



Report from the EPS Plasma Physics Divisional Board

Development of the Division

In accordance with the statutes of the EPS Plasma Physics Division, the Board – renewed in 2012 – will serve until mid 2016. For more information, connect to <http://plasma.ciemat.es/eps/board/>. Dedicated web pages for the “Beam Plasma & Inertial Fusion” section were created at <http://plasma.ciemat.es/eps/sections/bpif/> and three elected members, whose mandates ended in March 2014, were confirmed for one additional year.

Board meetings

The Board met twice in 2013, the 30th of June in Espoo (Finland) and the 6th of December in Massy-Palaiseau (France).

Espoo EPS PP Conference 2013

The 40th EPS Conference on Plasma Physics was held at the DIPOLI Conference Centre in Espoo (Finland) from the 1st to the 5th of July, 2013. It was locally organized by a team from VTT Technical Research Centre of Finland and from the Aalto University, coordinated by Taina Kurki-Suonio, with the help of Markus Airila as Scientific Secretary and the support of Tavicon Ltd. The conference attracted about 610 delegates coming from 36 countries. Thanks to the marvellous job done by the Local Organizing Committee, the astonishing architecture of the venue and the stimulating scientific program proposed by the Program Committee chaired by Volker Naulin, the conference was a success and reflected the richness of plasma physics, from fundamental questions to industrial applications. The four sub-committees set-up to cope with this diversity did a great job; they were coordinated by Clemente Angioni (*Magnetic Confinement Fusion - MCF*), Marco Borghesi (*Beam Plasma and Inertial Fusion - BPIF*), Stefan Poedts (*Basic, Space and Astrophysical Plasmas - BSAP*) and Svetlana Ratynskaia (*Low Temperature and Dusty Plasmas - LTDP*). Emphasis was put on plasma diagnostics, a cross-cutting topic to which was dedicated a satellite workshop chaired by Tony Donné and attended by 75 persons.

The proceedings, covering contributed orals and posters, were published in the Europhysics Conference Abstracts (ECA) Series (vol. 37D) and are available online at <http://ocs.ciemat.es/EPS2013PAP/html/>, or through the EPS website, thanks to the PC Scientific Secretary Boudewijn van Milligen (Spain). The invited papers were published in the December 2013 special issue of Plasma Physics and Controlled Fusion [vol. 55(12)] and can be consulted online at <http://iopscience.iop.org/0741-3335/55/12>.

Berlin EPS PP Conference 2014 (<http://eps2014-berlin.de/>)

The 41th EPS Conference on Plasma Physics is hosted by the Max-Planck-Institut für Plasmaphysik from the 23rd to the 27th of June, 2014, in the Berlin Congress Center (Germany). The Local Organising Committee is chaired by Thomas Klinger, with the help of Olaf Grulke. The Programme Committee, chaired by Svetlana Ratynskaia with the help of Paola Mantica (IT – MCF), Robert Bingham (UK – BSAP), Alessandra Benuzzi-Mounaix (FR – BPIF) and Giorgio Dilecce (IT – LTDP), met twice, in November 2013 in Massy-Palaiseau and in March 2014 in Berlin. Its detailed composition is given on the conference website at <http://eps2014-berlin.de/program-committee/>. Fruitful suggestions were received from individual scientists and institutional laboratories, through the EPS/PPD Open Forum, and from the American and Japanese Physical Societies.

The EFTSOMP workshop (*workshop on Electric Fields, Turbulence and Self-Organization in Magnetised Plasmas*) is organised as a satellite meeting of the conference.

Lisbon EPS PP Conference 2015

The 42nd EPS Plasma Physics Conference will be hosted by the Instituto de Plasmas e Fusão Nuclear and held in Lisbon (Portugal) at Centro Cultural de Belem from the 22nd to the 26th of June, 2015. The Local Organising Committee will be chaired by Bruno Soares Gonçalves. The Programme Committee, as for it, will be chaired by Robert Bingham (UK) and will include:

- MCF: Wolfgang Suttrop (DE – sub-chair), Fernanda Rimini (UK), Fulvio Zonca (IT), Emmanuelle Tsitrone (FR), Leonid Askinazi (RU), Horacio Fernandes (PT), Arturo Alonso (SP) and Colin Roach (UK)
- BPIF: Stefano Atzeni (IT – sub-chair), Christophe Rousseaux (FR), Istvan Földes (HU), Brigitte Cros (FR), Nelson Lopes (PT) and Vincent Bagnoud (DE)
- BSAP: Ken McClements (UK – sub-chair), Cesar La Hoz (NO), Francesco Miniati (CH), Martin Lemoine (FR) and Brian Reville (UK)
- LTDP: Rüdiger Foest (DE – sub-chair), Anne Bourdon (FR), Milan Simek (CZ), Carlos Pintasilgo (PT), Bengt Eliasson (DE) and Daniel Lundin (SE).

Suggestions from the community for invited and plenary speakers will be welcome through the Open Forum to be open by the end of the year on the conference website. See announcements on the divisional website.

Prizes

The EPS Plasma Physics Division took the opportunity of its annual conference to reward researchers who have achieved outstanding scientific or technological results, thus reinforcing excellence in science.

The **2014 Hannes Alfvén Prize** is awarded to **Patrick Mora** (Centre de Physique Théorique, Palaiseau, FR) "for decisive results in the field of laser-produced plasma physics, in particular for illuminating descriptions of laser light absorption in plasmas, electron heat transport in steep temperature gradients and plasma expansion dynamics into vacuum".

The first remarkable result of Patrick Mora is a theoretical model, now included in all the major textbooks, which couples laser light absorption and energy transport to plasma hydrodynamics. With his colleague Jean-François Luciani, he then proposed a nonlinear and nonlocal theory of electron heat transport which enables interpretation of experimental results showing a strong departure from the classical Spitzer and Härn formalism, thus inspiring a variety of models now currently used for hydro. computations of laser or x-ray created plasmas, especially in the context of inertial confinement fusion. Later, he drew, with Tom Antonsen, USA, a model for the propagation of a short laser pulse in under-dense plasmas, exhibiting its self-focusing character and its tendency to develop Raman-like instabilities. The numerical code he elaborated, named WAKE, is proved to be more efficient than usual Particle-in-Cell codes in numerous experimental situations and is now widely used. In particular it enabled the first simulation of complete cavitation of electron density in what was later named the "bubble regime", and shown to play a crucial role in relativistic quasi-monoenergetic electron beam acceleration. Finally his recent work on plasma expansion into vacuum is possibly his most important work as it gives a complete understanding of the flow dynamics, elucidating for instance the structure of the ion front and predicting the maximum ion velocity. This model was used to sustain a lot of recent experimental results on ion acceleration obtained in European laboratories.

The **2014 Plasma Physics Innovation Prize** of the European Physical Society is awarded to **Christoph Hollenstein** (Centre de Recherches en Physique des Plasmas, Ecole Polytechnique de Lausanne, Switzerland) "for instrumental contributions to the field of Plasma Processes in Industry and for his strong impact in spin-off activities of fusion R&D".

Among the various topics tackled by Christoph Hollenstein, one can first mention the development of a plasma process for thin film deposition using the plasma torch and, more significantly, all the work done on radio-frequency plasma reactors for large area deposition of amorphous or microcrystalline silicon for solar cell or flat display applications. As an additional outcome, he also contributed to the fundamental understanding of powder formation in reactive plasmas used for deposition of many important industrial coatings. Moreover, he studied the plasma chemistry of silicon-oxide deposition as barrier coating for packaging applications. More recently, a method was investigated to modify the functional and decorative properties - for instance the color - of a substrate under reactive plasma conditions, with potential applications in the watch industry. Electrical discharge machining was investigated as well, with a systematic study on the eroding spark physics performed thanks to a set of plasma diagnostics, including spectroscopic and imaging tools, which demonstrated that the spark is a cold and dense, weakly non-ideal, plasma, thus improving the understanding of the fundamental mechanisms underlying the industrial process. Christoph Hollenstein and his colleagues have also uncovered the physics behind the formation of plasmoids in RF plasma reactors, which exhibit a funnel-like behavior, and they proposed strategies to prevent damage induced by them. An additional experimental approach is currently used to explore arcing in spacecraft and spacecraft equipment, with special attention paid to arc ignition, propagation. Such studies lead to the development of safer electrical equipment. All these great developments and inventions were, and are, made in close collaboration with European industrial partners.

The **2014 EPS Plasma Physics Division PhD Research Award** has been judged by an external committee, comprising Francesco Pegoraro (IT), Miklos Porkolab (US), Karl-Heinz Spatschek (DE) and Elisabeth Rachlew (SE), who examined all the candidatures in a process managed by Elisabeth Wolfrum representing the EPS Plasma Physics Division. Based on their conclusions, this year's award goes to **Edmund Highcock** (Oxford Univ., UK) for his thesis entitled "The zero turbulence manifold of fusion plasmas".

The **2014 IoP-EPS Poster Prizes** and the **2014 Itoh Project Prize in Plasma Turbulence**, sponsored by the Kyushu University (Japan) and supported by IoP, will be awarded during the conference and their recipients announced during the closing session.

Finally, the **APS-EPS Landau-Spitzer** Committee, composed of Fred Skiff (APS), Richard Dendy (EPS), Martin Greenwald, Christine Labaune, Alexander Piel and Jonathan Wurtele, has decided to award the prize in **2014** to: **Manuel Garcia-Munoz** (University of Seville, SP), **Benedikt Geiger** (Max-Planck-Institut für Plasmaphysik, DE), **David C. Pace** (General Atomics, USA) and **Michael A. Van Zeeland** (General Atomics, USA) for the "greater understanding of energetic particle transport in tokamaks through collaborative research". The ceremony will be held at the next annual meeting of the APS Division of Plasma Physics.

*S. Jacquemot, on behalf of the EPS Plasma Physics Division Board
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