Physical Research Laboratory, Ahmedabad

COLLOQUIUM - 13 – 20

Speaker: **Prof. Dhiraj Bora**
Director, Institute for Plasma Research, Gandhinagar.

Title: **ITER – A Burning Plasma Experiment**

Abstract

Controlled thermonuclear fusion is one of the alternate clean energy sources for future. A worldwide research program in fusion has been going on for many years. Abundant availability of fuel, inherent safety, negligible radioactive waste and no greenhouse emissions are some of the advantages of this source. We note that not only is fusion an attractive source, it is realistic as well. With the acceptance of the International Thermonuclear Experimental Reactor (ITER) baseline in July 2010, the project has now moved into the construction phase at the Cadarache site in the south of France. Therefore, Fusion is no more a dream but a reality. ITER is an international collaboration of seven parties including India to build the first FUSION SCIENCE EXPERIMENT capable of producing a self-sustaining fusion reaction, called "burning plasma". Unique features will be its ability to operate for long durations and at power levels ~500 MW sufficient to demonstrate the physics of the burning plasma in a power plant like environment. It will also serve as a test-bed for additional fusion power plant technologies. ITER is a long pulse Tokamak with elongated plasma and single null poloidal divertor. In the first phase, nominal inductive operation would produce a DT fusion power of 500 MW for a burn length of ~400 s, with the injection of 50 MW of auxiliary power. The construction phase of ITER will end in November 2020 with the first plasma and DT experiments will start in early 2027. India has joined this international project as the seventh member of the team. Major part of the contribution of each member during the construction phase would be in kind. The present status of the ITER project will be discussed during the talk.

The Speaker

Prof. Dhiraj Bora completed his Master degree in Experimental Physics from Moscow, USSR in 1975. He then joined the Physical Research Laboratory from where he completed his Ph. D. in 1979. Since then, for more than three decades now, he has been active in research in the field of Plasma Physics and fusion science and technology, first at Physical research laboratory and then at the Institute for Plasma Research (IPR) where he is the Director at present. Prior to this appointment, Prof. Bora was a Deputy Director General and Director for Directorate for Controls, Heating and Diagnostics at ITER International Organization, Cadarache, France since September 2006. Before joining ITER, he had been a Professor and Project Leader at the Institute for Plasma Research, Bhat, Gandhinagar, India on various projects. He was a guest scientist in the Institut fuer Plasmaphysik in Juelich, Germany and a visiting scientist in Fusion Research Centre at the University of Texas at Austin. He has more than 150 publications in peer reviewed international/national journals and proceedings of international conferences/workshops. Prof. Bora has been a member of several Indian delegations to IAEA Fusion Research Meetings. He was a member of the delegation of Indian Academy of sciences to celebrate 25 years of Indo-Soviet Technical collaboration in Moscow. He had been a member of the C16 Commission on Plasma Physics of the International Union of Pure and Applied Physics (IUPAP). He is a member of the International Advisory Committee of the IAEA – Technical Meeting and a member of the SSOG group. He is also in the faculty of the Homi Bhabha National Institute (HBNI) at Mumbai. Presently he is a member of the Indian delegation to the ITER Governing Council. He is the recipient of the Kamal Kumari National Award for Science and Technology for the year 2012.

Wednesday: 14 August, 2013, 16:00 hrs
K.R. Ramanathan Auditorium, PRL
Tea at 15:30 hrs
ALL ARE WELCOME