

# Monday's Workshop Topics

**AM1 (9-12:30): Scientific paper writing workshop:**

Professional writing coach outlines successful strategies for journal manuscripts, reports, review papers.

**AM2 (2-5:30): Linking theory and experiment:**

Model validation by experiments. Combining diagnostic data with simulation and modeling for more confident understanding of processes.

**BM1 (9-12:30): Linking academia and industry:**

Characterization and diagnosis of plasma under manufacturing conditions. Lessons learned in navigating industry-supported research in academia.

**BM2 (2-5:30): Practical challenges for industry:**

Use of sensors with artificial intelligence; challenges in processing, atomic layer deposition, HiPIMS, processing, etching.

# Scientific Paper Writing Workshop

This new workshop theme, led by Dr. Bodil Holst, Professor, Head of Nanophysics Group, University of Bergen, will start at 9am, last 3.5 hours, and involve contributing and examining writing samples. Enrollment is \$50 per person.

The Scientific Paper Writing Workshop has two main goals. Firstly, to provide the participants with a set of “tools” helping them to present their scientific results in a clear and interesting way and, secondly, to make them aware of various strategic issues connected to paper writing (in which journal to publish, cover letter to the editor, etc.). The workshop is presented in English. The participants are encouraged to bring drafts of own papers, in particular an abstract for at least one paper, but this is not a prerequisite.

She is the author of the book “Scientific Paper Writing - A Survival Guide”, illustrated by Jorge Cham from PhD comics.

<https://www.amazon.com/Scientific-Paper-Writing-Survival-Guide-ebook/dp/B019ZI93XM>

# Linking theory and experiment

*Modeling of industrial plasma tools and applications: experimental validation*

Shahid Rauf, Applied Materials, Inc

*Validation of Computation by Experiment for the VSim and USim Codes*

John Cary, University of Colorado, Boulder and Tech-X Corporation

*Combining advanced optical diagnostics and simulations to reveal chemical kinetics in atmospheric pressure plasmas*

Sandra Schroeter, University of York

*Linking experimental measurements and numerical simulations to understand plasma-surface interaction processes*

Andrew Gibson, University of York

*The effects of elementary surface processes on the plasma parameters in capacitively coupled radiofrequency discharges*

Aranka Derzsi, West Virginia University

*Sputtering process data interpreted by heavy particle simulations*

Jan Trieschmann, RUB

# Linking academia and industry

There is a high demand for collaborations between academia and industry that apply fundamental scientific understanding and state-of-the-art plasma diagnostics to practical problems that cannot be solved empirically. This workshop aims at identifying potential topics of partnerships between industry and academia as well as problems that limit their foundation. Selected examples of successful collaborations will be presented.

One of several examples is the field of process control: Typically academia aims at developing complicated self-consistent and slow models that provide a detailed understanding of fundamental effects, while the industry requires more simplified quick models for real-time process control, that do not have to be self-consistent.

Meanwhile, industry often does not characterize plasmas sufficiently via complementary diagnostics to provide a basis for the unique identification of problems, that limit process control, and for their solution based on scientific understanding of the plasma physics. Clearly, the combination of the complementary expertise of academia and industry is required to move forward.

# Linking academia and industry

*Characterization and diagnostics of RF plasmas under manufacturing conditions* Michael Klick, Plasmetrex GmbH,

*Progress on Voltage Waveform Tailoring for plasmas: From science to process, from lab to fab*  
Erik Johnson, LPICM-CNRS, Ecole Polytechnique, University Paris-Saclay

*The status of etching processes in semiconductor fabrication, and upcoming challenges*  
Jin-Young Bang, Samsung Electronics

*Successes, failures, and lessons learned navigating industry-supported research in academia*  
Steven Shannon, North Carolina State University

*Application perspective of plasma science and technology for food and agriculture*  
Wonho Choe, Korea Advanced Institute of Science & Technology

*The application of the multipole resonance probe to industrially relevant processes*  
Moritz Oberberg, Bochum University

# Practical challenges for industry

*Use of plasma sensors combined with artificial intelligence in the diagnostics and monitoring of plasma processes*

Mike Hopkins, Impedans

*The significance of RF power delivery for thin-film semiconductor plasma processes and the enhancements of innovative solutions*

David Comou, MKS Instruments, Inc

*Plasma etch reactor design challenges for high RF power applications*

Alexei Marakhtanov, Lam

*Atomic Layer Processing of Silicon Dielectrics: Precursors, Processes, and Plasmas*

David C Smith, Lam Research Corporation

*Practical challenges for HiPIMS*

Sean Armstrong, K. J. Lesker Company

*Practical challenges for atomic layer deposition and the design of PVD tools*

J. R. Gaines, K. J. Lesker Company