PROGRAM

Monday, 20 September 2021

"Welcome - INTRODUCTION TO MICROELECTRONICS"

"Welcome - INTRODUCTION TO MICROELECTRONICS"

13:45-14:00	**Registration & Welcome**	-
14:00-14:30	**Opening & Organizational Matters**	Prof. J. Bartha (TU Dresden)
14:30-14:40	**Welcome to TU Dresden**	Prof. R. Tetzlaff (TU Dresden)
14:50-15:30	**Semiconductor Industry – Beyond Textbook Physics**	Dr. D. Droste (Bosch)
15:35-16:30	**Process Integration – Smart is Beautiful!**	Prof. J. Bartha (TU Dresden)
16:45-17:45	**Get Connected: Networking for Scientists**	Dr. S. Rohac (Kommunikation bewegt)
17:45-18:30	**Poster Session**	-

Tuesday, 21 September 2021

"MORE MOORE" - GLOBALFOUNDRIES

9:00- 9:15	Registration, Welcome & Technical Check	-
9:15-9:25	Welcome to GLOBALFOUNDRIES	Dr. M. Horstmann (VP & GM Fab Management)
9:30-10:30	**The Workhorse in nm Scale: Current & Future Approaches for Transistor Integration (FEoL)**	Dr. M. Wiatr (Director Technology Integration & Semiconductor Reliability)
10:40-11:40	**Sponge Bob on Chip: Cu Wiring in Porous Insulators**	Dr. M. Lehr (Manager BEOL-Integration)
11:45-12:15	**Changing the World from the Inside Out - Careers@Globalfoundries**	-
12:15-13:15	**Individual Conversations in Breakout Rooms**	GlobalFoundries recruiters
13:30-14:30	**Enlightening the Path: Advanced Lithography Beyond the Limits**	S. Mühle (Prozess Manager Lithography)

"MORE MOORE" - GLOBALFOUNDRIES

14:40-15:40	**eNVM Solutions for 2Xnm Nodes and Beyond**	Dr. S. Beyer (DMTS - Integration)
15:50-16:50	**Much Ado about Nothing: Physical/Chemical Analysis of Least Structures, Lowest Concentrations & Invisible Defects**	Dr. A. Meyer (Manager Materials Analysis Laboratory)
16:50-17:00	**Q&A and Closing**	-

Wednesday, 22 September 2021

"MORE THAN MOORE (1)" - X-FAB

9:00- 9:15	Registration & Welcome & Technical Check	-
9:15-10:00	KEYNOTE **X-FAB a Foundry for Medical Market**	Dr. K.-H. Stegemann (Process Integration & Business Development)
10:00-10:35	**Let's go RESURFing – High Voltage Devices for Foundry Technologies**	Dr. C. Ellmers (X-FAB)
10:35-11:10	**Analog/Mixed Signal Challenges – a Foundry Perspective**	Dr. S. Crocoll (Group Manager Reliability)

"MORE THAN MOORE (2)" - Bosch Semiconductor Manufacturing Dresden

14:00-14:05	Registration & Welcome & Technical Check	-
14:05-14:15	**Introduction Bosch Semiconductors**	Dr. C. Koitzsch (Fab Manager)
14:15-14:45	**Project Bosch 300-mm-Semiconductor Fab Dresden**	Dr. C. Koitzsch / O. Graf (Fab Manager)
14:45-15:30	**360° Virtual Fab Tour** - 3D BIM - Digital Twin & Augmented Reality - Smart Data & Connected Manufacturing - Use of Artificial Intelligence for Smart Manufacturing	Dr. O. Trovarelli (Manufacturing Engingeering)

"MORE THAN MOORE (2)" - Bosch Semiconductor Manufacturing Dresden

15:30-16:30	- Chip Design - Synergies in Dresden: Design and manufacturing in one place - Demonstrators	Dr. D. Droste (Head of ASIC Design Center Dresden, Bosch Sensortec)
16:30-17:00	Q&A Session	-

Thursday, 23 September 2021

"MORE THAN MOORE (3)" - Infineon Technologies Dresden GmbH & Co. KG

9:00- 9:10	Registration & Welcome & Technical Check	-
9:10-9:35	Talk 1: **Power to the People – Controlling Our Energy Flow with Power Semiconductors**	Dr. R. Weis (Senior Principal Engineer Technology Development High-Voltage-MOS)
9:35-10:00	Talk 2: **I See You in the Tera-Hertz Gap: Ultra-fast Bipolar Transistors for Autonomous Driving and Beyond**	Dr. D. Manger (Principal Process Integration / Project Leader)
10:00-10:25	Talk 3: **A Hitchhiker's Guide to System-on-chip Design**	S. Simon (Senior Manager Concept, Digital Design and Verification)
10:25-10:50	Talk 4: **AI-mazing, My Colleague is a Robot: Artificial Intelligence at Infineon**	M. Ernst (Principal Engineer Advanced Data Analytics)
10:50-11:20	**Quiz about the Talks**	-
11:20-12:00	*Break*	-
12:00-12:10	**Pitches to Introduce Focus Session**	-
12:10-13:10	**Focus Sessions** (rotating): ▪ From Idea to Implementation – Designing the Chips of Tomorrow ▪ Engineering and Verification in the Lab ▪ Edge AI + Radar = Vision without a Camera	
13:10-13:20	*Break*	

"MORE THAN MOORE (3)" - Infineon Technologies Dresden GmbH & Co. KG

13:20-13:50 **Virtual Coffee Corner** (parallel):

- Career Opportunities & Jobs at Infineon Dresden
- Talk to Young Professionals

13:50-14:00 **Summary and Feedback**

- **-**

14:30-15:30 **Panel Discussion - Career Paths in Microelectronics**

Managers of leading companies talk about their own paths into the top positions of Dresden's microelectronics industry. Get an exclusive insight into their careers as well as the unique chance to chat with the key players in Silicon Saxony.

Panelists:

- Christian Koitzsch (Bosch: Fab Manager)
- Axel Preusse (Globalfoundries: Fellow)
- Thomas Morgenstern (Infineon: Senior Vice President Managing Director)
- Michael Woittennek (X-Fab: Manager Operations)
- Stefan Mannsfeld (TU Dresden/cfaed)

Presentation: Yvonne Keil (Silicon Saxony Board)

Friday, 24 September 2021

"BEYOND MOORE" - TU Dresden

8:45-9:00	Registration & Welcome & Technical Check	-
9:00-9:30	**Hafniumoxid Based FeFETs for Application in Artificial Neurons**	Prof. T. Mikolajick (naMLab gGmbH, TU Dresden)
9:30-10:00	**From Neurons to Networks: Bio-inspired AI in Hardware and Algorithms**	Prof. C. Mayr (TU Dresden)
10:00-10:30	**Future Communication Systems for Tactile Internet Applications**	Prof. F. Fitzek (CeTI, TU Dresden)
10:35-11:05	**Organic Electronics Research at cfaed**	Prof. S. Mannsfeld (cfaed, TU Dresden)
11:05-11:30	**Wrap-up**	-

Ge-based Reconfigurable Transistors: A Platform Enabling Negative Differential Resistance

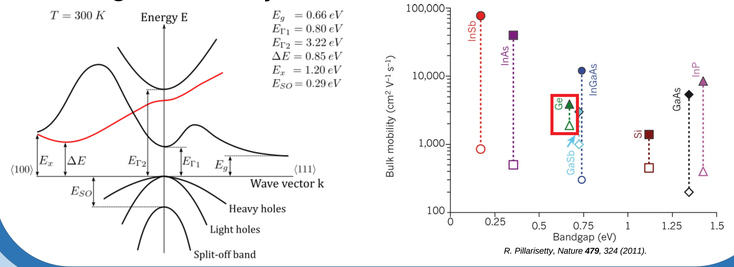
Raphael Böckle, Masiar Sistani, Walter M. Weber

Technische Universität Wien, Institute of Solid State Electronics, Vienna, Austria

Motivation

Why Ge?

- CMOS compatible (Group IV)
- Multi-valley conduction band
- High mobility material

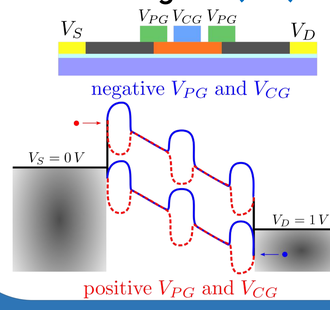


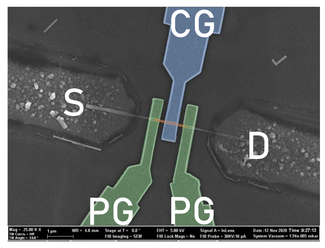
*R. Pillarisetty, Nature **479**, 324 (2011).*

Beyond CMOS Devices

RFET

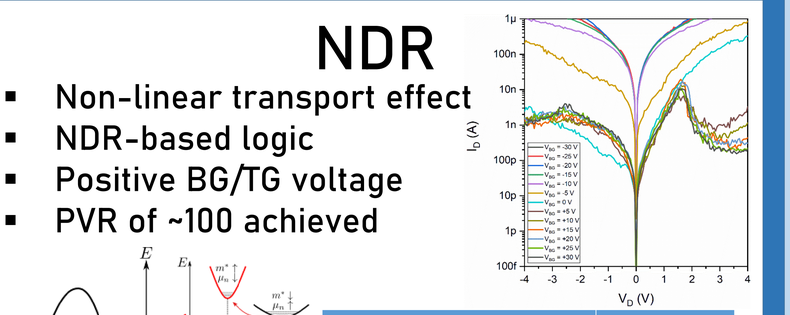
- Polarity-gates (PGs): Set p- or n-type mode
- Control-gate (CG): Modulate current

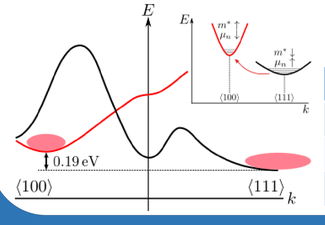




NDR

- Non-linear transport effect
- NDR-based logic
- Positive BG/TG voltage
- PVR of ~100 achieved

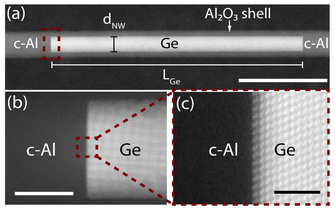




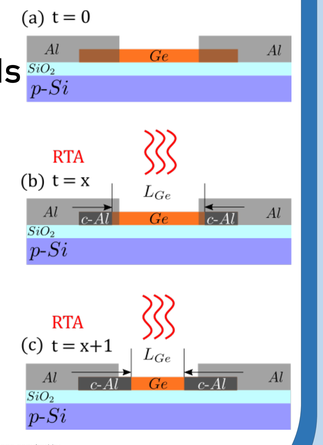
State of the Art devices	PVR
Si Esaki	2.00
Si/SiGe	1.54
AlAs/GaAs	2.90

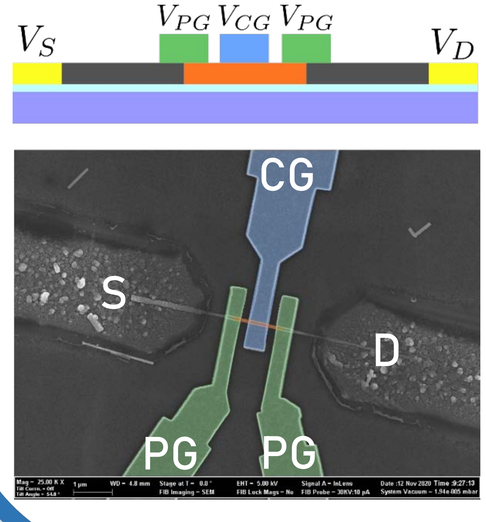
Device Integration

- Oxidized p-Si wafer
- Macroscopic Au bond pads
- i-Ge NW transfer
- Al S/D contacts (EBL)
- Annealing (RTA)
- Ti/Au top-gates (EBL)



TEM image acquired by M. A. Luong, E. Robin and M.I. den Hertog, CNRS, Institut Néel, Univ. Grenoble Alpes.





NDR-mode RFET

- NDR region can be modulated by CG
- Building block for small footprint multi-valued logic gates
  - Radix is set by number of devices in series
  - Significantly reduced circuit propagation delay