



## Report from the EPS Plasma Physics Divisional Board

### Dublin Conference 2010

The 37<sup>th</sup> annual conference of the EPS Plasma Physics Division took place at the Dublin City University Campus, from 21st to 25<sup>th</sup> of June. It was locally organized by a team belonging to different Irish institutions, lead by Dublin City University and Queen's University Belfast. It attracted a large number of delegates (nearly 750), coming from 37 countries. The scientific programme committee under T. Mendonça was organized in four sub-committees to represent the different fields of plasma physics. These committees were chaired by C. Bourdelle and A. Peeters (Magnetic Confinement Fusion), J. Honrubia (Beam Plasmas and Inertial Fusion), C. Hollenstein (Low temperature Plasmas) and U. Stroth (Basic Plasmas and Astrophysics). They played a key role in the development of the scientific programme. The EPS Plasma Physics Division Board (EPS PPD Board) expresses its thanks to all the organisers of this conference.

The Conference hosted three satellite meetings, and two special evening sessions. The satellite meetings were: the Third Workshop on Plasma for Environmental issues, the International Workshop on the Role of Arcing and Hot Spots in Magnetic Fusion Devices, and the Workshop on Electric Fields, Turbulence and Self-Organization in Magnetic Plasmas. One evening session, organized by D. Batani, was dedicated to Inertial Fusion where the main installations and experiments on laser fusion around the world were presented and critically discussed. The other session, dedicated to Plasma Physics Education, was organized by N. Lopes-Cardozo.

### Strasbourg Conference 2011

The 2011 Local Organising Committee comprises:

A. Bécoulet, CEA (Chair)

T. Hoang, CEA (co-Chair, Scientific Secretary)

The 2011 **Programme Committee** met in November 2010 in Madrid and in March 2011 in Strasbourg. The programme Committee was assisted by suggestions received from individual scientists through the EPS-PPD Open Forum.

#### 2011 PROGRAMME COMMITTEE MEMBERS

U. Stroth                      Chair PC  
C. Hidalgo                  Chair EPS PPD  
C. Forest                      APS, US  
M. Sasao                      JSPF, Japan

#### MCF plasmas

P. Helander                  Germany (sub-chair)  
J. Ongena                    Belgium  
E. Wolfrum                  Germany  
M. Beurskens                UK  
V. Antoni                    Italy  
T. Tala                        Finland  
G. Falchetto                 France

#### Basic and space plasmas

A. Fasoli                      Switzerland (sub-chair)  
F. Moreno-Insertis         Spain

R. Barndenburg             Germany  
N. Vilmer                     France  
L. Fletcher                  UK

#### BP & IF plasmas

L. Gizzi                        Italy (sub-chair)  
M. Kaluza                    Germany  
J. Limpouch                 Czech Republic  
M. Zepf                        UK  
R. Piriz                        Spain  
N. Andreev                  Russia

#### Low temperature plasmas

T. Gans                        UK (sub-chair)  
L. Pichford                  France  
F. Gordillo-Vázquez        Spain  
A. v. Keudell                Germany  
P. Lukac                      Slovakia  
Z. Petrović                    Serbia

## **The Hannes Alfvén Prize 2011**

The 2011 divisional **Hannes Alfvén Prize** is awarded to (in alphabetic order)

Patrick Diamond (University of California, United States of America; National Fusion Research Institute, Korea)

Akira Hasegawa (Osaka University, Japan)

Kunioki Mima (Graduate School for the Creation of New Photonics Industries at Kamamatsu, Shizuoka, Japan)

“for laying the foundations of modern numerical transport simulations and key contributions on self-generated zonal flows and flow shear decorrelation mechanisms which form the basis of modern turbulence in plasmas”.

Confined thermonuclear plasma is far from equilibrium due to strong external drives that maintain steep gradients in the plasma parameters. The heat and particle transport in fusion plasmas is generally due to turbulent processes associated with small-scale instabilities driven by the in-homogeneity of density and temperature profiles in the direction normal to the magnetic surfaces. The magnitude of turbulent transport is probably the dominant parameter affecting the global confinement properties and hence the understanding of turbulence is a fundamental issue for the success of controlled magnetic nuclear fusion. A. Hasegawa and K. Mima developed the model equation (the Hasegawa-Mima-Wakatani equations) predicting the development of inverse cascade of turbulent energy spectra and condensation of the spectrum to form zonal flows in the azimuthal direction which can control turbulent radial diffusion. P. Diamond’s contributions led to paradigm shifts on turbulent transport including the self-generation of zonal flows as a crucial element of turbulent transport, the shear decorrelation mechanisms and predictions based on predator-prey models of plasma bifurcations.

Their predictions have already been partially confirmed by experiments carried out in tokamak and stellarator devices and provide the basis for the development of predicting capability of transport in future fusion devices. The award of the 2011 Hannes Alfvén Prize to these three leading scientists underlines the importance of their ideas as the most influential in the area of turbulence and transport in magnetically confined plasmas and in the transfer of knowledge in plasma physics.

## **The Plasma Physics Innovation Prize 2011**

The 2011 **Plasma Physics Innovation Prize** of the European Physical Society is awarded to (in alphabetic order)

Alexander Litvak (Institute of Applied Physics of Russian Academy of Sciences, Russia)

Keishi Sakamoto (Japan Atomic Energy Agency, Japan)

Manfred Kaspar Andreas Thumm (Karlsruhe Institute of Technology, Germany)

“for outstanding contributions to the realization of high power gyrotrons for multi-megawatt long-pulse electron cyclotron heating and current drive on magnetic confinement nuclear plasma devices “.

The electron-cyclotron method of plasma heating and current drive has shown its efficiency in numerous experiments at large scale magnetic fusion experiments. The modern wave systems are based on gyrotrons, the most powerful sources of coherent radiation in the millimeter wavelength range, capable to generate radiation with a megawatt power level in long-pulse regimes. The three teams led by A. Litvak, K. Sakamoto and M. Thumm, together with a successful international collaboration, have provided outstanding contributions in the theoretical and experimental research and innovation on high power long pulse gyrotrons. The European Physical Society bestows its 2011 Plasma Physics Innovation Prize for all of these outstanding developments in high power sources of coherent microwaves.

## **The PhD Research Award 2011**

The Plasma Physics Division 2011 PhD Research Award has been recently judged by a committee comprising of Juergen Nuehrenberg, Uwe Czarnetzki and Jean-Claude Gauthier, who examined all the candidatures in a process managed by Dimitri Batani. The EPS PhD prize is a key element of the EPS PPD activities to recognise the exceptional quality of the work carried out by young scientists. Based on their conclusions, and considering the diversity of top PhD research work in different plasma physics areas, a decision was made to award the EPS-2011 PhD Award to (in alphabetic order):

Stefan Kneip (Imperial College, UK) for the investigation of laser generation of x-rays, including the study of electron acceleration in the bubble regime and experimental demonstration of self-guiding.

Julian Schulze (Ruhr-University Bochum, Germany) for his research on electron heating in capacitively coupled radio frequency discharges, including contributions on electrical asymmetry effects affecting ion energy distribution.

Mierk Schwabe (Max-Planck Institute for Extraterrestrial Physics, Germany) for his research on dynamical effects in complex plasmas to study phenomena ordinarily described by fluid dynamics at the level of individual particles.

## **Stockholm Joint EPS-ICPP Conference 2012**

The joint 2012 EPS -ICPP Plasma Physics Conference will be held in Stockholm (Sweden) from July 2 to July 6, 2012. The Local Organising Committee will be chaired by S. Ratynskaia and L. Blomberg. The conference organisation will be presented during the 2011 conference closing session, as is traditional. The 2012 Programme Committee is chaired by A. Fasoli and the membership includes:

Basic, Space and Astrophysical Plasmas:

G. Morales, T. S. Pedersen, I. Tanarro, S. Benkadda, R. Galvao, C. Z. Cheng

Magnetic Confinement Fusion:

V. Naulin, J. Schweinzer, B. Hnat, S. Cappello, T. Kurki-Suonio, A. Sen, S. I. Itoh, G. Navratil

Inertial Fusion and Beam Plasmas:

L. Silva, M. Perlado, B. Le Garrec, S. Le Pape, K. Mima, M. Tatarakis, V. Smirnov

Low Temperature and Dusty Plasmas:

P. Shukla, R. Dussart, J. Meichsner, C. Gómez-Aleixandre, V. Guerra, S. Vladimirov

## **The EPS Plasma Physics Division Board**

The Divisional Board currently has the following composition (<http://plasma.ciemat.es/>):

C. Hidalgo (chair), Joerg Winter (vice-chair), Sylvie Jacquemot (secretary), Vladimir Tikhonchuk, Holger Kersten, Dimitri Batani, Bertrand Lembege, Pascale Monier-Garbet, Elisabeth Rachlew, Boris Sharkov, Wolfgang Suttrop, Thomas Klinger, Javier Honrubia, Dirk Van Eester, Richard Dendy.

The Board met in November 2010 in Madrid and is due to meet in Strasbourg in June 2011.

Elections to the EPS Board (2012) will be organized to replace those elected members who finish their EPS term. All the necessary information for the submission of nominations and elections, including electronic forms for submission of nominations, will be made available on the Web site of the Plasma Physics Division early in the election year (2012).

***EPS PPD***

***Strasbourg, June 2011***