

Electronics in Seattle

Electronics—particularly electronics important to Seattle-area industries—is the major theme of this year's series of special symposia sponsored by the Forum on Industrial and Applied Physics (FIAP) at the March 2001 meeting of the American Physical Society (APS). Each year, FIAP

ments. The aim of this tutorial is to alert students, faculty members, and entrepreneurs to areas that are important in understanding new directions for electronics, condensed matter physics, and the physics of optics. Topics will include micro-opto-electronic networks, semiconductor lasers,

radionuclides released during the 1986 accident at the Soviet nuclear-power plant there. Speakers will also address issues in measuring environmental disasters and the pollution problems of the ocean.

Another thriving new technology will be discussed in the symposium "Applications

of Microelectromechanical Systems (MEMS)." Minas Tanielian, of the Boeing Phantom Works, will speak on airflow over airplane wings. Other talks include devices developed by DARPA for the military, applications in the automotive industry, and microgyroscopes.

In the symposium

titled "Micro-Optics," Thomas Furness from the University of Washington, Seattle, talks about micro-optics for airplane pilots. Others talk about the fabrication of micro-optic devices, photonic bandgaps, and the fabrication of photonic-bandgap structures.

"Semiconductor Optical Quantum Structures" will look at the potential of these devices and the challenges to developing them. Speakers will discuss quantum fountain unipolar lasers, high-speed quantum cascade lasers, quantum-well continuous-wave lasers, and quantum dots for infrared devices (see figure).

FIAP and DMP will co-sponsor the symposia "Organic Electronics," "Alternative Gate Dielectrics," and "Nanoscale Silicon Structures and Devices." In the organic-electronics session, speakers will discuss fast polymer modulators, superpure organic crystals, electrophosphorescence, electronic paper, and polymer light-emitting devices.

New materials for gate dielectrics are needed for very small silicon integrated circuits. Topics at the gate-dielectric symposium include gate-materials compatibility, gate-band offsets, structure for complemen-

chooses themes that are strategic to one or more industries in the city hosting the APS meeting and to major events of the year. This "technology of the year" serves as the focus for selecting topics that are of particular interest to industrial physicists.

At the meeting in Seattle on March 12–16, FIAP will sponsor five technical symposia, co-sponsor three others with the Division of Materials Physics (DMP), and present one each with the Division of Biological Physics (DBP) and the Topical Interest Group on Instrument and Measurement Science (GIMS). FIAP will also sponsor a tutorial and some focus-topic sessions, and it will co-sponsor with the Committee on the Status of Women in Physics a special symposium on the role of women scientists in start-up companies.

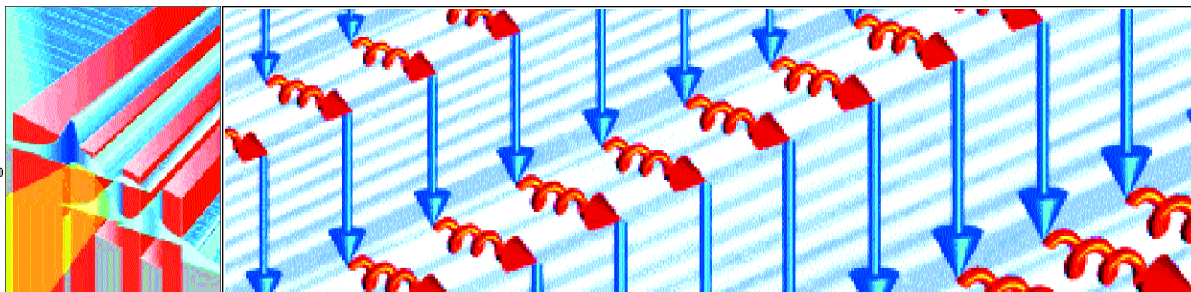
The tutorial, "Opportunities for Applications of Physics in Optical-Fiber Telecommunications," will be held Sunday afternoon, March 11. Instructors representing companies, from start-ups to giants of the industry, will address topics of interest to physicists preparing for research careers in one of technology's fastest growing seg-

and photonic crystals to guide light.

Women in senior scientific positions will discuss their decisions to work at start-up companies during the symposium on "Roles for Female Scientists at Start-ups." Drawing on their experiences, speakers will describe the start-up environment and the challenges to a fledgling company of developing, marketing, and bringing a new technology product to commercial viability.

In the symposium "Physics in the National Defense," the main speaker will be Ben Denbart from Boeing Corp., speaking about electromagnetic modeling. Other speakers will cover defense-related research at the Naval Research Laboratory and the Massachusetts Institute of Technology's Lincoln Laboratory, and efforts by the Defense Advanced Research Projects Agency (DARPA) to move materials for advanced electronics beyond silicon.

Physicists play an important but often unrecognized role in preventing and analyzing human-made disasters. At the symposium "Science Helping with Environmental Disasters," topics will include the radiocology of the Chernobyl area and the



Cascading quantum lasers will be just one of dozens of interesting topics to be discussed at the FIAP sessions. As shown in these illustrations, when an electric current flows through a quantum cascade laser, electrons cascade down an energy staircase, emitting a photon at each step. Applications include remote sensing of environmental gases and pollutants.

tary metal oxide semiconductors, spectroscopy of gate growth, and transition metal oxide gates. Speakers at the session on nanoscale silicon structures will examine the challenges presented by resonances in quantum dots, strained silicon field-effect transistors, nanoelectromechanical devices, and free-electron quantum dots.


The FIAP-DBP symposium is called "Spectroscopy and Structure of Disease" and features an honorary lecture by the winner of the Pake Prize, whose name has not been announced yet. The biophysics topics scheduled for discussion are X-ray tomography, the spectroscopy of cancer, modeling tumor invasion, and surface-enhanced Raman scattering.

Finally, FIAP and GIMS will present a discussion titled "NIST Quantum Standards," which will be a featured part of the National Institute of Standards and Technology

(NIST) 2001 centennial celebration. The session will focus on the NIST standards based on the Josephson voltage, quantum Hall resistance, single-electron transistor capacitance, and the fountain atomic-clock time standard.

Focus topic sessions are meant to expand on topics discussed during symposia. FIAP will sponsor as many focus sessions as are required by the number of abstracts submitted for the APS meeting. Among topics already scheduled are carbon nanotubes and coatings, nanoscale silicon structures, industrial materials theory, plasmas and the environment, and optical quantum structures.

As the largest group in APS, and one of the fastest growing, FIAP plays an important role in the physics profession. Through its programs, such as the sessions it sponsors at the annual APS March meeting and its

speakers bureau, the Forum seeks to educate all physicists and the public about the rapid changes in industrial physics and their implications for the nation's economy and security. For more information about the APS meeting see www.aps.org. 

B I O G R A P H Y

Gordon A. Thomas is distinguished research professor of physics at the New Jersey Institute of Technology (thomasg@adm.njit.edu), vice chair of FIAP, and chair of the FIAP program committee. The Forum department is initiated by the American Physical Society's Forum on Industrial and Applied Physics (FIAP). For more information about the Forum, please visit the FIAP Web site (<http://www.aps.org/FIAP/index.html>) or contact the chair, James Kaufman (kaufman@almaden.ibm.com).