



AVS SPECIALIZED TRAINING COURSES

5 Courses ❖ September 18-21, 2012 ❖ Denver, Colorado

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Fundamentals of Vacuum Technology

Course Objectives:

- Understand vacuum fundamentals essential to operating, maintaining, designing, or using vacuum systems.
- Know the working principles and limitations of pumps, gauges, and other vacuum system components.
- Understand the procedures for operating and performing preventive maintenance on vacuum systems, including analyzing and troubleshooting malfunctioning vacuum systems and leak detection.
- Learn the design concepts involved in matching equipment and instrumentation to applications.

Part I-Concept/calculations/gauging/pumps

Part II-Materials, valves and other components, system design considerations and maintenance

Dates: September 18-21, 2012 (T-F)

Instructor: Tim Gessert, Senior Scientist, NREL;
Neil Peacock, Development Engineer for HPS Division,
MKS Instruments, Inc.

Cost: \$900 Regular/\$300 Student (9/18-19, Part I)
\$1,500 Regular/\$600 Student (9/18-21, Parts I & II)

Growth of Self-Assembled Nanostructures

Course Objectives:

- Understand the primary experimental variables and surface reaction paths controlling nucleation/growth kinetics and microstructural evolution during vapor-phase deposition.
- Learn about the primary classical and quantum effects which controllably alter the properties of increasingly small nanostructures.
- Understand the mechanisms controlling self-assembly and self-organization during nanostructure growth.
- Learn how to better design nanostructure growth processes.

Date: September 18, 2012 (T)

Instructor: Joe Greene, Professor of Materials Science and Head of Electronics Materials Division,
University of Illinois

Cost: \$575 Regular/\$150 Student

Partial Pressure Analysis with RGA

Course Objectives:

- Provide the basic knowledge required to operate residual gas analyzers (RGAs) for vacuum applications ranging from UHV to atmospheric pressures.
- Learn how to specify the best RGA system for your application.
- Learn to configure RGA software to track real-time changes in gas composition.
- Know how to differentiate between background and process gases and how to identify common interactions between RGAs and sample gases.
- Learn how to quickly and effectively interpret typical RGA spectra.

Date: September 20, 2012 (Th)

Instructor: Gerardo Brucker, Chief Scientist,
Brooks Automation

Cost: \$575 Regular/\$150 Student

Reactive Sputtering and Deposition

Course Objectives:

- Understand the primary target and glow discharge volume processes controlling high-rate reactive sputtering of conductors and insulators..
- Understand the choice of deposition technologies used in reactive sputtering (dc, rf, magnetron, pulsed dc, mid-frequency ac, ion beam).
- Understand process control strategies and how to implement them.
- Learn how to better design high-rate reactive sputtering film growth systems and processes.

Date: September 21, 2012 (F)

Instructor: Joe Greene, Professor of Materials Science and Head of Electronics Materials Division,
University of Illinois

Cost: \$575 Regular/\$150 Student

Visit <http://www2.avs.org/chapters/rockymtn/courses/courses.html> for complete course descriptions and secure registration

Sputter Deposition

Course Objectives:

- Processes controlling film growth and properties
- The role of energetic particles in controllably modifying these processes
- Target sputtering effects
- Nature and energy of sputtered atoms
- Learn about magnetron (both balanced and magnetically unbalanced), diode, triode, and ion beam systems
- Learn about DC, pulsed DC, mid-frequency AC, and RF systems for targets and substrates
- Understand reactive sputtering of conducting and dielectric layers
- Understand film properties and learn system parameters

Date: September 19-20, 2012 (W-Th)

Instructor: Joe Greene, Professor of Materials Science and Head of Electronics Materials Division, University of Illinois

Cost: \$850 Regular/\$300 Student

Courses by Request

AVS is pleased to announce "Courses By Request." Through an online form, you tell us which course(s) you need, the time frame in which you need them offered, how many people (other than yourself) are interested in the same course(s), and your traveling restrictions. As requests are received, the Committee will work to identify additional interested participants, and schedule the course(s) at a facility and date that will meet everyone's needs. To request an AVS Short Course just complete the "Courses By Request" online form, <http://www.avs.org/education/byrequest.aspx>. If you have any questions about AVS Short Courses send us a note at courses@avs.org or call us between 8:30 a.m. and 4:30 p.m. Pacific time at 530-896-0477.

AVS Onsite Training Program

The AVS onsite training program provides training in vacuum technology, materials and materials characterization, surface science, and thin films and processing. Courses range from basic to advanced levels and are taught by nationally and internationally recognized professionals. We offer a diversity of subjects and the flexibility of customized course programs presented at a facility you select.

For more details visit [www](http://www.avs.org)



Travel and Hotel Information

All short courses will be held at the Doubletree Hotel Denver North, located minutes from both downtown Denver and Boulder. The hotel is conveniently located just off US-36 in Westminster, Colorado (8773 Yates Drive, Westminster, 303 427-4000).

Symposium and Exhibition

The Rocky Mountain Chapter of the AVS will hold its annual symposium on Thursday, September 20, 2012, at the Doubletree Hotel Denver North (same location as short courses). The topic of this year's symposium is "Vacuum on the Fringe" and will feature a session of invited speakers on this topic. The symposium will also include a student poster session, and a vacuum-vendor exhibit. The symposium and vendor exhibit are free of charge to anyone enrolled in the short courses or pre-registered for the Symposium. Short course registration rates will increase August 31 (\$50 regular/\$25 student).

Those wishing to attend the symposium should pre-register at <http://chapters.avs.org/rockymtn> or contact Paula Robinson at 303-384-6491, paula.robinson@nrel.gov or Rosine Ribelin at 720-872-5138, ribelin@ascentsolar.com.

*****EARLY REGISTRATION DEADLINE*****

AUGUST 31, 2012

COURSE TIMES: 8:30am to 4:30pm

Visit <http://www2.avs.org/chapters/rockymtn/courses/courses.html> for complete course descriptions and secure registration

Click Here to Register