

2005 ITRS Meeting Assesses the IC Industry's Rapid Advance into Nanotech

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The advanced chip industry is moving rapidly into nanotechnology, a trend that will be presented by global experts at next week's 2005 ITRS Public Conference of the draft 2005 *International Technology Roadmap for Semiconductors* (ITRS).

The ITRS summer meeting, scheduled from 8:00 a.m. to 5:30 p.m. July 13 at the San Francisco Marriott, will feature descriptions of emerging research devices and materials that explore nanotechnology potentials, along with the nanotech-related challenges faced by more established disciplines such as lithography, interconnect, and front-end processes.

“As a thematic topic for the latest Roadmap revision, the various working groups are paying special attention to industry assessments of technology needs in the nanometric domain,” said Linda Wilson, ITRS Managing Editor and a key conference organizer. “We’d like as many technologists as possible to attend the meeting, participate in the open forums, and network with the ITRS teams who are driving the Roadmap.”

A new edition to be released in December, the 2005 ITRS will contain extensive data and an assessment that have been developed by a consensus of more than 1000 industry experts from the US, Europe, Japan, Korea, and Taiwan. The Roadmap guides industry suppliers and manufacturers in continuously improving the functionality and cost of semiconductors.

At the upcoming conference, ITRS teams will ask the audience for input on critical challenges to keeping the industry on its historic growth trend. The teams also will present potential solutions and identify areas of encouraging innovation. The ITRS teams invite audience participation in evaluating solutions that extend current processes, equipment sets, and architectures.

Examples and associated challenges of the industry's continuing penetration into the nanotech realm – generally defined as device or circuit dimensions below 100 nm – are contained in ITRS presentations, such as:

-- Emerging Research Devices – This chapter explores the territory beyond “ultimate CMOS” and how various nanoelectronic architectures, molecular circuitries, and related technologies can progress from basic research into industry R&D. Risk assessment will be key in considering these devices for manufacturing.

-- Emerging Research Materials– This team continues the discussion of emerging research devices by evaluating the new possibilities and challenges of nanomaterials and their impact on such novel devices. Key to this presentation will be the properties of such materials.

-- Metrology – This discipline is so pervasive that resolving its challenges transport metrology beyond semiconductors and into other sectors of nanotech, such as biotechnology and nano-environmental. The presentation addresses metrology advancements for nanowires and nanoarchitectures, as well as the control issues involved in producing such structures.

-- Lithography – Maskless lithography (ML2) and molecular imprinting – along with extreme ultraviolet lithography (EUV) and innovations in immersion litho – will be discussed at the conference as near-term versus

long-term requirements demand a shift of focus on solution sets for future lithography.

-- Front End Processes –Larger wafers face unprecedented technical challenges (meeting specifications over larger areas) and economic hurdles, especially for wafer, equipment and metrology suppliers. Defining the critical path for 450 nm is urgent, since the industry lags in meeting the historic 12-year development cycle for wafer conversion.

-- Interconnect – The interconnect team presents global wiring issues, the systems approach for solutions for future interconnects, and the most recent developments of dielectric technology.

-- RF and Analog/mixed-signal for Wireless Technologies– This team will discuss those technologies being developed to support future wireless communications, their risks and opportunities, and the intersection of silicon-based technology with semiconductors of alternative compounds and potential technologies.

The 2005 ITRS is jointly sponsored by five organizations representing key chip-producing regions of the world. They include the European Semiconductor Industry Association, Japan Electronics and Information Technology Industries Association, Korea Semiconductor Industry Association, Taiwan Semiconductor Industry Association, and the US Semiconductor Industry Association.

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