

Final Program

Mar. 8
(Thur.)
08:30-09:00 **Opening**
(Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

Mar. 8
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09:00-10:30 **Plenary Session**
(Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

Co-Chairs: Bing-Zong Li, Fudan University, China
Mizuno Bunzi, Panasonic, Japan

K1 **Advanced Implant Application for 7nm and Beyond**

9:00 Wei (David) Zou, Kyu-Ha Shim and Todd Henry

(Keynote) AMAT, USA

K2 **Impact of the end of CMOS miniaturization on ICT and the world after that**

9:45 Hiroshi Iwai

(Keynote) Tokyo Institute of Technology, Japan

Coffee Break (10:30-10:45)

Mar. 8
(Thur.)
10:45-12:00 **Characterization for Shallow Junction**
(Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

Chair: Kyoichi Suguro, Toshiba, Japan

S01-01 **Analyses of 3D Atomic Arrangements of Impurity Atoms Doped in Silicon by Spectro-Photoelectron Holography Technique**

10:45 Kazuo Tsutsui¹, Tomohiro Matsushita², Takayuki Muro², Yoshitada Morikawa³, Kotaro Natori⁴, Takuya Hoshii⁴, Kuniyuki Kakushima⁴, Hitoshi Wakabayashi⁴, Kouichi Hayashi⁵, Fumihiko Matsui⁶, and Toyohiko Kinoshita²

(Invited) ¹Institute of Innovative Research, Tokyo Institute of Technology, Japan; ² Japan Synchrotron Radiation Research Institute (JASRI), Japan; ³ Osaka University, Japan; ⁴School of Engineering, Tokyo Institute of Technology, Japan; ⁵Nagoya Institute of Technology, Japan; ⁶ Nara Institute of Science and Technology, Japan

S01-02 **Junction profiling on hot carrier stressed device by dual lens electron holography and scanning capacitance microscopy**

11:15 Y.Y. Wang¹, J. Nxumalo¹, D. Ioannou¹, A. Katnani¹, J. Jeon¹, K. Bandy¹, M. Mcdonald¹, J. Bruley²

¹ Globalfoundries Inc., USA; ² IBM T. J. Watson Research Center, USA

S01-03 **Characterizing Junction Profiles in Ge Photodetectors using Scanning Capacitance Microscopy (SCM) and Electron Holography**

11:30 J. N. Nxumalo¹, Y.Y. Wang², M. Iwatake², C. Molella¹, A. Katnani², J. Orcutt³, J. Ayala², K. Nummy²

¹GlobalFoundries Inc., USA; ²GlobalFoundries Inc., USA; ³ IBM Thomas J. Watson Research Center, USA

S01-04 **Effect of Stress on Activation during the Formation of np Junction in Co-Implanted Germanium**

11:45 Nur Nadhirah Rashid¹, Umar Abdul Aziz¹, Siti Rahmah Aid¹, Suwa Akira², Hiroshi Ikenoue², Fang Xie³ and Anthony Centeno⁴

¹Universiti Teknologi, Malaysia; ²Kyushu University, Japan; ³Imperial College London, United

Kingdom;⁴Xi'an Jiaotong Liverpool University, China

Mar. 8
(Thur.)

Annealing Technology

(Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

13:30-15:15

Co-Chairs:

Paul J. Timans, Mattson Thermal Products GmbH, Germany
S. Boninelli, IMM-CNR, Italy

S02-01

Activation of High-temperature-implanted Phosphorus Atoms in 4H-SiC by Atmospheric Pressure Thermal Plasma Jet Annealing

13:30 H. Hanafusa and S. Higashi

(Invited) Hiroshima University, Japan

S02-02

Activation Trends in Millisecond Annealing of Heavy n-Type Doping of Silicon

14:00 Paul J. Timans

(Invited) Mattson Thermal Products GmbH, Germany

S02-03

Damage recovery and strain induced by Phosphorous in Laser Annealed Ge

14:30 S. Boninelli¹, and F. Cristiano²

(Invited) ¹IMM-CNR, Italy; ²LAAS-CNRS, France

S02-04

High Activation Reaching Supersaturation Achieved by Short-Duration Flash Lamp Annealing

15:00 Hideaki Tanimura, Kenji Inoue, Hikaru Kawarazaki, Takahiro Yamada, Kazuhiko Fuse, Takayuki Aoyama, Shinichi Kato and Ipeei Kobayashi

SCREEN Semiconductor Solutions Co., Ltd., Japan

Coffee Break (15:15-15:30)

Mar. 8
(Thur.)

Junction and Contact Technologies for Compound Semiconductors

(Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

15:30-17:30

Co-Chairs:

Hongyu Yu, Southern University of Science and Technology, China
Philippe Rodriguez, Univ. Grenoble Alpes, France

S03-01

Au-based and Au-free Ohmic Contacts to AlGaN/GaN Structures on Silicon or Sapphire Substrates

15:30 Wenmao Li^{1,2}, Jian Zhang³, Robert Sokolovskij^{1,2,4,5}, Yumeng Zhu^{1,2}, Yongle Qi^{1,2}, Xinpeng Lin^{1,2}, Jingyi Wu^{1,2}, Lingli Jiang^{1,2}, Hongyu Yu^{1,2}

(Invited) ¹ Southern University of Science and Technology, China; ² Shenzhen Key Laboratory of the Third Generation Semi-conductor, China; ³ Fudan University, China; ⁴ Delft University of Technology, the Netherlands; ⁵ State Key Laboratory of Solid State Lighting, China

S03-02

CMOS-Compatible Contact Technology for Si Photonics

16:00 Philippe Rodriguez¹, Elodie Ghegin², and Fabrice Nemouchi³

(Invited) ¹ Univ. Grenoble Alpes, France; ² CEA-LETI, France; ³ STMicroelectronics, France

S03-03

Characterization of b-Ga₂O₃ Schottky Barrier Diodes

16:30 T. Kaneko¹, I. Muneta¹, T. Hoshii¹, H. Wakabayashi¹, K. Tsutsui², H. Iwai², K. Kakushima¹

¹ School of Engineering, Tokyo Institute of Technology, Japan; ² Institute of Innovative Research, Tokyo Institute of Technology, Japan

S03-04

Effect of Deep Level Traps on the I-V and C-V Characteristics of InP/InGaAs Heterojunction

16:45 Man-Li Zhao, Hong-Liang Lu, Yu-Ming Zhang, Yi-Men Zhang, Xiao-Hong Zhao

Xidian University, China

S03-05

The effect of ZnO Interface Passivation Layer on Leakage Current Mechanisms and Band

Alignment for ZrO₂/In_{0.2}Ga_{0.8}As Metal Oxide Semiconductor Capacitor

17:00 TongYang, Hong-liang Lu, Chen Liu, Wei-jian Yu, Yu-ming Zhang, Yi-men Zhang
Xidian University, China

S03-06 Optimized transport properties of GaN MISHEMTs with thin AlN interlayer

17:15 Qianlan Hu, Sichao Li, Tiaoyang Li, Xin Wang, and Yanqing Wu
Huazhong University of Science and Technology, China

Mar. 9 (Fri.) 08:30-10:00 Doping Technology (Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

Chair: Hiro Ito, AMAT, Japan

S04-01 H₂ PLAD Hydrogenation Process on 3D NAND Array Poly-Si Access Devices

8:30 Shu Qin

(Invited) QinTek, Co., USA

S04-02 Monolayer doping and other strategies in high surface-to-volume ratio silicon devices

9:00 Ray Duffy¹, Noel Kennedy², Gioele Mirabelli¹, Emmanuele Galluccio¹, Paul K. Hurley^{1,2}, Justin D. Holmes^{2,3}, and Brenda Long²

(Invited) ¹ Tyndall National Institute, Ireland; ² University College Cork, Ireland. ³ Trinity College Dublin, Ireland.

S04-03 Enhancing Phosphorous Doping Level on Ge by Sb co-Doping with Non-Beamline Implantation Methods

9:30 Chuck Paeng, He Zhang, Bodo Kalkofen*, and YS Kim

Lam Research Corp., USA; *U. Magdeburg Otto-von-Guericke

S04-04 Atomic layer deposited solid sources for doping of high aspect ratio semiconductor structures

9:45 Bodo Kalkofen¹, Mindaugas Šilinskas¹, Marco Lisker², Y. S. Kim³, and Edmund P. Burte¹

¹ Otto von Guericke University, Germany; ² IHP, Germany; ³ Lam Research Corporation, USA

Coffee Break (10:00-10:15)

Mar. 9 (Fri.) 10:15-11:45 Metal/Semiconductor Contact Technology for CMOS (Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

Co-Chairs: Kuniyuki Kakushima, Tokyo Institute of Technology, Japan
Hao Yu, IMEC, Belgium

S05-01 On the manifestation of Ge Pre-amorphization Implantation (PAI) Impact on Both the Formation of Ultrathin TiSix and the Specific Contact Resistivity in TiSix/n-Si Contacts for sub-16/14 nm nodes and beyond

10:15 Jun Luo^{a,b}, Shujuan Mao^{a,b}, Jing Xu^a, Guilei Wang^a, Dan Zhang^{a,b}, Xue Luo^{a,b}, Ningyuan Duan^{a,b}, Shi Liu^a, Wenwu Wang^{a,b}, Dapeng Chen^a, Junfeng Li^a, Chao Zhao^{a,b}, Tianchun Ye^{a,b}

(Invited) ^a Institute of Microelectronics, Chinese Academy of Sciences, China; ^b University of Chinese Academy of Sciences (UCAS), China

S05-02 Titanium (Germano-)Silicides Featuring 10⁻⁹ Ω·cm² Contact Resistivity and Improved Compatibility to Advanced CMOS Technology

10:45 Hao Yu^{1,2}, Marc Schaeckers¹, Soon Aik Chew¹, Jean-Luc Everaert¹, Naoto Horiguchi¹, Dan Mocuta¹, Nadine Collaert¹, Kristin De Meyer^{1,2}

(Invited) ¹ Imec, Belgium; ² K. U. Leuven, Belgium

S05-03 Improved thermal stability of Al/TiO₂/n-Ge ohmic contact by inserting single layer

graphene

11:15 Yi Zhang, Genquan Han, Jiabo Chen, Yan Liu, Jincheng Zhang, and Yue Hao
Xidian University, China.

S05-04 Effect of platinum interlayer on the thermal stability improvement of nickel stanogermanide

11:30 Weijun Wan^{1,2}, Wei Ren¹, Xiaoran Meng^{2,3}, Yunxia Ping³, Xing Wei², Zhongying Xue², Wenjie Yu², Miao Zhang², Zengfeng Di², Bo Zhang²
¹Shanghai University, China; ²Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, China; ³Shanghai University of Engineering Science, China

Mar. 9 (Fri.) Contact and Junction Technologies for photon-electron interaction (Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

13:30-15:45

Co-Chairs: Kenji Araki, Toyota Technological Institute, Japan
Hitoshi Wakabayashi, Tokyo Institute of Technology, Japan

S06-01 Novel photodetector based on FD-SOI substrate with interface coupling effect

13:30 J. Wan¹, JN. Deng¹, XY. Cao¹, H. B. Liu¹, B. R. Lu¹, Y. F. Chen¹, A. Zaslavsky², S. Cristoloveanu³ and M. Bawedin³

(Invited) ¹Fudan University, China; ²Brown University, USA; ³IMEP-LAHC, France

S06-02 Opportunities for breaking an energy generation limit of photovoltaic using multijunction and super-multijunction cells

14:00 Kenji Araki, Kan-Hua Lee, and Masafumi Yamaguchi,

(Invited) Toyota Technological Institute, Japan

S06-03 Light Plastic Integrated Micro CPV Module: PIC with Three-Junction PV cells

14:30 Michihiko Takase, Masaharu Terauchi, Nobuhiko Hayashi, Hikaru Nishitani, Takuji Inohara, Youichirou Aya, Shutetsu Kanayama and Bunji Mizuno

(Invited) Panasonic Corporation, Japan

S06-04 Interfacial passivation by LiF or PbF₂ for high efficiency perovskite solar cell

15:00 Yiqiang Zhan

(Invited) Fudan University, China

S06-05 Photodetector Based on Silicon-on-Insulator with High Responsivity

15:30 X. Y. Cao^{1,2}, HB.Liu¹, JN.Deng¹, WS.Lin², and J. Wan¹

¹Fudan University, China; ² Shanghai University of Engineering Science, China

Coffee Break (15:45-16:00)

Mar. 9 (Fri.) Modeling and Simulation (Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

16:00-16:45

Chair: Dong-Ping Wu, Fudan University, China

S07-01 Parasitic Resistance Modeling and Optimization for 10nm-node FinFET

16:00 Xicheng Duan, Peng Lu, Weicong Li, Jason C.S. Woo
University of California, USA

S07-02 Simulation of Ge/(Si)GeSn Hetero-junction Tunnel FETs with Suppressed Ambipolar Current⁶

16:15 Yongwang Zhang, Suyuan Wang, Jun Zheng, Chunlai Xue, Chuanbo Li, Yuhua Zuo, Buwen Cheng, Qiming Wang
Institute of Semiconductors, Chinese Academy of Sciences and University of Chinese Academy of Sciences

S07-03 Thermal Failure and Voltage Overshoot Models for Diode Behavior under Electrostatic Discharge Stresses

16:30 Hang Li¹, Yuanzhong Zhou², Meng Miao¹, Javier A. Salcedo², Jean-Jacques Hajjar², and Kalpathy B. Sundaram¹

¹University of Central Florida, USA; ²Analog Devices, Inc., USA

Mar. 9 (Fri.) 16:45-18:00 Junction and Process Technology for Novel MOS Device Structures (Room 102, 1st floor, East Auxiliary Building Affiliated to Guanghua Building)

Chair: Jing Wan, Fudan University, China

S08-01 Gate stack and Ni(SiGeSn) metal contacts formation on low bandgap strained (Si)Ge(Sn) semiconductors

16:45 D. Buca¹, C. Schulte-Braucks¹, N. von den Driesch¹, A. T. Tiedemann¹, U. Breuer², J.M. Hartmann³, P. Zaumseil⁴, S. Mantl¹ and Q.T. Zhao¹

(Invited) ¹Peter Grünberg Institute (PGI 9) and JARA-FIT, Forschungszentrum, Germany; ²Central Division of Analytical Chemistry (ZCH), Forschungszentrum, Germany; ³CEA-LETI, France; ⁴IHP, Germany

S08-02 High-performance heterojunctions based on 2D semiconductors

17:15 Mingqiang Huang, Xiong Xiong and Yanqing Wu

(Invited) Huazhong University of Science and Technology, China

S08-03 Highly Selective Etch of Silicon Dioxide with Tungsten Hard Mask Deposited by PVD Process

17:45 Yuanhui Fang, Jian Zhang, and Yu-Long Jiang
Fudan University, China