

# Micro-plasmas at atmospheric pressure

---

*2-day micro-plasma workshop, December 10<sup>th</sup> & 11<sup>th</sup> 2014, Eindhoven*



## Promotional

Area-selective surface modification by atmospheric pressure micro-plasmas allows cost-effective surface energy tailoring for semiconductor and inkjet industries, as well as chemical functionalization, e.g. to be implemented in biosensor and tissue engineering applications.

During this micro-plasma workshop leaders of companies in these industries are matched with scientific experts in these fields to discuss on the application of the different micro-plasma techniques.

Direct steps for the application of micro-plasmas in industry will be taken in dedicated networking and discussion sessions, where R&D consortia may be formed.

Topics covered:

- Micro-plasma ignition (both small scale on-demand and large-scale roll-to-roll)
- Surface energy tailoring for semiconductor, MEMS, and inkjet applications
- Local adhesion improvement for area selective metallization
- Micro-fluidic channels and biosensing
- Specific chemical functionalization and tissue engineering

Who should attend:

- CEO/CTO , Technical manager , Project Leader R&D , Senior Researcher
- Professor , Group Leader , Post-Doc Researcher , PhD Student

Reasons to attend:

- High-level research scientists share their knowledge about cutting-edge micro-plasma techniques
- Discussion and exploration on micro-plasma applications
- Parallel demonstration sessions to familiarize with new surface modification and analysis techniques
- Dedicated network sessions for the formation of application oriented R&D consortia

## Workshop program

### Day 1 (December 10<sup>th</sup>) – Wettability and adhesion

#### Micro-plasmas to improve the localized surface adhesion/wettability of polymers and semiconductors in inkjet-, MEMS and printed electronics industry.

09.00u – 09.15u	Welcome
09.15u – 09.45u	Dr. Michael Thomas Fraunhofer-Institut für Schicht- und Oberflächentechnik IST, Braunschweig, Germany <i>'DBD based micro-plasmas – overview and applications'</i>
09.45u – 10.15u	Dr. Adriana Creatore Plasma and Materials Processing, Department of Applied Physics, Eindhoven University of Technology, Eindhoven, The Netherlands <i>'Potential of micro-plasmas for energy related technologies'</i>
10.15u – 10.45u	Break
10.45u – 11.15u	Dr. Ir. Alquin Stevens InnoPhysics B.V., Eindhoven, The Netherlands <i>'μPlasmaPrint: digital- and on-demand micro-plasmas'</i>
11.15u – 11.45u	Ir. Tom Huiskamp Electrical Energy systems, Department of Electrical Engineering, Eindhoven University of Technology, Eindhoven, The Netherlands <i>'μPlasmaPrint Throughput Enhancement by Pulsed Power Technology'</i>
11.45u – 12.15u	Dr. Ir. Hans Mulders FEI company, Eindhoven, The Netherlands <i>'A new, in-situ micro-plasma source for local surface modification'</i>
12.15u – 13.15u	Lunch

- 13.15u – 13.45u Ayat Soltani  
Department of Electronics and Communication Engineering,  
Tampere University of Technology, Tampere, Finland  
*'Application of micro-plasma in micro-electronic packaging'*
- 13.45u – 14.15u Dr. Ir. Jan van Dijk  
Elementary Processes in Gas Discharges, Department of Applied Physics,  
Eindhoven University of Technology, Eindhoven, The Netherlands  
*'Challenges in Modelling Micro-plasmas'*
- 14.15u – 14.45u Daniel Scholz  
DataPhysics Instruments GmbH, Filderstadt, Germany  
*'Understanding interfaces'*
- 14.45u – 15.15u Break
- 15.15u – 15.45u Dr. Ir. Martijn van Dongen  
Expertise Centre Thin Films & Functional Materials, Fontys  
University of Applied Sciences, Eindhoven, The Netherlands  
*' $\mu$ Plasma patterning to enhance localized wetting and mixing behavior'*
- 15.45u – 16.15u Dr. Ernst-Rudolf Weidlich  
GRT GmbH&Co.KG, Hamm, Germany  
*'Structured R2R plasma printing at atmosphere'*
- 16-15u - 16.30u Dr. Ir. Christian Berendsen  
Mesoscopic Transport Phenomena, Department of Applied Physics,  
Eindhoven University of Technology, Eindhoven, The Netherlands  
*'Redistribution of thin liquid films induced by atmospheric-pressure plasma jets – a possible diagnostic tool?'*
- 16.30u – 17.00u Break-out session: Application oriented R&D consortia 1  
*Can we pre-specify the call and the subject under discussion?  
Who will lead this discussion?*
- 17.00u – 17.30u Break-out session: Application oriented R&D consortia 2  
*Can we pre-specify the call and the subject under discussion?  
Who will lead this discussion?*
- 18.00u – Dinner & Evening program

## Day 2 (December 11<sup>th</sup>) – Biomedical and biochemical applications

### Micro-plasmas for surface functionalization of micro-arrays and scaffolds

09.00u – 09.15u	Welcome
09.15u – 09.45u	Prof. Dr. Achim von Keudell Research Department Plasmas with Complex Interactions, Ruhr University Bochum, Bochum, Germany <i>"Unraveling the reaction chemistry in atmospheric pressure micro-plasma jets"</i>
09.45u – 10.15u	Prof. Dr. Ir. Nathalie de Geyter Research Unit Plasma Technology, Department of Applied Physics, Faculty of Engineering, Ghent University, Ghent, Belgium <i>'The use of non-thermal plasma technology at medium and atmospheric pressure for biomedical applications'</i>
10.15u – 10.45u	Break
10.45u – 11.15u	Dr. Kristina Lachmann Fraunhofer-Institut für Schicht- und Oberflächentechnik IST, Braunschweig, Germany <i>'Surfaces with area-selective functionality for biomedical applications'</i>
11.15u – 11.45u	Prof. Dr. Carlijn Bouten Soft Tissue Biomechanics & Tissue Engineering, Department of Biomedical Engineering, Eindhoven University of Technology, Eindhoven, The Netherlands <i>'Scaffold functionalization to control cell differentiation and tissue organization'</i>
11.45u – 12.15u	Dr. Aart van Amerongen Wageningen University & Research centre <i>'The added value of micro-plasma printing in diagnostics'</i>
12.15u – 13.15u	Lunch

13.15u – 13.45	<p>Dr. Wilfried Weigel  Scienion A.G., Berlin, Germany  <i>'Biofunctionalization as Key Step for  Array-based and Biosensor Applications'</i></p>
13.45u – 14.15u	<p>Dr. Ir. Mark Olde Riekerink  Micronit Microfluidics B.V.  <i>'Micro-fluidic flow control by capillary force only'</i></p>
14.15u – 14.45u	<p>Dr. Lorenzo Moroni  1. Tissue Regeneration department, University of Twente,  Enschede, The Netherlands  2. MERLN Institute for Technology Inspired Regenerative  Medicine, Complex Tissue Regeneration department,  Maastricht University, Maastricht, The Netherlands  <i>'Gas plasma technology: a tool to change the physicochemical  properties of biomaterials for tissue engineering and  regenerative medicine'</i></p>
14.45u – 15.15u	Break
15.15u – 15.45u	<p>Prof. Dr. Ir. Pascal Jonkheijm  Molecular NanoFabrication Group, MESA+ Institute for  Nanotechnology, University of Twente, Enschede, The Netherlands  <i>'Multiprint and Micro-well chips'</i></p>
15.45u – 16.15u	<p>Dr. Thomas Willers  KRÜSS GmbH, Hamburg, Germany  <i>'Contact angle measurement and surface free energy  determination: basic concept, application examples and recent  advances in experimental techniques'</i></p>
16.30u – 17.00u	<p>Break-out session: Application oriented R&amp;D consortia 1  <i>Can we pre-specify the call and the subject under discussion?  Who will lead this discussion?</i></p>
17.00u – 17.30u	<p>Break-out session: Application oriented R&amp;D consortia 2  <i>Can we pre-specify the call and the subject under discussion?  Who will lead this discussion?</i></p>
17.30u –	Closing & Drinks

## Evening program December 10<sup>th</sup>

### 18.00u – Dinner at 'Meneer Frits' (Muziekgebouw Frits Philips Eindhoven)

Two- or three-course monthly changing dinner

### 20.15u – Muziekgebouw Frits Philips Eindhoven – Fado singer Carminho

Carminho is a Portuguese fado singer who made her smash hit solo album debut in 2009 with Fado. Born Carmo Rebelo de Andrade and hailing from Lisbon, she is the daughter of fado singer Teresa Siqueira. She cites influences that include fado legends Lucília do Carmo, Fernando Maurício, and Amália Rodrigues as well as pop/rock legends Queen and the Beatles. Carminho made her recording debut in 2003 on Saudades do Fado: Tertúlia de Fado Tradicional, a collaborative album produced by guitarist Luis Penedo on which she is featured as a vocalist. Critically acclaimed, she won the Prémio Amália Revelação award in 2005 and was later featured prominently in the Carlos Saura film Fados (2007). Carminho debuted with Fado (on EMI) at the relatively young age of 25. Produced by Diogo Clemente, the album features musical backing by an all-star group of Portuguese musicians including Ricardo Rocha, José Manuel Neto, Bernardo Couto, Ângelo Freire, Marino de Freitas, and Carlos Barretto. Critically acclaimed as well as commercially successful, Fado reached number two on the Portuguese albums chart and spent a few weeks in the Top Five. Two songs were released as promotional singles, "Escrevi o Teu Nome No Vento" and "A Bia da Mouraria."



## Scientific Committee

Prof. Dr. Ir. Gerrit Kroesen	Elementary Processes in Gas Discharges, Department of Applied Physics, Eindhoven University of Technology, Eindhoven, The Netherlands
Dr. Jan Bernards	Expertise Centre Thin Films & Functional Materials, Fontys University of Applied Sciences, Eindhoven, The Netherlands
Dr. Frank de Jong	FEI company, Eindhoven, The Netherlands
Prof. Dr. Claus-Peter Klages	1. Fraunhofer-Institut für Schicht- und Oberflächentechnik IST, Braunschweig, Germany 2. Institut für Oberflächentechnik (IOT), Technische Universität Braunschweig, Braunschweig, Germany
Prof. Dr. Ir. Pascal Jonkheijm	Molecular NanoFabrication Group, MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands
Prof. Rino Morent	Research Unit Plasma Technology, Department of Applied Physics, Faculty of Engineering, Ghent University, Ghent, Belgium
Dr. Aart van Amerongen	Biomolecular Sensing & Diagnostics, Wageningen University and Research Centre, Wageningen, The Netherlands
Prof. Dr. Carlijn Bouten	Soft Tissue Biomechanics & Tissue Engineering, Department of Biomedical Engineering, Eindhoven University of Technology, Eindhoven, The Netherlands
Dr. Wilfried Weigel	Scienion A.G., Berlin, Germany