European Summer School

"Low Temperature Plasma Physics: Basics and Applications"

and

"Master Class: Physics and Technology of Plasma-enhanced PVD Methods"

Physikzentrum Bad Honnef

Chairman: Prof. Dr. J. Winter, Bochum
Co-Chairman: Prof. Dr. M.C.M. van de Sanden, Eindhoven

Organization: Dr. M. Böke / Dr. R. Engeln / P. Burkhardt

Support:

Arbeitsgemeinschaft PLASMAPHYSIK

CPS CENTRUM VOOR PLASMAFYSICA EN STRALINGSTECHNOLOGIE

RUB BOCHVM · RVHR-VNIVERSITAT

CENTER OF EXCELLENCE RUHR-UNIVERSITY BOCHUM PLASMA SCIENCE AND TECHNOLOGY

Graduiertenkolleg GK1051 ***Sonderforschungsbereich SFB591***

Scope of the Course and Master Class

The level of the course is aimed at:

Ph.D.-students in first year

Diploma- and M.-Sc.-students in last year

The aim of the course is to make the students become acquainted with the up-to-date 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 during the Course and the Master Class. During the course a special session will be devoted to presentations of the students to encourage interaction. Participants are invited to bring with them presentation material in form of posters.

All lectures and discussions are in English.

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...

During the **Master Class** the topic of **Physics and Technology of Plasma-enhanced PVD Methods** will be discussed at a level of forefront research.

Please Notify:

Lecture Notes:

The lecture notes are meant to give support to the students attending the course. Additional notes and the presentations will be also made available after the school through the website of the school (www.plasma-school.org).

Hence, the distribution is restricted to the students attending the course and reproduction of the notes or parts of the notes is not permitted without permission of the authors.

Program of the School 2007

Saturday, Oct. 6: **Arrival/Registration from 17.00 - 21.00 (Dinner included)**

Sunday, Oct. 7:

08.30-09.30	Welcome and introduction (Plot of the School, Plasma Science)
09.30-10.45	Introduction into Plasma Physics *(R. Engeln, TU Eindhoven)*
11.00-12.00	Fundamentals of Gas Discharges I *(M.A. Lieberman, U of California, Berkeley)*
14.00-15.30	Fundamentals of Gas Discharges II *(M.A. Lieberman, U of California, Berkeley)*
16.00-17.30	Fundamentals of Gas Discharges III *(M.A. Lieberman, U of California, Berkeley)*
19.00-21.30	Poster Session

Monday, Oct. 8:

08.30-10.00	Plasma diagnostics I: Measuring the Electron Density and Ion Flux *(N.St.J. Braithwaite, The Open University Oxford)*
10.30-12.00	Capacitively and Inductively Coupled Discharges (U. Czarnetzki, CPST Bochum)
14.00-15.30	Microwave Generated Plasmas *(J. Berndt, CPST Bochum)*
16.00-17.30	Plasma Diagnostics II: Basics of Plasma Spectroscopy *(M.C.M. van de Sanden, TU Eindhoven)*
17.30-18.00	Summary and case studies
19.00	Summer School Dinner

Tuesday, Oct. 9:

08.30-11.00	High Pressure Thermal Plasmas and Sources *(J. Heberlein, U Minnesota)*
10.15-12.45	Electron Kinetics in Atomic and Molecular Plasmas I *(L.L. Alves, IST Lisbon)*
Afternoon	**Outing**

Wednesday, Oct. 10:

08.30-10.00	Plasma Diagnostics III: Advanced Optical Diagnostics) *(N. Sadeghi, Grenoble)*
10.30-12.00	Electron Kinetics in Atomic and Molecular Plasmas I I Fluid Modeling of Plasma Discharges *(L.L. Alves, IST Lisbon)*
14:00-15:30	Lamps *(M. Born, Philips Research Technology Lab, Aachen)*
16:00-17:30	Plasma Diagnostics IV: Molecules and Radicals *(R. Engeln, TU Eindhoven)*
17.30-18.00	Summary and case studies
20.00-21.30	Evening Lecture: Plasmas in Hollywood *(A. von Keudell, CPST Bochum)* (a popular evening lecture with plasmas in movies)

Thursday, Oct. 11:

08.30-10.00	Dusty Plasmas *(L. Boufendi, GREMI Orleans)*
10.30-12.00	Corona & Barrier Discharges (U. Kogelschatz, Hausen)
14.00-15.30	Modelling of Low Temperature Plasmas: Global Models *(R.P. Brinkmann, CPST Bochum)*
16.00-17.30	Plasma-Surface Interaction: Diagnostics (*A. von Keudell, CPST Bochum*)

Master Class "Physics and Technology of Plasma-enhanced PVD Methods"

Friday, Oct. 12:

08.30-10.00	Introduction to Magnetron Sputtering *(A. Bogaerts, U Antwerp)*
10.30-12.00	Plasma-target interaction in reactive magnetron sputtering *(W. Möller, FZ Rossendorf)*
14.00-15.30	HI-PIMS *(R. Cremer, CemeCon AG)*
16.30-18.00	Interface Engineering with Hi-PIMS *(A. Ehiasarian, Sheffield Hallam University)*

Saturday, Oct.13:

08.30-10.00	Laser based diagnostics of magnetron sputtering processes *(K. Sasaki, PLANT Nagoya)*
10.30-12.00	Designing Materials by PEPVD Methods *(P. Immich, RWTH Aachen)*