



Report from the EPS Plasma Physics Divisional Board

Hersonissos Conference 2008

The 35th annual conference of the EPS Plasma Physics Division was held in Hersonissos, Crete, 9-13 June, under the local chairmanship of Paraskevas Lalouis and Stavros Moustazis of the FORTH institute, Heraklion. The scientific programme committee under Carlos Hidalgo was organized in four sub-committees to represent the different fields of plasma physics. These committees were chaired by Xavier Garbet (Magnetic Confinement Fusion), Sylvie Jacquemot (Beam Plasmas and Inertial Fusion), Hubertus Thomas (Low temperature Plasmas) and Nigel Woolsey (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 EPS-2008 conference has been the last conference with Jo Lister as chairman of the EPS PPD Board. The divisional Board expresses its recognition for his important leading role during his mandate as the EPS PPD chair.

Sofia Conference 2009

The 2009 Local Organising Committee comprises:

Matey Mateev (Chair)
Evgenia Benova (Scientific Secretary)
Tsviatko Popov
Basil Duval (Elise submissions)

The 2009 **Programme Committee** met in November 2008 in Paris and in March 2009 in Sofia. The 2009 PC members are:

2009 PROGRAMME COMMITTEE MEMBERS

Sylvie Jacquemot France (Chair)

MCF plasmas

Piero Martin Italy (sub-chair)
Marina Becoulet France
Lorella Carraro Italy
Stefano Coda Switzerland
Kieran Gibson UK
Kenneth McClements UK
François Ryter Germany
Tom Antonsen (APS)

BP & IF plasmas

Michel Koenig France (sub-chair)
Gianluca Gregori UK
Amdrea Macchi Italy
Stuart Mangles UK
Javier Sanz Spain

Basic and space plasmas

Tito Mendonça Portugal (sub-chair)
Valery Nakariakov UK
Pavel Sasorov Russia
Loukas Vlahos Greece

Low temperature plasmas

Volker Schultz van der Gathen Germany(sub-chair)
Pascal Chabert France
Svetlana Ratynskaia Sweden
Dirk Uhrlandt Germany
Evgenia Benova Bulgaria
Satoshi hamaguchi (JPS)

Award of the Hannes Alfvén Prize 2009

The 2009 divisional **Hannes Alfvén Prize** is awarded to Professor Doctor **Jürgen Meyer-ter-Vehn**, the Head of Laser Plasma Theory Group, Max-Planck-Institut für Quantenoptics, Garching and Honorary Professor at the Munich Technical University (Germany) "*for his outstanding theoretical work in the fields of inertial confinement fusion, laser-matter interaction, and, specifically, relativistic laser-plasma interaction and laser wake field electron acceleration.*"

Jürgen Meyer-ter-Vehn is an outstanding scientist in the fields of inertial confinement and laser-matter interaction, well-known to everybody in the plasma physics and nuclear fusion community. His carrier in this domain started in beginning of 80es with his arrival to the laser fusion group at the MPQ. In a rather short period of a few years he contributed to the development of the approach to inertial confinement fusion by using the converging shocks and the X-ray thermal radiation. He and his colleagues (primarily R. Sigel) at the MPQ, Garching and at the Institute of Laser Engineering, Osaka, have developed a rather complete theory of the X-ray generation, confinement and ablative drive that was confirmed in experiments. It provides the conditions for an efficient transformation of the laser energy in thermal radiation with temperatures exceeding 200 eV, and shows how it can be used for compression of fusion pellets. It became apparent a few years later, that this approach, known today as indirect drive fusion, was the one retained for forthcoming first demonstration of the ICF breakeven at the MJ-scale laser installations in the United States and in France. The major contribution of J. Meyer-ter-Vehn to this area has been acknowledged by the ICF community in 1997 with the Edward-Teller Award, the most prestigious recognition in the domain of the inertial confinement fusion.

This major achievement was not a conclusion of his scientific achievements, but just a step in his passionate quest for an efficient and reliable source of inertial fusion energy. A phenomenal progress in high power laser technology in the end of 80es and the fast ignition approach put forward in 90es by the American scientists provided a way for more flexible and efficient target designs. These developments opened a new area of relativistic laser-plasma interaction so rich in outstanding results. Jürgen Meyer-ter-Vehn largely contributed to laser-assisted charge particle acceleration and their application for ignition of fusion targets. In particular, he with his colleague A. Pukhov proposed a new method of laser wake field acceleration of electrons in the blow-off regime that has been confirmed experimentally in 2004. He continues this work by studying new schemes of electron and ion acceleration and their applications in quantum electrodynamics and nuclear physics, bringing together these rather distant communities.

Jürgen Meyer-ter-Vehn has educated young scientists from many countries and together with S. Atzeni, he has written in 2004 a book on the Physics of Inertial Fusion thus propagating internationally the values of science in general, the theoretical plasma physics and fusion research.

This laudation addresses only principal areas where this exceptionally gifted scientist has made important contributions to the progress in the plasma and fusion research. It is especially appropriate and timely, in the year when the National Ignition Facility is making its first shots. It is supposed to demonstrate the breakeven by using the approach that carries the crucial contributions of Jürgen Meyer-ter-Vehn.

The Hannes Alfvén Prize is awarded by the Board of the Plasma Physics Division. A large number of international experts were consulted to prepare a short-list of appropriate candidates. These candidatures were debated during the winter Divisional Board meeting.

The Plasma Physics Innovation Award 2009

The 2009 **Plasma Physics Innovation Prize** of the European Physical Society is awarded to Professor Doctor **Emmanuel Marode**, Directeur de Recherche, Laboratoire de Physique des Gaz et des Plasmas, Ecole Supérieure d'Electricité, Gif sur Yvette (France) "*for breakthrough developments and applications of basic plasma physics tools to address environmental concerns.*"

Emmanuel Marode has been making pioneering and innovative contributions to low temperature plasmas and their industrial and societal applications throughout his four-decade tenure at the Ecole Supérieure d'Electricité in France.

One high-impact area of his research which deserves to be singled out because of its environmental implications concerns pollutant and combustion control using the chemical activation of cold electrical discharges. They demonstrated that energy can be channeled in different ways to meet given objectives, depending on how it is distributed in the various discharge sequences. They moreover showed that both experiments and modeling confirm the idea that electrical discharge

causes a highly localized injection of reactive substances which spread and ultimately react with the entire gaseous medium. Rather than being transformed into pure heat loss, this energy can be then be utilized - for example, to selectively destroy undesirable molecules, or provide a non-thermal trigger for motor combustion.

From early on in his career to this very day, Emmanuel Marode has been a relentless advocate of computer simulations to aid in the understanding of the very complex phenomena which characterize low temperature plasmas.

As a final example of the importance that Emmanuel Marode attaches to the useful applications of low temperature plasmas, one must cite at least one of his patents for his invention, along with Micheline Paliere, Salem Achat and Yves Teisseyre, of a plasma reactor.

For all of these longstanding and outstanding contributions to low temperature plasmas, the European Physical Society bestows its 2009 **Plasma Physics Innovation Prize** to Emmanuel Marode.

The PhD Research Award 2009

The Plasma Physics Division 2009 PhD Research Award has been judged by a committee comprising Jack W Connor, Jean-Claude Gauthier and Hans J Hartfus, who examined all the candidatures in a process managed by Dimitri Batani. EPS PhD prize is a key element of the EPS PPD activities to recognise exceptional quality of the work carried out by young physicists. The jury nominated 3 award winners from an impressively high quality of candidates. The 2009 citations in alphabetical order are:

Cedric Thaury, for first principles study of effects in nonlinear laser–plasma interaction including high-order harmonic generation of intense laser light by reflection at a plasma mirror. Identification of a novel mechanism at lower laser power (‘Coherent Wake Emission’), as well as a clear characterisation of its properties and detailed comparison with the known ‘Relativistic Oscillating Mirror’ process occurring at higher power.

Ian Chapman, for sophisticated theoretical modelling, integrating theoretical ideas on linear stability into, and then developing, state-of-the-art codes for describing sawteeth behaviour; this modelling is validated by comparing with the detailed behaviour of sawteeth periods in a range of European tokamaks. Its significance is that it offers an important means of control for ITER.

Tilman Lunt, for impressive diagnostic development and its application to a fundamental aspect of the plasma sheath, the Bohm criterion; this work is important for experimentally validating the interpretation of probe data and the Bohm criterion forms the basis for aspects of divertor modelling, e.g. for ITER.

Dublin Conference 2010

The 2010 EPS Plasma Physics Conference will be held in Dublin (Ireland) from June 21 – 25, 2010, at the Dublin City University. The Local Organising Committee will be chaired by Miles Turner. The conference organisation will be presented during the 2009 conference closing session, as is traditional. The 2009 Programme Committee is chaired by Tito Mendoça and the membership includes:

Magnetic Confinement Fusion (MCF): A. Peeters, A. Kallenbach, D. McDonald, C. Bourdelle, E. Gusakov, R. Sanchez, S. Zoletnik and J. Weiland.

Beam Plasmas and Inertial Fusion (BPIF): J. Honrubia, T. Cowan, C. Lewis, D. Jaroszynski, V. Bychenkov and D. Juraszek.

Basic and Astrophysical Plasmas (BAP): U. Stroth, T. Amari, T. Bell, A. Gomez de Castro and A. Piel.

Low Temperature Plasmas (LTP): C. Hollenstein, D. Block, E. Stoffels and L. Zajickova.

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 Jacquemont (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 2008 in Madrid, and is due to meet at Sofia in June 2009.

For your board, Carlos Hidalgo, Chairman, Sofia, June 2009