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The Fourth State

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



30 Years of Aditya Tokamak

IPR organised a two-day National Symposium for Commemorating 30-years of the successful operation of the first indigenous tokamak in India – “ADITYA and its Upgrade” (NSC30AT2020) at the Entrepreneurship Development Institute (EDI), Gandhinagar during January 27 – 28, 2020. The main focus of the symposium was to celebrate 30 years of scientific activities of ADITYA – tracing its historical evolution, highlighting its scientific and technical achievements, discussing the experimental program of its latest avatar (the upgraded ADITYA-U) and finally, discussing the possible future scientific and technological roadmap of the program. The meeting was inaugurated by lighting the traditional lamp by the chief guest Dr. Anil Kakodkar (Former Chairman, AEC), the guest of honour Dr. R. B. Grover (Homi Bhabha Chair, DAE, HoD ITER Council), Dr. S. Chaturvedi (Director, IPR) and Dr. S. Deshpande (Chairman, NSC30AT). Over 300 participants from all over the country participated in this symposium. During the opening session, Dr. S. Chaturvedi welcomed the gathering and shared his memories of ADITYA early days. Dr. Anil Kakodkar delivered the Inaugural Address and shared his valuable thoughts on this occasion.



(L) Inauguration of NSC30AT2020 (R) Releasing of the Souvenir of NSC30AT2020



(L) Dr. S. Chaturvedi addressing the gathering (R) Dr. Anil Kakodkar delivering the Inaugural Address

Dr. R. Grover and Prof. A. Sen delivered the Keynote Addresses. Dr. Grover emphasized upon the India's electricity demand and the economic aspects of electricity generation and Prof. A. Sen deliberated on the journey of how ADITYA tokamak was born and the efforts made towards expanding the fusion program in India. The two-day symposium had 23 invited talks delivered by eminent speakers from IPR as well as from DAE units and other institutes. A 'Panel Discussion' was conducted on how ADITYA Upgrade tokamak could be made a national facility to provide hands-on experience on tokamak research for the students of different universities within the country. A poster session was also organized, where a total of 55 posters were presented. An ADITYA-U visit was organized for participants on the evening of 27th January, 2020 followed by welcome dinner organised by the LOC, NSC30AT at IPR.



(L) Dr. R. B. Grover and (C) Prof. A. Sen delivering the Keynote Address. (R) Dr. S. Deshpande moderating the Panel Discussion



(L-R) Prof. R. Pal, Prof. P. I. John, Prof. Y. C. Saxena, Dr. R. Srinivasan, Dr. Joydeep Ghosh delivering their invited talks



(L-R) Prof. P. K. Chattopadhyaya, Dr. S Kulkarni, Mr. B Doshi, Mr. K Satyanarayana, Dr. S Pahari and Mr. S. B. Bhatt



(L-R) Dr. K. Balakrishnan, Shri. S.. Malhotra, Shri H. Pujara, Mrs. A. Behere, Dr. R. K. Sharma and Prof. A. K. Ganguly



(L) Mr. R. L. Tanna delivering the Vote of Thanks (C) Poster session (R) Aditya visit

A Conference on Plasma Simulations (CPS) was held at the Institute for Plasma Research during January 23-24, 2020. The conference was well attended and was rich in scientific content. There were 22 invited talks and 52 poster presentations during the 2-day event. The participants came from more than 23 different universities and research institutes across India and their research interests and contributions covered a wide range of plasma science topics such as magnetic and inertial fusion, space and astrophysical plasmas, plasma surface interactions, industrial applications of plasma, plasma based propulsion devices, plasma based particle accelerators etc. A host of simulation models and techniques such as gyro-kinetic and gyro-fluid models, MHD models, fluid and PIC simulations were discussed. This conference was supported by IPR, DAE-BRNS and SERB.



Participants of the Conference on Plasma Simulations held at IPR



Images from the Conference on Plasma Simulations organized at IPR

In the centenary year of the founder of Department of Atomic Energy, IPR celebrated the Vikram Sarabhai Centenary National Science Day during 1-2 February 2020 at the IPR main campus with immense amount of enthusiasm. The event was inaugurated by Director, IPR Dr. Shashank Chaturvedi and Mr Ravi Shankar, AGM, SBI Regional Business Office-1, Gandhinagar. The centenary event had several posters and videos on Dr. Vikram Sarabhai on display. Over 900 students and teachers from both urban and rural schools across Gujarat participated in this event. The NSD also had competitive live events like Quiz, Eloquence, Skit as well as science exhibits by schools and by IPR staff, in collaboration with the BSc Physics students of St. Xavier's College, Ahmedabad. Offline competitions like poster and essay writing were conducted for the school students in the month of December. In the competition organized for school teachers for innovative teaching aids, Shri H. K. Gohil of Kalapi Vinay Mandir, Lathi, won the first prize. This event had over 3000 visitors visiting IPR during the two days to see the exhibition and open house. The concluding session was held on 3rd February where the prizes for the various competitions were given out by Dean R&D, Dr. P.K. Atrey. Some of the schools that won prizes in multiple events are Poddar International School, Ahmedabad, Saint Mary School, Amreli, Divyapath Science School, Ahmedabad, GK Dholakiya School, Rajkot, New Era Senior Secondary School, Vadodara etc.



Inauguration of the NSD-2020





Images from the Vikram Sarabhai Centenary National Science Day 2020

प्रशासनिक प्रशिक्षण संस्थान(ATI), परमाणु ऊर्जा विभाग, मुंबई में 27 से 31 जनवरी, 2020 के दौरान विभिन्न यूनिटों के हिंदी पदाधिकारियों के लिए आयोजित संकाय विकास कार्यक्रम में डॉ.सूर्यकान्त गुप्ता, वैज्ञानिक अधिकारी-जी ने आमंत्रित वार्ताकार के रूप में वहाँ उपस्थित सभी पदाधिकारियों को आईपीआर की गतिविधियों से परिचित कराया एवं विस्तार पूर्वक चर्चा की। सभी प्रतिभागी प्लाज़्मा एवं उसके अनुप्रयोग संबंधी रोचक एवं महत्वपूर्ण जानकारी प्राप्त कर लाभान्वित हुए।



(L) प्रशिक्षण कार्यक्रम में आईपीआर की गतिविधियों पर व्याख्यान देते हुए डॉ. सूर्यकान्त गुप्ता (R) संयुक्त निदेशक (राजभाषा), पऊवि एवं हिंदी पदाधिकारियों के साथ डॉ.सूर्यकान्त गुप्ता |

IPR @ 34th Gujarat Science Congress

IPR participated in the 34th Gujarat Science Congress held at Ganpat University, Kherva, Mehsana, during 8-9 February, 2020. In the science exhibition associated with the Science Congress, IPR exhibited several working and static models at this exhibition. Shri K.N. Vyas, Chairman AEC and Secretary DAE, who delivered the Divatia Memorial Lecture on "Societal uses of atomic energy" at the GSC, also visited the exhibition. Over 1000 persons, including dignitaries of GSC, participants and students of Ganpat University visited the IPR stall.





Ms. Pratibha Gupta presented a poster entitled "Design, Fabrication and Installation of support structure for reflectometry diagnostics on Aditya-U tokamak" for National Symposium for Commemorating 30-years of ADITYA Tokamak, NSC30AT, held during 27-28 January 2020 at EDII, Gandhinagar.



Dr. Sunil S of LIGO division gave a talk entitled "*Black Holes*" on 8-Jan-2020, at the Gujarat Science City, Ahmedabad in the programme conducted for school students to commemorate the birth anniversary of eminent astrophysicist Prof. Stephan Hawking.



Mr. Ashish Yadav was presented the H. D. Govindraj Memorial Research Award-2018 for the second best Research Paper (Welding Metallurgy, Modelling and Extensive Testing), for his paper entitled "Welding distortion assessment for hydraulic connections of complex assembly of Neutral Beam Accelerator grid" The award was presented to him by The Indian Institute of Welding (IIW-INDIA) at Mumbai on 6th Feb, 2020.

30 Years of Aditya Tokamak



Participants of NSC30AT2020



The LOC members of the conference

Educational Visits to IPR/FCIPT – Feb 2020

Name Of the Institution	Date	Number of visitors
H&HB Kotak Institute of Science, Rajkot	19-Feb-2020	54 BSc. Physics (Final year) students
Govt. Engineering College, Banswara, Rajasthan	19-Feb-2020	24 BE (Mech, Elect) students
Aditya Silver Oak Institute of Technology , Ahmedabad	26-feb-2020	48 students of B.E. (Electrical Engineering)



Students of the Govt. Engineering College, Banswara, Rajasthan, during their visit to IPR



Students of the H&HB Kotak Institute of Science, Rajkot, during their visit to IPR



Students of the Aditya Silver Oak Institute of Technology , Ahmedabad, during their visit to IPR

- ◆ **Ms. Sonakshi Sachdev**, Chennai Mathematical Institute, Tamil Nadu, gave a talk on "Conservative regularization of ideal fluids and plasmas" on 29th January 2020
- ◆ **Mr. Chinmoy Mallick**, Institute for Plasma Research, Gandhinagar, gave a talk on "Studies of cavity modes on plasma and its influence on ion beam in a microwave ion source" on 30th January 2020
- ◆ **Dr. Ritu Dey**, Institute for Plasma Research, Gandhinagar, gave a talk on "Novel method of estimating electron temperature using modelling of gas-puff induced H-alpha emission from the edge region of ADITYA-U tokamaks" on 30th January 2020
- ◆ **Dr. Deepa Verma**, LSPM-CNRS, France, gave a talk on "Terahertz generation from a collective plasma dynamics in a thin semiconductor gap" on 31st January 2020
- ◆ **Mr. Rohit Agarwal**, ITER-India, Institute for Plasma Research, Gandhinagar, gave a talk on "Design and Development of Power Supply for Solid State Power Amplifier" on 3rd February 2020
- ◆ **Dr. Amit Kumar Patel**, Institute for Plasma Research, Gandhinagar, gave a talk on "Study of plasma instability confined by a versatile multi-pole line cusp magnetic field" on 5th February 2020
- ◆ **Prof. B. K. Dutta**, Homi Bhabha National Institute, gave a talk on "Mechanical Properties of OFE Copper Subjected to Electron Irradiation" on 5th February 2020 (Colloquium # 301)
- ◆ **Dr. Arup Sarkar**, Indian Institute of Science Education and Research (IISER), Berhampur, gave a talk on "Surface properties of ultrathin films" on 11th February 2020
- ◆ **Dr. Abhijit Boruah**, Institute of Advanced Study in Science and Technology, Guwahati, Assam, gave a talk on "Wave experiments in strongly coupled dusty plasma" on 20th February 2020
- ◆ **Prof. Bruce T. Tsurutani**, Pasadena Research Associates, Pasadena, California, USA, gave a talk on "From the Sun: Solar Flares, Auroras, Magnetic Storms and the Van Allen Radiation Belts: A General Summary of Space Weather" on 21st February 2020 (Colloquium # 302)
- ◆ **Dr. Pallabi Pathak**, Institute of Advanced Study in Science and Technology, Guwahati, Assam, gave a talk on "Ion acoustic rogue waves" on 26th February 2020

Upcoming Events

- ◆ 12th International Symposium on Advanced Plasma Science and its Applications for Nitrides and Nanomaterials/13th International Conference on Plasma-Nano Technology and Science, (ISPLASMA2020/IC-PLANTS2020), Nagoya, Japan, 08-11 March 2020 <http://www.isplasma.jp/>
- ◆ International Youth Nuclear Congress (IYNC 2020), Sydney, Australia, 08-13 March 2020 <https://iync2020.org/>
- ◆ Nuclear engineering for safety, control and security, Bristol, United Kingdom, 26 March 2020 <https://events2.theiet.org/nuclear/>
- ◆ 2020 ANS Student Conference, Raleigh, North Carolina, United States, 26-28 March 2020 <http://studentconf.ans.org/>
- ◆ International Conference on Physics of Reactors (PHYSOR2020) Transition to a scalable Nuclear Future, Cambridge, United Kingdom, 29 March-02 April 2020 <https://www.physor2020.com/>
- ◆ International Topical Meeting on Advances in Thermal Hydraulics (ATH 2020), France, 31 March-03 April 2020 <https://www.sfen-ath2020.org/>



Dr. Mukesh Ranjan gave an invited talk entitled "Plasma produced nanostructure in sensing and wettability" at the International Conference on Advances in Plasma Science and Technology (ICAPSAT), organized by Shri. Shakthi Institute of Engineering and Technology, Coimbatore from 12-14 Feb, 2020.

Shri Aroh Shrivastava gave an oral presentation entitled "Measurement of effective thermal conductivity of lithium titanate ceramic packed bed under helium atmosphere" at the 22nd DAE-BRNS workshop and symposium on thermal analysis (THERMANS-2020) at BARC, Mumbai during 28 Jan- 01 Feb 2020. He received the Best Oral Presentation Award.



The IPR Newsletter Team

Ritesh Srivastava	Tejas Parekh	Ravi A. V. Kumar	Priyanka Patel	Dharmesh P	Mohandas K.K.
Suryakant Gupta	Ramasubramanian N.	Chhaya Chavda	Shravan Kumar	Supriya Nair	Harsha Machchhar

Institute for Plasma Research
Bhat, Near Indira Bridge
Gandhinagar 382 428,
Gujarat (India)



Web : www.ipr.res.in
E-mail : newsletter@ipr.res.in
Tel : 91-79-2396 2000
Fax : 91-79-2396 2277