



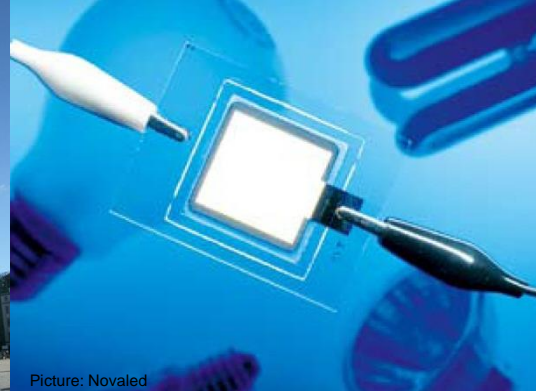
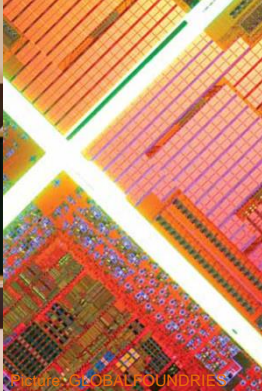
FCMN 2015: WELCOME TO DRESDEN

Ehrenfried Zschech

Fraunhofer IKTS-MD Dresden and TU Dresden/DCN

Dresden, April 14, 2015

DRESDEN – A MEETING POINT



Picture: Fraunhofer IPMS

Picture: GLOBAL BOUNDRIES

Picture: Novaled

SILICON SAXONY E. V.



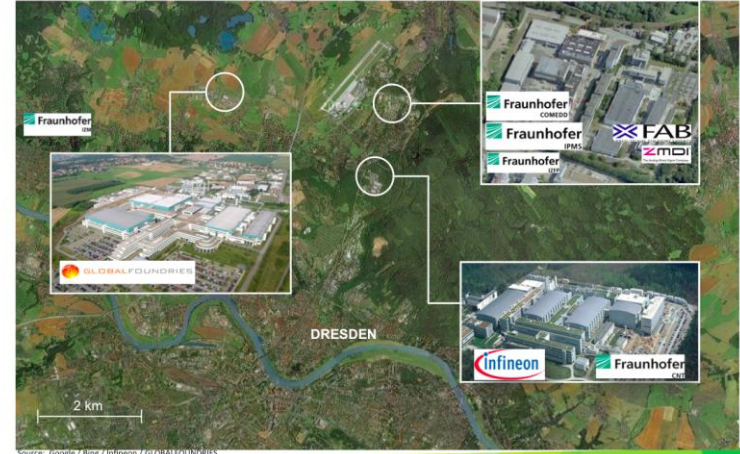
MORE THAN **300** MEMBERS



5 DIVISIONS

- Europe's most successful network for
- MICRO- & NANO-ELECTRONICS
 - SOFTWARE
 - APPLICATIONS
 - SMART SYSTEMS
 - ENERGY SYSTEMS

Microelectronics / ICT in Saxony
Production Sites of Chip Manufacturers in Dresden and Selected Fraunhofer Institutions



SILICON SAXONY E. V.

The High-Tech Network

SILICON SAXONY

A LOCATION OF DIVERSIFICATION



- Vast experience in high volume production (More Moore and More than Moore, 200mm and 300mm)
- Silicon Saxony as core of the ICT cluster (2,100 enterprises, 51,000 employees)
- Strong research landscape (9 universities with over 100,000 students, relevant for MNE: HZDR, 13 Fraunhofer, 3 Max Planck and 3 Leibniz Association)
- Strong industrial base for equipment makers and materials, strength also in 3D systems integration, smart systems



Join our **XPERTS!**

450 mm
IC-DESIGN

CYBER-PHYSICAL SYSTEMS

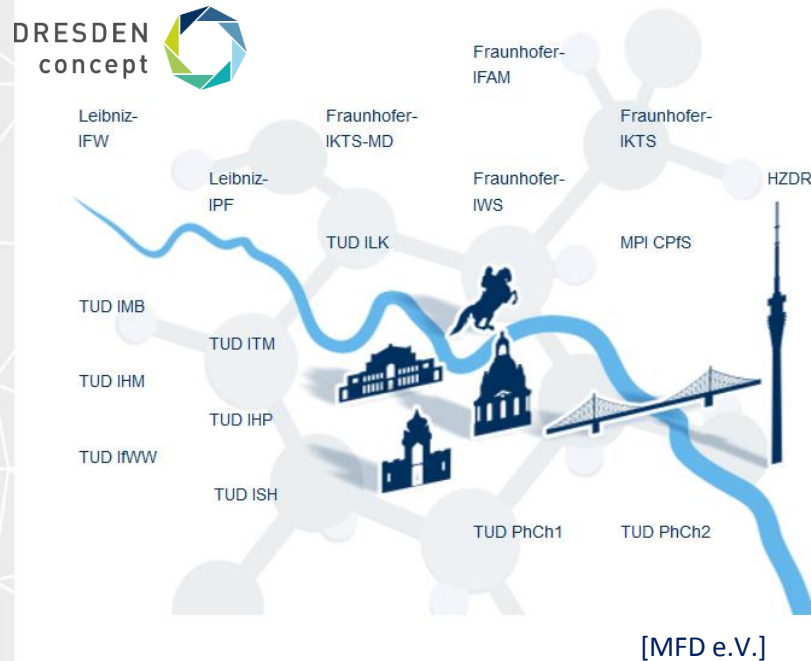
RFID PATENTS-LAW-TAXES
PERSONNEL DEVELOPMENT

SMART CITY
SMART INTEGRATED SYSTEMS
COOL SILICON



MATERIALS RESEARCH IN DRESDEN

Dresden: „Capital of Materials Research“



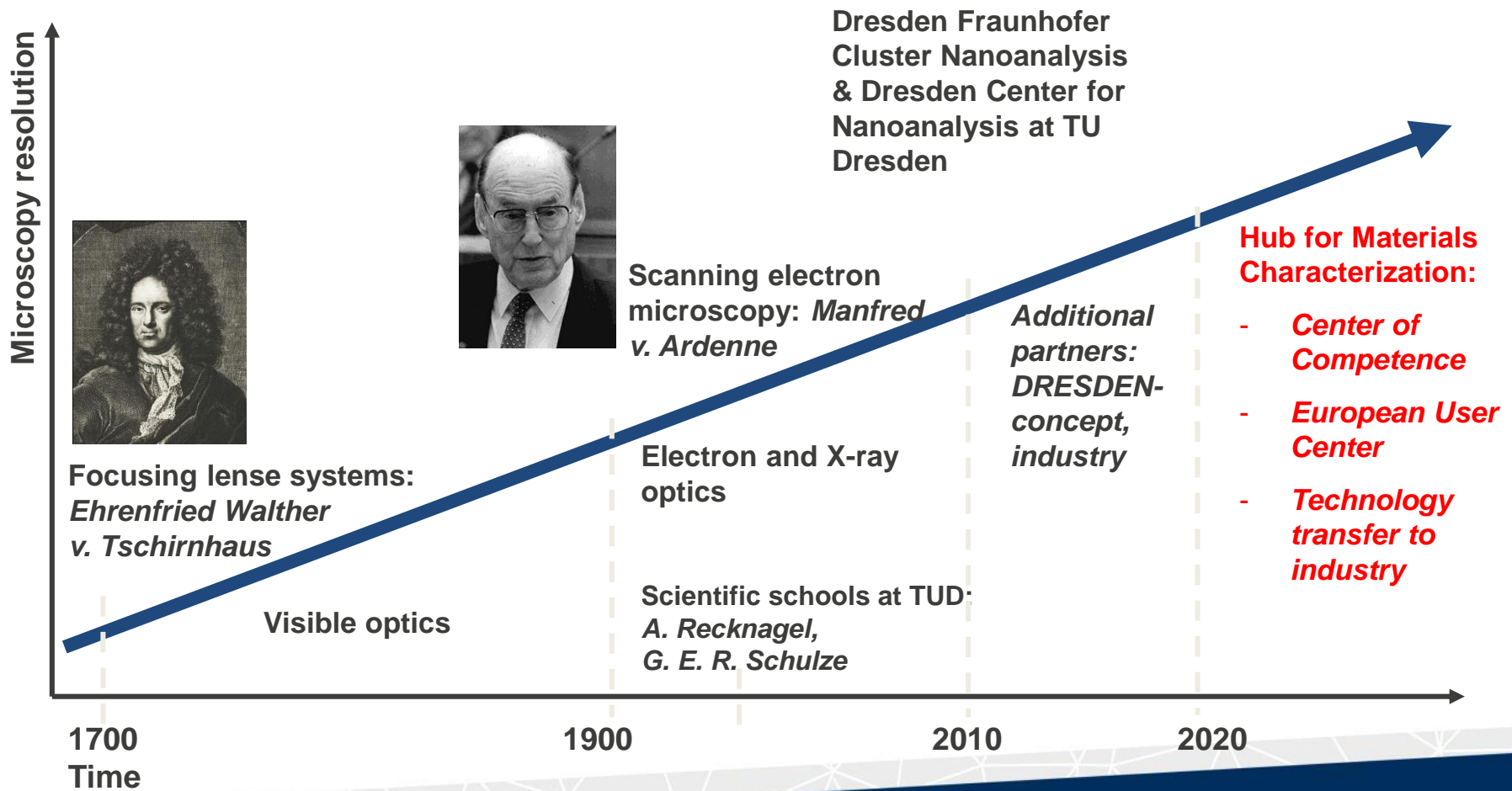
Locational advantage:

- More than 2.000 active scientists in materials research, estimated annual budget of 135 Mio €
- Broad competences in different material classes and application fields
- Top 100 location in Materials Science (No. 59 in 2014 U.S. News & World Report Best Global Universities Ranking).

Challenges:

- Securing national and international visibility and competitiveness
- Strengthening collaboration of academia and industry in teaching, research and innovation
- Facing current megatrends in research and technology and interdisciplinary topics (“Industrie 4.0”)
- Unique competence in computational materials science/simulation and materials characterization.

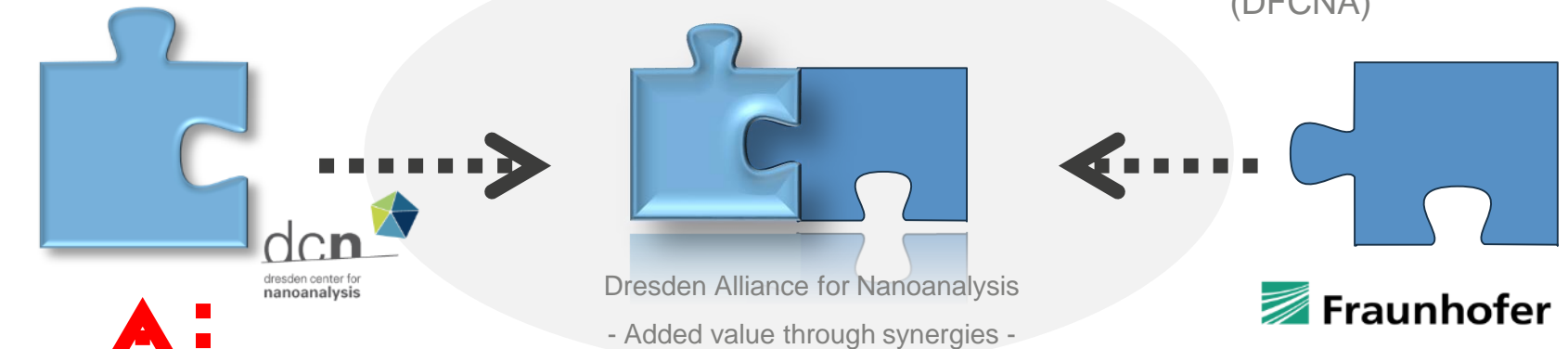
HISTORY AND VISION - MATERIALS AND STRUCTURE CHARACTERIZATION IN SAXONY: PROFILE LINE OF THE RESEARCH HUB DRESDEN



COMPUTATIONAL MATERIALS ANALYSIS AND MATERIALS CHARACTERIZATION within the **DRESDEN CONCEPT** - DRESDEN ALLIANCE FOR NANOANALYSIS: **DCN @ TU DRESDEN** and **DRESDEN FRAUNHOFER CLUSTER NANOANALYSIS DFCNA**

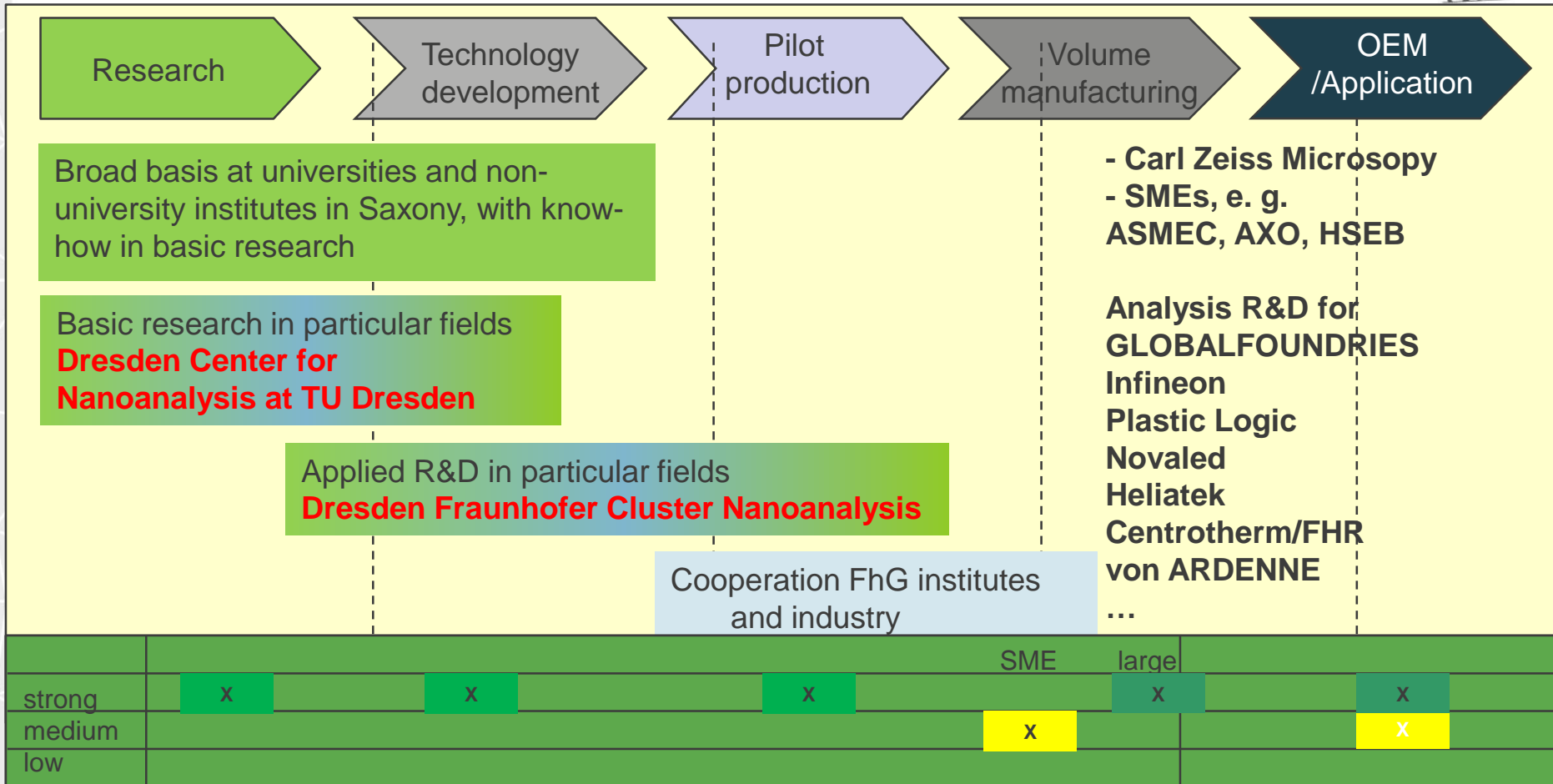
Dresden Center for Nanoanalysis (DCN)

Dresden Fraunhofer Cluster Nanoanalysis (DFCNA)



- Expertise at different length scales and complexity levels
- Broad disciplinary spectrum
- Excellent high performance computing infrastructure and materials analysis infrastructure
- Bundling of competences in interdisciplinary research networks

VALUE AND INNOVATION CHAIN - NANOANALYSIS IN SAXONY



- Cooperation within the „DRESEN concept“
- Excellent basic and applied research
- Cooperation with industry in bilateral contracts and networks



INDUSTRY PARTNERS IN THE FIELD OF NANOCHARACTERIZATION

Globally operating companies located in Dresden



SMEs located in Dresden



Equipment suppliers located in Dresden



Other companies

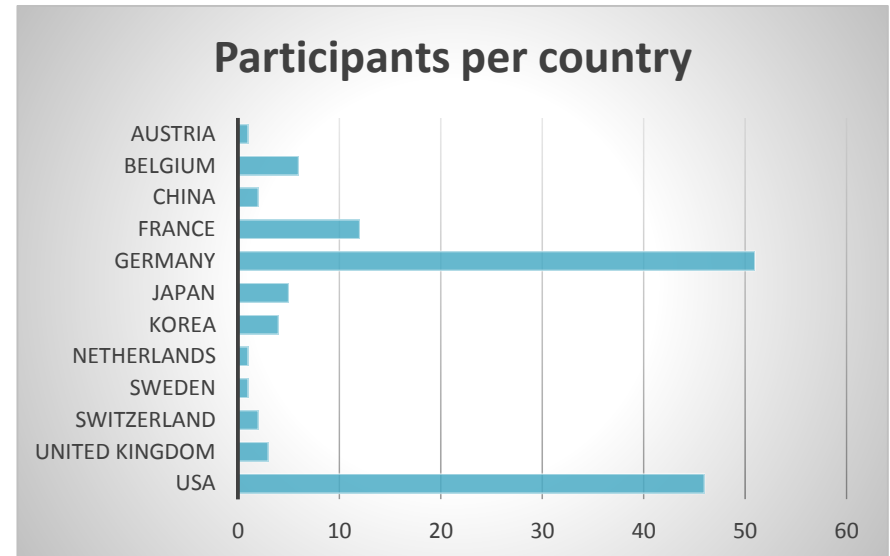
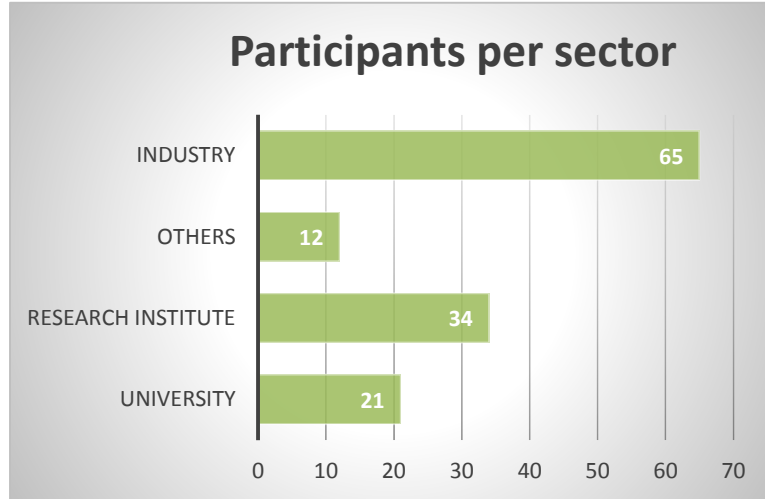


SBA Materials, Inc.



PARTICIPANTS AT FCMN

Total: 132 (April 10, 2015)



SPECIAL THANKS TO OUR SPONSORS



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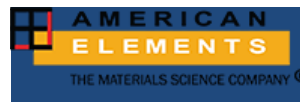


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Gold Sponsor



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SPECIAL THANKS TO ...



Supporting Organizations

National Science Foundation (NSF)
American Vacuum Society (AVS)

Cooperation Partners

Dresden Fraunhofer Cluster Nanoanalysis
Fraunhofer IKTS Dresden
Technische Universität Dresden - Dresden Center for Nanoanalysis (DCN)
and Center for Advanced Electronics Dresden (cfaed)
National Institute of Standards and Technology

Innotec21 GmbH



SPECIAL SESSION / SYMPOSIUM „3D INTEGRATION“

FCMN Session Chair

Martin Gall, Fraunhofer IKTS-MD Dresden

Fraunhofer Session Chairs

Jürgen M. Wolf, Fraunhofer IZM-ASSID Dresden

Stefan Schulz, Fraunhofer ENAS Chemnitz

Ehrenfried Zschech, Fraunhofer IKTS-MD Dresden



SAVE THE DATE !

**SYMPOSIUM
3D INTEGRATION - TECHNOLOGY,
MATERIALS, RELIABILITY**

APRIL, 16th, 2015

Hilton Hotel Dresden, 12 p.m. - 6 p.m.

SPEAKERS AT A GLANCE:

| | |
|------------------|----------------------------|
| PAUL S. HO | University of Texas |
| VALERIY SUKHAREV | Mentor Graphics |
| SESHRAMASWAMI | Applied Materials |
| JUERGEN GLUCH | TU Dresden/Fraunhofer IKTS |
| KRIS VANSTREELS | IMEC |
| PETER CZURRATIS | PVA Teplo |
| MARKUS KEIL | HSEB Dresden GmbH |
| M. J. WOLF | Fraunhofer IZM |
| SVEN RZEPKA | Fraunhofer ENAS |

PROGRAM & REGISTRATION:

www.3D-integration.fraunhofer.de



The symposium is organized by the Fraunhofer Cluster 3D Integration in close collaboration with the Dresden Fraunhofer Cluster Nanoanalysis.

Frontiers of
Characterization
and Metrology for
Nanoelectronics



Dresden
Nanoanalysis
Symposium

3RD DRESDEN NANOANALYSIS SYMPOSIUM (DNS)



dcn
dresden center for
nanoanalysis

PROGRAM

Friday, 17-04-15

3rd Dresden Nanoanalysis Symposium

(kindly supported by Dresden Fraunhofer Cluster Nanoanalysis (DFCNA))

09:00 Welcome

Ehrenfried Zschech

Fraunhofer IKTS Dresden and Technische
Universität Dresden, GERMANY

09:15 Material modeling, numerical simulation and characterization - Basis for modern materials science and engineering

Krzysztof Kurzydowski,
NCBiR Warsaw, POLAND

09:40 Combining X-ray microtomography with the finite elements method to study damage and cracking in structural materials

Henry Proudhon, Centre des Matériaux MINES
Paristech, FRANCE

10:05 Characterization of Nanowires- Electrical, Optical, Thermal

Heike Riel

IBM Research, Rüschlikon, SWITZERLAND

10:30 3D chemical analysis of nanodevices using correlative transmission electron microscopy and atom probe tomography

Adeline Grenier

CEA, LETI, MINATEC Campus, Grenoble, FRANCE

10:55 Coffee break and poster session

11:25 Materials for a new window of the ICT age

Rodrigo Martins

University Lisbon, PORTUGAL

11:50 Organic electronics - A challenge for nanoanalysis

Karl Leo

Technische Universität Dresden, GERMANY

12:15 Characterization of nano-structured polymer systems: From nano-medicine to function electronic materials and smart polymers

Ulrich S. Schubert

University Jena, GERMANY

12:40 Lunch break and poster session

13:40 Advancements in Electron Microscopy for the Electronics Market

Rob Krueger

FEI, Eindhoven, NETHERLANDS

14:05 Recent Applications of an Environmental, Aberration-corrected TEM for Nanomaterial Studies

Robert Sinclair

Stanford University, Palo Alto/CA, USA

14:30 Nano X-ray tomography- Novel concepts and applications for energy storage

Jürgen Gluch

Fraunhofer Institute for Ceramic Technologies and
Systems Dresden, GERMANY

14:55 Fracture toughness and crack propagation analysis for metal-dielectric stacks

Michael Hecker

GLOBALFOUNDRIES, Dresden, GERMANY

15:20 Closing remarks and poster prizes

Ehrenfried Zschech

Fraunhofer IKTS Dresden and
Technische Universität Dresden, GERMANY

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dresden center for nanoanalysis

SPECIAL NOTES

Talks on-line

We will ask each speaker for permission after the event

Poster session and complementary wine and cheese: Tuesday 16:15 – 18:15, Hilton Dresden, Rooms 4-5

Numbers are posted above each poster. Authors are responsible for displaying and removing (at the end of the conference) their posters.

Silence Phones! No WLAN in the conference room!

Emergency Exits

Conference Survey

A survey will be distributed via e-mail after the event. Your feedback is appreciated!

CONFERENCE DINNER

Wednesday 19:00

Pulverturm restaurant, located just around the corner from the Hilton Dresden

