

**March 31, 2015, 5:30pm – 6:30pm,  
RIT Inn & Conference Center, 5257 W. Henrietta Rd. Rochester, NY 14623**

**2015 IEEE JCM  
Rochester Section Joint Microwave Theory and Techniques &  
Antennas and Propagation Society presents:**

*Modeling and Simulation of Plasma Based Applications in  
the Microwave and RF Frequency Range*

By

**Dr.-Ing. Frank H. Scharf  
Senior Application Engineer  
CST of America  
Framingham, MA**



**Abstract:**

Plasma is often referred to as “the fourth state of matter”. It can be created by ionizing a gas. Even at low degrees of ionization (1% or less), plasmas exhibit a number of interesting properties. Depending on the application, those properties can be desired (e.g., plasma etching) or detrimental (e.g., blackout during space vehicle re-entry). A detailed understanding of the interaction between the plasma and the electromagnetic fields can help to either minimize or maximize the effect of the plasma.

In many cases, plasmas can be inaccessible to measurement or difficult to reproduce in a laboratory environment. This is where numerical simulation comes into play. Unfortunately, plasma simulations also turn out to be complex and challenging.

This talk will first present a brief introduction into the basic physics behind plasmas and typical simulation approaches. The talk will then focus further on a number of microwave and RF applications that involve plasma and how numerical simulation can be used to study the effects of plasmas.

**Biography:**

Frank H. Scharf (M’15) received his Dipl.-Ing. (M.S. equivalent) and Dr.-Ing. (Ph.D. equivalent) in Electrical Engineering from Ruhr-Universitaet Bochum (Germany) in 2003 and 2008, respectively. He spent part of his studies at Purdue University, West Lafayette, IN. During his doctoral studies he focused on modeling and simulating the plasma sheath in high intensity discharges. His thesis, “*Fluid Dynamic and Kinetic Modeling of the Near-Cathode Region in Thermal Plasmas,*” was awarded the “Gebr. Eickhoff-Preis” (Eickhoff Award) in 2009.

In 2008, Frank started working as an Application Engineer with CST in Darmstadt, Germany. In 2009, he transferred to CST of America in Framingham, MA where he currently works as a Senior Application Engineer and Team Leader. He focuses on applications around plasmas and photonics.

---

**1) Registration for Dr. Scharf’s Presentation at the JCM:**

Although it is not required for attendance, please register for Dr. Scharf’s talk: <https://meetings.vtools.ieee.org/m/33171>

Note: **There is no fee for Dr. Scharf’s presentation.**

After Dr. Scharf’s presentation, please stay and enjoy the dinner and the keynote presentation, “Collaborative Research and Development in a Dynamically Evolving High Technology Landscape.” The talk will be given by Dr. Stefan Wurm, the SEMATECH Director of Strategic Alliances.

**2) To register for the JCM Dinner:** <https://meetings.vtools.ieee.org/m/31549>

Note: there is a fee for the dinner: \$30 for IEEE members, \$40 for non-members, and \$15 for students.

Please see the website for more information.