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The 4th State

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

73rd Independence Day Celebrations @ IPR

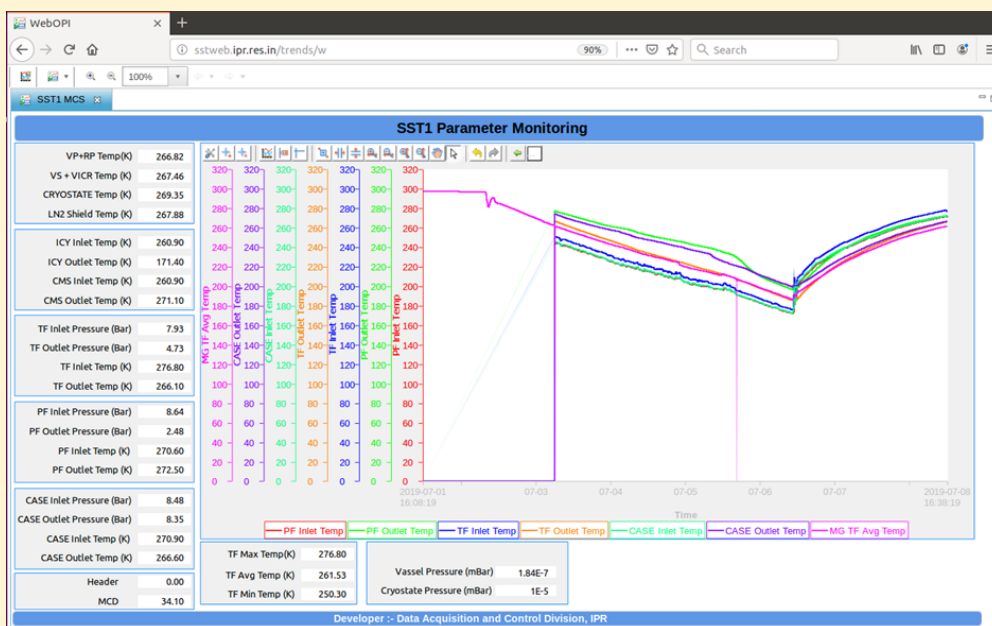
IPR celebrated the 73rd Independence day by hoisting the national tricolor at the IPR main campus. The National flag was hoisted by Dr. Shashank Chaturvedi, Director, IPR. This was followed by the national anthem and guard of honour to the Director by the security personnel. Prizes were distributed to winners of various sports & games organized by the Staff Club. Various competitions including drawing and poetry recitation were also organized for the children of IPR staff. A motivation talk by Shri. Raghu Nandan Prasad (IES, IRSS Retd.) was also organized for the benefit of those present. The event ended with lunch for IPR staff and their family members.





It takes an approximate fortnight to bring SST-1 in superconducting state before start of experiment window. During this period all the essential subsystems water-cooling, vacuum, cryogenics, magnet are operational 24x7. During this long running period everyone is curious to know integrated machine status at anytime from anywhere in the campus from a common interface.

IPR Data Acquisition and Control Division (DAC) Division in co-operation with SST-1 operation division (SOD) has put efforts to develop a web based monitoring system. The key parameters of SST-1 machine like vacuum pressure, cryostat pressure, TF Magnet temperature etc. can be monitored from SST-1 network as well as IPR network using web browser without installation of any additional software. The displayed data trends are customizable by individual user. Moreover the same interface can be used to see historical data. In order to avoid licensing fees of commercial software we have used open source software with GPL license. SCADA software EPICS, Apache servlet and MySQL has been used to make data available to web browser. The system is developed in such a way that it can be scaled to N folds. Gradually each SST-1 subsystem is planned to migrate on this platform. SST-1 cryogenics subsystem monitoring software has already been migrated on this platform.



SST-1 machine monitoring on web browser.

IPR Outreach - Academic Visits to IPR

Educational Visits to IPR/FCIPT – July-August, 2019

Name Of the Institution	Date	Number of visitors
Shree Swami Atmanand Saraswati Vidya Sankul, Kapodara, Varachha Road, Surat	25-Jul-2019	103 Students of BE-4th and 6th Semester and 4 faculty members
Om Science College , Junagadh	30-Jul-2019	16 third Year B.Sc Students and two faculty members



Student of Shree Swami Atmanand Saraswati Vidya Sankul, Kapodara, Surat during their visit to IPR

73rd Independence Day Celebrations @ CPP-IPR

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CPP-IPR celebrated the 73rd Independence Day at its campus with half-day long activities. In the morning, the national flag was hoisted by Prof. B. K. Saikia, Acting Centre Director. After the national anthem, Mr. A. Baishya, SO-D delivered a short speech on the freedom struggle and paid homage to the freedom fighters. Later on, various entertaining local sports and cultural competitions, including a quiz on freedom struggle, were held among the employees and their family members. The programme concluded with lunch.



Images from the Independence day Celebrations at CPP-IPR

IPR coordinated the exhibition associated with the Centenary Celebrations of Dr. Vikram Sarabhai which was inaugurated at Ahmedabad on 12th Aug, 2019 at the Gujarat University Convention Centre. This event was jointly organized by DAE and ISRO and attended by dignitaries from both DAE and DOS. A one-day exhibition was also held to showcase the various technologies developed by both DAE and ISRO. IPR exhibited the plasma pyrolysis model at this event. Chairmen of both DAE and ISRO, invitees as well as students visited the exhibition.



(L) The exhibition being inaugurated by Dr. K. Sivan (Chairman, ISRO) and Shri Pramod Kale, former Director, SAC (R) Shri. K. N. Vyas, Secretary DAE and Chairman AEC at the DAE exhibition



(L) Plasma pyrolysis model along with the DAE panels. (R) Ms. Mallika Sarabhai at the IPR exhibit



(L) ISRO Chairman Dr. K. Sivan at the IPR exhibit. (R) Shri. K. N. Vyas with DAE staff.

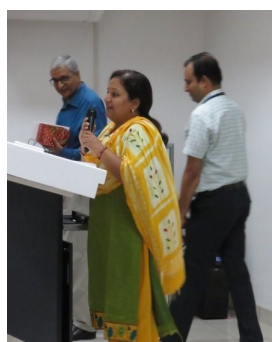
Dr. Mukesh Ranjan gave an oral presentation entitled “*Low energy ions for fabricating ordered plasmonic structures for second harmonic generation and sensing applications*” at the 10th international conference on nanoscale pattern formation at surfaces held at University of Surrey, Guildford, UK during 7-10 July, 2019. **Mr. Vivek Pachchigar**, Research Scholar of IPR also made an oral presentation entitled “*Superhydrophobic PTFE Surface Achieved by Low Energy Ar⁺ Ion Beam Irradiation*” at the same conference.



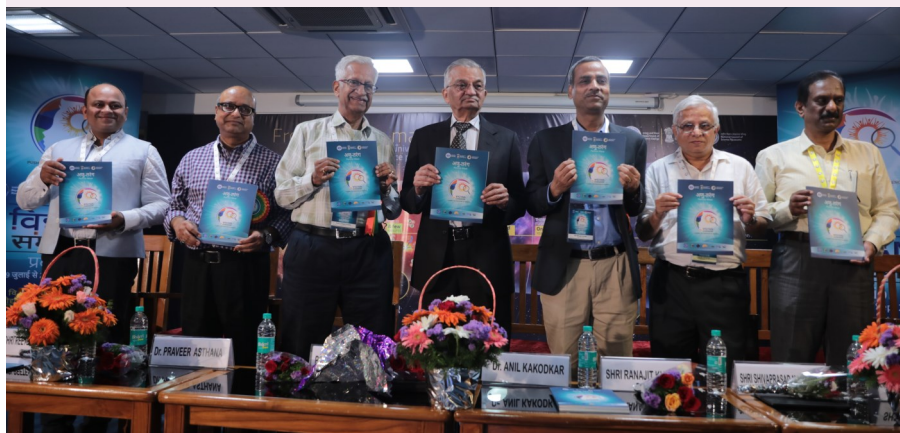
(L) Dr. Mukesh Ranjan (R) Mr. Vivek Pachchigar delivering their talks

हिंदी व्याख्यान

हिंदी व्याख्यान की श्रृंखला में दिनांक **8 अगस्त, 2019** को संस्थान में ऑयल एंड नैचुरल गैस कॉर्पोरेशन लिमिटेड (ओएनजीसी) की गतिविधियों पर एक व्याख्यान का आयोजन किया गया। ओएनजीसी, अहमदाबाद के महाप्रबंधक एवं अंतर्राष्ट्रीय वेधक डॉ. उमेश पांडे को इस विषय पर व्याख्यान देने हेतु आमंत्रित किया गया था। डॉ. उमेश पांडे ने ओएनजीसी के मूल ध्येय से अवगत कराते हुए पूरे भारत में स्थापित इसके प्रतिष्ठान की गतिविधियों से परिचित कराया। तेल निकालने की प्रक्रिया में विभिन्न तकनीकी पद्धतियों का इस्तेमाल करते हुए कई चरणों में इस कार्य को अंजाम दिया जाता है, जैसी कई महत्वपूर्ण जानकारी अपने व्याख्यान एवं पावर पॉइंट प्रस्तुति के माध्यम से श्रोताओं को उपलब्ध कराई। ओएनजीसी की जड़ें देश में ही नहीं अपितु पूरे विश्व में भी जमीं हुई है। पांडे जी ने अपने वक्तव्य में पवन ऊर्जा, सौर ऊर्जा के क्षेत्र में ओएनजीसी का पदार्पण एवं प्रगति के भी शुभ संकेत दिये। वक्तव्य के दौरान कर्मचारियों द्वारा पूछे गये प्रश्नों का उत्तर देकर उनकी शंकाओं को दूर किया। सभी श्रोताओं के लिए ओएनजीसी की गतिविधियों को जानना बहुत ही रोचक एवं ज्ञानवर्धक अनुभव रहा। अंत में श्री निरंजन वैष्णव, मुख्य प्रशासनिक अधिकारी ने उन्हें धन्यवाद देते हुए संस्थान की ओर से स्मृति चिन्ह प्रदान किया।



The “Vigyan Samagam” began its second leg on 29th July, at the Visvesvaraya Industrial and Technological Museum, Bangalore (VITM). The exhibition was inaugurated by Dr. Anil Kakodkar, Member AEC & Chairman RGSTC, Mumbai, along with Prof. V. S Ramamurthy, Emeritus professor, NIAS, Bengaluru. The ITER week will be held from 20-24 August, 2019 at the VITM, Bangalore. In addition to popular talks, IPR and ITER-India will be exhibiting interactive exhibits on plasma and its applications during the ITER week at the Vigyan Samagam.

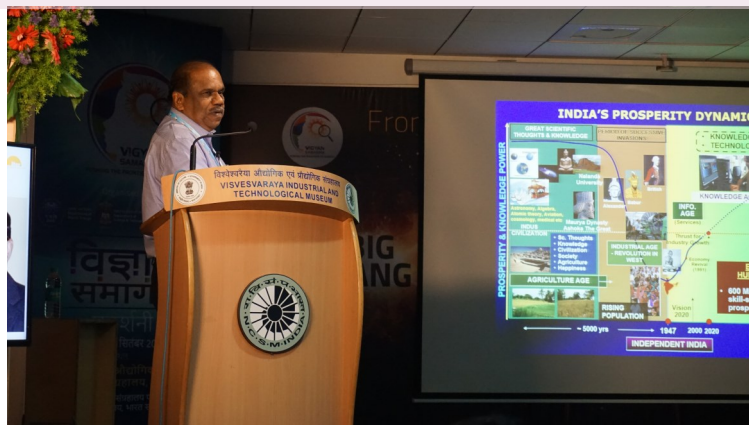


(L) Releasing the technical publication “Anu Tarang” during the inauguration (R) Opening of the exhibition



Dr. Anil Kakodkar and Prof. V. S Ramamurthy at the ITER stall of the exhibition

During the technical talks, on behalf of ITER project, talks were delivered by Dr. A. Sivathanu Pillai and Dr. Eisuke Tada, DDG, ITER, while Mr. Dilshad Sulaiman convened the event. Panel discussion on ITER project execution with Indian industry and the role of academia. This session is conducted by Shri. Shrishail Padasalagi (Project Manager IWS ITER-India) and had panellists Shri Narayan Rao (Ex CMD, Midhani) Shri Prasanth Shakamuri (MD, HHV) and Shri Praveen Bhatt (Head Nuclear PBU, L&T Heavy Engineering, who is in-charge of ITER cryostat manufacturing activities). Shri Bhatt joined the discussions over video conferencing.



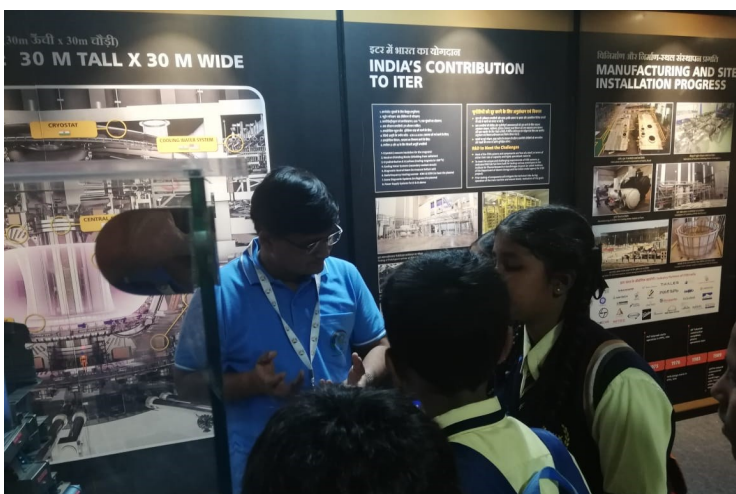
(L) Dr. Eisuke Tada and (R) Dr. A. Sivathanu Pillai delivering their talks during the technical session of the inaugural function.

Vigyan Samagam @ Bengaluru... Continued

Spread over 700 sqft, the exhibition at VITM Bengaluru has stalls from CERN, ITER, TMT, INO, SKA, FAIR, MACE and LI-GO projects. From this edition onwards, the Major Atmospheric Cerenkov Experiment Telescope (MACE) was also added to the exhibition panels. The exhibition was opened to public after the inauguration of the Vigyan Samagam.

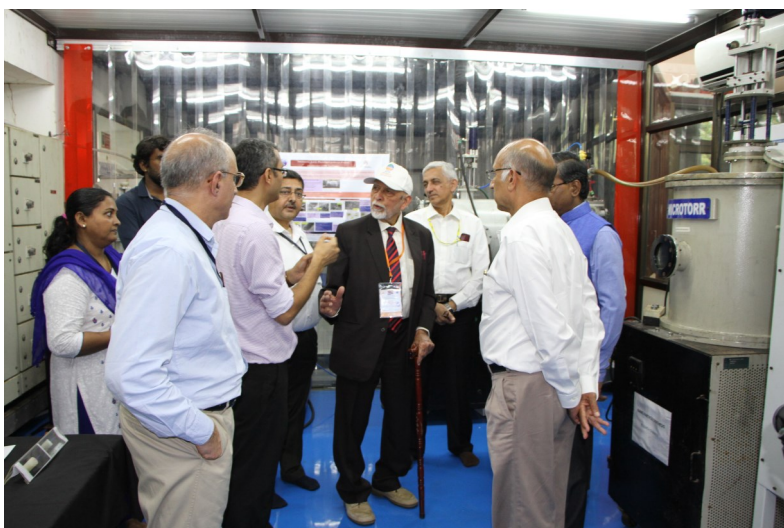


(L) Dr. Eisuke Tada at the ITER stall (R) The ITER panel discussion in progress



Chairman's Visit to IPR/FCIPT

Dr. M. R. Srinivasan, Dr. R. Grover, Dr. S. Banerjee (Members, AEC), Dr. A. K. Mohanty (Director BARC), Shri U. Kamachi Mudali (Chairman & Chief Executive of Heavy Water Board), Shri P. Goverdhan (Controller, BARC) and Shri. K. N. Vyas, Secretary DAE and Chairman AEC visited IPR/FCIPT on 12th August, 2019. They visited the various experiments at both FCIPT and IPR and interacted with the staff.





Images from the visit of dignitaries to FCIPT

IPR participated in the exhibition associated with the DAE-NJU workshop for journalists from the media, which was organized at RAPS, Rawatbhata during 5-9 August, 2019. IPR exhibited interactive and static models of technology developed by IPR related to societal, textile and industrial applications of plasma. Over 50 journalists of both print and TV media, from the western region of India participated in the workshop and they interacted extensively with IPR personnel during the course of the exhibition. Students of local schools and colleges from Kota, as well as public also visited the exhibition in large numbers.



Images from the DAE-NJU Workshop exhibition

- ◆ **Dr. J.K. Atul**, Institute for Plasma Research, Gandhinagar, gave a talk on "Nonlinear Pumping, Finite Temperature and Magnetic Shear Induced Stabilization Of Multiple Instabilities In Convective Fluid Plasma Transport Scenario" on 22nd July 2019
- ◆ **Dr. Rudrashish Panda**, Institute for Plasma Research, Gandhinagar, gave a talk on "Preparation of functional materials using high power lasers for photonics and industrial applications" on 24th July 2019
- ◆ **Mr. Jervis Ritesh Mendonca**, Institute for Plasma Research, Gandhinagar, gave a talk on "Flow Effects on Viscous resistive modes in a Tokamak" on 24th July 2019
- ◆ **Dr. Arkaprava Bokshi**, University of York, UK, gave a talk on "Towards understanding the origins of small ELMs and rotation reversals in tokamak plasmas" on 25th July 2019
- ◆ **Dr. Ankita Gaur**, M.L.V. Textile and Engineering College, Bhilwara, Rajasthan, gave a talk on "Studies on multi-mode Erbium doped fiber amplifiers" on 29th July 2019
- ◆ **Ms. Prachi B. Orpe**, Nirma University, Ahmedabad, gave a talk on "The study of magnetic nanostructures in relation to its atomic ordering and oxidation state" on 2nd August 2019
- ◆ **Dr. Debraj Mandal**, Aix-Marseille Universite, PIIM- Laboratory, Marseille, France, gave a talk on "Cross-field chaotic transport of electrons by $E \times B$ electron drift instability in Hall thruster" on 9th August 2019
- ◆ **Dr. Mithun Karmakar**, Institute for Plasma Research, Gandhinagar, gave a talk on "Proton beam driven plasma wake wave excitation and studies on phase mixing of Lower Hybrid mode" on 14th August 2019
- ◆ **Dr. Bibhu Prasad Sahoo**, Institute for Plasma Research, Gandhinagar, gave a talk on "3D EMC3-EIRENE modeling for ITER Main chamber recycling (MCR) Study" on 16th August 2019
- ◆ **Mr. Dinesh Kumar Sharma**, Institute for Plasma Research, Gandhinagar, gave a talk on "Generic Controller for Feed-back Control of Plasma Parameters" on 20th August 2019

Upcoming Events

- ◆ 6th International Symposium on Liquid Metals Applications for Fusion (ISLA 2019), Illinois, USA, 30 Sep-03 Oct 2019
- ◆ 18th European Fusion Theory Conference, Ghent, Belgium, 07-10 October 2019 <http://www.eftc2019.ugent.be/>
- ◆ 17th Technological Plasma Workshop (TPW-2019), Coventry, United Kingdom, 09-10 October 2019
- ◆ 17th International Workshop on H-mode Physics and Transport Barriers, Shanghai, China, 09-11 October 2019
- ◆ 61st Annual Meeting of the APS Division of Plasma Physics, Fort Lauderdale, Florida, 21-25 October 2019

Know Our Colleagues



Ms. Priyavandana J. Rathod joined IPR as Scientist SC in 2002 after completion of her MSc from the Sardar Patel University, Vallabh Vidhyanagar, Gujarat. Currently, she is associated with the Microwave Plasma Division under Basic Plasma Physics Group. During the course of her work, she has developed PFN-based pulse-power sources for plasma generation and carried out the simulation of the pulse-power sources, virtual cathode oscillator-based high-power microwave source etc. She has also developed an open TEM (Transverse Electromagnetic) cell for EM field measurements, which is useful to test high frequency diagnostics such as E-dot and B-dot probes. She is actively involved in the development of the system SYMPLE (System of Microwave Plasma Experiment) and associated diagnostics to investigate the interaction of electromagnetic wave in over-dense plasma. She is currently pursuing her PhD from HBNI. She has actively contributed to scientific outreach programs like National Science Day organized by IPR and demonstrated scientific experiments like Tesla Coil and a Van De Graff Generator.

Mr. Kaushal Pandya joined IPR in year 2002 as a Scientific Assistant in the Laser Diagnostic Group. He worked for Design, development and testing of the multi-channel interference filter polychromator, leak testing of the beam transport line components and laser beam profile measurement for SST-1 Thomson scattering system, molecular beam injection system of Aditya Tokamak, PMT testing and Laser beam dump of Aditya Thomson scattering system. After completion of his MSc, he was promoted to SO-C. From 2008, he was assigned to the Negative NB Systems Development Division, where he was involved in the commissioning of the single driver negative hydrogen ion source; ROBIN and in the design, development and operation of auxiliary systems of ROBIN. He was responsible for the assembly, disassembly and testing of the ROBIN ion source along with accelerator system. He also was part of the team in the design and development of the Cesium oven and plasma and beam diagnostic system for ROBIN. He also involved in the commissioning of the multi-driver negative ion source; TWIN source and sharing considering his experience for developing the INTF. He has presented his work at various conferences.



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