

ADVANCE PROGRAM

1954 ~ 50th Anniversary ~ 2003



2003

IEEE

INTERNATIONAL SOLID-STATE CIRCUITS CONFERENCE

FEBRUARY

9, 10, 11, 12, 13

CONFERENCE THEME:

**POWER-AWARE
SYSTEMS**

**SAN FRANCISCO
MARRIOTT HOTEL**

**5-DAY
PROGRAM**

SUNDAY ALL-DAY: 2 WORKSHOPS: Analog Telecom; Near-Limit CMOS; 7 TUTORIALS
3 SPECIAL-TOPIC EVENING SESSIONS: 3G Cell-Phone Integration; Circuits for Emerging Technologies; Highlights of DAC
50th-ANNIVERSARY EVENTS (page 91) **WEB REGISTRATION:** Hotel, Conference: 1 Short Course, 7 Tutorials, 4 Workshops

SPECIAL-TOPIC EVENING SESSIONS

SE2: Circuits in Emerging Technologies

(Salon 8)

Organizer: **Werner Simbuerger**, *Infineon, Corporate Research, Munich, Germany*

Chair: **Ian Young**, *Intel, Logic Technology Development, Hillsboro, OR*

Ubiquitous access to information, anywhere, anyplace, and anytime, will require whole new kinds of information systems. This demand for novel communication systems will translate into innovation in emerging technologies, circuit-design methodologies and fabrication techniques. At the core of these approaches, heavy emphasis is placed on finding the right match between circuit techniques and fabrication-process technology.

This Special-Topic Evening Session addresses circuit techniques that are emerging for both high-performance design at microwave frequencies and for future giga-scale integrated circuits. Some of these techniques include high-speed CMOS, SiGe, GaAs and InP, double-gate FinFET, and Carbon Nanotube technologies.

Recently, CMOS has been demonstrated to be a viable technology for very-high-bit-rate broadband circuit design at over 10Gb/s in highly integrated systems.

Meanwhile, advances in device scaling and doping-profile optimization have also resulted in SiGe bipolar transistors with impressive performance, including cut-off frequencies in the range of 200GHz. This makes them an attractive choice for applications at 40Gb/s and above.

Current InP bipolar integrated-circuits support high-performance mixed-signal applications at frequencies up to 200GHz. The high cut-off frequencies and high breakdown voltages present a unique combination which addresses some major issues.

With the scaling of device dimensions being the primary factor driving improvements in integrated circuit performance and cost, new device structures, such as FinFET, and new materials will be needed to overcome the technological challenges.

Finally, nanometer-scale electronic devices will not only be much smaller, but they must also operate according to designs and quantum-mechanical principles that are quite different from those employed by present-day microelectronic devices.

The speakers will present circuits and circuit techniques in these emerging technologies. In addition, they will address potential solutions for overcoming emerging challenges.

Time **Topics**

- 7:30 **CMOS High-Speed Broadband Techniques**
Michael Green, Professor, *University of California, Irvine, CA*
- 8:00 **Design of SiGe Bipolar Circuits for 40Gb/s Applications**
Herbert Knapp, *Infineon Technologies, Corporate Research, Munich, Germany*
- 8:30 **Indium-Phosphide Bipolar Integrated Circuits: 40GHz and Beyond**
Mark Rodwell, Professor, *University of California, Santa Barbara, CA*
- 9:00 **The Double-Gate FinFET: Device Impact on Circuit Design**
Ingo Aller, *IBM Entwicklung GmbH, Boeblingen, Germany*
- 9:15 **Carbon Nanotubes: From Synthesis to Integration**
Hongjie Dai, Associate Professor, *Stanford University, CA*
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