BuildMoNa Symposium 2019

Transparent Conductive Oxides – Fundamentals and Applications

Monday, 23 September to Friday, 27 September 2019
Universität Leipzig, 04103 Leipzig, Linnéstr. 5,
Lecture Hall for Theoretical Physics

Agenda

Monday, 23 September 2019

13:00     Prof. Dr. Marius Grundmann
          Universität Leipzig, Germany
          Opening

13:05     Dr. Debdeep Jena*
          Cornell University, USA
          Paul Drude Lecture I: The Drude Model Lives On: Its Simplicity and
          Hidden Powers

13:50     Prof. Vanya Darakchieva*
          Linköping University, Sweden
          Paul Drude Lecture II: Optical properties of the electron gas

14:35     Dr. Robert Karsthof
          University of Oslo, Norway
          Revisiting the electronic transport in doped nickel oxide

14:50     Dr. Petr Novák
          University of West Bohemia, Plzeň, Czech Republic
          Important factors influencing the electrical properties of sputtered AZO
          thin films

15:05     Coffee break (Aula)

*Invited talk
15:35  Dr. Andriy Zakutayev*  
National Renewable Energy Laboratory, USA  
*Invited talk
Wide Band Gap Chalcogenide Semiconductors

16:20  Alexander Koch  
Universität Jena, Germany  
Ion Beam Doped Transparent Conductive Oxides for Metasurfaces

16:35  Prof. Chris van de Walle*  
UC Santa Barbara, USA  
Fundamental limits on transparency of transparent conducting oxides

Tuesday, 24 September 2019

08:15  Excursion BMW Group Plant Leipzig  
Departure by bus from Leipzig, Linnéstr. 5

09:15  Start Excursion BMW Visitor Center

12:15  Departure by bus from BMW Visitor Center

12:45  Lunch (Aula)

14:30  Prof. Dr. Pedro Barquinha*  
Universidade Nova de Lisboa, Portugal  
Towards autonomous flexible electronic systems with zinc-tin oxide thin films and nanostructures

15:15  Dr. Saud Bin Anooz  
Leibniz Institute for Crystal Growth, Berlin, Germany  
Optimization of $\beta$-$\text{Ga}_2\text{O}_3$ film growth on miscut (100) $\beta$-$\text{Ga}_2\text{O}_3$ substrates by MOVPE

15:30  Dr. Piero Mazzolini  
Paul-Drude-Institut für Festkörperlektronik, Berlin, Germany  
Control over In-incorporation for monoclinic $(\text{In}_x\text{Ga}_{1-x})_2\text{O}_3$ alloys on $\beta$-$\text{Ga}_2\text{O}_3$ substrates via molecular beam epitaxy

15:45  Max Kneiß  
Universität Leipzig, Germany  
Epitaxial stabilization of $\kappa$-$(\text{In}_x\text{Ga}_{1-x})_2\text{O}_3$ and $\kappa$-$(\text{Al}_x\text{Ga}_{1-x})_2\text{O}_3$ layers up to $x_{\text{In}} \leq 0.28$ and $x_{\text{Al}} \leq 0.65$ by tin-assisted VCCS-PLD
16:00 Coffee break (Aula)

16:30 Dr. Felix Gunkel*
FZ Jülich, Germany
*Thermodynamic control of ionic-electronic structure in oxide thin films, heterostructures, and TCOs*

17:15 Melanie Budde
Paul-Drude-Institut für Festkörperlektronik, Berlin, Germany
*Application potential of epitaxial, meta-stable p-type SnO: Temperature stability and pn-junction with Ga$_2$O$_3$*

17:30 Dr. Marcel Himmerlich*
CERN, Geneva, Switzerland
*What to learn from surface spectroscopy about oxide layer functionality in electronic devices and particle accelerator components?*

18:30 Poster session and finger food (TA307)

**Wednesday, 25 September 2019**

09:00 Dr. Lars Grieger*
Malvern Panalytical B.V., Almelo, The Netherlands
*To swim or drown in XRD data - Measurement and Evaluation of 200 reciprocal space maps*

09:45 Prof. Giuseppe Iannaccone*
University of Pisa, Italy
*Quantum Engineering of transistors based on 2D materials heterostructures*

10:30 Coffee break (Aula)

11:00 Prof. Christiana Di Valentin*
University of Milan, Italy
*Theory of oxide surfaces and interfaces*

11:45 Prof. André Schleife*
University of Illinois, Urbana Champaign, USA
*Excited electrons in TCOs: Dielectric screening and electron dynamics*

12:30 Lunch (Aula)

*Invited talk*
13:30  Prof. Dr. Tobias Voss*
TU Braunschweig, Germany
*Invited talk
Controlled formation of hybrid functional ZnO/polymer junctions by oxidative chemical vapor deposition (oCVD)

14:15  Dr. Markus Wagner*
TU Berlin, Germany
Optical and thermal characteristics of Ga$_2$O$_3$ polymorphs

15:00  Johannes Feldl
Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany
Cubic (In,Ga)$_2$O$_3$ films studied by Raman scattering and spectroscopic ellipsometry

15:15  Prof. Dr. Dieter Schmeißer
BTU Cottbus-Senftenberg, Germany
UV photogeneration in in Ga$_2$O$_3$

15:30  Coffee break (Aula)

16:00  Prof. Wladek Walukiewicz*
Lawrence Berkeley, USA
Materials Design Principles for Transparent Conductors

16:45  Dr. Chang Yang
Universität Leipzig, Germany
Amorphization of sputtered Cul thin films

17:00  Prof. Hideo Hosono*
Tokyo Institute of Technology, Japan
The Karl Bädeker Lecture: Novel Transparent Oxide Semiconductors: Design, Property and Application

17:45  Group photo shooting (in front of the main entrance)

20:00  Prize ceremony and conference banquet at Mückenschlösschen

Thursday, 26 September 2019

09:45  Dr. Riccardo Frisenda*
Materials Science Factory, Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), Spain
Scanning photocurrent studies of 2D materials

*Invited talk
10:30 Coffee break (Aula)

11:00 Prof. Silvana Botti*
Universität Jena, Germany
First-principles engineering of Cul by control of Cu vacancies and doping

11:45 Prof. Jim Speck*
UC Santa Barbara, USA
Development of β-Ga2O3 and β-(AlxGa1-x)2O3/Ga2O3 Heterostructures by Plasma-Assisted MBE

12:30 Lunch (Aula)

13:30 Dr. Andrew Green*
AirForce Res. Lab., Ohio, USA
Scaled β-Ga2O3 MOSFET devices for high performance power electronics and radio frequency amplification

14:15 Prof. Leonard J. Brillson*
Ohio State University, USA
Nanoscale Identification and Control of Native Point Defects in TCO Semiconductors

15:00 Dr. Anna Reinhardt
Universität Leipzig, Germany
Process optimization for the sputter deposition of amorphous zinc oxynitride thin films

15:15 Dr. Ruslan Muydinov
TU Berlin, Germany
Crystallization of amorphous indium zinc oxide films

15:30 Coffee break (Aula)

16:00 Dr. Jakub Kaczmarski*
Institute of Electron Technology, Warsaw, Poland
Transparent Ru-Si-O/In-Ga-Zn-O Schottky-gated devices on flexible substrates

16:45 Dr. David Caffrey
University of Dublin, Ireland
The importance of local bond order to conduction in amorphous, transparent, conducting oxides: The case of amorphous ZnSnOy

*Invited talk
17:00  Dr. Tilo Meister*
TU Dresden, Germany
*Invited talk
Bendable Metal Oxide and Printed Electronics for High Frequency Wireless Communications

Friday, 27 September 2019

09:00  Dr. Gertjan Koster*
University of Twente, The Netherlands
Advanced Pulsed Laser Deposition

09:45  Alexandra Papadogianni
Paul-Drude-Institut für Festkörperlektronik, Berlin, Germany
Homoepitaxial Growth of In$_2$O$_3$ Films by Plasma-Assisted Molecular Beam Epitaxy on (111)-, (011)-, and (001)-oriented bulk substrates

10:00  Raphael Müller
Ulm University, Germany
New CVD based growth method for highly crystalline epitaxial ZnO layers on Si(111) and c-plane sapphire

10:15  Coffee break (Aula)

10:45  Dr. Frank Herklotz
TU Dresden, Germany
Photoconductive detection of a hydrogen donor in SnO$_2$

11:00  Dr. Peter Schlupp
Universität Leipzig, Germany
Influence of the cation ratio on defect formation and properties in zinc-tin-oxide thin films

11:15  Dr. Niko Münzenrieder*
Free University of Bozen-Bolzano, Italy
Thin-film transistors for flexible analog circuits

12:00  Prof. Dr. Marius Grundmann
Universität Leipzig, Germany
Closing

12:15  Prospective end

*Invited talk