

If your company is seeking to capitalize on the opportunities that the compound semiconductor industry will offer over the next decade then the Key Conference is for you. Whether you work at a device manufacturer, materials specialist or equipment supplier, our focus on five critical technological areas – III-V/silicon convergence, SiC power devices, nitride materials technology, photovoltaics and semiconductor lasers – will give you the insight to exploit the changing industry landscape as it evolves.

Conference day 1 – November 13, 2006

7.30 Breakfast
8.25 Welcome address

Session 1: III-V/silicon convergence

8.30 The role of compound semiconductors in high-growth, venture-funded markets

- applications attracting keen venture interest;
- crucial role of venture capital;
- compound semiconductors playing the key, distinguishing role in advancing a range of new technologies.

Bill Magill, managing director, Telesoft Partners

8.55 Compound semiconductor MOSFETs: development and road to commercialization

- latest progress in Freescale's GaAs MOSFET program – device results and processing;
- expected applications of III-V MOSFETs – their potential role in wireless communications and other sectors;
- how GaAs MOSFETs will extend the rule of Moore's Law;
- the road to commercialization.

Karl Johnson, Freescale Semiconductor

9.20 Ge and III-V transistors for the 22 nm technology node and beyond

- vision of IMEC's Ge/III-V program for sub-45 nm device technology;
- why meeting the demands of the ITRS requires a move away from simple silicon MOSFET scaling;
- the need to boost carrier mobility beyond the universal curves of silicon and the motivation behind Ge and III-V transistors;
- development status of Ge and III-V MOSFETs.

Gareth Nicholas, IMEC

9.45 Coffee break

10.15 Monolithic incorporation of III-V in silicon for I/O and digital logic

- materials and process advances that now allow for the monolithic integration of III-V materials within a silicon CMOS process;
- electronic and optoelectronic devices created using this technology;
- amorphous AlN dielectrics deposited within an MOCVD system for channel deposition.

Eugene Fitzgerald, professor, Massachusetts Institute of Technology

10.40 Higher-mobility materials for advanced CMOS technology

- limitations of strained-silicon technology for mobility enhancement;
- current status of III-V and Ge MOSFETs;
- device and integration issues.

Steven Koester, research staff member, IBM

11.05 MOSFET scaling through the end of the ITRS and the potential impact of compound semiconductor channels

- the major challenges expected to arise as silicon transistor technology is scaled, including difficulties in meeting the desired increase in transistor performance;
- potential use of SiGe, germanium and III-V MOSFET channel materials;
- key expected technological innovations to enable successful scaling.

Peter Zeitoff, senior fellow, SEMATECH

11.30 Open discussion

12.00 Lunch

Session 2a: New directions in III-V photonics – solar cells

13.30 Terrestrial application of III-V solar cells: the market opportunity now emerging

Presentation details to be confirmed.

Earl Fuller, Emcore

13.55 Metamorphic III-V/silicon photovoltaics for space and terrestrial solar power

- integration of III-V material with silicon via SiGe interlayers;
- prospects for scalable III-V/Si solar cell technology;
- field data from ongoing International Space Station experiments.

Steve Ringel, director of Ohio State's Institute for Materials Research, Ohio State University

14.20 High-efficiency multi junction concentrating solar cells for low-cost energy generation

- multi junction III-V solar cells as an attractive alternative for low-cost terrestrial power generation and status at Spectrolab;
- the paths and value of achieving more than 45% cell efficiency;
- current status of integrating MJ cells in receiver designs;
- manufacturability and reducing the cost of photovoltaic energy generation.

Nasser Karam, vice-president, Spectrolab

14.45 Coffee break

Session 2b: New directions in III-V photonics – lasers

15.15 Technical and business trends in reliable, high-power AlGaInAs laser diodes

- technical advances in 980nm pumps;
- applying telecom know-how to industrial laser applications;
- portents for a second boom driven by diode lasers in the industrial lasers arena.

Toby Strite, manager, HPL marketing, JDSU

15.40 Optoelectronics perspectives at OIDA: nanophotonics, silicon photonics and displays

- innovative technologies that are expected to encroach on the dominance of liquid-crystal display panels in the display segment, including projection and laser-based displays;
- HB-LEDs and lasers for large-area display applications;
- emergence of markets for silicon photonics and nanophotonics.

Michael Lebby, president and CEO, Optoelectronics Industry Development Association

16.05 Production of GaN-based lasers at Sony Corporation

Presentation details to be confirmed.

Michiro Chiba, Sony Corporation

16.30 High-performance computing applications of integrated photonic components

Presentation details to be confirmed.

Dave Welch, chief strategy officer and co-founder, Infinera

17:00 End of conference day 1

Conference day 2 – November 14, 2006

7.30 Breakfast

8.25 Welcome address

Session 3: SiC power devices

8.30 SiC and GaN high-power devices: status and market opportunities

- latest progress in SiC MOSFET development at Rohm, Mitsubishi Electric, Denso and Philips;
- introduction of GaN-based Schottky diodes and their potential for dramatic price reduction;
- applications and opportunities for SiC-based converters and inverters.

Philippe Roussel, project manager, materials and equipment, Yole Développement

8.55 Energy-efficient wide-bandgap devices

- understanding what drives the commercial market to use wide-bandgap electronics;
- focus on the issues that will make wide-bandgap electronic technologies successful;
- potential billion-dollar energy savings in electricity through the use of SiC devices;
- latest high-power device results.

John Palmour, executive vice-president, Cree Inc.

9.20 A comparison of SiC power switches for high-efficiency, high-temperature applications

- review of SiC-based VJFETs, MOSFETs and BJT technologies;
- pros and cons of each device type for individual applications;
- design options for “normally off” SiC devices.

Will Draper, technical product marketing director, SemiSouth Laboratories

9.45 Coffee break

10.15 Microsemi Corporation's SiC product initiative

- Microsemi's approach to the development of its SiC product portfolio and commitment to becoming a merchant supplier;
- technology and licensing partnerships and the development of supplier relationships;
- implementation of manufacturing;
- SiC product roadmap highlighting both technical and cost challenges.

Marc Vandenberg, director, silicon operations, Microsemi Power Products Group

10.40 Continuous ruggedness improvement of SiC power devices: a key for reliable and cost-effective SiC-based application design

- reasons behind the limited market penetration of SiC power devices so far;
- comparison between Infineon's first- and second-generation Schottky diode technology;
- application results and customer benefits of the latest diodes;
- specific benefits of SiC-based unipolar switches.

Roland Rupp, principal SiC technology, Infineon Technologies AG

11.05 Applications and issues with SiC for high-power, high-temperature electronics

- device and system advantages of SiC power electronics;
- potential new applications areas, such as converters directly integrated with high-temperature motors;
- new types of SiC switch devices and their potential applications.

Fritz Kub, head of the power electronics branch, Naval Research Laboratory

11.30 Open discussion

12.00 Lunch

Session 4: III-N device and materials strategies

13.30 GaN HEMTs for commercial RF applications

Presentation details to be confirmed

Jeff Shealy, vice-president of infrastructure of product group, RF Micro Devices

13.55 Deep-UV light-emitting diodes: technology and applications

- the range of potential applications for deep-UV light sources based on AlGaIn structures – air and water purification, surface decontamination, bio-agent detection and more;
- current status of III-N based deep-UV development;
- latest improvements of devices emitting in the spectral range from 247nm to 365nm.

Remis Gaska, president and CEO, Sensor Electronic Technology

14.20 Substrate matters in nitride semiconductor device applications

- the market opportunity for nitride semiconductor devices;
- competition between current and new substrate developers;
- current and eventual substrate cost structure.

Keith Evans, president and CEO, Kyma Technologies

14.45 Coffee break

15.15 GaN-on-diamond substrates and semiconductor technology

- the potential for GaN-on-diamond to enable the world's most powerful and efficient FETs, HEMTs, MMICs, blue/green LEDs and blue/green laser diodes – at no additional cost;
- theory behind the GaN-on-diamond material solution;
- Group4's processing approach for semiconductor-on-diamond;
- inherent scalability of the material-type and diameter of the proposed technology and applicability to practically any compound semiconductor species.

Felix Ejeckam, CEO, Group4 Laboratories

15.40 Low-defect semiconductors for solid-state lighting

- push towards high-current-density wide-bandgap semiconductor devices for general illumination;
- defect problem and the need to manage defects in a cost-effective manner;
- Cermet's drastically different approach to engineering low-defect density LEDs for solid-state light sources.

Jeff Nause, president, Cermet

All delegates are invited to join the speakers at a complimentary drinks party at the close of the conference.



17.00 End of conference day 2

CS Week Texas Ranch party

Relax and mingle with colleagues at the CS Week party, starting at 6.00pm at the Rio Cibolo Texan Ranch. There will be food, drink and entertainment. Attendance is free for Key Conference delegates.

Institute of Physics Publishing reserves the right to change the venue and/or program details.