

**ISCDG**



**IEEE**

**2013 International Semiconductor Conference  
Dresden - Grenoble (ISCDG)**

alternating venue in Dresden (Germany) and Grenoble (France) every other year

Technology, Design, Packaging, Simulation and Test  
International Conference and Table Top Exhibition

**September 26 to 27, 2013 -**

**Technische Universität Dresden, Dresden, Germany**



**PROGRAM**

**Venue:**

**Technische Universität Dresden  
Hörsaalzentrum / Lecture Hall Center  
Bergstr. 64  
01069 Dresden, Germany**



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**„Meet Leading Players and Experts at the ISCDG 2013 in Dresden, Germany“.  
The Largest Microelectronic Centre in Europe!**



## Welcome Note

Dear Friends and Colleagues,

with great pleasure I like to welcome you to the IEEE International Semiconductor Conference Dresden Grenoble 2013 (ISCDG 2013) taking place in Dresden. The objective of the ISCDG is to enhance the visibility of international excellence of the European players in micro- and nanoelectronics.

Only some weeks ago, the European Commission proposed a new European industrial strategy for electronics to mobilise €100 billion in new private investments for micro- and nanoelectronics. Its goal is to strengthen the advanced manufacturing in Europe. With this decision, the European Commission acknowledges the fact that the European electronics sector underpins Europe's wider industrial competitiveness because it is a key enabling technology for other sectors, like energy, automotive and health care. Therefore, a growing electronics sector is essential for growth and jobs in Europe. Micro- and nanoelectronic components and systems are not only essential for digital products and services, they are also the basis for innovation and competitiveness in all large industry sectors.

With the ISCDG 2013 we address actual topics in the field of More Moore as well as More than Moore. We will have outstanding keynote presentations from the automotive application point of view by Toyota Motor Corporation as well as from European and global key players in microelectronics, namely ST Microelectronics, GLOBALFOUNDRIES and Infineon Technologies. Moreover, we will have 13 invited talks by international experts and 40 oral presentations selected by the technical program committee.

I like to thank most sincerely the different committees and teams for their efforts in making this event a reality and especially Christoph Kutter, the Technical Program Chair of this event, for his commitment.

I look forward to meeting you in Dresden. You will meet leading players and experts from all over the world. Do not miss to visit the beautiful historic city center of Dresden and the other sightseeing highlights of Dresden and its surroundings. The get-together on Thursday evening will be on the conference site.

Thomas Gessner  
General Chair of the ISCDG 2013



**General Chairman**  
Thomas Gessner, Fraunhofer ENAS



## Patronage



**Hermann Eul,**  
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Intel Mobile and  
Communications Group  
Intel Corporate  
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Santa Clara USA

## Steering Committee

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**Thomas Gessner,** Fraunhofer ENAS

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**Joachim Burghartz,** IMS CHIPS

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**Robert Weigel,** University of Erlangen-Nuremberg

### Publications Chair:

**Dietmar Kissinger,** University of Erlangen-Nuremberg

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**Isabelle Chartier,** LITEN

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**Dominique Morche,** CEA LETI

**Bich Yen Nguyen,** SOITEC

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**Quentin Raffhay,** Grenoble INP

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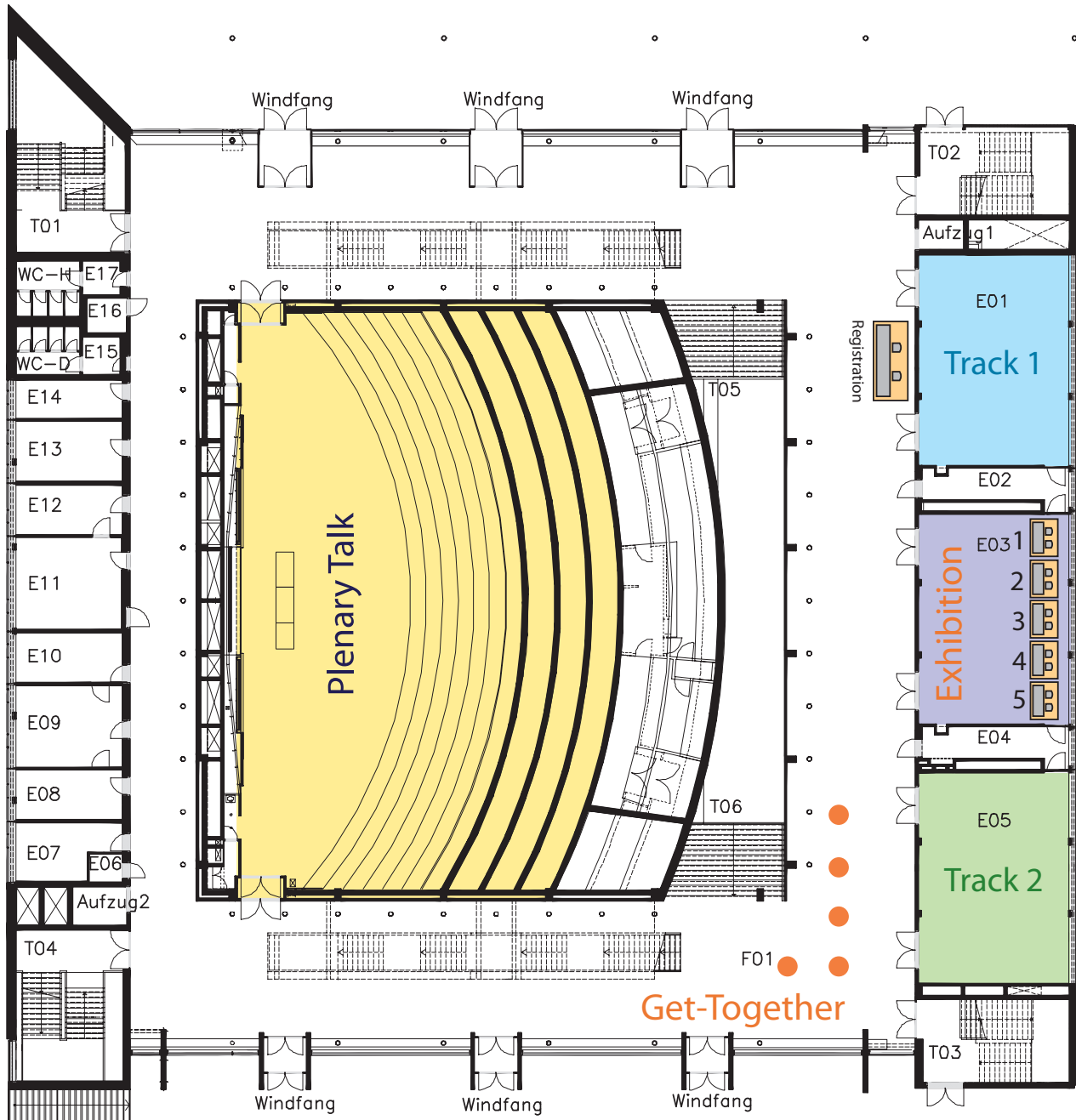


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## Location



Technische Universität Dresden  
Hörsaalzentrum / Lecture Hall Center  
Bergstr. 64  
01069 Dresden, Germany



## Main areas covered by the conference:

### Materials, devices and systems science, engineering and architectures and their characterization

#### ■ **Integrated Circuit and System Design**

Mixed-signal, analogue and digital circuits and systems for high speed and/or low power consumption, adaptive power management, RF up to sub-THz, low costs, and advanced performance and density, circuits in More than Moore and beyond Moore technologies. Manufacturing challenges (cost and cycle time reduction, test, wafer - prime - production. etc..), ...

#### ■ **More Moore and Beyond Moore Devices Technologies**

Ultimate CMOS (silicon and IV-IV strained alloys on insulator, multi-gate and channels transistors, III-V channels), nanowires, thin films dielectrics: high-k and low-k, nano materials, advanced on-chip interconnects, Beyond Moore: TunFETs, carbon electronics,...

#### ■ **Memory Technologies**

Stand alone and embedded memory technologies, new memory technologies: RRAMs, CBRAMs, MRAMs, 1T DRAM, ...

#### ■ **More than Moore Technologies**

MEMS, NEMS, power devices, RF and analog passive components (MIM, filters, supercapacitors, inductances, ...); spintronics based devices, bio sensors, imagers, thermoelectric energy harvesting, ...

#### ■ **Interconnection and Packaging Technologies**

3D and novel interconnects, wire bonding, flip chip, solder replacement flip chip, under bump metallurgy, high density substrates, new packaging technologies for single chip, multi-chip, wafer level, power and stacked-die packages, wafer bumping and thinning, ...

#### ■ **Optical Devices and Photonics**

Optical component assemblies, electro-optical modules, waveguides, silicon based photonic devices, organic devices, optical materials, ...

#### ■ **Organic and Flexible Electronics**

Polymer and organic, printed electronics, organic PV and PV in organic, OLEDs, ...

#### ■ **Characterization, Quality and Reliability**

Electrical characterization, testing strategies and protocols, physical characterization for process development and process control, component, board and system level reliability assessment, failure analysis, interfacial adhesion, accelerated testing and models, component and system qualification, ...

#### ■ **Modeling and Simulation**

EDA, TCAD, electrical, thermal, thermo-mechanical, reliability, optical, modeling and simulation for devices, component and system level applications.





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<b>Conference Registration:</b>	Thursday, September 26, 2013, 8.00 am - 4.00 pm Friday, September 27, 2013, 8.00 am - 4.00 pm
<b>Conference Opening:</b>	Thursday, September 26, 2013, 9.00 am
<b>Technical Sessions:</b>	Thursday, September 26, 2013, 9.00 am - 6.00 pm Friday, September 27, 2013, 9.00 am - 6.00 pm
<b>Table-top Exhibition Opening Hours:</b>	Thursday, September 26, 2013, 9.00 am - 5.00 pm Friday, September 27, 2013, 9.00 am - 4.00 pm
<b>Social Event: Get-Together</b>	Thursday, September 26, 2013, 5.40 pm - 7.00 pm Foyer

## Track 1

Thursday September 26, 2013

09.00 - 09.20	<b>Thomas Gessner, Fraunhofer ENAS - General Chair</b> Dirk Hilbert, Wirtschaftsbürgermeister	<b>Conference Opening</b> Welcome to Dresden
<b>Plenary Session</b>		
09.20 - 09.30	<b>Simon Deleonibus</b> CEA LETI	Best Student Paper Award of the 2012 ISCDG edition
09.30 - 10.10	<b>Rutger Wijburg</b> GLOBALFOUNDRIES	Reversing the Trend: A New Path towards High Volume, Leading Edge Semiconductor Manufacturing in Europe
10.10 - 10.50	<b>Akira Mikami</b> Toyota Motor Corporation	Power Electronic Components for Present and Future Automobiles
10.50 - 11.20	Coffee Break	
11.20 - 12.00	<b>Joel Hartmann</b> STMicroelectronics	ST vision on advanced CMOS roadmap evolution
12.00 - 12.40	<b>Michael Treu</b> Infineon Technologies Austria	Power Electronics – A System Perspective
12.40 - 13.40	Lunch Break	
<b>Session A.1</b>		
<b>Integrated Circuit and System Design</b>		
13.40 - 14.10	<b>Bernd Tillack</b> IHP and TU Berlin	SiGe BiCMOS Technology for More than Moore Functional Diversification for Opto- and Microelectronic Applications
14.10 - 14.30	<b>Gregor Tretter</b> Technische Universität Dresden	10-GS/s Track and Hold Circuit in 28 nm CMOS
14.30 - 14.50	<b>Konstantin Schmid</b> eesy-ic	Modeling and Simulation of Quantizer and DAC Nonidealities of a Continuous Time $\Delta \Sigma$ Modulator
14.50 - 15.10	<b>Uroschanit Yodprasit</b> Technische Universität Dresden	1.2-V 101-GHz W-Band Power Amplifier Integrated in a 65-nm CMOS Technology
15.10 - 15.30	<b>Stefan Timm</b> eesy-ic	A Trimmable Precision Bandgap Voltage Reference on 180nm CMOS
15.30 - 16.00	Coffee Break	
16.00 - 16.20	<b>Hongcheng Xu</b> University of Ulm	An efficiency-enhanced asynchronous buck converter with threshold compensated freewheeling diode
16.20 - 16.40	<b>Robert Wolf</b> Technische Universität Dresden	Fully Differential Diode Detector with Linearization and Voltage Gain
16.40 - 17.00	<b>Jinshu Zhao</b> Technische Universität Dresden	Fully Integrated LTE Doherty Power Amplifier
17.00 - 17.20	<b>David Schöniger</b> Technische Universität Dresden	A low-noise energy-efficient inductor-less 50 Gbit/s transimpedance amplifier with high gain-bandwidth product in 0.13 $\mu\text{m}$ SiGe BiCMOS
17.20 - 17.40	<b>Umair Ali</b> University of Paderborn	A Millimeter Wave Quad-Phase Ring Oscillator using 0.13 $\mu\text{m}$ SiGe BiCMOS HBT Technology

		09.00 - 09.20
		09.20 - 09.30
		09.30 - 10.10
		10.10 - 10.50
Coffee Break		10.50 - 11.20
		11.20 - 12.00
		12.00 - 12.40
Lunch Break		12.40 - 13.40
<b>Session B.1</b>	<b>More than Moore Technologies</b>	
<b>Shunri Oda</b> Tokyo Institute of Technology	Silicon Quantum Dots for Future Nanoelectronics	13.40 - 14.10
<b>Ralf Lerner</b> X-FAB Semiconductor Foundries	Trench Isolated Thick SOI Process for Various Optical and High Voltage Devices	14.10 - 14.30
<b>Yusuke Shuto</b> Tokyo Institute of Technology	FinFET-based pseudo-spin-transistor: Design and performance	14.30 - 14.50
<b>Wenke Weinreich</b> Fraunhofer CNT	Scaling and optimization of high-density integrated Si-capacitors	14.50 - 15.10
<b>Felix Stein</b> STMicroelectronics	Robustness of the Base Resistance Extraction Method for SiGe HBT Devices	15.10 - 15.30
Coffee Break		15.30 - 16.00
<b>Jens Schneider</b> Infineon Technologies	3D Lithography for Implant Applications	16.00 - 16.20
<b>Bernhard Klein</b> Technische Universität Dresden	Design of a Cloverleaf Antenna for an Antenna Coupled Bolometer for Room Temperature THz Imaging	16.20 - 16.40
<b>Jacopo Iannacci</b> Center for Materials and Microsystems – CMM	An Energy Harvester Concept for Electrostatic Conversion Manufactured in MEMS Surface Micromachining Technology	16.40 - 17.00
<b>Daniel Etter</b> Institute for Microelectronics Stuttgart	Microbolometer Technology Using Serial PN-Diodes	17.00 - 17.20
<b>Jaroslav Czarny</b> CEA LETI	New architecture of MEMS microphone for enhanced performances	17.20 - 17.40

Session A.2			Modeling and Simulation
09.00 - 09.30	<b>Philippe Dollfus</b> IEF - CNRS	Carbon-based devices: a modelling viewpoint	
09.30 - 09.50	<b>Tobias Nardmann</b> Technische Universität Dresden	A length-scalable compact model for InP DHBTs	
09.50 - 10.10	<b>Fabian Utermöhlen</b> Robert Bosch	Temperature Sensitivity Modeling of pn-Junction Diodes for Microbolometer-Based Thermal Imaging Applications	
10.10 - 10.30	<b>Julia Krause</b> Technische Universität Dresden	Sensitivity of Class-E Power Amplifier Performance to Individual Transistor Model Parameters	
10.30-11.00	<b>Coffee Break</b>		
11.00-11.20	<b>Johannes Ocker</b> NaMLab	Characterization of Multilayer Gate Stacks by Multi-Phonon Transient Trap Spectroscopy	
11.20-11.40	<b>Thanh Vinh Dinh</b> LaMIPS	Model of Mutual Coupling between Two Bonding Wires On Glass Substrate	
11.40-12.00	<b>Charalabos Dimitriadis</b> Aristotle University of Thessaloniki	Compact modeling of Nano-Scale Trapezoidal Cross-Sectional FinFETs	
12.00-13.00	<b>Lunch Break</b>		
Session B.2			Characterization, Quality and Reliability
13.00 - 13.30	<b>Rainer Dudek</b> Fraunhofer ENAS	Thermo-mechanical Reliability Assessment in 3-D Integration with Focus on CPI	
13.30 - 13.50	<b>Sehoon Chun</b> Institute for Microelectronics Stuttgart	Design of Online Aging Sensor Architecture for Mixed-Signal Integrated Circuit	
13.50 - 14.10	<b>Eberhard Kaulfersch</b> Fraunhofer ENAS	Finite Element Analysis for BEOL Stress Engineering to Improve Yield and Reliability	
14.10-14.30	<b>Martin Schuster</b> NaMLab	HEMT test structure technology for fast on-wafer characterization of epitaxial GaN-on-Si material	
14.30-14.50	<b>Coffee Break</b>		
Session C.2			Memory Technologies
14.50 - 15.20	<b>Elisa Vianello</b> LETI	Resistive switching devices (OxRAM, CBRAM) for future memory applications	
15.20 - 15.50	<b>Ricardo Sousa</b> Spintech	MRAM concepts for sub-nanosecond Precessional Switching and sub-20nm Cell Scaling	
15.50 - 16.10	<b>Christoph Bukethal</b> Infineon Technologies Taiwan	Analysis and Optimization of Program Disturb in Split-gate Cells using SSI	
16.10 - 16.30	<b>Coffee Break</b>		
16.30 - 16.50	<b>Daniel Blaschke</b> Helmholtz-Zentrum Dresden – Rossendorf	Resistive Switching in thermally oxidized Titanium Films	
16.50 - 17.10	<b>Agnieszka Bogusz</b> Helmholtz-Zentrum Dresden-Rossendorf	Resistive switching in thin multiferroic films	
17.10 - 17.30	<b>Kotb Jabeur</b> CEA/CNRS/UJF	Compact model of a three-terminal MRAM device based on Spin Orbit Torque switching	

Session D.2		Optical Devices and Photonics, Organic and Flexible Electronics
<b>Karl Leo</b> TU Dresden	OLED-on-Silicon: Widening the Scope of Silicon Photonics	09.00 - 09.30
<b>Edoardo Charbon</b> TU Delft	Photon Counting Cameras for LIDARs, Nuclear Medicine, and Molecular Imaging	09.30 - 10.00
<b>Delphine Marris-Morini</b> IEF - Université Paris Sud	Silicon and Germanium-based optical modulators: Towards high speed integrated circuits	10.00 - 10.30
		<b>Coffee Break</b>
<b>Reza Shabanpour</b> Technische Universität Dresden	A 2.62 MHz 762 $\mu$ W Cascode Amplifier in Flexible a-IGZO Thin-Film Technology for Textile and Wearable-Electronics Applications	11.00 - 11.20
<b>Andreas Willert</b> Fraunhofer ENAS	Customized Printed Batteries Driving Sensor Applications	11.20 - 11.40
<b>Adam Szyszka</b> IHP	M-S and M-O-S contacts to N-polar GaN on Silicon (111) for UV photo-detector application	11.40 - 12.00
		<b>Lunch Break</b>
		12.00 - 13.00
Session E.2		More Moore and Beyond Moore Devices Technologies
<b>Francois Andrieu</b> LETI	Scaling the planar FDSOI below 14nm	13.00 - 13.30
<b>Franz Kreupl</b> Technische Universität München	Carbon Wonderland from an Engineering Perspective	13.30 - 14.00
<b>Alessandro Cresti</b> Minatec	Chemical modifications of graphene ribbons for transport gap engineering: a root to logic devices?	14.00 - 14.30
		<b>Coffee Break</b>
		14.30 - 14.50
<b>Imed Ben-Akkez</b> STMicroelectronics	Impact of back biasing on the effective mobility in UTBB FDSOI CMOS technology	14.50 - 15.10
<b>Dimitrios Tassis</b> Aristotle University of Thessaloniki	Variability analysis – prediction method for nanoscale triple gate FinFETs	15.10 - 15.30
<b>Martin Claus</b> Technische Universität Dresden	About the charge injection limitation in Schottky barrier CNTFETs	15.30 - 15.50
<b>Roman Leitsmann</b> AQcomputare	Oxygen Related Defects and the Reliability of High-k Dielectric Films in FETs	15.50 - 16.10
		<b>Coffee Break</b>
		16.10 - 16.30
Session F.2		Interconnection and Packaging Technologies
<b>Takayuki Ohba</b> Tokyo Institute of Technology ICE Cube Center Yokohama	Wafer level 3DI using Bumpless Interconnects for Tera-Scale Generation	16.30 - 17.00
<b>Mario Baum</b> Fraunhofer ENAS	Development and Characterization of 3D Integration Technologies for MEMS based on Copper TSVs and Copper-to-Copper Metal Thermo Compression Bonding	17.00 - 17.20



# IEEE

## 2013 International Semiconductor Conference Dresden - Grenoble (ISCDG)

### Exhibitor List

### Booth No.

Agilent Technologies	01
Cascade Microtech	02
eesy-ic	03
eesy-id	04
Rohde & Schwarz	05
TACTRON ELEKTRONIK	06
Tanner EDA	07



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