राजभाषा के क्षेत्र में उत्कृष्ट कार्य हेतु इस अवसर पर पिछली छमाही (जुलाई-दिसम्बर, 2017) के लिए अंतर अनुभागीय चल राजभाषा शील्ड प्रशासन अनुभाग-II (श्री ए.ई. हार्वे, अनुभाग प्रमुख) को प्रदान की गई है।



हिन्दी सेमिनार 2018 की तस्वीरें |

National Safety Week – 2018 @ IPR

The 47th National Safety Week was celebrated at IPR from 4-10 March 2018. The institute organized various competitions during this week to create safety awareness among its employees. Competitions were organized on Slogan in Hindi & English, Cartoon Making, Quiz and Essay Writing in Hindi & English based on decided topics for the employees of IPR, FCIPT & ITER-India. Encouraging response was received from the employees for various competitions.

Demonstration of use of fire extinguisher was conducted for the employees as well as security staff at IPR during this week. A mock drill on electrocution scenario was conducted for Electrical Power Distribution Section. An awareness program on "Importance and Understanding of Personal Protective Equipment (PPEs)" was conducted by M/s. Honeywell International India Limited. Employees have acquainted themselves during this program by practical demonstration of PPEs.

No.	Competition	1st Prize	2nd Prize	3rd Prize
1	Hindi slogan	Sandhya Dave	Urmil Thaker	Mitesh Patel
2	English slogan	Shirin Bhesania	Shravan Kumar S.	Yashashri Patil
3	Cartoon	Suman Aich	Rakesh Patel	
4	Quiz	Vrushank Mehta	Naveen Rastogi	Pratibha Gupta Atul Garg Dheeraj Sharma
5	Hindi essay	Sandhya Dave	Ritesh Sugandhi	Kanubhai Parmar
6	English essay	Srinivasa M.	Vinit Shukla	

Top : Mr. C. K. Gupta delivering his talk. **Bottom** : Safety pledge being administered.

In the concluding session that was held on 9th March 2018, Mr. D V Modi welcomed the gathering and a talk on "Safety Procedures and Practices during Electrical Works" by Shri C.K. Gupta. Mr. Ujjwal Baruah, Dean (Admin.) expressed his thoughts on safety and he also administered the "safety oath" to the IPR staff present. A safety quiz for the audience was organized by Mr. Bharat Doshi and Dr. D. Chenna Reddy, Dean (R&D) read out Director's message, which highlighted that everyone is accountable for safety performance and the four 'Cs', *i.e.*, Competence, Control, Co-operation and Communication are very important for a positive safety culture. The prize distribution followed and the vote of thanks was delivered by Mr. Sunil Kumar, the Chairman of the Safety Committee of IPR.

Name of the best safety coordinators	Group/Division
Govind Lokhande	Computer Centre
Rakesh L. Tanna	Aditya Tokamak
Tushar Patel	Plasma Facing Component Division
Yagnesh Trivedi	WC & AC Section
Mehul Chodavadiya	Infrastructure Group, ITER-India

Images from the concluding session of the National Safety Week 2018

IPR Visits

Date of Visit	Institution	Course undertaken by the visiting students	Number of visitors
13-APR-2018	Kadi Sarva Vishwavidyalaya, Gandhinagar	MSc Physics	Students : 70 Faculty : 04
20-APR-2018	30th IITP Batch-SAC-ISRO, Ahmedabad	Technical Trainees	Trainees : 136 Faculty : 02
25-APR-2018	Sankalchand Patel College of Engineering, Visnagar	Engineering Graduates	Students : 58 Faculty : 02
25-APR-2018	Pandit Deendayal Petroleum University, Gandhinagar	MSc Nuclear Physics	Students : 05 Faculty : 02

IPR visit on 13/4/2018: First year M.Sc Physics Students from Kadi Viswavavidyalaya

IPR visit on 20/4/2018: 30th IITP batch from SAC-ISRO, Ahmedabad

Welcome To Our New CAO

IPR's new Chief Administrative Officer (CAO), **Shri. Niranjan Vaishnaw** took charge on the 6th April, 2018. Mr. Vaishnaw, prior to joining IPR as CAO, held the post of Sr. Officer (Accounts) in ITER-India since April, 2011. He started his career with the renowned textile group "Raymond" in 1996, where he served till April 2011 as Asst. Manager (Fin. & Accounts). With "Raymond" group, he was overall responsible for factory accounting and in charge of Finance and Accounts function of one of the cotton shirting plant situated at Kolhapur (Maharashtra). He is a Commerce Graduate from M.D.S. University, Ajmer and he also holds a Diploma in Business Management (DBM) and Post Graduate Diploma in Business Administration (PGDBA) with specialization in Finance.

A welcome reception was organized by the IPR Staff Club for him on 10th April, 2018.

(L-R) Shri Niranjan Vaishnaw, Dr. Shashank Charurvedi and Dr. Chenna Reddy speaking during the welcome reception

Past Events @ IPR

- ***Dr. Subrata Pradhan,*** Institute for Plasma Research, Gandhinagar, gave a talk on "High-Performance Supercapacitors for Future Practical Applications with Zinc Ferrite Anchored Multi-Walled Carbon Nanotubes" on 2nd April 2018
- ***Mr. Umesh Kumar,*** Institute for Plasma Research, Gandhinagar, gave a talk on "Experimental studies on the role of toroidal field topology in a simple magnetized toroidal plasma" on 11th April 2018
- ***Ms. Vidhi Goyal,*** Institute for Plasma Research, Gandhinagar, gave a talk on "Experimental study on force balance in thermal plasma torch" on 12th April 2018
- ***Dr. Sudhir Ranjan Jain,*** Bhabha Atomic Research Centre, Mumbai, gave a talk on "Making the Sound Visible" on 13th April 2018 (Colloquium # 287)
- ***Dr. Harish Charan,*** Institute for Plasma Research, Gandhinagar, gave a talk on "Novel structures in strongly coupled complex plasma" on 19th April 2018
- **Mr. Abhishek Sharma**, Institute for Plasma Research, Gandhinagar, gave a talk on "Detection of Pneumonia clouds in Chest X-ray using Image processing approach" on 25th April 2018

Upcoming Events

- 19th International Congress on Plasma Physics, Vancouver, Canada, 4-8 June 2018 http://icppvancouver2018.ca/
- 11th Chaotic Modeling and Simulation International Conference (CHAOS2018), Rome, Italy, 5-8 June 2018 http://www.cmsim.org/
- 8th International Workshop & Summer School on Plasma Physics (IWSSPP), Kiten, Bulgaria, 10-17 June 2018 http://www.iwsspp.plasmer.org/
- 15th International HITRAN Conference (united with the 14th ASA conference), Cambridge, Massachusetts, USA, 13-15 June 2018 http://hitran.org/conferences/hitran-15-2018/
- 7th International Conference on Plasma Medicine, Philadelphia, Pennsylvania USA, 17-22 June 2018 https://www.openconf.org/icpm7/openconf.php
- 23rd International Conference on Plasma Surface Interactions in Controlled Fusion Devices, Princeton University, NJ, USA, 17-22 June 2018 https://psi2018.princeton.edu/
- 28th Symposium on Plasma Physics and Technology, Prague, Czech Republic, 18-21 June 2018 http://www.plasmaconference.cz/
- 45th IEEE International Conference on Plasma Science (ICOPS 2018), Denver, Colorado USA, 24-28 June 2018 http://www.icops2018.org/

Know Our Colleagues

Smt. Rakhi Singh joined the Institute in 2000. She was initially assigned various tasks in the Despatch section and was also manning the Reception section for some time. At present she is a member of Administration-II looking after issuance of Identity Cards to the permanent, temporary and retired employees of the Institute, ITER-India, CPP as well as to the external students working on various projects in IPR. She is also taking care of the Access Control System which registers the attendance and movement of the employees. She interacts with the empanelled Advertising agency in connection with release of various recruitment related advertisements, tender notices etc., of the Institute and processing the bills pertaining to the same. She keeps track of payment of utility bills and other bills issued by various Govt. bodies. She has been actively participating in various activities relating to promoting official language in the Institute.

Mr. Bhavesh R Kadia, an electrical engineering graduate from L D College of engineering, Ahmadabad, joined IPR in 2000 with the RF group and presently with the High power ICRH system division. His fields of specialization are design ,development and integration of High voltage and high current power supplies for triode and tetrode based CWRF amplifiers like Anode, Screen grid, Control grid and Filament power supplies. He has high experience in Ignitron based fast operating crowbar protection system for RF and microwave tubes and also have acquired expertise in the fields of design and development of IGBT based high voltage DC series switch to be used in protection of triode and tetrode tubes of RF amplifiers. The IGBT based technology switch is scalable and can be used for higher voltages easily. He has gained very good experience in operation and maintenance of high voltage DC power supplies of RF amplifiers. He has been guiding graduates and under-graduate students for their academic projects. He has developed two novel technologies which are now undergoing Indian Patenting process .

The IPR Newsletter Team

Ritesh Srivastava	Tejas Parekh	Ravi A. V. Kumar	Priyanka Patel	Dharmesh P	Mohandas K.K.
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