

**Voltaix**

**CVD GASES**



**GERMANE**

**Pure or Mixtures  
In-house Production**

**100% GC/MS Analysis**

**Always the Same  
Still the Best**

**Packaging Options**

- ◆ Any quantity
- ◆ Steel, polished steel or aluminum cylinders
- ◆ Pneumatic valves for fail-safe gas supply
- ◆ Choice of flow restrictor for added safety
- ◆ VCR outlet for UHV connection to system

**Also of Interest**

- ◆ Digermane mixtures
- ◆ Diborane mixtures
- ◆ Trimethyl boron
- ◆ UHP Disilane

**Voltaix, Inc.**

P.O. Box 5357, 197 Meister Ave.  
N. Branch, New Jersey 08876  
Telephone: (201) 231-9060  
Telex: 9102500134 VoltaixUJ

Figures appearing in the EDITOR'S CHOICE are those arising from materials research which strike the editor's fancy as being aesthetically appealing and eye-catching. No further criteria are applied and none should be assumed. When taken out of context, such figures often evoke images beyond and unrelated to the original meaning. Submissions of candidate figures are welcome and should include a complete source citation, a photocopy of the report in which it appears (or will appear), and a reproduction-quality original drawing or photograph of the figure in question.



How often do our fellow scientists boast both of having damaged a specimen and obtained a nebulous result? Well, this month's Editor's Choice comes from just such an unexpected source. To study the structural evolution in a sol to gel transition, J.K. Bailey and M.L. McCartney of the University of Minnesota used fast freezing and a transmission electron microscope cold-stage to capture the structure at intermediate stages of the process. Their work is reported in *Better Ceramics Through Chemistry III*, edited by C.J. Brinker, D.E. Clark, and D.R. Ulrich (Mater. Res. Soc. Symp. Proc. 121 [1988] p. 367-372). In the vitrified state of the frozen samples, exposure to too great a dose of electrons in the microscope results in radiation damage, which causes void formation (light regions) and solvent crystallization (dark inclusions). If the scale of this photo were kiloparsecs, these submicron-sized features of inner space could well be mistaken for great galactic clouds of which proper nebula are made.



# “In vacuum valves, Huntington designs ’em smarter. And builds ’em better.”

## Solid construction. Better integrity.

Huntington machines each valve out of a solid block of 304 stainless. With thicker walls. And minimum welding.

Compare that with other valves: Tube stock construction and lots of welding.

And compare surface finish: Huntington’s is shinier — because it’s chemically cleaner and *physically smoother*. For less friction, better flow.

## A superior seal. Patented.

Huntington uses conical tapered seats for tighter seals with less force. Also for better conductance. And far longer seal life.

In all-metal valves, for example, Huntington’s copper gaskets frequently get hundreds of closures!

In butterfly valves, Huntington’s patented floating shaft design automatically centers the flapper for a perfect seal. Time after time.

## Faster, easier cleaning.

Why make things difficult? Huntington uses a number of innovative designs to simplify seal changing and cleaning . . .

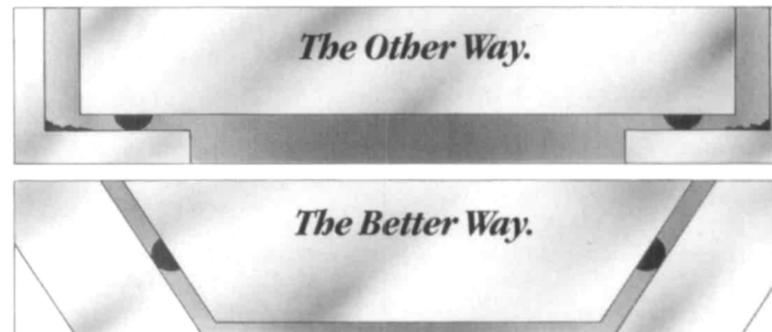
For example, in pneumatics: Instead of unscrewing lots of bolts and dealing with springs and grease — you simply spin off the top cylinder. Saving downtime and mess.

## More choices. And quicker.

Whatever valves you need, Huntington builds them better:

Bakeable or elastomer-sealed. Manual or pneumatic. Butterfly, gate, right-angle, straight-through, in-line . . .

And over 90% of their orders ship within 72 hours. If you need a special, just say the word. They’ve got the experts to make that happen, fast.



*The Other Way retards flow, collects particulates and requires more force to seal. Huntington’s conical tapered seat streamlines flow, eliminates particle build-up and seals tighter with less applied force.*

## Get your free catalog, now.

For complete details on all these better-built vacuum valves — plus a full spectrum of better-built vacuum components — get the all-new Huntington catalog . . .

For your free copy, just call or write: Huntington Laboratories, 1040 L’Avenida, Mtn. View, CA 94043. (800) 227-8059 or (415) 964-3323.



## Short Course Program

Selected Short Courses covering the latest developments in materials science and technology will be offered in conjunction with the 1989 Fall Meeting of the Materials Research Society. These up-to-date courses are at the forefront of science and technology and complement Fall Meeting symposium topics. SPECIALTY, REVIEW, AND SURVEY courses are designed to meet needs of professional scientists, engineers, technical staff, and managers who want to know the latest techniques in characterization and fabrication of materials. CLASS SIZES ARE LIMITED. Early telephone preregistrations are encouraged.

**1-9-8-9**  
FALL MEETING

November 26-  
December 2, 1989  
Boston Marriott  
Copley Place

Telephone:  
**(412) 367-3003**  
FAX: **(412) 367-4373**

### PREREGISTRATION TUITION

#### ADVANCED MATERIALS

- M-04 Optoelectronic Materials, Processes, and Devices**  
Instructor: Mool C. Gupta  
Friday-Saturday, December 1 - 2 .....\$510
- M-05 Fabrication, Characterization, and Applications of High-Temperature Superconducting Materials**  
Instructors: David A. Rudman and Robert E. Schwall  
Sunday-Monday, November 26 - 27 .....\$510
- M-06 Growth and Characterization of Diamond and Diamond-Like Films**  
Instructors: Daniel L. Flamm, Thomas R. Anthony, and Jeffrey T. Glass  
Monday, November 27 .....\$400

#### CHARACTERIZATION OF MATERIALS

- C-01 Modern Materials Analysis Techniques**  
Instructors: James A. Borders, Kenneth H. Eckelmeyer, and Suzanne H. Weissman  
Monday-Wednesday, November 27 - 29 .....\$775
- C-03 Surface and Thin Film Analysis**  
Instructors: Leonard C. Feldman and James W. Mayer  
Friday-Saturday, December 1 - 2 .....\$580
- C-06 Deep Level Transient Spectroscopy**  
Instructor: Charles E. Barnes  
Monday, November 27 .....\$345
- C-08 Ceramic and Metal Matrix Composites**  
Instructors: Jack Mecholsky and Maurice F. Amateau  
Friday-Saturday, December 1 - 2 .....\$510
- C-09 Fractals: Concepts and Applications in Materials Science and Engineering**  
Instructors: James E. Martin and Alan J. Hurd  
Sunday-Monday, November 26 - 27 .....\$510
- C-14 Scanning Tunneling Microscopy**  
Instructor: Robert J. Hamers  
Monday, November 27 .....\$345
- C-16 Scanning Electron Microscopy and X-Ray Microanalysis**  
Instructors: David C. Joy and Dale E. Newbury  
Monday, November 27 .....\$365
- C-19 Practical Transmission & Analytical Electron Microscopy - Theory, Practice and Specimen Preparation**  
Instructors: Alton D. Romig, Jr., David B. Williams, and Ron M. Anderson  
Tuesday-Thursday, November 28 - 30 .....\$775
- C-20 Optical Characterization of III-V Semiconductor Epitaxial Layers**  
Instructor: Gary W. Wicks  
Friday, December 1 .....\$345

#### PREPARATION AND FABRICATION OF MATERIALS

- P-05 Plasma Enhanced CVD of Thin Films for Microelectronics**  
Instructor: Rafael Reif  
Monday, November 27 .....\$345
- P-06 Ion Implantation, Diffusion, Defects, and RTP**  
Instructors: Nathan W. Cheung, Dennis M. Maher, and Steven C. Shatas  
Friday-Saturday, December 1 - 2 .....\$510
- P-12 Photon-Controlled Processing for Microelectronics**  
Instructor: Richard M. Osgood, Jr.  
Friday, December 1 .....\$345

- P-14 Film Formation, Adhesion, Surface Preparation, and Characterization of Thin Film Structures**  
Instructor: Donald M. Mattox  
Friday-Saturday, December 1 - 2 .....\$535
- P-15 Ohmic Contacts to Compound Semiconductors**  
Instructor: Peter A. Barnes  
Friday, December 1 .....\$345
- NEW P-16 Epitaxial Growth of Compound Semiconductors**  
Instructors: L. Ralph Dawson, P. Dan Dapkus, and Gary W. Wicks  
Tuesday-Thursday, November 28 - 30 .....\$775
- F-01 Film and Coating Deposition Techniques**  
Instructor: Donald M. Mattox  
Tuesday-Wednesday, November 28 - 29 .....\$535
- F-02 Plasma Etching for Microelectronic Fabrication**  
Instructor: G. Kenneth Herb  
Thursday, November 30 .....\$345
- F-04 Microelectronic Packaging: Materials, Processing, and Reliability**  
Instructors: Shankara K. Prasad and Rama K. Shukla  
Thursday-Saturday, November 30 - December 2 .....\$775
- NEW F-08 Chemical Engineering Aspects of Silicon Integrated Circuit Fabrication**  
Instructors: Isaac Trachtenberg and Dean P. Neikirk  
Monday-Wednesday, November 27 - 29 .....\$745

### MRS ON-SITE SHORT COURSE PROGRAM

Available at your facility

One of the best ways to keep your staff up to date on the latest developments is through an on-going program of continuing education. Many of the courses described in this flyer, as well as others not being presented at the 1989 Fall Meeting, are now available on a contract basis for presentation at your facility or technical meeting.

For further details about courses available at your facility, nearby site, or your technical meeting, write or call:

Vivienne Harwood Mattox (505) 294-9532  
MRS Short Course Manager FAX (505) 298-7942  
440 Live Oak Loop  
Albuquerque, NM 87122

**REGISTRATION INFORMATION:** Call (412) 367-3003 and ask for the Short Course Office to request information about student scholarships and special meeting registration discounts.