

New England Society for Microscopy Fall 2010 Meeting

hosted by

**Carl Zeiss SMT, Inc.
Nano Solutions Center
One Corporation Way
Peabody, MA 01960
Phone: (978) 826-1500**

Wednesday, October 27, 2010

- 5:45-6:15 pm Registration
Open House-Zeiss SMT Corporation Facility
- host – John Treadgold
- 6:15-7:25 pm Buffet Supper (Open House continues)
- 7:20 pm Introductory Remarks- Warren MoberlyChan, President, NESM
- 7:25-8:45 pm Technical Presentations
- "The Orion Plus Helium Ion Microscope: Principles & Applications."**
Dr. Larry Scipioni, Director of Applications Development
Carl Zeiss SMT, Peabody, MA
- "Nanostructured Materials for Sensor & Organic Photovoltaic Applications."**
Prof. Jayant Kumar, Physics Department
University of Massachusetts @ Lowell, MA
- 8:45 pm Adjourn-Warren MoberlyChan, President, NESM

(more details updated at <http://nesm.cims.harvard.edu/>)

The Orion Plus Helium Ion Microscope: Principles and Applications

Dr. Larry Scipioni,
Carl Zeiss NTS;
Peabody, MA

Abstract

The Helium Ion Microscope (HIM) has been described as an impact technology, offering new windows into nanoscale imaging. This talk will present the principles behind the technology and well as two application areas of current research interest. Combining a high brightness Gas Field Ion Source (GFIS) with unique sample interaction dynamics, the HIM provides images offering unique contrast and complementary information to existing charged particle imaging instruments.

One exciting application area being explored with HIM is the imaging of biological samples. A current driver for much life science research today is the need to understand the correlation between structure and function at the nano-scale. We have explored a variety of systems, including tissues, cells, and bioengineered materials. We have demonstrated the ability to gather new information, and selected examples will be presented.

Besides high resolution imaging, the helium beam can be used for advanced nanomachining. Patterning through sputtering of materials such as graphene has demonstrated the ability to make smaller structures with higher fidelity. Beam induced deposition and etch have shown improved properties over other techniques. High fidelity patterning of resist using the helium beam has been demonstrated with almost no proximity effects.

Biography

Larry Scipioni earned his Ph.D. in Physics from New York University, in the study of surface science. His career has been centered on the physics and applications of ion beam technologies. At the Micrion Corporation, he did ion source characterization and experimentation, including LMIS, plasma, and GFIS technologies – also including modeling of emission and optics. He has worked in R&D management at FEI Company and Carl Zeiss NTS (currently), where he manages the Applications Laboratory.

Nanostructured Materials for Sensor & Organic Photovoltaic Applications.

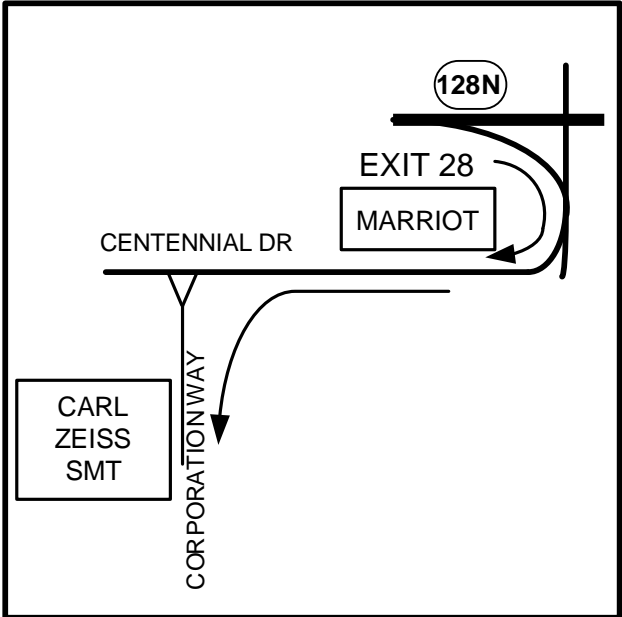
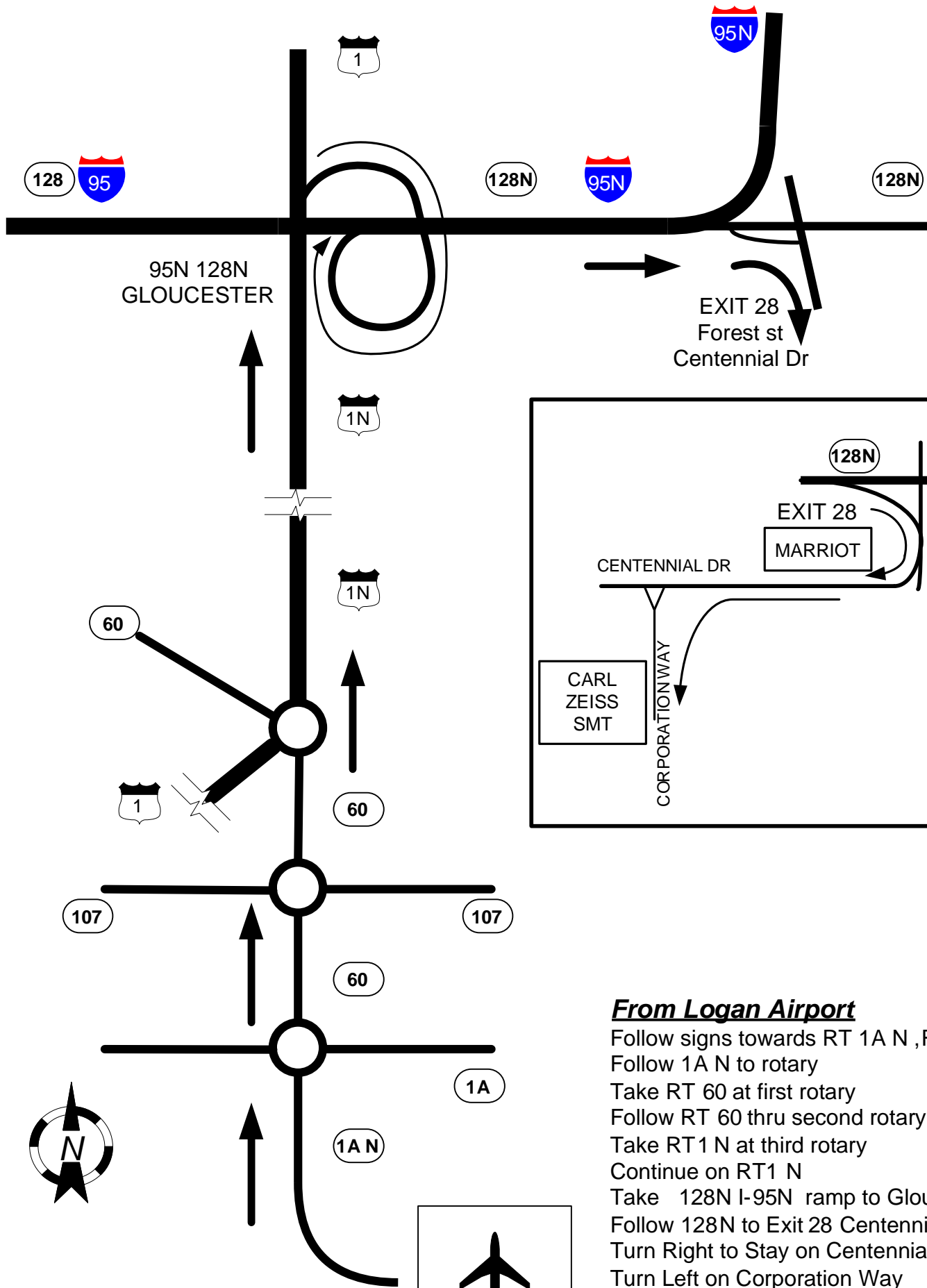
Professor Jayant Kumar
Department of Physics
University of Massachusetts @ Lowell

Abstract

The need for high sensitivity chemical and biological sensing and the quest for inexpensive solar energy conversion devices have resulted in significant increase in research in the area of nanostructured materials. To attain the desired sensitivities and efficiencies, the control of the structure and morphology at length-scales of nanometers is essential. Some of the challenges for controlling the nanostructures in these materials will be discussed, using examples from recent research in sensors and organic photovoltaics.

Biography

Dr. Jayant Kumar received his B.Sc. and M.Sc. in Physics from the Indian Institute of Technology, Kharagpur, India and a Ph.D. in Physics from Rutgers University. He conducted research at Bell Laboratories at Holmdel on the behavior of excitons in large bandgap crystalline materials. He subsequently worked at Argonne National Labs and then at the University of Southern California, Department of Electrical Engineering. At Argonne his research mainly focused on high resolution laser spectroscopy and at USC on nonlinear optics and their applications. In 1987 he joined the University of Massachusetts, Lowell, where he is Professor of Physics and the Director for the Center for Advanced Materials. His current research activity is in the area of molecular and polymeric materials for photovoltaic and sensor applications and development of materials with novel optical electronic properties.



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- Follow 1A N to rotary
- Take RT 60 at first rotary
- Follow RT 60 thru second rotary.
- Take RT 1 N at third rotary
- Continue on RT1 N
- Take 128N I-95N ramp to Gloucester
- Follow 128N to Exit 28 Centennial Drive
- Turn Right to Stay on Centennial Dr
- Turn Left on Corporation Way

