

19TH EUREGIONAL WELTPP

Workshop on the Exploration of Low Temperature Plasma Physics



December 1 and 2, 2016

"Rolduc"

Kerkrade, the Netherlands

Jointly sponsored and organized by

**RUHR
UNIVERSITÄT
BOCHUM**

RUB

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Technische Universiteit
Eindhoven
University of Technology

RESEARCH DEPARTMENT
Plasmas with Complex Interactions

UNIVERSITY *of York*

 **SFB-TR 87**

 **DIFFER**
Dutch Institute for
Fundamental Energy Research

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Workshop on the Exploration of Low Temperature Plasma Physics

Welcome to the 19th *Workshop on the Exploration of Low Temperature Plasma Physics* (WELTPP-19). This workshop is intended for active scientists working in the field of low temperature plasma physics.

The aim of this workshop is to create a forum for young low temperature plasma scientists, that is graduate students and postdoctoral researchers, to meet, learn from each other, exchange knowledge, present results and establish new contacts. The emphasis is on the presentation of the work of the people new in this field.

The workshop is sponsored and organized by the Research Department "Plasmas with complex interactions" of the Ruhr-Universität Bochum, SFB-TR 87, and the Eindhoven University of Technology, more precisely by the groups Plasma and Materials Processing (PMP) and Elementary Processes in Gas Discharges (EPG) in close collaboration with the Dutch Institute for Fundamental Energy Research (DIFFER) and the York Plasma Institute. This year WELTPP-19 is also kindly supported by Ocean Optics B.V.

We wish you a fruitful and pleasant conference.

Organizing committee:

Jan van Dijk (Eindhoven University of Technology)
Richard Engeln (Eindhoven University of Technology)
Jeanne Loonen (Eindhoven University of Technology)
Jan Trieschmann (Ruhr-Universität Bochum)
Erik Wagenaars (York Plasma Institute)
Stefan Welzel (FOM Institute DIFFER)



Oral presentations

Programme WELTPP at Rolduc, 1 & 2 December, 2016

Thursday, December 1st

10.30 **Registration (coffee/tea in the Foyer)**
10.50 **Opening**

Session 1 **Plasmadiagnostics** (Conference room 4)
11.00-11.20 O1 **Substrate biasing during plasma-enhanced atomic layer deposition:
On the role of ion energy control on planar and 3D substrates**
T. Faraz (Eindhoven University of Technology)
11.20-11.40 O2 **Investigating the maximum yields and energy efficiencies of
atmospheric pressure radio-frequency plasmas for the conversion
of CO₂ into CO**
A.P.S. Foote (York Plasma Institute)
11.40-12.00 O3 **Obtaining vibrational temperatures from the pure rotational
Raman spectrum in a CO₂ plasma**
D.C.M. van den Bekerom (DIFFER)
12.00-12.20 O4 **Ion dynamics in extreme ultraviolet induced hydrogen plasmas**
T.H.M. van de Ven (Eindhoven University of Technology)

12.30 **Lunch in the “Grote Eetzaal”**

Session 2 **Plasma Probes** (Conference room 4)
14.00-14.20 O5 **Planar multipole resonance probe: A functional analytic approach**
M. Friedrichs (Leuphana University Lüneburg)
14.20-14.40 O6 **A simple and practical expression for the resonance frequencies
of curling probe**
A. Arshadi (Ruhr-Universität Bochum)
14.40-15.00 O7 **Kinetic investigation of ideal multipole resonance probe**
J. Gong (Ruhr-Universität Bochum)

15.00-15.30 **Coffee/Tea in the Foyer**

15.30-17.30 **Poster session** (Conference room 2)
Poster numbers P1 – P14 can be posted from 12:00 hrs.

Session 3 **Invited** (Conference room 4)
18.00-19.00 O8 **Simulating fast pulsed discharges: The basics, the present and the future**
J. Teunissen (KU Leuven)

19.30 **Dinner in “De Verloren Zoon”**

From 21.00 the bar in “De Verloren Zoon” will be open.



Friday, December 2nd

08.00 **Breakfast in the “Grote Eetzaal”**

Please return your room key to the reception before attending Session 4!

Session 4	Modelling	(Conference room 4)
09.00-09.20	O9	Theoretical investigation of power balance of a miniature microwave ICP-plasmajet M. Klute (Ruhr-Universität Bochum)
09.20-09.40	O10	Simplifying plasma chemistry from intrinsic low dimensional manifold method T. Rehman (Eindhoven University of Technology)
09.40-10.00	O11	Capacitive radio frequency magnetron discharges: A global model D. Engel (Ruhr-Universität Bochum)
10.00-10.20	O12	The characteristics of RF modulated plasma boundary sheaths: An analysis of the standard sheath model S. Naggary (Ruhr-Universität Bochum)

10.30 **Coffee/Tea in the Foyer**

11.00-12.30 **Poster session** (Conference room 2)
All poster numbers greater than P14 can be posted

12.30 **Lunch in the “Grote Eetzaal”**

Session 5	Plasma-Surface-Interaction	(Conference room 4)
14.00-14.20	O13	The effect of UV/VUV radiation from oxygen, hydrogen and argon plasmas on the adhesion of organosilicon coatings on polypropylen M. Jaritz (RWTH Aachen)
14.20-14.40	O14	Phase and stoichiometry controlled copper oxide thin film using plasma enhanced pulsed laser deposition S. Rajendiran (York Plasma Institute)
14.40-15.00	O15	Modelling deposition removal from fusion optics D. Shaw (York Plasma Institute)

15.05 **Closure of the workshop**





Poster presentations

Thursday, December 1st

- P1: **Characterization of a newly developed electrode configuration for air purification**
V. Bracht, *Ruhr University Bochum, Germany*
- P2: **Ionic wind produced by corona discharge and its simulation**
She Chen *Eindhoven University of Technology,*
- P3: **Spark OES**
S. Dijcks *Eindhoven University of Technology,*
- P4: **Comparison of Langmuir-probe and multipole resonance probe measurements in argon, hydrogen, nitrogen and oxygen mixtures in a double ICP discharge**
M. Fiebrandt, *Ruhr University Bochum,*
- P5: **Electron and neutral temperature measurements in CO₂ and N₂/O₂ microwave plasmas by Thomson and Raman scattering**
N. Gatti *Universita' di Trento*
- P6: **Characterization of a spark discharge of spark plugs by spectral line broadening**
S. Groeger, *Ruhr University Bochum, Germany*
- P7: **Volcanic lightning: the violent side of tribo-electricity**
L.C.J. Heijmans *Eindhoven University of Technology*
- P8: **Determination of metastable (¹s₅, ¹s₃) and resonant (¹s₄, ¹s₂) densities from emission spectra of argon with hydrogen, oxygen and nitrogen in a double ICP**
B. Hillebrand, *Ruhr University Bochum*
- P9: **Spectroscopic measurement of the electric field in a helium plasma jet**
M. Hofmans *Eindhoven University of Technology,*
- P10: **The effect of resonant Ar-lines on metastable densities**
J.F.J. Janssen *Eindhoven University of Technology*
- P11: **Introduction of an iterative model for determining the coupling between the multipole resonance probe and the plasma**
J. Kaiser *Ruhr University Bochum*
- P12: **Characterisation of a dielectric barrier discharge in controlled atmosphere**
F. Kogelheide *Ruhr University Bochum*
- P13: **Atmospheric-pressure dual frequency diffuse dielectric barrier discharge for thin film deposition**
Y. Liu *Dutch Institute for Fundamental Energy Research*
- P14: **Time resolved optical emission spectroscopic investigation of a pulsed CO₂ microwave discharge**
T. Verreycken *Dutch Institute for Fundamental Energy*

Friday, December 2nd

- P15: **Going for a spin; Levitating dust particles in an RF-discharge**
P. Meijaard Eindhoven University of Technology
- P16: **Charging and shielding of particles in plasma afterglow: first results**
B. van Minderhout Eindhoven University of Technology
- P17: **Plasma pretreatment of polypropylene and its effect on defect formation and chemical structure of Silicon Oxide barrier films**
F. Mitschker Ruhr-University Bochum
- P18: **A global PLASIMO model for H₂O chemistry**
S. Tadayon Mousavi Eindhoven University of Technology
- P19: **Electric field and charge measurements in helium plasma bullets**
T. Y. N. Nguyen Eindhoven University of Technology,
- P20: **Characterisation of a twin dielectric barrier surface discharge using defined gas mixtures**
B. Offerhaus Ruhr University Bochum
- P21: **Hydrogen peroxide measurements in an atmospheric pressure plasma**
F. Riedel York Plasma Institute, University of York
- P22: **Analysis of kinetic damping in the spectrum of the impedance probe by means of a block-based LU decomposition**
J. H. Röhl Leuphana University Lüneburg
- P23: **Start-up of a pulsed plasma jet: formation of plasma bullets in He, Ar and N₂**
M. van der Schans Eindhoven University of Technology
- P24: **0-dimensional model of atmospheric smd discharge and afterglow in humid air**
R. T. Smith Ruhr Universität Bochum
- P25: **TALIF on CO for discharges used for solar fuel production**
P.D. Machura Eindhoven University of Technology,
- P26: **Obtaining the thickness from linearized sheath model**
F. Voigt Ruhr-University Bochum
- P27: **Nonlinear Interaction between Plasma Sheath and Bulk in Asymmetric CCRF Discharges**
S. Wilczek Ruhr University Bochum
- P28: **Effect of flow dynamics on CO₂ dissociation in a microwave plasma**
A.J. Wolf Dutch Institute for Fundamental Energy Research