

## Everything's Up to Date in Kansas City

**H**ave they gone about as far as they can go? Probably not, but the Forum on Industrial and Applied Physics (FIAP) of the American Physical Society (APS) is planning to demonstrate just how far applications of physics have progressed recently in some exciting areas of research. For the 1997 March APS Meeting, to be held in Kansas City, Missouri (March 16–21), FIAP has planned eight invited sessions. Six are technical, with topics ranging from silicon-device processing to printing technologies, and two sessions will be devoted to professional concerns: industry-university interactions and entrepreneurial careers. New ventures for FIAP include three focused (contributed) sessions and a tutorial on industrial and applied physics.

The six technical sessions will include:

**Role of Hydrogen and Deuterium in Silicon-Device Processing.** This session will examine work done by Joe Lyding and Karl Hess of the University of Illinois at Urbana-Champaign and Isik Kizilyalli of AT&T Bell Laboratories in Orlando. This group recently showed that incorporating deuterium rather than hydrogen at the Si/SiO<sub>2</sub> interface leads to significant improvements in the lifetime of metal oxide semiconductor (MOS) transistors. Such improvements will become essential for future generations of devices, in which oxide thickness and device dimensions will shrink.

**Applications of Chaos.** This session will give an overview of recent work inspired by

Edward Otto and his colleagues at the University of Maryland at College Park, who invented a method for controlling chaotic systems. Topics include applications of chaos theory to communications, mechanical systems, lasers, and optimal fluid mixing.

**Magnetoresistive Sensors and Applications.** This session will feature an overview of giant/colossal magnetoresistance (GMR/CMR) and its applications to magnetic sensors and advanced memories. The design of magnetic recording heads will also be discussed. The session will be sponsored jointly by the Topical Group on Magnetism and Its Applications.

**Advanced Semiconductor Characteriza-**



**tion, Instrumentation, and Techniques.** This will be a joint session with the Instruments and Measurements Science Topical Group and will discuss semiconductor characterization with acoustic and thermal waves on picosecond scales, photothermal characterization of thermal and electronic processes in porous silicon, and electromodulation characterization of wafer-scale semiconductor-device structures.

**Applications of X-ray Micro-Beams.** State-of-the-art X-ray optics on high-brilliance synchrotron sources has led to the development of the scanning X-ray microprobe (XMP), a revolutionary new tool in microcharacterization that is capable of very high sensitivity measurements of crystallographic strain and trace-element distributions with submicron spatial resolution. This session will cover these unique capabilities, which will have a revolutionary impact on device engineering, materials, and biology.

**Printing Markets and Technologies.** Printing technology impacts almost everyone and every business. This session will include discussions of digital multicolor printing, laser xerography, thermal and ink-jet printing, as well as printing and display with micromirror devices.

## Professional sessions

**Industry-University Interactions.** In response to suggestions by FIAP members, a session on the relationships between industries and universities will be presented. This theme always raises many interesting questions. Who is interacting with whom? What sort of results are we seeing? How can one teach applied physics? How can researchers understand university and industry cultures, needs, and priorities?

**Entrepreneurial Careers in Physics.** This session will feature a panel discussion with physicists and former physicists who have launched companies. They will discuss their experiences in developing ideas, innovations, and the results of research to the stage of commercial products.

## Focused sessions

FIAP is also sponsoring three focused sessions for contributed papers:

**Applications of X-ray Micro-beams.** Papers are solicited in a variety of areas including soft X-ray microscopy in biological

studies, soft X-ray tomography, X-ray microdiffraction for VLSI (very large-scale integrated circuits), X-ray microprobe measurements in semiconductor devices, and Bragg-Fresnel optics for hard X-ray microscopy.

**Industrial Applications of High-Temperature Superconductor Materials.** The industrial applications of high-temperature superconductor (HTS) materials have seen impressive growth in recent years. Examples of appropriate topics include low-loss delay lines, antenna arrays, ferroelectric/HTS-tunable microwave devices, junction-based electronics, single-flux quantum logic devices, scanning SQUID (superconducting quantum interference device) magnetometers, and SQUID-based picovoltmeters.

**Novel Physics and Materials of Mid-Infrared (3-6 micron) Semiconductor Lasers.** Mid-infrared semiconductor lasers are required for chemical process control, environmental sensing, and infrared countermeasure applications. Recent advances in III-V semiconductor growth and bandstructure engineering have resulted in breakthroughs in the physics and materials for mid-infrared semiconductor lasers operating above 200 K. To promote implementation of these devices, papers on sensor applications of mid-infrared lasers are invited.

On Sunday, March 16, 1997, the Tutorial on Industrial and Applied Physics will be presented. It will examine the activities of physicists pursuing industrial careers and working in applied physics. Case studies from representative industries as well as an overview of goals, career choices, technical activities, motivation, and other aspects of the professional life of industrial physicists will be discussed. For academic researchers, this tutorial may offer insight into establishing collaborations with industrial physicists.

FIAP also plans to celebrate the 50th anniversary of the invention of the transistor and the 100th anniversary of the discovery of the electron conjunction with the Forum on History of Physics.

For more information, contact L. Craig Davis, FIAP Program Chair, by regular mail (MD 3028 SRL, Ford Motor Co., Dearborn, MI 48121-2053), telephone (313-322-7006), fax (313-322-7044), or e-mail (LDAVIS7@ford.com). Also see the FIAP home page (<http://aps.org/FIAP>). 