Second International Symposium on Defect Recognition and Image Processing in III-V Compounds Announced

DRIP II, the second International Symposium on Defect Recognition and Image Processing in III-V Compounds, will be held April 27-29, 1987 in Monterey, California. To enhance participation from overseas, DRIP II has been scheduled for the week following the 1987 MRS Spring Meeting, April 21-25, in Anaheim, California.

This symposium seeks to promote a better understanding of the origins of electrical and structural inhomogeneities in III-V compound semiconductors. In keeping with the charter of the first DRIP symposium, DRIP II will be a forum for the presentation and critical discussion of research in defect distributions, extending from the "classical" field of defect identification to device performance mapping.

Contributed and invited papers will cover spatially resolved defect and device characterization, including: infrared absorption imaging, luminescence imaging, electrical performance mapping, device performance mapping, photothermal imaging, x-ray topography, crystal tomography, and image processing. Exhibit tables will display literature and instruments from companies involved in III-V crystal growth, characterization, device design and production, and image processing systems.

The first DRIP symposium was organized in 1985 by Prof. J.P. Fillard in Montpellier, France. The proceedings of DRIP I, including contributions of approximately 100 authors, are available from Elsevier as Volume 31 of the Materials Science Monographs.

For further information about the symposium contact DRIP II, Continuing Education in Engineering, University Extension, University of California, 2223 Fulton St., Berkeley, CA 94720; telephone (415) 642-4151; telex 910 366-7114 UC BERK BERK.

SPIE to Hold Symposium on Advances in Semiconductors and Semiconductor Structures

A science and technology symposium on Advances in Semiconductors and Semiconductor Structures, sponsored by SPIE—The International Society for Optical Engineering, will be held March 23-27, 1987 in Bay Point, Florida. The symposium is intended to create a forum for interaction between scientists involved in the fundamental aspects of semiconductor materials, structures, and device concepts, and researchers developing devices with increased density, greater speeds, and extended responses. While focusing mainly on materials and devices of the III-V and II-VI semiconductor family, this symposium will also address promising techniques for other compound semiconductors as well as elemental materials like silicon and germanium.

The symposium will be composed of the six conferences detailed below. For further information, contact SPIE, P.O. Box 10, Bellingham, WA 98227-0010; telephone (206) 676-3290; telex 46-7053.

Modern Optical Characterization Techniques for Semiconductors and Semiconductor Devices

Dramatic advances that are the result of new technologies and many new developments (such as homojunctions, heterojunctions, quantum wells, and superlattices) have increased the need for characterization methods to provide information about structural, vibrational, electronic, and electrical properties on smaller dimensional scales and with greater sensitivities and higher precision than ever before. Optical and modulated optical techniques provide powerful tools for probing these relevant materials and structure parameters.

This conference will report on new optical and modulated optical characterization techniques for examining and monitoring surfaces, interfaces, thin films, microscopically inhomogeneous materials, and microstructures such as superlattices, quantum wells, and heterojunctions. Studies involving the cross-correlation between optical and modulated optical techniques and structural characterization methods (TEM, STEM, LEED, RHEED, RBS, PIXE, channeling, etc.) will be reported.

Characterization of Very High Speed Semiconductor Devices and Integrated Circuits

In recent years, the speeds of the fastest electronic and optoelectronic devices have significantly outpaced the speed/bandwidth capabilities of readily available test and measurement instrumentation. There is a strong need for new probing technologies (e-beam, laser) with high temporal and spatial resolution and high sensitivity to on-chip voltages and/or currents. This critical review conference will focus on measurement needs for current and anticipated very high speed electronic and optoelectronic devices, demonstrated research lab solutions to some of these measurement problems, new ideas under investigation, description of state-of-the-art instrumentation, and anticipated advances in techniques and instrumentation.

Quantum Well and Superlattice Physics

Within the past decade, research on ultrathin multilayer structures and other low-dimensionality systems has evolved into one of the most exciting, active, and successful fields of semiconductor physics. At this time, a closer working relationship is sought between optics oriented scientists and engineers and those with semiconductor physics and electronics backgrounds. This represents the merging of two different disciplines to form the field of optoelectronics. In fact, many of the potential device applications of quantum wells and superlattices are found in the domain of optoelectronics (e.g., optical communications), as well as in pure optics (e.g., optical data processing and computing).

The goal of this first SPIE conference of its type is to provide information on the state of the art and to provide a forum for the presentation and discussion of novel physical properties and phenomena of quantum well and superlattice structures. The emphasis will be on those topics which have already proved to be of value or are expected to have impact for future applications in photonics.

Ultrafast Lasers Probe Phenomena in Bulk and Microstructure: Semiconductors I

Ultrafast laser technology offers the possibility of studying and discovering key processes unresolved in the past, and especially of understanding the microscopic world of semiconductors. The time scale for the excitations in this world is in subpicoseconds. Therefore, fundamental information on the mechanisms, interactions, and dynamics and on the various processes they spawn is obtained from direct time measurements on the ultrafast time scale from 10^{-15}s to 10^{-9}s. Some of the processes to be investigated in 3D, 2D and 1D are the cooling and thermalization rates of hot carriers, the lifetimes of phonons, the formation time of excitons, the screening of optical-phonon-carrier interactions, the dynamics of ballistic transport, the intervalley scattering times and momentum relaxation times. Knowledge of these phenomena will aid in the development of small-scale ultrafast devices.

This conference is organized to bring together the semiconductor, electrical engineering, and optical physics communities. There is a need for a conference covering the various aspects of ultrafast phenomena that occur in semiconductors and the methods used to study them. This is the first of such conferences.

Growth of Compound Semiconductors

The increased breadth of applications for optoelectronic devices has focused attention on both III-V and II-VI semiconductor compounds. These two classes of direct bandgap materials have in common high quantum efficiencies and low optical losses. Bandgap values vary from the far-infrared to the near-ultraviolet, with alloys provid-

Continued

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ing a continuous variation. Not only are planar configurations necessary for modern optoelectronic applications, but recently developed thin-film growth techniques provide for modulated bandgap structures. These new multiple quantum well and superlattice structures create opportunities for bandgap engineering.

This conference will provide a forum for discussing important new growth techniques for fabricating both thin-film and quantum well structures. The conference will feature sessions with the following emphasis:

- Molecular beam epitaxial (MBE) growth of III-V semiconductors
- Issues of growth kinetics
- Growth and characterization of II-VI semiconductors
- OMVPE growth for optical device applications

Advanced Processing of Semiconductor Devices

This conference is intended to be a common forum on process technologies for high speed electronic and optoelectronic semiconductor devices using Si, Ge, GaAs and other III-V and II-VI semiconductors. It will address the common fabrication processes applicable to the various materials, including the semiconductors that go into the fabrication of devices. It will also include composite process technologies that compete against one another to produce the same end result—a device or an ensemble of integrated devices such as MMICs, integrated electronic and optoelectronic devices. Issues relating to device physics as applied to devices design and fabrication culminating in the eventual dissolution of the difference between microwave and optoelectronic devices in the distant future will also be considered. Thus, the conference will bring together researchers and technologists in apparently different areas of specialty to communicate on common themes and ultimate objectives.

Papers will be given in the following areas:

- Frontiers of silicon technologies
- Plasma, laser, and wet chemical etching and processing of semiconductors
- Ion beam and high temperature processing of III-V and II-VI s/cs
- Devices using epitaxial regrowth on processed semiconductors
- High speed electron and optoelectronic devices and fabrication processes

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The first issue contains the review:
NEW PERMANENT MAGNET MATERIALS by K.H.J. Buschow

The following reviews will appear in future issues:
N.W. Cheung: Megavolt Ion Implantation in Semiconductors and their Interfaces; **L. Csepregi:** Micromechanics: Silicon Microfabrication Technology: **P.J. Grunthaner, M.H. Hecht, F.J. Grunthaner:** Photoemission Studies of the SiO2Si Interface; **T.F. Kuech:** Metal-Organic Vapor Phase Epitaxy of Compound Semiconductors; **L.G. Meiners, H.H. Wieder:** Semiconductor Passivation; **G.L. Olson, J.A. Roth:** Kinetics and Mechanisms of Solid Phase Crystallization in Amorphous Silicon; **P.S. Peercy, M.O. Thompson:** Measurement of Melt and Solidification Dynamics; **K. Gamo, R. Shimizu, S. Namba:** Ion Beam Lithography.

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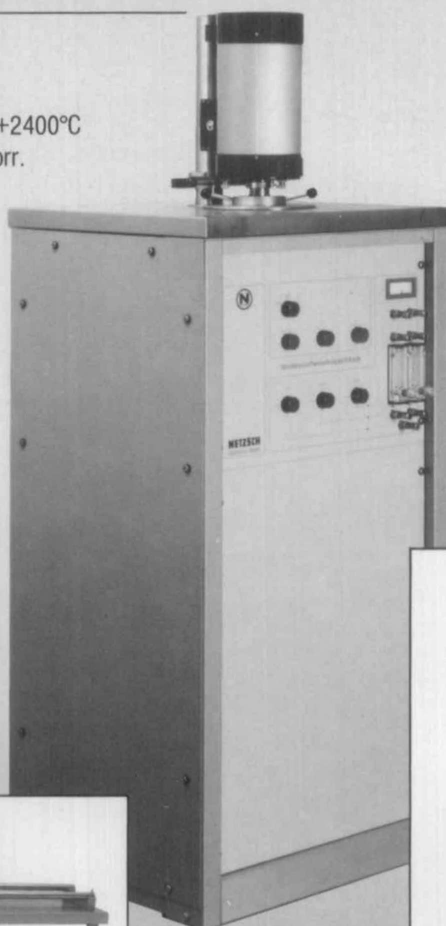

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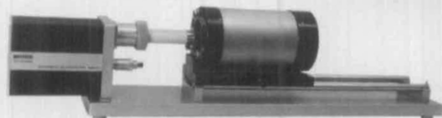

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