



Report from the EPS Plasma Physics Divisional Board

Board meetings

The Board met twice in 2015, the 22nd of June in Lisbon (Portugal) and the 4th of December in Paris (France).

Development of the Division

In accordance with the statutes of the Division, Sylvie Jacquemot will be succeeded the 8th of July by Richard Dendy who was elected during the winter Board meeting. The mandate of 4 Board members will also end this summer: Dirk van Eester, Javier Honrubia, Thomas Klingner and Bertrand Lembège. The Division is grateful for their many contributions. An election process was initiated in February and completed the 3rd of June. Kristel Crombé (ERM/KMS, Belgium), Andreas Dinklage (IPP Garching, Germany), Basil Duval (EPFL, Switzerland), Carlos Silva (IPFN/IST, Portugal) and Vladimir Tikhonchuk (CELIA, France) were thus chosen by the EPS Plasma Physics community. For more information, connect to <http://plasma.ciemat.es/eps/board/>.

Lisbon EPS PP Conference 2015 (<http://www.ipfn.ist.utl.pt/EPS2015/>)

The 42nd EPS Conference on Plasma Physics, hosted by the Instituto de Plasmas e Fusão Nuclear, was held at the Centro Cultural de Belém (Portugal) from the 22nd to the 26th of June, 2015. The Local Organizing Committee - Bruno Gonçalves (chair), Carlos Silva (co-chair) and Rui Coelho (scientific secretary) and their staff - did an excellent job to ensure a smoothly run conference which finally attracted 647 delegates coming from 38 countries, amongst them 158 students. The scientific programme benefitted from the enthusiasm and the dedication of the Programme Committee, especially of its chair - Robert Bingham – and sub-chairs: Wolfgang Suttrop (*Magnetic Confinement Fusion: MCF*), Stefano Atzeni (*Beam Plasma & Inertial Fusion: BPIF*), Ken McClements (*Basic, Space & Astrophysical Plasmas: BSAP*) and Rüdiger Foest (*Low Temperature & Dusty Plasmas: LTDP*), and from the effective work done behind the scene by Boudewijn van Milligen as responsible for the online computer system. The proceedings, covering contributed orals and posters, were published in the Europhysics Conference Abstracts (ECA) Series (vol. 39E) and are available online at <http://ocs.ciemat.es/EPS2015PAP/html/> or through the EPS website. The invited papers were published in the January 2016 special issue of Plasma Physics and Controlled Fusion (PPCF - vol. 58(1)) and can be consulted online at <http://iopscience.iop.org/0741-3335/58/1>.

Leuven EPS PP Conference 2016 (<https://kuleuvencongres.be/eps2016/>)

The 43rd EPS Conference on Plasma Physics is hosted by the Katholieke Universiteit (KU) Leuven (Belgium) from the 4th to the 8th of July, 2016, on the university's campus. The Local Organising Committee is chaired by Stefaan Poedts, with the help of Tom Van Doorselaere (scientific secretary) and Nele Vennekens (conference & events office). The Programme Committee, chaired by Paola Mantica with the help of Gerardo Giruzzi (MCF), Elena Amato (BSAP), Marta Fajardo (BPIF) and Timo Gans (LTDP), met twice, in December 2015 in Paris and in March 2016 in Leuven. Its detailed composition is given on the conference website at <https://kuleuvencongres.be/eps2016/committees>. Suggestions were received from individual scientists and institutional laboratories, through the EPS/PPD Open Forum, and from the American and Asia Pacific Physical Societies.

Belfast EPS PP Conference 2017

The 44th EPS Plasma Physics Conference will be held in Belfast (UK) from the 26th to the 30th of June, 2017 and hosted by the Queen's University of Belfast (UK). The Local Organising Committee will be chaired by Brendan Dromey. The Programme Committee will be chaired by Marta Fajardo (PT) and will include:

- MCF: E. Westerhof (NL – sub-chair), C. Challis (UK), A. Hakola (FI), P. Hennequin (FR), M. Hirsch (DE), R. Lorenzini (IT), M.-L. Mayoral (UK), B. van Milligen (SP), T. Puetterich (DE) and V. Pustovitov (RU)
- BPIF: C. Riconda (FR – sub-chair), A. Marocchino (IT), F. Negoita (RO), J. Nedjl (CZ), G. Sarri (UK), U. Schramm (DE), P. Velarde (SP) and J. Vieira (PT),
- BSAP: A. Bret (SP – sub-chair), J. Büchner (DE), R. Keppens (BE), J. Petri (FR) and A. Robinson (UK),
- LTDP: A. Melzer (DE – sub-chair), N. Bordel (SP), O. Miloch (NO), I. Pilch (SE) and S. Starikovskaya (FR).

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.

In addition to the annual Divisional conference, the Division supports a new series of conferences dedicated to plasma diagnostics. The 1st conference was held from the 14th to the 17th of April, 2015, in Frascati, at Villa Mondragone, and gathered

about 180 participants. This series was initiated by a successful workshop organized as a satellite of the 2013 Plasma Physics conference in Helsinki. The proceedings are published in Proceedings of Science (<http://pos.sissa.it/cgi-bin/reader/conf.cgi?confid=240>) with an extended version of selected papers in a special issue of the Journal of Instrumentation (JINST – vol. 10(11)), available online at <http://iopscience.iop.org/1748-0221/focus/extraproc48>. The 2nd edition of the **European Conference on Plasma Diagnostics (ECPD)** will be held in Bordeaux (France) from the 18th to the 21st of April, 2017.

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 **2016 Hannes Alfvén Prize** is awarded to **Sergei Bulanov** (National Institute for Quantum and Radiological Science and Technology, Japan, and A.M. Prokhorov Institute of General Physics of Russian Academy of Sciences, Russia) and **Hartmut Zohm** (Max Planck Institute for Plasma Physics, Germany) “for their experimental and theoretical contributions to the development of large-scale next-step devices in high-temperature plasma physics research”. Sergei Bulanov is one of the most influential theoretical physicists in the field of modern ultra-intense laser-plasma interaction, known as “relativistic plasma optics”. After introducing in the late 90’s the concept of transverse-wake wave breaking that paved the way towards later experimental breakthroughs in laser electron acceleration, he focused his interest to high-field physics, at higher and higher laser intensities. He proposed, in particular, the innovative “flying mirror” scheme to intensify laser light and achieve the Quantum Electro-Dynamics critical field and identified a novel mechanism to efficiently accelerate relativistic ions by radiation pressure towards multi-GeV energies. These scientific visions of Sergei Bulanov have motivated the efforts towards a new generation of laser facilities, especially in Europe the Extreme Light Infrastructure (ELI). Another important contribution of Sergei Bulanov to plasma physics is in the field of magnetic reconnection, a topic which bridges the gap between the two major pillars of the EPS Plasma Physics Division: high-temperature plasmas and astrophysical plasmas. Hartmut Zohm pioneered the use of electron cyclotron resonance current drive for the stabilization of neoclassical tearing modes (NTM) which are considered as a substantial threat for tokamak plasma confinement, especially through limitation of the reachable plasma pressure and occurrence of current disruptions. After derivation of analytical expressions for all quantities at stake and identification of an elegant solution, Hartmut Zohm and his team demonstrated - for the first time - NTM control on ASDEX Upgrade in 1999 thanks to localized and phased injection of micro-waves into the centre of an emerging magnetic island. The success was ensured by a wide range of expertise perfectly mastered by Hartmut Zohm, from theoretical to experimental plasma physics and technology. These achievements have not only shaped the field but have been implemented on numerous existing tokamaks and are planned as tools on the International Thermonuclear Experimental Reactor (ITER) and probably on future demonstration power plants. Hartmut Zohm has also made major contributions to fusion power plant physics and design.

The **2016 EPS Plasma Physics Innovation Prize** is awarded to **Klaus-Dieter Weltmann** and **Thomas von Woedtke** (Leibniz Institute for Plasma Science and Technology, Germany) “for their pioneering work in the field of plasma medicine”. It recognizes their outstanding and novel contributions to the basic understanding of cold non-thermal plasma sources, operated at atmospheric pressure, and of their biological effects. It is an appreciation of their visionary combination of plasma physics and technology, on one hand, and, on the other hand, life science and medicine. The activities of Klaus-Dieter Weltmann, Thomas von Woedtke and their collaborators at INP Greifswald and Greifswald University span various therapeutic applications, from wound healing and dermatology to cancer treatment. They have developed and fully characterized numerous devices, not only in terms of plasma properties (temperature, UV radiation or electromagnetic fields) but also in terms of biological effects on cells and tissues. One of these devices - kINPen MED® - based on an argon plasma jet, received in March 2013 CE marking for local treatment of infected wounds and pathogen-induced skin diseases. It is currently commercialized by a German start-up, which indicates the success of the strategy, uniting basic research in plasma physics, life sciences and technology under one roof, followed by our two prize’s recipients. Their pioneering work has seeded a rapidly growing field and the coming years will surely result in additional spin-offs from cold plasma technology into life science.

The **2016 EPS Plasma Physics Division PhD Research Award** has been judged by an external committee, comprising Carlos Alejandre, Fabrice Doveil, Christine Labaune and Guido van Oost, 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: **Bastien Bruneau** (LPICM, FR) for his PhD thesis on the “control of radio frequency capacitively coupled plasma asymmetries using Tailored Voltage Waveforms”, **Arnaud Colaitis** (CELIA, FR) for his PhD thesis on a “multiscale description of the Laser-Plasma Interaction, application to the physics of shock ignition in Inertial Confinement Fusion” and **Natasha Jeffrey** (U. Glasgow, UK) for her PhD thesis on the “spatial, spectral and polarization properties of solar flare X-ray sources”.

The **2016 Landau Spitzer Award** is awarded to **John Berkery** (Columbia University, USA), **Steven Sabbagh** (Columbia University,

USA), **Yueqiang Liu** (CCFE, UK), and **Holger Reimerdes** (EPFL, CH) for their “seminal joint research providing key understanding and quantitative verification of global mode stability in experimental high performance tokamak plasmas, based on drift-kinetic MHD theory, and made possible by strong and essential partnership between Europe and the USA”. The panel was composed of Richard Dendy (chair), Stefano Atzeni and Christoph Hollenstein, representing EPS, David Meyerhofer (vice-chaire), Alain Brizard and Jim Hanson, representing APS.

The **2016 EPS/PPCF/IUPAP Poster Prizes** and the **2016 Itoh Project Prize**, sponsored by the Kyushu University (Japan) and supported by IoP, will be awarded during the conference and their recipients announced during the closing session.

The *Beam Plasma & Inertial Fusion* section of the Division will take the opportunity of the conference to announce that the **2016 Edouard Fabre Prize**, for contributions to the physics of laser-driven inertial confinement fusion and laser-produced plasmas, is awarded to **Jérôme Faure** (LOA, FR). The prize is supported by the COST action MP1208.

Finally, the EPS Plasma Physics Board congratulates **Sibylle Günter** (IPP, DE) for the **2015 EPS autumnal Emmy Noether Distinction for Women in Physics** awarded for “her leading role in the study of the effects of microscopic physics on the large-scale behaviour and stability of hot magnetized plasmas in fusion devices. With her solid scientific record, many leadership roles and mentoring of researchers and students, she is a model for women physicists”.

A handwritten signature in black ink, appearing to read 'S. Jacquemot', with a long horizontal line extending to the left.

S. Jacquemot
on behalf of the EPS Plasma Physics Division Board
June 2016