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ITER and India

Dhiraj Bora

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In the quest for new energy sources, the world is pinning its hope on controlled fusion as one of the promising futuristic alternate source of energy. Once realized, it would have endless source of fuel to continue and very limited controlled radioactive waste. Thus an environment friendly energy source is in the horizon.

It is well known to the Plasma Physics community that magnetically controlled fusion research has come a long way to start building a test experimental reactor that would pave the way to harness fusion energy commercially. For more than a decade now, an international team of experts worked to finalize the design of a machine (ITER) which could lead the way towards fusion. It is heartening to note that finally the site for ITER (International Thermonuclear Experimental Reactor) project has been finalized as Cadarach in Southern France and the legal entity will be formed in very near future.

ITER means "the way" in Latin. It is a step between today's studies of plasma physics and tomorrow's electricity-producing fusion power plants. For those of you who are not familiar with this project, it is an international collaboration 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 the next big step towards making fusion energy a reality.

There are six partners namely, China, EU, Japan, Korea, Russian federation and the USA. India has also shown its interest to join the team as a full partner. There is a good possibility that India will join the league in the very near future. Each member will contribute in kind amounting to

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New PSSI Web Site

The PSSI has moved to an independent domain name and web server and this is still under implementation. Members can access the site at <http://www.pssi.in>. As more content will be added, comments & suggestions from our esteemed members is always welcome. Some of the currently implemented as well as planned future facilities on the website are ;

On-line member data update
On-line comments/queries
RSS news feed
PSSI Mailing list

Bulletin board for members
On-line submission of abstracts for future PSSI conferences
On-line, member contributed contents

Members are requested to use the on-line member data update form to send in their updated contact details. A site feedback form is also provided on the web page.

In order to increase the activities of the society and also to add more content to the newsletter, it is proposed that the Newsletter as well as the website will carry advertisements to generate the additional funds for society activities. Members are kindly requested to lend a hand to this cause by helping in procuring advertisements from their locality. The current rates are as follows ;

Location	Image size	Cost	Remarks
Web/NL	468x60 pixel	Rs.12,000/-	6 months display on the web, 1 insertion in all NL issues for 1 year
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Web	468x60 pixel	Rs.6,000/-	6 months display on the www.pssi.in web front page
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NL	90x90mm	Rs.5,000/-	Single insertion in one NL issue.
NL	90x90mm	Rs.10,000/-	Single insertion in all the NL issues for 1 year.

For further information please contact Editor, PSSI. As a non-profit society, PSSI has applied for IT exemption for donations made to the society and advertisers can avail of this benefit -- Editor PSSI.

PSSI workshop on “Plasma Science and Technology: Industrial Applications and Diagnostics”

A report by Dr. Ram Prakash, Birla Institute of Technology, Extension Centre, Jaipur

PSSI National Workshop on “Plasma Science and Technology: Industrial Applications and Diagnostics” held at Birla Institute of Technology, Extension Centre Jaipur from 30th August – 2nd September, 2005.

The workshop began on 30th August 2005 at 9.00 a.m. with ignition of a plasma lamp by the Chief Guest Prof. S. R. Sharma, former president, PSSI. The keynote address was delivered by Prof. R. P. Dahiya, IIT Delhi, on “Glimpses of the How and Why of Plasmas”. Prof. S. R. Sharma gave his inaugural address and also released the Proceedings of the Workshop.

Thirty participants from various parts of the country were selected for the workshop. More than 25 experts in various fields of plasma science & technology delivered lectures to the participants. Topics varied from general plasma physics as well as experimental plasma techniques. The participants also got to conduct hands-on experiments on plasma generation in the laboratory using a glow discharge plasma system. Advanced industrial plasma topics such as ; 1. Surface engineering 2. Polymerization. 3. Plasma Applications in Semi-conductor Technology, Development of Scaled Microelectronic Circuits, Low-pressure Plasma Switches for Pulsed Power Applications, Plasma Applications in Aerospace Engineering. 4. Plasma torches for waste treatments, material coatings, Nano-Technology and Nano-particle fabrications. 5. Anodic coating for corrosion resistance etc.

The training covered during this four-day workshop was well appreciated by both participants as well speakers in their feedback forms. The success of this workshop can be realized by the fact that there was almost 100 % presence throughout the course of the workshop.

The combination of lectures, tutorials and lab sessions was specially found to be useful. During the concluding session, it was felt that plasma should be classified as an interdisciplinary field and more young people be trained for such cross and interdisciplinary areas of research. It was also felt that focused workshops on various aspects of plasma should be organized more regularly. There was a serious concern that the plasma applications, though environment-friendly and effective, were not being adopted by Indian Industries. Probably, we may have to develop more trained manpower and also, more commercial plasma-based product. In the concluding session, Prof. H.C. Pande, Vice-Chancellor Emeritus, BIT, pointed out "*in earlier times, the focus of plasma technology was energy but now industrial applications are gaining momentum. Today we are seeing real-life problems solved by our dynamic researchers and scientists*". He expressed his commitment to develop a plasma lab at BIT Jaipur Centre. He emphasized to increase foreign collaboration to strengthen the research and development in India. The workshop ended with a vote of thanks proposed by the convenor.

Photographs of the inaugural function



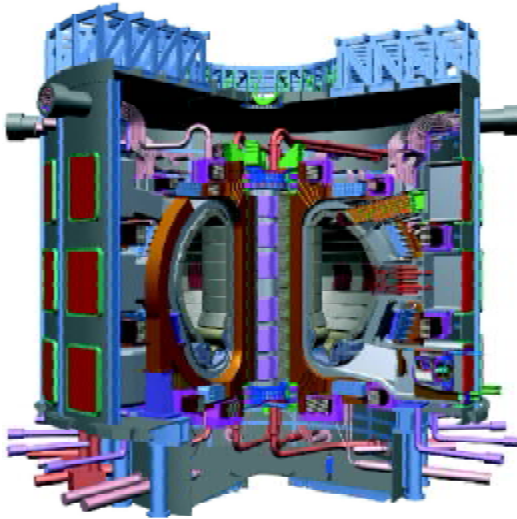
L-R : Prof. P.K. Barhai, Prof. J. Engemann, Prof. R.P. Dahiya, Prof. S.R. Sharma, Dr. Amita Das, Dr. Ram Prakash, Prof. S.K. Mukherjee



L-R : Prof. R.P. Dahiya, Dr. Amita Das (Secretary, PSSSI), Prof. S.R. Sharma, Dr. Ram Prakash (Convenor)

ITER and India

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Schematic of the proposed ITER machine

approximately 10% cost of the machine towards the construction of the machine. Estimated cost of ITER construction alone is about 5 billion US dollars.

ITER is a unique international project of prime importance and participating in it itself is prestigious. It speaks of international standard in India's capability. Thus by ITER participation Indian experts will gain experience which will help shorten the learning process for our future national programme.

ITER participation will give an opportunity to Indian specialists in collaboration with the Indian industry to build components of international standard within stipulated time frame. With these and many more benefits, India will be in a position to pursue its own national programme at an accelerated pace.



India has the largest technically qualified manpower in the world. Therefore, India is in a position to contribute financially as well as through its large technical human resource.

Confirmation of India's participation in ITER would bring half of the humanity into active participation in the quest for a clean alternate source of energy for the mankind – CONTROLLED THERMONUCLEAR FUSION.

Prof Dhiraj Bora <dbora@ipr.res.in>

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