UNIVERSITÄT LEIPZIG

BuildMoNa
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BuildMoNa Minisymposium

Transparent Conductive Oxides – Fundamentals and Applications

TCO 2017

Monday, 18 September to Friday, 22 September 2017
Universität Leipzig, 04103 Leipzig, Linnéstr. 5,
Lecture Hall for Theoretical Physics

Agenda

Monday, 18 September 2017

13:30 Prof. Dr. Marius Grundmann
Universität Leipzig, Germany
Opening

14:00 Dr. Klaus Ellmer*
Helmholtz-Zentrum Berlin, Germany
Electronic transport in heavily doped oxides: Effect of ionized impurities, grain boundaries, secondary phases and dopant clustering

14:45 Gentnet Deyu
TU Darmstadt, Germany
Defect modulation doping of transparent conducting oxides

15:05 Jasper Westphalen
TU Ilmenau/ Fraunhofer FEP Dresden, Germany
Flash lamp annealing of ITO thin films on large area ultra-thin glass

15:25 *Coffee break (Aula)*

*Invited talk
°Keynote talk

16:00 Dr. Joel B. Varley*
Lawrence Livermore National Laboratory, Livermore, CA, USA
Insights into the conductivity of TCOs through hybrid functional calculations

16:45 Prof. Dr. Peter Deák*
University of Bremen, Germany
Beyond-standard DFT defect calculations in the prospective TCO materials TiO_2 and Ga_2O_3

*Invited talk
°Keynote talk

Tuesday, 19 September 2017

09:00 Prof. Dr. Takahisa Omata*
IMRAM, Tohoku University, Japan
Wurtzite-type ternary I-III-O_2 oxide semiconductors; new materials expanding the energy band gap range covered by oxide semiconductors

09:45 Dr. Chang Yang
Universität Leipzig, Germany
Towards high-performance p-type transparent conductive thin films with copper iodide

10:05 Mohammed M. Gomaa
Linköping University, Sweden/ National Research Center Giza, Egypt
Effect of spray pyrolysis parameters on the structural and optical properties of NiO films as a p-type-TCO

10:25 *Coffee break (Aula)*

11:00 Dr. Encarnación G. Víllora*
National Institute for Materials Science, Tsukuba, Japan
Halide vapor phase epitaxy of metastable α- and ε-Ga_2O_3

11:45 Prof. Dr. Armin Dadgar*
Otto-von-Guericke-Universität Magdeburg, Germany
GaN, a transparent conductive nitride

12:30 *Lunch (Aula)*

14:00 Dr. Geoffroy Hautier*
Université catholique de Louvain, Belgium
High-throughput computational search for new high mobility transparent (semi)conducting oxides

14:45 Prof. Dr.-Ing. Paul Erhart°
Chalmers University of Technology, Gothenburg, Sweden
A unifying perspective on oxygen vacancies in wide band gap oxides

15:30 *Coffee break (Aula)*

*Invited talk
°Keynote talk

16:00 Prof. Dr. Lasse Vines*
University of Oslo, Norway
Self-compensation and the vacancy-dopant pair in highly Al- and Ga-doped ZnO

16:45 Dr. Shengqiang Zhou
Helmholtz-Zentrum Dresden-Rossendorf, Germany
Ion implantation and sub-second annealing for oxide and semiconductor processing

17:05 Dr. Magdalena Nistor
National Institute for Lasers, Plasma and Radiation Physics, Bucharest-Magurele, Romania
Tuning electrical and optical properties of Nd:ZnO films grown by PLD or PED

17:25 Jack Swallow
University of Liverpool, United Kingdom
Self-compensation in F-doped SnO_2

18:00 Poster session and finger food (TA307)

*Invited talk
°Keynote talk

Wednesday, 20 September 2017

09:00 Lars Grieger
PANalytical B.V., Almelo, The Netherlands
Fully automated measurement and analysis of reciprocal space maps

09:20 Dr. Jesús Zúñiga-Pérez*
UCA, CRHEA-CNRS, Valbonne, France
ZnO-based polariton lasers: From heteroepitaxial to homoepitaxial optical microcavities

10:05 Marcel Wille
Universität Leipzig, Germany
Demonstration of lasing in cuprous iodide microwires

10:25 *Coffee break (Aula)*

11:00 Dr. Chris Sturm*
Universität Leipzig, Germany
Optics and tensor properties of anisotropic TCOs

11:45 Andreas Fiedler
Leibniz-Institute for Crystal Growth, Berlin, Germany
Photo- and electroluminescence of chromium doped β-Ga_2O_3

12:05 Theresa Berthold
TU Ilmenau, Germany
On the interaction of oxygen, ozone and water with In_2O_3(111) surfaces

12:30 *Lunch (Aula)*

14:00 Dr. Oliver Bierwagen*
Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany
Bulk and surface charge transport in semiconducting oxides

14:45 Alana Hyland°
University of Canterbury, Christchurch/ The MacDiarmid Institute for Advanced Materials and Nanotechnology, Wellington, New Zealand
Persistent photoconductivity in ZnO-based ultraviolet photodetectors

15:30 *Coffee break (Aula)*

*Invited talk
°Keynote talk

16.00 Dr. Kevin D. Leedy*
Air Force Research Laboratory, Ohio, USA
Conductivity control in homoepitaxial Si-doped β-Ga_2O_3 thin films by pulsed laser deposition

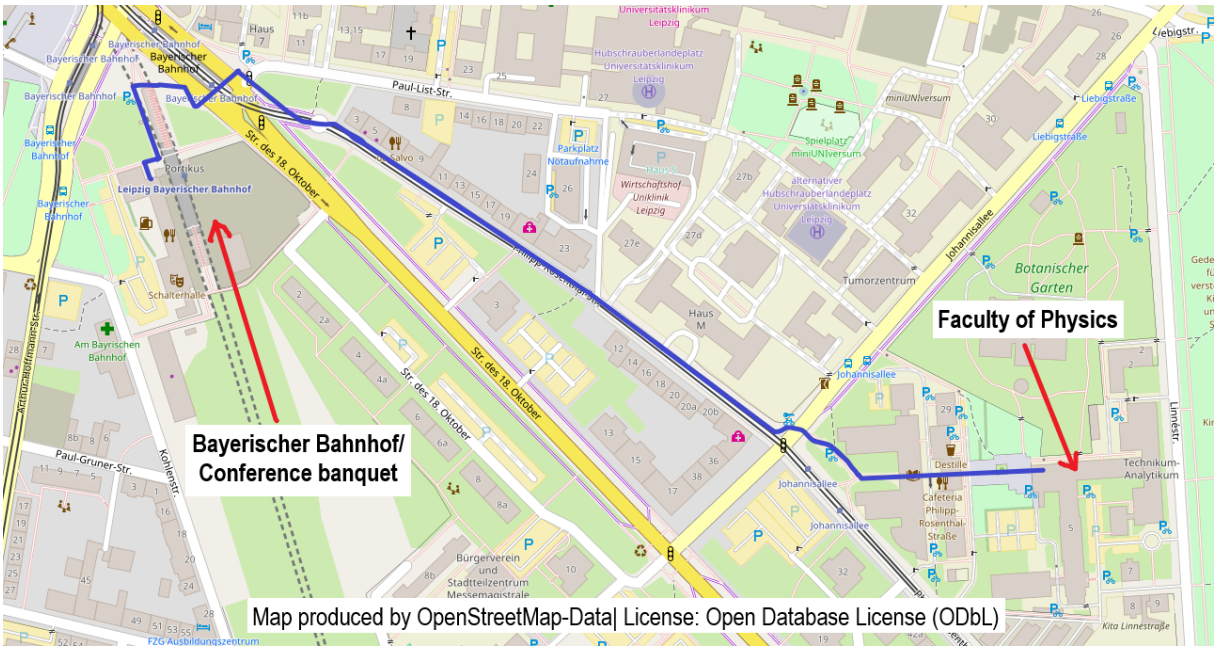
16:45 Jonas Michel
TU Ilmenau, Germany
Mechanism of Schottky contact formation on indium oxide semiconducting films

17:05 Philipp Wendel
TU Darmstadt, Germany
Polarization dependence of ZnO Schottky barrier heights

17:25 Peter Schlupp
Universität Leipzig, Germany
Room temperature fabricated fully oxide junction field-effect transistors and inverters on rigid and flexible substrates

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

20:00 Prize ceremony and conference banquet at Bayerischer Bahnhof



*Invited talk
°Keynote talk

Thursday, 21 September 2017

09:00 Prof. Dr. Judith L. MacManus-Driscoll*
University of Cambridge, United Kingdom
A new paradigm for defect, strain and coupling in oxide epitaxial nanocomposite thin films for realising unprecedented functional properties

09:45 Max Kneiß
Universität Leipzig, Germany
A new pulsed laser deposition technique to control the composition of ternary thin films in growth direction demonstrated on the transparent $Mg_xZn_{1-x}O$ alloy

10:05 Dr. Vikas Sharma
Indian Institute of Technology Delhi/ Malaviya National Institute of Technology Jaipur, India
Tuning of optical and electrical properties of SnO_x-Ag-SnO_x stacked structure using noble ion irradiation for TCO application

10:25 *Coffee break (Aula)*

11:00 Prof. Dr. Marjorie Olmstead*
University of Washington, Seattle, USA
Aluminum gallium oxide: A tunable solar-blind conductor

11:45 Prof. Dr. Andreas Klein
TU Darmstadt, Germany
Interfaces and grain boundaries of Cu_2O

12:05 Viet-Anh Ha
Université catholique de Louvain, Belgium
Structural design principles for low hole effective mass s-orbital-based p-type oxides

12:30 *Lunch (Aula)*

14:00 Prof. Dr. Chris McConville*
RMIT University Melbourne, Australia/ University of Warwick, UK
Transparent conducting oxide semiconductors:
Exploring their electronic structure

*Invited talk
°Keynote talk

14:45 Magda Barecka (INREP)
Lodz University of Technology, Poland
Towards more sustainable TCO layers: Environmental effects of replacement of ITO by alternative materials

15:05 Dr. Daniel Fritsch (INREP)
University of Bath, United Kingdom
Optical properties of amorphous Zn-Sn-Ti oxides: A combined molecular dynamics and density functional theory study

15:30 *Coffee break (Aula)*

*Invited talk
°Keynote talk

Friday, 22 September 2017

09:00 Dr. Janne-Petteri Niemelä (INREP)
Eindhoven University of Technology, The Netherlands
Atomic layer deposition of MoO_x and Al-doped ZnO for Si heterojunction solar cells

09:20 Dr. Margaret A. Hopkins (INREP)
University of Bath, United Kingdom
Indium-free transparent ohmic contacts to N-polar n-type GaN

09:40 Dr. Simon Rushworth (INFINITY)
EpiValence Limited, The Wilton Centre, Cleveland, United Kingdom
Introduction to INFINITY - Indium-free transparent conductive oxides for glass and plastic substrates
Stabilisation of active ingredients in novel low temperature transparent conducting oxide printing process to improve performance

10:10 Prof. Dr. Alan Taylor (INFINITY)
TWI Ltd., Cambridge, United Kingdom
Development of novel active binders for indium-free transparent conductive oxides

10:30 *Coffee break (Aula)*

11:00 Cristina Salazar (INFINITY)
Centro Tecnológico Lurederra, Spain
Industrial production of tailored nanoparticles by advanced, high-output, high-versatility Flame Spray Pyrolysis

11:20 Dr. Thiago M. Amaral (INFINITY)
INM-Leibniz Institute for New Materials, Saarbrücken, Germany
Improvement of the conductivity of wet chemical deposited Al doped ZnO coatings by thermal treatment of the nanoparticles under forming gas

11:40 Dr. Thiago M. Amaral (INFINITY)
INM-Leibniz Institute for New Materials, Saarbrücken, Germany
Effect of different atmospheres during UV treatment on the conductive properties of In-free TCO coatings

12:00 Dr. Anton Serkov (INFINITY)
University of Hull, United Kingdom
Laser treatment of gravure-printed ITO films on PET

*Invited talk
°Keynote talk

12:20 Prof. Dr. Marius Grundmann
Universität Leipzig, Germany
Closing

12:35 Prospective end

*Invited talk
°Keynote talk