European Summer School

"Low Temperature Plasma Physics: Basics and Applications"

October 8 – 13, 2011
and

"Master Class: Plasma Coatings on Polymers"

October 13 – 15, 2011

Physikzentrum Bad Honnef

Chairmen: Prof. J. Winter, Dr. M. Böke (Ruhr-Universität Bochum)
Prof. M.C.M. van de Sanden, Dr. R. Engeln (TU Eindhoven)

Organization: V.M. Scharf (Ruhr-Universität Bochum)

Webpage: www.plasma-school.org

CPS CENTRUM VOOR PLASMAFYSICA EN STRALINGSTECHNOLOGIE

Arbeitsgemeinschaft PLASMAPHYSIK

RUHR-UNIVERSITÄT BOCHUM

CENTER OF EXCELLENCE RUHR-UNIVERSITY BOCHUM PLASMA SCIENCE AND TECHNOLOGY

Scope of the Course

1. The level of the course.

The level of the course is aimed at *Ph.D.-students in first year* and *Diploma- and M.-Sc.-students in last year.*

2. The aim of the course.

The aim of the course is to make the students become acquainted with the present status of the field of low temperature plasma physics. It is assumed that the students have followed introductory physics courses in their home university. However, the basic principles will be summarized at the beginning of the course. The course offers a broadening of knowledge in plasma physics and in the interaction of plasmas with surfaces including a description of advanced diagnostics. In addition, the students will be able to interact with the teachers of the course and they will meet fellow-students from other universities in Europe and the rest of the world. Participants are invited to bring with them presentation material in form of posters.

3. All lectures and discussions are in English.

4. Well-known experts in the field will present lectures in the following areas:

- fundamentals of plasma physics,
- plasma sources,
- thermal and low pressure plasmas,
- atomic processes,
- electron kinetics,
- diagnostics and plasma spectroscopy,
- modelling,
- plasma-surface interactions,
- etc...

Please notice:

Breakfast, lunch and dinner:

Breakfast, lunch and dinner are organized by the Physikzentrum. Please notice that every meal starts punctually.

Breakfast: 7.30-8:30 hours
lunch: 12.15 hours,
dinner: 19.00 hours.

Invited speakers and some other participants will also stay overnight in hotel Seminaris and have breakfast in the same hotel. All other meals (and drinks!) will be available at the Physikzentrum – the School location.

On Monday evening there will be the Summer School dinner.

Beverages are not included in the course fee, except for the drinks during the Summer School dinner. After putting your name on a list, you may take beverages out of the refrigerators. **We kindly ask you to pay** the total amount for your beverages at the office of the Physikzentrum (room #1) **before you leave Bad Honnef.**

Lecture Notes

The lecture notes are meant to give support to the students attending the course. Hence the distribution is restricted to the students attending the course and reproduction of (part of) the lecture notes is not permitted without permission of the authors.

Poster session

The poster session will take place on Monday evening on the ground floor. The participants who present posters are kindly asked to display their posters during the whole course.

Entrance Physikzentrum

To enter the Physikzentrum, please use the door code (phone-like keyboard on the right hand side of the main entrance) for entering the Physikzentrum in Bad Honnef. This code is valid during the whole School. **The code is : C2010. "**C" stands for "clear" and is a reset in a case of a previous error

Program of the School 2011

Saturday, Oct. 8: **Arrival/Registration from 17.00 - 21.00 (Dinner included)**

Sunday, Oct. 9:

08.30-08.45	Welcome and introduction (Plot of the School, Plasma Science)
08.45-10.15	Introduction into Plasma Physics
10.30-12.00	Fundamentals of Gas Discharges I *(M.A. Lieberman, Berkeley)*
14.00-15.30	Fundamentals of Gas Discharges II *(M.A. Lieberman, Berkeley)*
16.00-17.30	Fundamentals of Gas Discharges III *(M.A. Lieberman, Berkeley)*
20.00-21.30	Poster Session

Monday, Oct. 10:

08.30-10.00	Plasma Diagn. I: Measuring the Electron Density and Ion Flux *(N.St.J. Braithwaite, Milton Keynes)*
10.30-12.00	Plasma Diagnostics II: Basics of Plasma Spectroscopy *(V. Schulz-von der Gathen, Bochum)*
14.00-15.30	Modelling of plasmas *(A. Bogaerts, Antwerp)*
16.00-17.30	High Pressure Thermal Plasmas and Sources *(A. Murphy, Lindfield)*
19.00	Summer School Dinner

Tuesday, Oct. 11:

08.30-10.00	Electron Kinetics in Atomic and Molecular Plasmas *(L.L. Alves, Lisbon)*
10.30-12.00	Fluid Modeling of Discharge Plasmas *(L.L. Alves, Lisbon)*
Afternoon	**Outing**

Evening: Practical Course: Let's play with a Boltzmann Solver (L.L. Alves)

Wednesday, Oct. 12:

08.30-10.00	Corona and Barrier discharges *(F. Massines, Perpignan)*
10.15-12.15	Capacitively and Inductively Coupled Discharges *(U. Czarnetzki, Bochum)*
14:00-15:30	Magnetron Sputtering (D. Music, Aachen)
16:00-17:30	Physics of Microplasmas (*P. Bruggeman, Eindhoven)*
19:00	Dinner
20.00-21.30	Evening Lecture: Plasmas in Hollywood *(A. von Keudell, Bochum)* (a popular evening lecture with plasmas in movies)

Thursday, Oct. 13:

08.30-10.00	Plasma Diagnostics III: Advanced optical diagnostics *(N. Sadeghi, Grenoble)*
10.30-12.00	Dusty Plasmas *(L. Boufendi, Orléans)*
14.00-15.30	Plasma-Surface Interaction: Diagnostics (*J. Benedikt, Bochum*)

Program of the Master Class 2011 - Plasma Coatings on Polymers

Thursday, Oct. 13: Arrival/Registration from 17.00 - 21.00 (Dinner included)

Friday, Oct. 14:

08.30-08.45	Welcome and introduction (Plot of the School, Plasma Science)
08.45-10.15	The Physics and Chemistry of Plasma-Coatings on Polymers *(M. Wertheimer, Montreal)*
10.30-12.00	Barrier Coatings *(P. Awakowicz, Bochum)*
14.00-15.30	Methods For Processing Super Barrier Films For Organic Electronics *(S. Graham, Atlanta)*
16.00-17.30	Plasma coated polymers in the packaging industry *(H.-Chr. Langowski, Freising)*

Saturday, Oct. 15:

08.30-10.00	Silicon based coatings on polymers using dielectric barrier discharge at atmospheric pressure *(N. Gherardi, Toulouse)*
10.30-12.00	(In)organic thin films: deposition techniques, growth mechanisms and moisture permeation barrier properties *(A. Creatore, Eindhoven)*
14.00-15.30	Interactions of the coating plasma with the substrate *(R. Förch, Mainz)*