

Issue 079

February 2020

# The Fourth State

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



**Shri. K. N. Vyas @ IPR**



Images from the visit of Shri K. N. Vyas (Chairman (AEC) & Secretary (DAE), to IPR on 01 January 2020.



71st Republic Day of the nation was celebrated with gaiety and enthusiasm with a large number of IPR families attending the program. Dr. Shashank Chaturvedi hoisted the national flag and received the guard of honor on the occasion. The day also saw the culmination of the sports activities organized by the Staff Club and the medals for football, volleyball and cricket tournament were distributed on this occasion. Over one hundred staff members and their families participated in the sports events like lemon spoon race, sack race etc. A popular talk by Mr. Sanjay Thorat, entitled "*Positive Use of Social Media*" was organized by the staff club after the flag hoisting ceremony. A few other competitions like poetry, singing, etc. were also organized by the staff club.



Images from the 71st republic day celebrations at IPR main campus.





Images from the 71st republic day celebrations at IPR main campus.

## 71st Republic Day Celebrations @ CPP-IPR

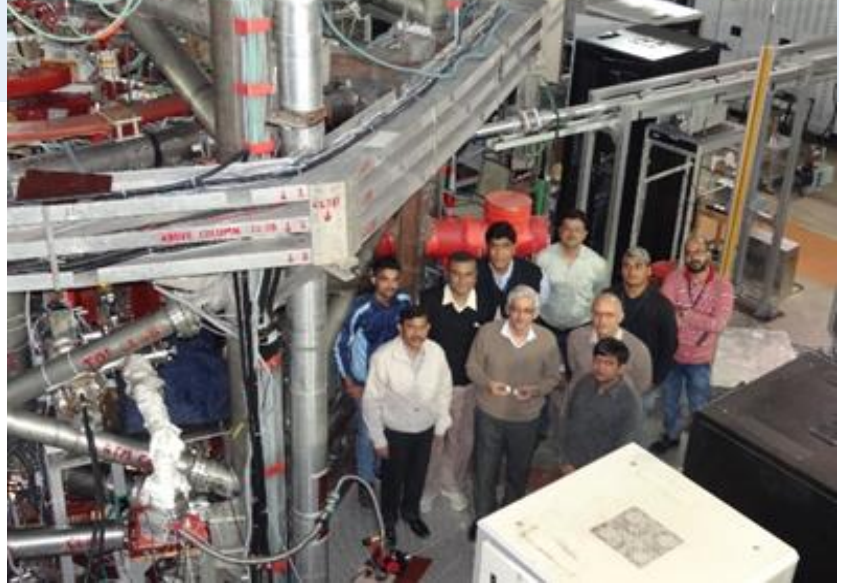
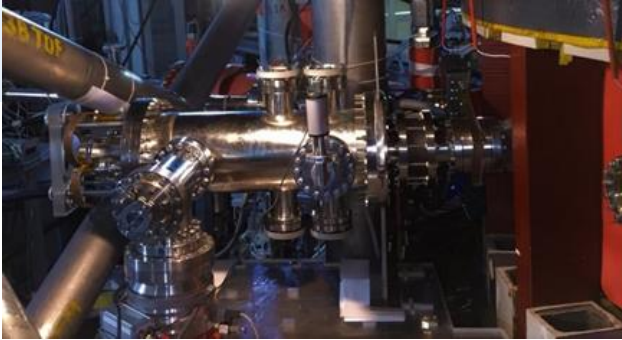
The 71st Republic Day was observed at CPP-IPR. The national flag was hoisted by Dr. S. R. Mohanty, Asso. Professor - F. Prof. S. Bujarbarua, Founder Centre Director of CPP-IPR, graced the occasion as a guest of honour and delivered a short speech on the importance of the day.



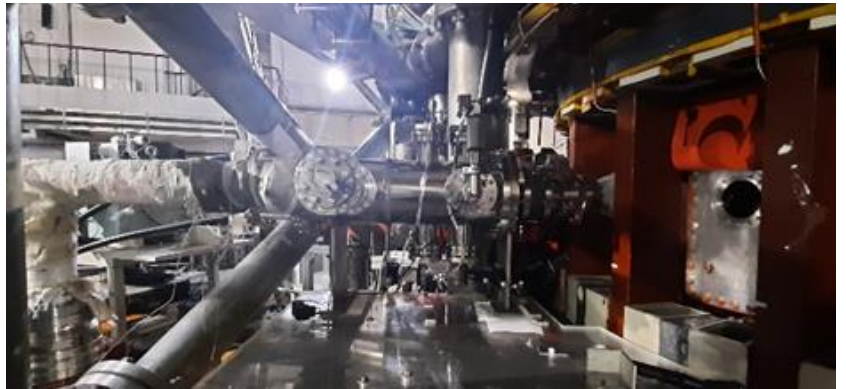
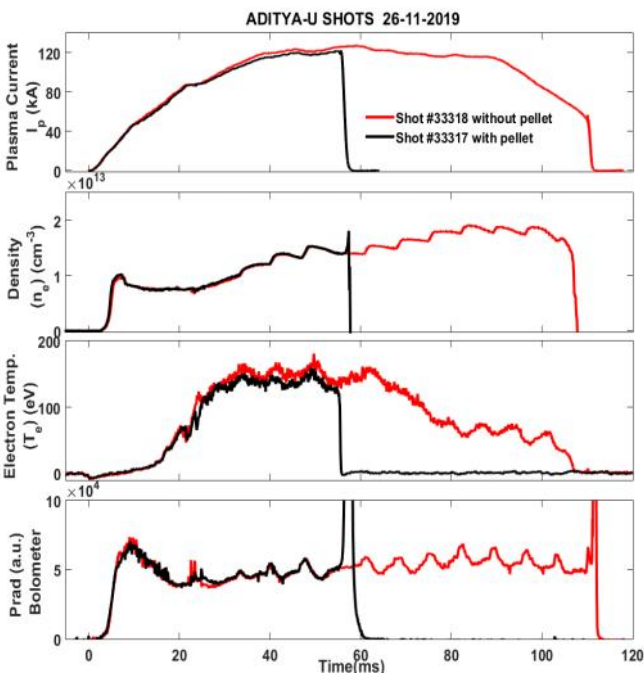


Disruption mitigation using pellet injection is an important technique being examined for ITER.

On the Aditya-U tokamak, a fully-electromagnetic IPI (Inductive Pellet Injection) system has been successfully integrated and commissioned. In the first experiments, a few hundred milligrams of powder has been injected at high velocity. The powder quenches the plasma in a few milliseconds through intense radiation.



The IPI team with Shri K.N. Vyas during his visit to Aditya

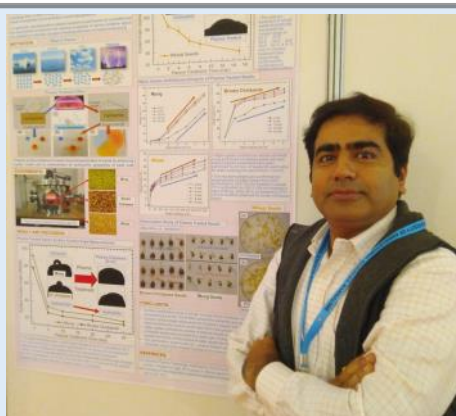


(L) the details of the Aditya Plasma shot where the IPI was deployed. (R) The IPI system installed on Aditya machine

## IPR @ Conferences



**Mr. Jagannath Mahapatra** received the Best Poster Award for his poster entitled "Magnetic Island Coalescence Dynamics in Multiple Current Sheets." presented at the International Conference on Plasma Science and Applications (ICPSA-2019) held at Lucknow University during 11-14 Nov., 2019.



**Mr. Chetan Jariwala**, SO-F, presented a poster entitled "Low temperature RF air plasma treatment: A tool for improvement of water uptake and germination for wheat, mung and brown chickpeas seeds" at the 107th Indian Science Congress, held at UAS, Bangalore, during 3-7 January, 2020.



**Mr. Rajiv Sharma** delivered an oral presentation entitled "In-house Development of Cryogenic Vacuum Barrier Joint of Superconducting Bus-bar of Fusion Machine" at the National Conference on Cryogenic for Space (NCCS-2019), held at ISRO, Valiyamala, Thiruvananthapuram, on 13-Dec, 2019



## Educational Visits to IPR/FCIPT – Jan 2020

Name Of the Institution	Date	Number of visitors
Mar Thoma College Chungathara, Kerala	9-Jan-2020	34 BSc. Physics (Final year) students
Christ College, Rajkot	22-Jan-2020	28 BSc. Physics (Final year) students



Students from Mar Thoma College Chungathara, Kerala, during their visit to IPR



Students from Christ College, Rajkot, during their visit to IPR

## Upcoming Events

- ◆ 1st International Conference on Advances in Plasma Science and Technology (ICAPST), Sri Shakthi Institute of Engineering and Technology, Coimbatore, 12-14 February 2020 <http://www.icapst.in/>
- ◆ 1st International Conference on Smart and Nanomaterials and Structures (ICSNMS2020), IIT-BHU, 17-20 February 2020 <https://www.icsnms.in/>
- ◆ KSTAR Conference 2020, Gyeongju Hwabaek International Convention Center Gyeongju, Korea, 19-21 February 2020 [https://kstar.nfri.re.kr/conference\\_2020](https://kstar.nfri.re.kr/conference_2020)
- ◆ Power & Energy Technology Summit (PowerTech 2020), New Delhi, India, 28-29 February 2020 <http://www.powersummit.in/>



IPR participated in the "Pride of India" exhibition under the DAE pavilion of the 107th Indian Science Congress, which was held at the University of Agricultural Sciences, Bangalore during 3-7 January, 2020. IPR exhibited several working and static models related to plasma and its applications at this exhibition. Over 10,000 people visited the IPR stall during the Science Congress. Members of the Outreach Division organized the IPR stall. Shri Chetan Jariwala presented a poster and Dr. Ravi Kumar gave a tele-talk on "R&D in DAE institutions and opportunities for Engineering & Science students" at the exhibition.



Images from visitors at the IPR stall at the "Pride of India" exhibition of the 107th Indian Science Congress



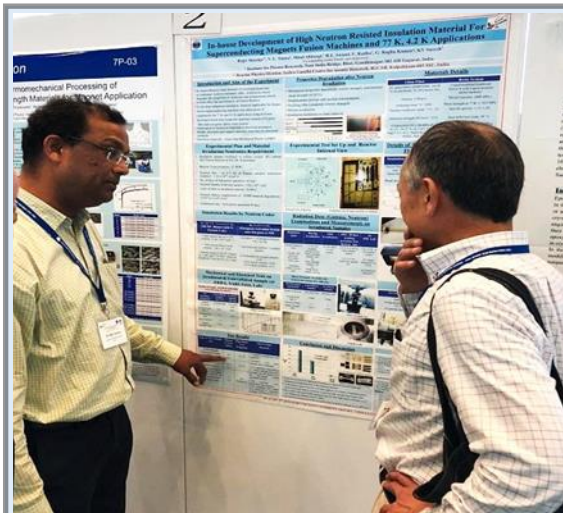
## Re-routing & Extension Work of LN<sub>2</sub> Vent Lines of 80 K Distribution System of SST-1

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The exhaust line of the main 80 K system and sub-cooler vessel of SST-1 exit from the cryogenic hall wall is located at a height of nearly 13 meters. Welding activities and thermal insulation on the exhaust lines at 13 meter was carried out to reduce ice frosting formation at the end point of exhaust lines. (Task Coordinator: Rajiv Sharma, Cryogenic division, SST-1).



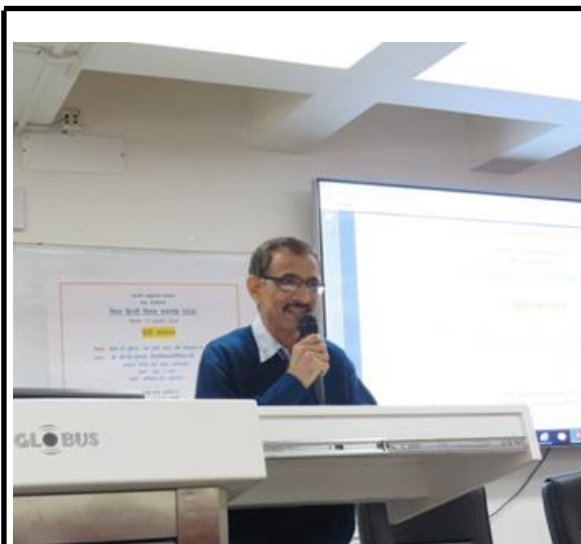
(L-R) LN<sub>2</sub> Liquid/vapour venting out, Welding of the line. Extended thermal insulated LN<sub>2</sub> vent lines



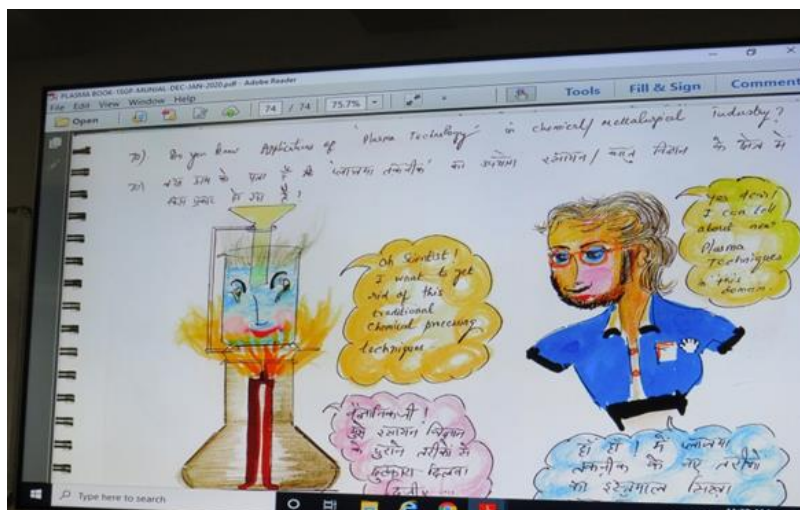
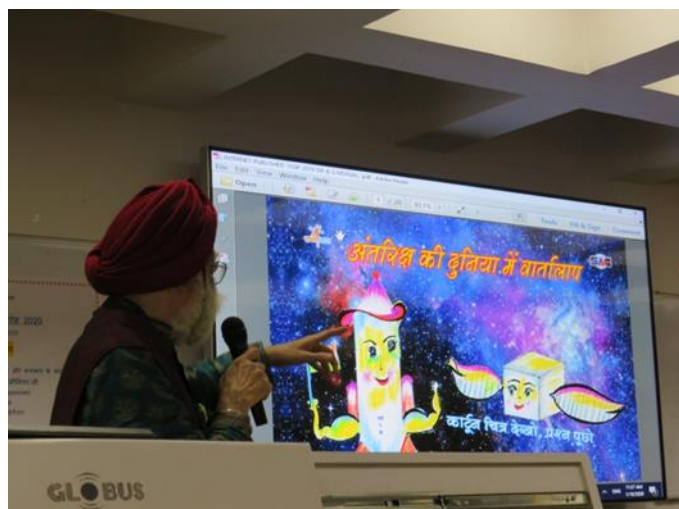
**Mr. Rajiv Sharma** gave Poster presentation entitled "In-house development of high neutron resisted insulation material for superconducting magnets fusion machines and 77 K, 4.2 K applications" in 10th Asian Conference on Applied Superconductivity and Cryogenics (ACASC) and 2nd International Cryogenic Materials Conference in Asia (Asian-ICMC) organized by Cryogenics and Superconductivity Society of Japan (CSSJ) on 7 January, 2020, Okinawa Convention Centre, Japan.

## विश्व हिंदी दिवस समारोह 2020

10 जनवरी, 2020 को विश्व हिंदी दिवस समारोह के अवसर पर प्रारंभ में संस्थान के सदस्यों के लिए सेमिनार हॉल में हिंदी प्रश्नोत्तरी प्रतियोगिता का आयोजन किया गया, जिसमें सभी उपस्थित सदस्यों ने उत्साहपूर्वक भाग लिया। इसके पश्चात् हिंदी वक्तव्य हेतु अंतरिक्ष उपयोग केंद्र, इसरो अहमदाबाद के डॉ.बी.एस.मुंजाल, वैज्ञानिक/इंजीनियर-जी को आमंत्रित किया गया। डॉ. मुंजाल एक वैज्ञानिक होने के साथ-साथ कवि हृदय, शायर और कलाकार भी है। उन्होंने इस अवसर पर 'हिंदी की दुनिया- एक कवि, शायर और कलाकार के अंदाज में...' पर अपने विचार व्यक्त किये। उन्होंने हिंदी भाषा को आम पाठकगण और बालकों के लिए आकर्षक और ग्राह्य बनाए रखने हेतु हिंदी को एक नये, निराले और रोचक अंदाज में प्रस्तुत करने और श्रोताओं को हिंदी के साथ नये प्रयोग करने हेतु प्रेरित किया। एक विशिष्ट विद्वान होने के साथ कवि हृदय डॉ. मुंजाल एक कार्टून आर्टिस्ट भी है। वक्तव्य के दौरान उन्होंने श्रोतागणों को अपने द्वारा लिखी गई कार्टून पुस्तक 'अंतरिक्ष की दुनिया में वार्तालाप' की कुछ झलकियाँ दिखाई। इसके साथ ही, हाल ही में प्लाज़्मा विज्ञान पर लिखी गई कार्टून पुस्तक की कुछ झलकियाँ भी प्रस्तुत की। वक्तव्य के पश्चात् राभाकास के उपाध्यक्ष श्री राजसिंह जी ने डॉ. मुंजाल साहब को उनके विशिष्ट व्याख्यान हेतु धन्यवाद अर्पित किया। अंत में डॉ. शशांक चतुर्वेदी, निदेशक, आईपीआर ने संस्थान की ओर से डॉ. बी.एस.मुंजाल का आभार व्यक्त करते हुए संस्थान







विश्व हिंदी दिवस समारोह 2020 में डॉ.बी.एस.मुंजाल की प्रस्तुति

## OSMY Award 2019

**Mr. Rajnikant P. Bhatasana** who works in the Large Cryogenic plant and Cryosystem division as scientific assistant-"B", was awarded the "Outstanding Staff Member of the Year 2019 (OSMY)". He joined the Institute on 24 Sept 2015. Initially he was deputed at LCPC lab IPR Vidhata premises where he was responsible for setting up the lab from scratch. He also supervised the fabrication work done in the lab with his ability to work with CAD and ability to deal with various fabricators and vendors for this. He also maintained the material stock of the lab. He supervised installation, performance tests and acceptance of air compressors.

He was involved in the work of conversion of air compressor into Helium compressor and for that, he prepared the process flow and process instrumentation diagrams under the guidance of Mr. A.K. Sahu. He prepared the 3D drawing and assembly layouts and generated the bill of materials required and was also responsible for communication with local vendors for procurement of the same from local market. He has also interacted with the IPR workshop for fabrication of components. He carried out the leak testing in the high vacuum system by MSLD and other techniques.

He has participated in various Hindi competitions organized by IPR and also won several prizes. Mr. Bhatasana expertise in translation has been put to use in translating several documents of the Institute through the Hindi cell. He is a self-motivated person and is always focused on the work entrusted to him, and this quality has never made anyone feel that he is a physically challenged person.

On behalf of IPR, the IPR Newsletter congratulates him on this achievement!



Mr. Rajnikant P. Bhatasana receiving the OSMY award from Director, IPR



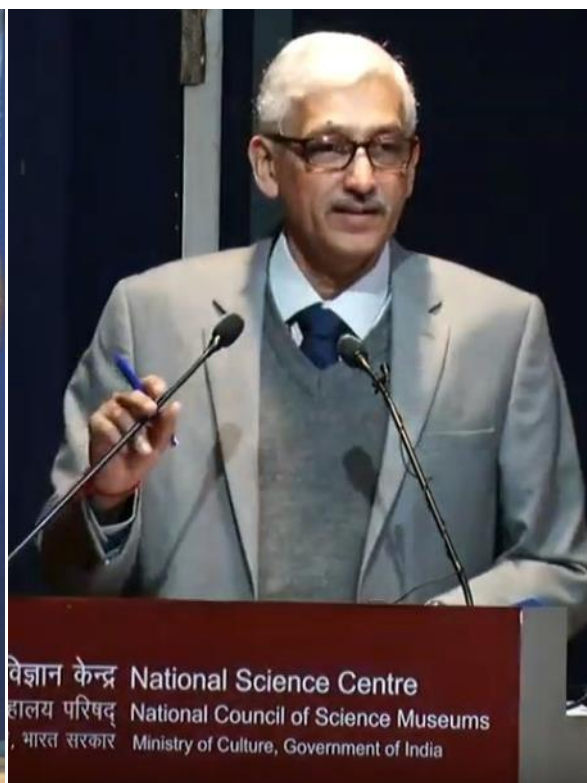
The final edition of the “Vigyan Samagam”, the mega science exhibition organized by DAE, DST and NCSM began at the National Science Center, New Delhi on 21 January 2020. The exhibition will run until 20 March, 2020. The exhibition was inaugurated by Dr. Jitendra Singh, Hon'ble Union Minister of State (Independent Charge), Ministry of DoNER; Minister of State, PMO; Ministry of Personnel, Public Grievances and Pensions; DAE; and DoS. Chairman DAE, Sri K.N. Vyas also presided over the function. The ITER week of this event will be during 3-7 March, 2020. Senior Professor (Retired) Padma Shri P. I. John, delivered a talk on “*ITER and fusion technology development in India*” during the inaugural event.



Inauguration of the Vigyan Samagam at New Delhi



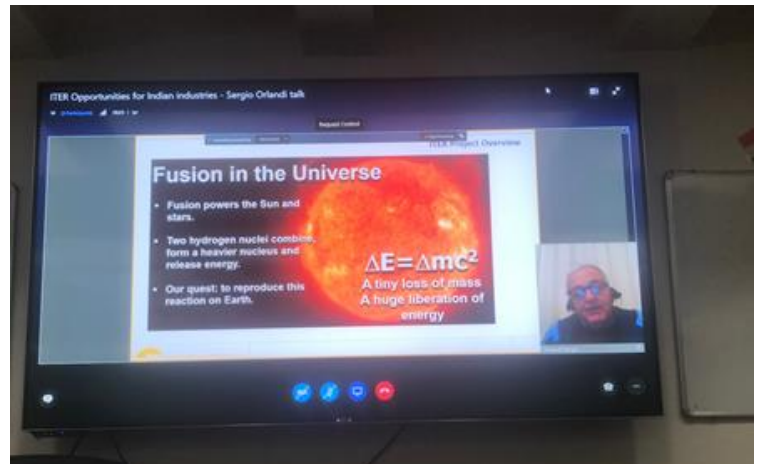
(L) Opening of the exhibition (R) Dr. Jitendra Singh at the ITER stall



(L) Dr. Jitendra Singh (M) Shri K. N. Vyas speaking at the inaugural function (R) Prof. P. I. John delivering his ITER lecture.



The first ITER-India Industry meet was conducted in IPR on 21st December 2019 with the participation of 40 representatives from 25 industries. Shri. Ujjwal Baruah welcomed the participants and explained the need to create awareness and to encourage Indian industries to participate in competitive bidding of ITER Organizations' direct procurements. Prof. Shishir Deshpande presented about Nuclear fusion, ITER Project and the progresses made in ITER-India procurement packages. The other speakers Shri. Ajith Kumar, Shri. Dilshad Sulaiman and Shri. Malay Vora talked about the engagement of Indian industries so far with ITER project, forthcoming opportunities, various modes of engagement with ITER project and the steps involved during bidding process. In his remote presentation, Dr. Sergio Orlandi explained about the progresses made at ITER site, upcoming opportunities, ITER's tendering processes with stress on expected quality of bid documents. Shri. Arun Chakraborty in his talk, sensitized the need to prepare the bid, complete in all aspects. The interaction session was led by Shri. Arun Chakraborty in which the participants from the industries requested for continuous interactions with ITER-India as well as they shared their willingness to find collaborating industries within Indian and/or abroad for joint biddings. A set of actions on ITER-India was identified for future actions, including nominating industrial liaising officer, consolidating the list of industries with their expertise, introducing known European industries to the Indian industries for possible tie-ups, etc. Moreover, ITER-India agreed to engage with ITER to bring more clarifications on contract terms & conditions, tender budget estimates, eligibility criteria, bid submission, etc. General expectation of industry representatives is to conduct similar workshops periodically for greater success of Indian industries. The participants had chance to visit Aditya Tokamak, SST-1 and ITER-India laboratories too. Finally, Shri Ujjwal Baruah thanked the participants and expressed the hope of conducting a similar meeting at a larger forum.





- ♦ **Mr. Tejas Jagdishbhai Parekh**, Institute for Plasma Research, Gandhinagar, gave a talk on "Investigation of mechanical properties of Plasma processed aluminized Ti6Al4V alloy" on 24th December 2019
- ♦ **Dr. Atul Kumar**, Institute for Plasma Research, Gandhinagar, gave a talk on "Study of novel features in dense magnetised plasma" on 7th January 2020
- ♦ **Dr. Kshama Pansare**, Institute for Plasma Research, Gandhinagar, gave a talk on "A Pre-clinical in vivo study: Cold atmospheric plasma in treatment of gingivobuccal squamous cell carcinoma" on 9th January 2020
- ♦ **Dr. Nirmal K Bisai**, Institute for Plasma Research, Gandhinagar, gave a talk on "Studies on Neon Gas Seeding in Tokamak Plasma" on 9th January 2020
- ♦ **Dr. Christian Hopf**, Max Planck Institute for Plasma Physics, Germany, gave a talk on "Towards steady-state tokamak operation: recent current drive experiments on ASDEX Upgrade and challenges for neutral beam current drive on DEMO and beyond" on 10th January 2020
- ♦ **Dr. Nageswara Rao Epuru**, Physical Research Laboratory, Ahmedabad, gave a talk on "Laser Induced Plasma spectroscopic studies of Nitroazoles, Brass and Rocks" on 10th January 2020
- ♦ **Ms. Garima Arora**, Institute for Plasma Research, Gandhinagar, gave a talk on "Laboratory studies of stationary and non-stationary structures in flowing complex plasmas" on 13th January 2020
- ♦ **Dr. Uttam Kumar Goswami**, Institute for Plasma Research, Gandhinagar, gave a talk on "Development of Cost-Effective High-Efficient Magnetron based Microwave Source for Plasma Interaction Applications" on 13th January 2020
- ♦ **Mr. Lavkesh T. Lachhvani**, Institute for Plasma Research, Gandhinagar, gave a talk on "Long-time Confinement of Toroidal Electron Plasma in SMARTEX-C" on 14th January 2020
- ♦ **Dr. Paramita Patra**, Indian Institute of Technology (IIT), Kharagpur, gave a talk on "Assessment of thermal spike model via swift heavy ion mixing" on 21st January 2020
- ♦ **Dr. Dipanjan Mitra**, NCRA-TIFR, Pune, gave a talk on "Relativistic charge solitons caused due to Nonlinear Landau Damping: An excellent candidate for explaining the Coherent Radio Emission from Pulsars" on 21st January 2020 (Colloquium # 300)
- ♦ **Ms. Harshita Raj**, Institute for Plasma Research, Gandhinagar, gave a talk on "Study of generation and transport of runaway electrons in Aditya and Aditya-U tokamak" on 22nd January 2020
- ♦ **Dr. Debjyoti Basu**, Institute for Plasma Research, Gandhinagar, gave a talk on "Progress of alternate RF-assisted current start up system development for SST-1" on 31st January 2020

## IPR @ Conferences



**Mr Deepak Aggarwal** from the IPR Computer Center delivered a talk entitled "Development of ROBUST: A Web-Based Application for Remotely Submitting and Monitoring Jobs on a Cluster" at the 26th IEEE International Conference On High Performance Computing, Data, And Analytics (HiPC-2019) held at Hyderabad International Convention Centre, Hyderabad during 17-20 December 2019.



**Dr. Ravi A V Kumar** delivered an interactive tele-lecture entitled "R&D in DAE institutions and opportunities for Engineering & Science students" to students from various technical institutions under the Department of Higher Education, Government of Karnataka, under the auspices of Visveswaraya Technology University, Belagavi. This was broadcast from the premises of the 107th Indian Science Congress exhibition on 4th January, 2020 at the UAS, Bengaluru.

## The IPR Newsletter Team

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