

Workshop Schedule

Sunday, 15 July, 2018

16:00-20:00 Registration

18:00-20:00 **Welcome reception**, The 60th Anniversary Hall, Kyoto Institute of Technology

Monday, 16 July, 2018

09:00-09:05 Opening

09:00-10:45 Theory and Fundamental study

09:05-9:45 Mo-1 (invited)

DFT based modeling of the optical properties of dilute bismides

Lars C. Bannow¹, J. Hader^{2,3}, S. C. Badescu⁴, J. V. Moloney^{2,3}, S. R. Johnson⁵, and S. W. Koch¹, ¹ *Philipps-Universität Marburg, Germany*, ² *Nonlinear Control Strategies Inc., USA*, ³ *University of Arizona, USA*, ⁴ *Wright-Patterson AFB, USA*, ⁵ *Arizona State University, USA*

09:45-10:05 Mo-2

Structural and electronic properties of zinc-blende, wurtzite and monolayer III-Bi materials

Maciej P. Polak and R. Kudrawiec, *Wroclaw University of Science and Technology, Poland*

10:05-10:25 Mo-3

Atomic-scale study of the local electronic structure near single Bi centers in InP

Christian M. Krammel¹, A. R. Cruz¹, L. Y. Zhang², P. Wang², K. Wang², Y. Y. Li², S. M. Wang^{2,3}, M. E. Flatté^{1,4}, and P. M. Koenraad¹, ¹ *Eindhoven University of Technology, The Netherlands*, ² *Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China*, ³ *Chalmers University of Technology, Sweden*, ⁴ *University of Iowa, USA*

10:25-10:45 Coffee break

10:45-12:05 GaAsBi – Growth

10:45-11:25 Mo-4 (invited)

Low-dimensional quantum structure formation in GaAs/GaAsBi core-multishell nanowires

Fumitaro Ishikawa¹, Kosuke Yano¹, Kyohei Takada¹, Pallavi Patil¹, Satoshi Shimomura¹, and Yumiko Shimizu²
¹ *Ehime University, Japan*, ² *Toray Research Center, Japan*

11:25-11:45 Mo-5

Bi incorporation probed by in-situ sample curvature – the role of substrate temperature and surface reconstruction

Clara Cornille, Alexandre Arnoult, Quentin Gravelier, Fuccio Cristiano, and Chantal Fontaine, *Université de Toulouse, France*

11:45-12:05 Mo-6

Bi incorporation and the role of surface droplets in GaAsBi epitaxy

Janne Puustinen, J. Hilska and M. Guina, *Tampere University of Technology, Finland*

12:05-13:00 Lunch

13:00-14:20 Special session - Bi-containing topological materials

13:00-13:40 Mo-7 (invited)

Bismuth-based topological insulators: Quantum anomalous Hall effect, Majorana Fermion and antiferromagnetic spintronics

Xiaoyu Che, Qing Lin He, and Kang L Wang, *University of California, Los Angeles, USA*

13:40-14:20 Mo-8 (invited)
Bi and Bi alloy films: Platforms for topological physics
Toru Hirahara, *Tokyo Institute of Technology, Japan*

14:20-14:40 Coffee Break

14:40-16:00 GaAsBi – Characterization

14:40-15:00 Mo-9

Optical and structural properties of as-grown and annealed GaAs/GaAsBi single quantum well structures grown by molecular beam epitaxy

Haifa Alghamdi¹, H. Galeti², M. Schmidbauer³, Y. Gobato², M. Henini¹, D. Fan⁴, Y. I. Mazur⁴, M. E. Ware⁴, S.-Q. Yu⁴, and G. J. Salamo⁴, ¹ *University of Nottingham, UK*, ² *Universidade Federal de São Carlos, Brazil*, ³ *Institute for Crystal Growth, Germany*, ⁴ *University of Arkansas, USA*

15:00-15:20 Mo-10

Bismuth content dependence of the electron spin relaxation time in GaAsBi epilayers and quantum well structures
Hélène Carrere, A. Balocchi, S. Azaizia, F. Cadiz, S. Mazzucato, D. Lagarde, A. Arnoult, T. Amand, C. Fontaine, and X. Marie, *Université de Toulouse, France*

15:20-15:40 Mo-11

Exciton hopping dynamics in GaAsBi

Yukihiko Harada¹, T. Wilson², N. P. Hylton², R. D. Richards³, J. P. David³, T. Kita¹, and N. J. Ekins-Daukes^{2,4}, ¹ *Kobe University, Japan*, ² *Imperial College London, UK*, ³ *University of Sheffield, UK*, ⁴ *University of New South Wales, Australia*

15:40-16:00 Mo-12

Investigation of GaAsBi conduction band structure by THz excitation spectroscopy

Vaidas Pačebutas, A. Arlauskas, S. Stanionytė, R. Norkus, B. Čechavičius, and A. Krotkus, *Centre for Physical Sciences and Technology, Lithuania*

16:00 Memorial address for the late Jeff Hosea (University of Surrey)

17:30-19:30 **Banquet** at the old town, KARASUMA Kyoto Hotel

19:30- Exploring the eve of Gion Festival

Tuesday, 17 July, 2018

In the morning **Excursion:** Viewing Parade of Gion Festival

13:00-14:00 Lunch, the 60th Anniversary Hall, Kyoto Institute of Technology

14:00-15:00 GaSbBi

14:00-14:20 Tu-1

Transmission electron microscopy of Ga(Sb,Bi)/GaSb quantum wells with varying Bi content and quantum well thickness

Esperanza Luna¹, O. Delorme², L. Cerutti², E. Tournié², J.-B. Rodriguez² and A. Trampert¹, ¹ *Paul-Drude-Institut für Festkörperelektronik, Germany*, ² *Univ. Montpellier, France*

14:20-14:40 Tu-2

Molecular beam epitaxy growth of GaSb_{1-x}Bi_x without rotation

Chaodan Chi^{1,2,5}, Y. C. Zhang^{1,2,3}, L. Yue^{1,2}, and S. M. Wang^{1,2,4}, ¹ *Key Laboratory of Terahertz Solid-State*

Technology, Chinese Academy of Sciences, China, ² Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China, ³ ShanghaiTech University, China, ⁴ Chalmers University of Technology, Sweden, ⁵ University of Chinese Academy of Sciences, China

14:40-15:00 Tu-3 Late News

Growth and properties of AlSbBi films using molecular beam epitaxy

Xiaolei Zhang^{1,2}, Yanchao Zhang^{1,2}, Li Yue¹, Shumin Wang^{1,3}, ¹ *Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China, ² ShanghaiTech University, China, ³ Chalmers University of Technology, Sweden*

15:00-18:00 Quaternary alloys

15:00-15:20 Tu-4

Comparative studies of structural characterization of InAsSbBi epilayers grown on-axis and offcut GaSb substrates
Rajeev Reddy Kosireddy, Stephen T. Schaefer, Arvind J. Shalindar, and Shane R. Johnson, *Arizona State University, USA*

15:20-15:40 Tu-5

MBE growth and optical properties of InAsSbBi on (100) oriented and offcut GaSb substrates

Stephen T. Schaefer, Rajeev R. Kosireddy, Arvind J. Shalindar, and Shane R. Johnson, *Arizona State University, USA*

15:40-16:00 Coffee Break

16:00-16:40 Tu-6 (invited)

GaAsN₂Bi alloys: Lattice-matching and energy bandgaps

J. Occena¹, T. Jen¹, W. Linhart², R. Kudrawiec², and Rachel S. Goldman¹, ¹ *University of Michigan, USA, ² Wroclaw University of Technology, Poland*

16:40-17:00 Tu-7

MOVPE growth and characterization of quaternary Ga_yIn_{1-y}As_{1-x}Bi_x structures on GaAs and InP substrates

Thilo Hepp¹, L. Nattermann¹, J. Veletas², M. Sharpe³, I. P. Marko³, S. Chatterjee², S. J. Sweeney³, and K. Volz¹, ¹ *Philipps-Universität Marburg, Germany, ² Justus-Liebig-University Giessen, Germany, ³ University of Surrey, UK*

17:00-17:20 Tu-8

Structural and optical properties of In_xGa_{1-x}As_yBi_{1-y} grown by MBE or MOVPE

M. K. Sharpe¹, Igor P. Marko¹, J. England¹, E. M. Stori¹, M. Kesaria², C. H. Tan², T. Hepp³, K. Volz³ and S. J. Sweeney¹, ¹ *University of Surrey, UK, ² University of Sheffield, UK, ³ Philipps-Universität Marburg, Germany*

17:20-17:40 Tu-9

Influence of Bi incorporation in quaternary alloys

Julian Veletas¹, Thilo Hepp², Lukas Nattermann² Kerstin Volz², and Sangam Chatterjee¹, ¹ *Justus-Liebig-University Giessen, Germany, ² Philipps-Universität Marburg, Germany*

17:40-18:00 Tu-10

Al-containing dilute bismuthides

Jing Zhang, Yuejing Wang, and Joshua M.O. Zide, *University of Delaware, USA*

Wednesday, 18 July, 2018

09:00-10:00 Ternary alloys

09:00-09:20 We-1

Composition dependence of electronic and optical properties of quaternary $\text{In}_x\text{Ga}_{1-x}\text{N}_{1-y}\text{Bi}_y$ alloys

Qian Wang¹, Dan Liang¹, Shumin Wang^{2,3}, and Pengfei Lu¹, ¹ *Beijing University of Posts and Telecommunications, China*, ² *Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China*, ³ *Chalmers University of Technology, Sweden*

09:20-09:40 We-2

Molecular beam epitaxy and magnetotransport of InBi and InN_{Bi} crystals for high spin-orbit interaction

Phillip Dang¹, Sergei Rouvimov², and Debdeep Jena¹, ¹ *Cornell University, USA*, ² *University of Notre Dame, USA*

09:40-10:00 We-3

Terahertz properties of III-V Bismide alloys

C P Vaisakh¹, M K Bhowal², S Dhar², C T Foxon³, S V Novikov³, A Mascarenhas⁴ and R N Kini¹, ¹ *IISER-TVM, India*, ² *University of Calcutta, India*, ³ *University of Nottingham, UK*, ⁴ *National Renewable Energy Laboratory, USA*

10:00-12:30 Devices

10:00-10:20 We-4

High temperature characterization of GaAsBi/GaAs MQWs

Robert D Richards, Faezah Harun, and John P R David, *University of Sheffield, UK*

10:20-10:40 We-5

Fabrication of PEDOT: PSS/GaAs_{1-x}Bi_x solar cells

Sho Hasegawa, Kyohei Kakuyama, Pallavi Patil, Hiroyuki Nishinaka, and Masahiro Yoshimoto, *Kyoto Institute of Technology, Japan*

10:40-11:00 Coffee Break

11:00-11:40 We-6 (invited)

Progress in the development of near- and mid-IR bismide based materials and devices

Stephen J. Sweeney and Igor P. Marko
University of Surrey, UK

11:40-12:00 We-7

GaAsBi/GaAs multiple quantum wells with up to 120 periods

Thomas BO Rockett¹, Robert D Richards¹, Yuchen Liu¹, Faezah Harun¹, Zhize Zhou¹, Yi Gu², and John PR David¹,
¹ *University of Sheffield, UK*, ² *Shanghai Institute of Microsystem and Information Technology, China*

12:00-12:20 We-8

III-V-Bi quantum structures for IR sources

Renata Butkutė, J. Devenson, A. Jasinskis, S. Pūkienė, S. Stanionytė, E. Pozingytė, B. Čechavičius, A. Geižutis and A. Krotkus
Centre for Physical Sciences and Technology, Lithuania

12:20-12:30 Closing

12:30- Lunch