11th CAROLUS MAGNUS SUMMER SCHOOL ON PLASMA AND FUSION ENERGY PHYSICS

August 26 – September 6, 2013

Physikzentrum, Bad Honnef, Germany

Organised by the Trilateral Euregio Cluster (TEC) with its EURATOM associated members

- Forschungszentrum Jülich, Institute of Energy and Climate Research – Plasma Physics (IEK-4), Germany
- LPP-ERM/KMS Laboratory for Plasma Physics, Brussels, Belgium
- SCK•CEN, Mol, Belgium
- FOM Institute DIFFER, Nieuwegein, The Netherlands

Important Dates	
Deadline for application	May 31, 2013
Notification of acceptance	June 14, 2013
Abstracts of posters	August 1, 2013
Arrival at Physikzentrum	August 25, 2013
Start of Summer School	August 26, 2013

The most recent information on the Carolus Magnus Summer School 2013 can be found via this web address: www.carolusmagnus.net/.

11th CAROLUS MAGNUS SUMMER SCHOOL ON PLASMA AND FUSION ENERGY PHYSICS

Together with the FOM Institute DIFFER (Nieuwegein, The Netherlands), the Laboratory for Plasma Physics in the ERM/KMS (Brussels, Belgium) and SCK•CEN (Mol, Belgium), the Institute of Energy and Climate Research – Plasma Physics at Forschungszentrum Jülich, forms the Trilateral Euregio Cluster (TEC). The TEC is responsible for the organisation of the Carolus Magnus Summer Schools taking place every two years. Most lectures will be given by senior physicists from the TEC institutes and by academic staff from nearby universities of North Rhine-Westphalia, Belgium and The Netherlands. A few lectures will also be delivered by experts from other laboratories associated in the European Fusion Research Programme and from ITER.

The 11th Carolus Magnus Summer School will be devoted to the theoretical and experimental aspects of high temperature plasmas confined in toroidal magnetic traps and is relevant to energy production using controlled nuclear fusion. Special emphasis will be laid on tokamaks, but stellarators will also be discussed. With the ITER project now officially being under way, increased attention will be paid to physics addressing this next-step device. The Summer School programme also contains two evening lectures on special subjects.

The Summer School is primarily intended for Ph.D. students and undergraduates in their last year. Experienced scientists who, coming from other disciplines, recently entered the field of plasma physics and fusion will also benefit from the School, which not only provides an overview of the various interconnected research domains but also describes the latest developments in various aspects of fusion research.

The proceedings of the Summer Schools will be published as a Forschungszentrum Jülich Report and will be available online. Participants will receive a printed copy of the proceedings. The slides and corresponding papers of the various lectures will be made available on the Carolus Magnus Summer School's website.

Participants will have the opportunity of presenting and discussing their own work during two special poster sessions, for which they should send one-page abstracts to the conference secretariat before August 1, 2013.

Two excursions will be organized to (i) the Institute of Energy and Climate Research – Plasma Physics at Forschungszentrum Jülich (Germany) hosting the TEXTOR tokamak and the PSI-2 linear device, and (ii) the FOM institute DIFFER in Nieuwegein (The Netherlands) hosting the MAGNUM-PSI linear plasma generator.

ACCOMMODATION AND FEE

The 11th Carolus Magnus Summer School will be held in the 'Physikzentrum', Bad Honnef, Germany. Take a look at the website www.dpg-physik.de/dpg/pbh/ to get an impression of the house. Bad Honnef is a medium sized village with about 25000 inhabitants and offers shops, supermarkets, and all kind of services. The stately mansion housing the Physikzentrum is surrounded by a park at the foot of the Siebengebirge ("the Seven Hills") on the right bank of the Rhine River. Public transport offers convenient access to nearby cities of Bonn (15 km) and Cologne (40 km) with many cultural and scientific attractions.

On the free weekend in between the two-week lecture period, participants can explore the area, enjoy a boat trip on the Rhine, and see historic villages, castles and vineyards. In the immediate neighbourhood an extensive net of hiking-paths in the Germany's oldest nature preserve invites pleasant short or long walks. The upper middle Rhine valley south of the city of Koblenz is a UNESCO world heritage area. Nearby to the north are cities of Bonn and Cologne which offer many museums and historical buildings (e.g. Cologne cathedral).

The fee, including accommodation in shared twin rooms on site, meals and proceedings amounts to 850 Euro. Participants should arrive at the Physikzentrum on Sunday, 25th August. During the weekend of August 31st and September 1st no meals will be provided. Limited support to students from non-EU countries will be discussed on request on a case-to-case basis. As the Carolus Magnus Summer School is a non-profit organization, the extent of the support we can give depends on the sponsoring we get. All applications for funding should be accompanied by a recommendation of the scientific supervisor.

The deadline for registration is May 31, 2013. The acknowledgement of receipt will be sent within a week after the application is received. In the case of electronic registration an email confirming the receipt is sent to the applicants immediately. Attendance is limited to approximately 60 students and early application is recommended. Applicants will be notified about their acceptance by June 14, 2013. Practical information will be made available to successful candidates approximately one month before the Summer School begins.

PROGRAMME

Introduction

- Energy resources and reactor safety
- Thermonuclear burn criteria

Confinement concepts

- Magnetic fields and plasmas
- Guiding centre motion
- Tokamaks
- Stellarators
- Plasma equilibrium in tokamaks
- Operational limits

Theoretical description of plasmas

- Kinetic and gyro-kinetic description
- Macroscopic description

Waves and instabilities

- Wave propagation and absorption in confined plasmas
- Ideal and resistive MHD instabilities
- Micro-instabilities

Plasma heating and current drive

- Neutral beam injection
- Wave heating (ECRH, ICRH)
- Current drive (ECRH, ICRH, Lower Hybrid, NBI)

Transport in tokamaks

- Classical, neoclassical and anomalous transport
- Fluctuations in tokamaks
- Degraded and improved confinement
- Transport codes

Diagnostics

- Microwave, optical and spectroscopic diagnostics for the plasma core and edge, equilibrium and fluctuations

Edge plasma physics

- Plasma-wall interaction and wall conditioning
- Ash removal, recycling
- Radiation phenomena at the edge and in the divertor
- Divertor concepts
- Materials for the first wall

Present status of fusion

- Overview of tokamak results
- Scaling and extrapolation to reactors
- ITER

LIST OF LECTURERS

IEK, Forschungszentrum Jülich

S. Brezinsek
H. R. Koslowski
A. Krämer-Flecken
A. Kirschner
J. Linke
D. Reiser
D. Reiter
U. Samm
O. Schmitz
M. Z. Tokar
B. Unterberg

LPP-ERM/KMS, Brussels

P. Dumortier
E. Lerche
J. Ongena
D. Van Eester
M. Van Schoor
M. Vergote

SCK•CEN, Mol

V. Massault
I. Uytdenhouwen

FOM Institute DIFFER, Nieuwegein

H. J. de Blank
M. de Baar
A. J. H. Donné
G. M. D. Hogeweij
G. Van Rooij
E. Westerhof

Others

D. Hartmann (Max-Planck-Institut für Plasmaphysik, Greifswald)
P. Helander (Max-Planck-Institut für Plasmaphysik, Greifswald)
R. Jaspers (Technische Universiteit Eindhoven)
V. Kiptily (CCFE, Culham)
S. Lisgo (ITER, Cadarache)
M. Rubel (KTH, Stockholm)
S. Sharapov (CCFE, Culham)
G. Van Oost (Universiteit Gent)
B. Weyssow (Université Libre de Bruxelles)
H. R. Wilson (University of York)
R. Wolf (Max-Planck-Institut für Plasmaphysik, Greifswald)

Special Evening Lectures

G. M. W. Kroesen (Technische Universiteit Eindhoven)
T. Klinger (Max-Planck-Institut für Plasmaphysik, Greifswald)

APPLICATION

Preferably, please apply electronically via our web server
www.carolusmagnus.net/registration

Otherwise, please return this form to the address overleaf.

First name:	
Last name:	
Title:	
Affiliation:	
Department:	
Street / P.O.Box:	
Zip code:	
City:	
Country:	
Email:	
Phone:	
Fax:	

Your present level:

- □ graduated bachelor, preparing a master's degree or equivalent
- □ graduated master or equivalent, preparing a PhD
- □ post doc
- □ other, please specify: ………..............................……………………..........................……..

□ I intend to present a poster contribution entitled:

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Accommodation and fee: 850 EUR

Applicants will be informed about their acceptance by June 14, 2013. The fee includes accommodation, meals and proceedings. During the weekend of August 31st and September 1st no meals will be provided.

Participants who require a visa should contact the scientific secretary of the meeting (email address given on next page).

ORGANISATION

The 11th Carolus Magnus Summer School on Plasma and Fusion Energy Physics is organized by the partners in the Trilateral Euregio Cluster (TEC):

Association EURATOM – Forschungszentrum Jülich GmbH
Forschungszentrum Jülich GmbH
Institute of Energy and Climate Research – Plasma Physics (IEK-4)
52425 Jülich, GERMANY

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1000 Brussels, BELGIUM

SCK•CEN
The Belgian Nuclear Research Centre
Boeretang 200
2400 MOL, BELGIUM

Association EURATOM – FOM
FOM Institute DIFFER
P.O. Box 1207
3430 BE Nieuwegein, THE NETHERLANDS

Programme Committee

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All correspondence should be directed to the scientific secretary:

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