

Technical Program

Sunday, May 16

Registration

(15:00 - 19:00, the Lake View Hotel)

Welcome Reception

(18:30 - 20:30, The Greenery Coffee Shop, the Lake View Hotel)

Monday, May 17

Opening Address

(8:30 - 9:00, Zhonghua Hall, the Lake View Hotel)

Plenary Session (PL1)

(9:00 - 10:30, Zhonghua Hall, the Lake View Hotel)

Chair: A. Yoshikawa (Chiba Univ., Japan)

F. Ponce (Arizona State Univ., USA)

PL1 (Plenary) 9:00 - 9:45

Title Next ten years of the research and development of nitride-based devices

Hiroshi Amano

Dept. of Electrical Engineering and Computer Science, Graduate School of Engineering,
Nagoya University, Japan

PL2 (Plenary) 9:45 - 10:30

Title Progress in the Growth, Characterization and Device Performance for Nonpolar
and Semipolar GaN-based Materials

James S. Speck

Materials Department, University of California, Santa Barbara, USA

Coffee Break (10:30-10:45)

Session A: LEDs

(10:45 - 12:30, Zhonghua Hall, the Lake View Hotel)

Chairs: H. X. Jiang (Texas Tech University, USA)

E. J. Yoon (Seoul National University, Korea)

A1 (Invited) 10:45 - 11:15

Title AllnGaN micro-pixel light emitting diodes for instrumentation, optical communications and hybrid inorganic/organic optoelectronics

Martin Dawson, Institute of Photonics, University of Strathclyde, UK

A2 (Invited) 11:15 - 11:45

Title Growth of $\text{Al}_x\text{Ga}_{1-x}\text{N}$ alloys by MOCVD

R. Zhang, B. Liu, Z. L. Xie, L. Li, X. Q. Xiu, H. Zhao, P. Han, Y. D. Zheng,
Nanjing National Lab of Microstructures, Jiangsu Provincial Key Lab of Advanced Photonic and Electronic Materials and School of Electronic Science and Engineering, Nanjing University, China

A3 11:45 - 12:00

Title Improved light extraction of GaN-based green light-emitting diode with antireflection layer by ZnO nanowires

Jang-Won Kang^{1,a}, Yong-Seok Choi^{1,b}, Tae-Young Park^{1,c}, Chu-Young Cho^{1,d}, C. W. Tu^{2,e} and Seong-Ju Park^{1,2,f}

¹Department of Materials Science and Engineering, Gwangju institute of Science and Technology, Republic of Korea

²Department of Nanobio Materials and Electronics, Gwangju institute of Science and Technology, Republic of Korea

A4 12:00 - 12:15

Title M-plane InGaN LEDs Grown by PAMBE

Li-Wei Tu^{1,a}, Y. T. Lin¹, C. Y. Ho¹, T. W. Liang¹, W. J. Yen¹, M. F. Hsieh¹, S. Y. Chiang¹, G. H. Lee¹, D. L. Lee¹, S. T. Chou¹, M. C. Chou^{2,b}, and Y. S. Chen^{1,c}

¹Department of Physics and Center for Nanoscience and Nanotechnology, National Sun Yat-Sen University, Kaohsiung 80424, Taiwan

²Department of Materials Science & Opto-electronic Engineering, National Sun Yat-Sen University, Kaohsiung 80424, Taiwan

A5 12:15 - 12:30

Title Mechanically and electrically stressed blue InGaN-MQW-LEDs – a comprehensive degradation analysis correlating Photo-, Electro-Luminescence and Laser Beam Induced Current Microscopy

Thomas Fey, Thomas Hempel, Juergen Christen

Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, Germany

Lunch (12:30-14:00)

(The Greenery Coffee Shop, the Lake View Hotel)

Session B: Materials

(14:00 - 16:00, Zhonghua Hall, the Lake View Hotel)

Chairs: K. Onabe (the University of Tokyo, Japan)

Y. Luo (Tsinghua University, China)

B1 (Invited) 14:00 - 14:30

Title Mapping of efficiency droop in InGaN quantum wells studied by scanning near-field optical microscopy

Yoichi Kawakami^{1, a}, Akira Hashiya¹, Akio Kaneta¹, and Mitsuru Funato¹

¹Department of Electronic Science and Engineering, Kyoto University, Japan

B2 14:30 - 14:45

Title P-type In_xGa_{1-x}N epilayers with High In-Contents

H. X. Jiang and J. Y. Lin

Department of Electrical and Computer Engineering, Texas Tech University, USA

B3 14:45 - 15:00

Title Enhancement of Light Extraction from a Light-emitting Diode through Grating-patterned Photoelectrochemical Surface Etching

Cheng-Hung Lin^a, Cheng-Yen Chen, Dong-Ming Yeh, and C. C. Yang^b

Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan

B4 15:00 - 15:15

Title Carrier localization and nonradiative recombination in yellow emitting InGaN quantum wells

T. Li¹, A. M. Fischer¹, Q. Y. Wei¹, F. A. Ponce¹, T. Detchprohm² and C. Wetzel²

¹Department of Physics, Arizona State University, USA

²Department of Physics and Future Chips Constellation, Rensselaer Polytechnic Institute, USA

B5 15:15 - 15:30

Title Light emitters based on InGaN quantum dots

C. Kruse¹, C. Tessarek¹, S. Figge¹, J. Kalden², K. Sebald², J. Gutowski², A. Rosenauer³, and D. Hommel^{1, a}

Institute of Solid State Physics, ¹Semiconductor Epitaxy, ²Semiconductor Optics,

³Electron Microscopy, University of Bremen, Germany

B6 15:30 - 15:45

Title Growth of Si Doped c-GaN and c-AlGaN Films on MgO (001) Substrates by RF-MBE

Masahiro Kakuda, Yujiro Fukuhara, Keito Nakamura, Shigeyuki Kuboya and Kentaro Onabe

Department of Advanced Materials Science, the University of Tokyo, Japan

B7 15:45 - 16:00

Title Growth of InGaN-Based Optoelectronic Device Structures in Mass-Production MOCVD Reactors

A. Alam, A. Boyd, B. Schineller and M. Heuken

AIXTRON AG, Germany

Coffee Break (16:00-16:15)

Session C: Novel Materials and Devices

(16:15 - 17:45, Zhonghua Hall, the Lake View Hotel)

Chairs: H. Yang (Suzhou Institute of Nano-tech and Nano-bionics, CAS, China)

H. Hirayama (RIKEN, Japan)

C1 (Invited) 16:15 - 16:45

Title Thin film and Surface Analysis for LED R&D and manufacturing

Yumin Gao

Evans Analytical Group, USA

C2 16:45 - 17:00

Title Design of filled tetrahedral nitrides and nitride nanowires for green LEDs

Su-Huai Wei, Aron Walsh, and Hong-Jun Xiang

National Renewable Energy Laboratory, USA

C3 17:00 - 17:15

Title Crystal structure and optical properties of catalyst-free InP nanowires by MOCVD

Guoqing Miao, Shuzhen Yu, Yixin Jin, Hang Song, Hong Jiang, Dabing Li, Zhiming Li, Xiaojuan Sun, and Yiren Chen

Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, China

C4 17:15 - 17:30

Title Measurement of real wafer temperature during GaN growth on sapphire and SiC

F. Brunner¹, K. Haberland², T. Schenk², T. Thieme², M. Weyers¹, J.-T. Zettler²

¹Ferdinand-Braun-Institut für Höchstfrequenztechnik, Germany

²LayTec GmbH, Germany,

C5 17:30 - 17:45

Title Mechanisms of light output enhancement using top surface and side-wall nanorod arrays in GaN-based light emitting diodes

Chih-Chien Lin^{1,a}, Shiu-Fang Yen^{2,b} and Ching-Ting Lee^{3,c}

^{1,3}Institute of Microelectronics, Department of Electrical Engineering, National Cheng Kung University, Taiwan

²Microsystems Technology Center, Industrial Technology Research Institute (ITRI), Taiwan

C6 17:45 – 18:00

Title Cathodoluminescence Imaging of Stacking Faults in Laterally Overgrown GaN Nanowires

J. Lähnemann, P. Dogan, C. Pfüller, U. Jahn, O. Brandt, L. Geelhaar, C. Roder, A. Trampert, H. Riechert

Paul-Drude-Institut für Festkörperelektronik, Germany

Tuesday, May 18

Session D: LEDs and Non-polar Materials

(8:30 - 10:30, Zhonghua Hall, the Lake View Hotel)

Chairs: C. H. Hong (Chonbuk National University, Korea)

Y. Liu (Sun Yat-sen University, China)

D1 (Invited) 8:30 - 9:00

Title Surface Plasmon Coupled Light-emitting Diode - An Alternative Light-emitting Channel

Kun-Ching Shen, Chih-Feng Lu, Cheng-Hung Lin, Che-Hao Liao, Chih-Yen Chen, and C. C. Yang^a

Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan

D2 9:00 - 9:15

Title High spatial resolution cathodoluminescence mapping of InGaN/GaN LED structures

J. Bruckbauer¹, P.R. Edwards¹, T. Wang² and R.W. Martin^{1,a}

¹Department of Physics, SUPA, Strathclyde University, U.K.

²Department of Electronic and Electrical Engineering, Sheffield University, U.K.

D3 9:15 - 9:30

Title Optical and structural properties of non-polar m-plane GaN on patterned Si substrates

F. Bertram¹, J. Christen¹, X. Ni², and H. Morkoç²

¹Experimental Physics, Otto-von-Guericke-University Magdeburg, Germany

²Department of Electrical and Computer Engineering, Virginia Commonwealth University, Virginia

D4 9:30 - 9:45

Title Indium Incorporation and Optical Transitions in Strained InGaN Bulk Materials and Quantum Wells with Arbitrary Polarity

M. Durnev^{1,a}, A. Omelchenko^{1,b}, I. Evstratov^{2,c}, and S. Karpov^{2,d}

¹St.Petersburg Academic University – Nanotechnology Research & Education Centre RAS, Russia

²STR Group – Soft-Impact, Ltd., Russia

D5 9:45 - 10:00

Title Nonpolar a-plane LED with in-situ SiNx interlayer on r-plane sapphire grown by metal-organic chemical vapor deposition

Fang Hao, Sang Liwen, Long Hao, Xiong Chang, Qi Shengli, Yu Tongjun,^a Yang Zhijian, Zhang Guoyi

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, Peking University, China

D6 10:00 - 10:15

Title Carrier dynamics and the efficiency in InGaN light emitting diodes at high injection levels

X. Ni¹, X. Li¹, J. Lee¹, S. Liu¹, V. Avrutin¹, A. Matulionis², Ü. Özgür^{1,a}, F. Bertram³, J. Christen³, and H. Morkoç^{1,b}

¹Virginia Commonwealth University, USA

²Semiconductor Physics Institute, Lithuania

³Otto-von-Guericke-University Magdeburg, Germany

D7 10:15 - 10:30

Title Vertically-mounted LEDs for superior light extraction

Ling Zhu^a, Pui To Lai and Hoi Wai Choi

Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong

Coffee Break (10:30-10:45)

Session E: UV Emitters and Materials

(10:45 - 12:30, Zhonghua Hall, the Lake View Hotel)

Chairs: D. Hommel (University of Bremen, Germany)

C. C. Yang (National Taiwan University, Taiwan)

E1 (Invited) 10:45 - 11:15

Title Recent Advances of High Efficiency Deep UV-LEDs by Plasma-assisted Molecular Beam Epitaxy

Yitao Liao^{1, a}, Christos Thomidis^{1, b} and Theodore D. Moustakas^{1, c}

¹Saint Mary's St., Department of Electrical and Computer Engineering and Photonic Center, USA

E2 (Invited) 11:15 - 11:45

Title Fabrication of Deep Ultra-violet Light Source using AlGaN on AlN/sapphire

Hideto Miyake^{1a}, Hiroyuki Taketomi¹, Yuuki Shimahara¹, Kazumasa Hiramatsu¹, Fumitsugu Fukuyo², Tomoyuki Okada², Hidetsugu Takaoka², and Harumasa Yoshida²

¹Department of Electrical and Electronic Engineering, Mie University, Japan

²HAMAMATSU PHOTONICS K. K., Japan

E3 11:45 - 12:00

Title High-Efficiency 247-262 nm AlGaN Deep-UV LEDs Using Multiquantum-Barrier

Hideki Hirayama^{1,3, a}, Yusuke Tsukada^{1,2,3}, Noritoshi Maeda^{1,3} and Norihiko Kamata^{2,3}

¹RIKEN, Japan

²Saitama University, Japan

³CREST, Japan Science and Technology Agency, Japan

E4 12:00 - 12:15

Title High Power Near-UV VLEDs on Cu Alloy for Curing Applications

Chen-Fu Chu^{1, a}, Feng-Hsu Fan^{1,3}, Chao-Cheng Cheng¹, Wen-Huan Liu¹, Jiunn-Yi Chu¹, Hao-Chun Cheng¹, Chia-Feng Lin³, Chuong Anh Tran², Trung Doan²

¹SemiLEDs Optoelectronics Corp., Taiwan

²SemiLEDs Corp., U.S.A.

³Department of Materials Engineering, National Chung Hsing University, Taiwan

E5 12:15 - 12:30

Title Enhanced Output Power of Near-Ultraviolet Light-Emitting Diodes Using a Novel Defect Reduction Template

Dong-Sing Wu^{1, a}, Shih-Yung Huang¹, Shih-Cheng Huang¹, Po-Rung Lin¹, Jen-Hung Tu¹, Chun-Cheng Shen²,

Ying-Chen Chen¹, and Ray-Hua Horng^{3,b}

¹Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

²Institute of Precision Engineering, National Chung Hsing University, Taiwan

³Institute of Electro-Optical Science and Engineering, National Cheng Kung University, Taiwan

Lunch (12:30-14:00)

(The Greenery Coffee Shop, the Lake View Hotel)

Session F: Solar Cells

(14:00 - 16:00, Zhonghua Hall, the Lake View Hotel)

Chair: K. Kishino (Sophia University, Japan)

C. T. Lee (National Cheng Kung University, Taiwan)

F1 (Invited) 14:00 - 14:30

Title Applications of III-nitrides for solar power conversion

Wladek Walukiewicz

Materials Sciences Division, Lawrence Berkeley National Laboratory, USA

F2 14:30 - 14:45

Title Asymmetric Structure GaN/1-ML InN/InGaN/GaN QWs for Novel Blue-Green Light Emitters and Next Generation Solar Cells

Kazuhide Kusakabe, Yoshihiro Ishitani, and Akihiko Yoshikawa

Graduate School of Electrical and Electronics Engineering, Chiba University, Japan

F3 14:45 - 15:00

Title Improved Conversion Efficiency of Textured InGaN Solar Cells with Interdigitated Imbedded Electrodes

Ray-Hua Horng^a, Mu-Tao Chu^b, Hung-Ruei Chen^b, Wen-Yih Liao^c, Ming-Hsien Wu^c, Dong-Sing Wu^d

^aDepartment of Electro-Optical Engineering, National Cheng Kung University, Taiwan

^bInstitute of Precision Engineering, National Chung Hsing University, Taiwan

^cElectronics and Opto-Electronics Research Laboratories, Industrial Technology Research Institute, Taiwan

^dDepartment of Materials Science and Engineering, National Chung Hsing University, Taiwan

F4 15:00 - 15:15

Title Enhancement in Efficiency of Silicon Solar Cell Based on Porous surfaces

Asmiet Ramizy *, Z. Hassan, Khalid Omar
School of Physics, Universiti Sains Malaysia, Malaysia

F5 15:15 - 15:30

Title Band offset of III-V nitride film evaluated by hard X-ray photoelectron spectroscopy for design of solar cell

Masatomo Sumiya^{1, a}, Mickeal Lozack², Kazuaki Sakota^{1,2}, Hideki Yoshikawa³, Shigenori Ueda³, and Keisuke Kobayashi³

¹ National Institute for Materials Science, Japan

² University of Tsukuba, Japan

³ NIMS Beamline Station at SPring-8, Japan

F6 15:30 - 15:45

Title Undoped and Mg-doped InN Grown Using Droplet Elimination by Radical-beam Irradiation Method

T. Yamgauchi^{1,a}, K. Wang¹, R. Iwamoto¹, N. Miller², M. Mayer², J.W. Ager III², K. M. Yu², W. Walukiewicz², T. Araki¹ and Y. Nanishi^{1,3,b}

¹Ritsumeikan University, JAPAN

² Lawrence Berkeley National Laboratory, USA

³Seoul National University, KOREA

F7 15:45 - 16:00

Title Quantum confinement in near-UV InN/GaN light-emitting diode

Wei Lin^{1,a}, Shun Ito^{2,b}, Shuping Li^{1,c} and Junyong Kang^{1,d}

¹Fujian Key Lab of Semiconductor Materials and Applications, Department of Physics, Xiamen University, China

²Institute for Materials Research, Tohoku University, Japan

Coffee Break (16:00-16:15)

Session G: ZnO Based Materials and Emitters

(16:15 - 18:15, Zhonghua Hall, the Lake View Hotel)

Chairs: S. H. Wei (National Renewable Energy Laboratory, USA)

Y. H. Cho (KAIST, Korea)

G1 (Invited) 16:15 - 16:45

Title Progress in ZnO-based Light Emitting Diodes

Jianlin Liu, Jieying Kong, Lin Li, Sheng Chu, and Zheng Yang

Quantum Structures Laboratory, Department of Electrical Engineering, University of California, USA

G2 16:45 - 17:00

Title P-type thin films and light-emitting junctions using Na-doped Zn_{1-x}MgxO

Zhizhen Ye^a, Xinhua Pan, Jingyun Huang, Yinzhu Zhang

State key laboratory of silicon materials, Department of Materials, Zhejiang University, China

G3 17:00 - 17:15

Title ZnO nanorod homojunction LED

Xiaowei Sun

School of Electrical and Electronic Engineering Nanyang Technological University, Singapore

G4 17:15 - 17:30

Title Passivated ZnO-based nanorod light-emitting diodes using a photoelectrochemical method

Ching-Ting Lee^{1,a}, Jheng-Tai Yan^{2,b}, and Hsin-Ying Lee^{3,c}

^{1,2}Institute of Microelectronics, Department of Electrical Engineering, National Cheng Kung University, Taiwan

³Department of Electro-Optical Engineering, National Cheng Kung University, Taiwan

G5 17:30 - 17:45

Title Structural and optical properties of ZnO/ZnMgO multiple quantum well structures grown on ZnO substrates

Song-Mei Li^{1,a}, Bong-Joon Kwon¹, Ho-Sang Kwack¹, Li-Hua Jin¹, Yong-Hoon Cho^{1,b*}, Young-Sin Park², Myung-Soo Han³, and Young-Sik Park³

¹Department of Physics and Graduate School of Nanoscience & Technology (WCU), Korea Advanced Institute of Science and Technology (KAIST), Korea

²Quantum Functional Semiconductor Research Center, Dongguk University, Korea

³Micro-Optics Team, Korea Photonics Technology Institute, Korea

G6 17:45 – 18:00

Title Blue LED growth from 2 inch to 8 inch

Frank Lu, Dong Lee, Eric Armour, Bill Quinn

Veeco Turbodisc-Somerset, U.S.A.

G7 18:00 – 18:15

Title Role of thermal effects on chromatic characteristics of a phosphor-conversion white LED

M.V. Bogdanov^{1,a}, K.A. Bulashevich^{1,b}, I.Yu. Evstratov^{1,c}, S.Yu. Karpov^{1,d},
O.V. Khokhlev^{1,2,e}, A. Omelchenko^{2,f}, and M.S. Ramm^{1,g}

¹ STR Group – Soft-Impact, Ltd., Russia

² St.Petersburg Academic University – Nanotechnology Research & Education Centre
RAS, Russia

Wednesday, May 19

Session H: Lasers

(8:30 - 10:30, Zhonghua Hall, the Lake View Hotel)

Chairs: Y.P. Zeng (Institute of Semiconductor, CAS, China)

T. Honda (Kogakuin University, Japan)

H1 (Invited) 8:30 - 9:00

Title Current status of AlInN layers and AlInN-based heterostructures nearly lattice-matched to GaN for photonics

R. Butt^{d,a}, J.-F. Carlin¹, E. Feltin¹, A. Castiglia¹, G. Cosendey¹, A. Altoukhov¹, J. Levrat¹, and N. Grandjean¹

¹Ecole Polytechnique Fédérale de Lausanne (EPFL), ICMP, CH-1015 Lausanne, Switzerland

H2 (Invited) 9:00 - 9:30

Title Design and fabrication of optically pumped GaN-based VCSELs

B. P. Zhang, J. Y. Zhang, L. E. Cai, X. L. Hu

Pen-Tung Sah Micro-Nano Technology Research Center and Department of Physics,
Xiamen University, China

H3 9:30 - 9:45

Title GaN Photonic Crystal Membrane Laser

Cheng-Hung Lin^a, Jyh-Yang Wang, Cheng-Yen Chen, Kun-Ching Shen, Dong-Ming Yeh, Yean-Woei Kiang, and C. C. Yang^b

Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan

H4 9:45 - 10:00

Title A Study of the Operating Parameters and Barrier Thickness of Al_{0.08}In_{0.08}Ga_{0.84}N/Al_xIn_yGa_{1-x-y}N Multi-Quantum Wells Laser Diodes

A. J. Ghazai, S.M.Thahab, H. Abu Hassan, and Z. Hassan

Nano-Optoelectronics Research and Technology Laboratory, School of Physics,
Universiti Sains Malaysia, Malaysia

H5 10:00 - 10:15

Title Lasing actions in GaN hexagonal nanorings grown by selective area growth of rf-plasma assisted molecular beam epitaxy

Tetsuya Kouno^{1,3,(a)}, Katsumi Kishino^{1,2,3}, Takuto Suzuki¹, Masaru Sakai^{1,2,3} and Akihiko Kikuchi^{1,2,3}

¹Department of Engineering and Applied Sciences, Sophia University, Japan

²Sophia Nanotechnology Research Center, Sophia University, Japan

³CREST, Japan Science and Technology Agency, Japan

H6 10:15 - 10:30

Title High Power Blue Superluminescent Diodes

Marco Rossetti^{1, a}, Julien Dorsaz^{1,b}, Raffaele Rezzonico^{1,c}, Marcus Duell^{1,d}, Christian Velez^{1,e}, Eric Feltrin^{2,f}, Antonino Castiglia^{3,g}, Gatien Cosenday^{3,h}, Jean-francois Carlin^{3,i} and Nicolas Grandjean^{3,1}

¹EXALOS AG, Switzerland

²NOVAGAN s.a.r.l. , Switzerland

³Ecole Polytechnique Federale de Lausanne, Switzerland

Coffee Break (10:30-10:45)

Session I: High Al Content Materials

(10:45 - 12:30, Zhonghua Hall, the Lake View Hotel)

Chairs: K. Hiramatsu (Mie Univ. Japan)

H. Song (Changchun Institute of Optics, Fine Mechanics and Physics, CAS, China)

I1 (Invited) 10:45 - 11:15

Title New progress on MOCVD growth of III-nitrides using high temperature AlN buffer on sapphire

Tao Wang

Department of Electronic and Electrical Engineering, University of Sheffield, United Kingdom

I2 11:15 - 11:30

Title Enhanced light emission of deep-ultraviolet light-emitting diodes via a hole-blocking layer

Weihuang Yang^a, Shuping Li, Hangyang Chen, Dayi Liu, and Junyong Kang^b

Fujian Key Laboratory of Semiconductor Materials and Applications, Department of Physics, Xiamen University, China

I3 11:30 - 11:45

Title Deep-ultraviolet luminescence from Si-doped AlGaN grown by low-pressure MOVPE

Yuki Shimahara^{1, a}, Hiroyuki Taketomi¹, Hideto Miyake¹,
Kazumasa Hiramatsu¹, Fumitsugu Fukuyo², Tomoyuki Okada²,
Hidetsugu Takaoka² and Harumasa Yoshida²

¹Department of electrical and electronic engineering, Mie University, Japan

²HAMAMATSU PHOTONICS K.K.

¹1577 Kurima-machiya, Tsu, Mie 514-8507, Japan

²314-5 Shimokanzo, Iwata, Shizuoka 438-0193, Japan

I4 11:45 - 12:00

Title High-temperature MOCVD growth of AlN on sapphire by controlling nucleation layer with in-situ monitoring

Dabing Li, Yiren Chen, Xiaojuan Sun, Hang Song, Hong Jiang, Zhiming Li and Guoqing Miao

Key Laboratory of Excited State Processes, Changchun Institute of Optics, Fine Mechanics and Physics (CIOMP), Chinese Academy of Sciences, P. R. China

I5 12:00 - 12:15

Title Design of Multiquantum-Barrier Electron-Blocking Layer for 230-280 nm-band AlGaN Deep-UV LEDs

Yusuke Tsukada^{1,2,3}, Hideki Hirayama^{1,3, a} and Norihiko Kamata^{2,3}

¹RIKEN, Japan

²Saitama University, Japan

³CREST, Japan Science and Technology Agency, Japan

Lunch (12:30-14:00)

(The Greenery Coffee Shop, the Lake View Hotel)

Session J: Defects and Bulk Materials

(14:00 - 16:00, Zhonghua Hall, the Lake View Hotel)

Chairs: A. Hoffmann (Technical University of Berlin, Germany)

T. Wang (University of Sheffield, United Kingdom)

J1 (Invited) 14:00 - 14:30

Title Structural Characterization of III-Nitride Heterostructures: Some Recent Studies

David J. Smith¹, Lin Zhou¹ and Theodore D. Moustakas²

¹Dept of Physics, Arizona State University, USA

²Dept. of Electrical & Computer Engineering, Boston University, USA

J2 14:30 - 14:45

Title Control of c-plane bowing in free standing GaN crystals

B. Łuczniak, T. Sochacki, M. Sarzyński, M. Kryško, J. Weyher, G. Kamler, I. Grzegory and S. Porowski

Institute of High Pressure Physics PAS, Poland

J3 14:45 - 15:00

Title High Pressure Solution Growth of GaN on 2 inch free standing GaN substrates

M. Boćkowski, I. Grzegory, B. Łuczniak, T. Sochacki, M. Kryško, J. Weyher, G. Kamler and S. Porowski

Institute of High Pressure Physics PAS, Poland

J4 15:00 - 15:15

Title HVPE growth of crack-free thick AlN film on trench-patterned AlN template

Kohei Fujita^{1,a}, Kazuteru Okuura¹, Hideto Miyake¹, Kazumasa Hiramatsu¹, Jyun Norimatsu², Hideki Hirayama²

¹Mie University, Japan

²RIKEN, Japan

J5 15:15 - 15:30

Title Strain relaxation of AlGa_xN grown on AlN templates by misfit dislocation generation

Z. H. Wu^{1, a}, K. Nonaka², Y. Kawai², T. Asai², F. A. Ponce³, C. Q. Chen¹, M. Iwaya², S. Kamiyama², H. Amano², and I. Akasaki²

¹Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, China

²Faculty of Science and Technology, Meijo University, Japan

³Department of Physics, Arizona State University, USA

Abstract:

Two strain relaxation processes have been observed in Al_xGa_{1-x}N layers grown on thick AlN templates. One is the inclination of *a*-type threading dislocations (TDs) with $\mathbf{b}=1/3\langle 11\bar{2}0 \rangle$ toward the $\langle 1100 \rangle$ directions, and the other one is the generation of interfacial misfit dislocations by glide of *a+c* type TDs with Burgers vector of $\mathbf{b}=1/3\langle 11\bar{2}3 \rangle$ on $\{1\bar{1}0\}$ planes. The inclination angle of the *a*-type TDs is found to increase with the magnitude of the compressive strain in AlGa_xN. The extent of misfit accommodated by each strain relaxation process depends on the density of pre-existing TDs of each type present in the AlN underlayer, the interfacial misfit dislocations playing a very important role in strain relaxation of AlGa_xN/AlN heterostructures.

J6 15:30 - 15:45

Title The Enhanced Growth of GaN on α -AlN Substrates

John Goldsmith^{1*}, Yanhao Du², Jiejun Wu², Weike Luo², Honglin Du², Zhijian Yang² and Guoyi Zhang²

¹Sino Nitride Semiconductor, LTD, Sci-Tech Industrial Park, China,

²State Key Laboratory for Artificial Microstructures and Mesoscopic Physics, Peking University, China

J7 15:45 – 16:00

Title Role of stacking faults in misfit strain relaxation in m-plane InGaN quantum wells

A. M. Fischer^{1, a}, Z. H. Wu¹, F. A. Ponce^{1, b}, R. Senda², D. Iida², M. Iwaya², and H. Amano^{2, d}

¹Department of Physics, Arizona State University, USA

²Faculty of Science and Technology, Meijo University, Japan

Coffee Break (16:00-16:15)

Session K: ZnO and Spin Materials

(16:15 - 18:15, Zhonghua Hall, the Lake View Hotel)

Chairs: Y. Nanishi (Ritsumeikan University, JAPAN)

Z. C. Feng (National Taiwan University, Taiwan)

K1 (Invited) 16:15 - 16:45

Title Optical characteristics and carrier dynamics of various ZnO epilayers and quantum structures

Yong-Hoon Cho^{a*}

Department of Physics and Graduate School of Nanoscience & Technology (WCU), Korea Advanced Institute of Science and Technology (KAIST), Korea

K2 16:45 - 17:00

Title Growth mode controlled synthesis of ZnO epitaxial films by metal organic chemical vapor deposition

Yong-Seok Choi^{1,a}, Jang-Won Kang^{1,b}, Chu-Young Cho^{1,c}, Sang-Jun Lee^{1,d}, Bong-Joon Kwon^{2,e}, Yong-Hoon Cho^{2,f} and Seong-Ju Park^{1,g}

¹Department of Materials Science and Engineering, Gwangju Institute of Science and Technology, Republic of Korea

²National Research Laboratory for Nano-Bio-Photonics, Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

K3 17:00 - 17:15

Title Influence and improvement of polarization effect in GaN-based multiple quantum wells

Hui-Min Lu^a and Gen-Xiang Chen^b

Institute of Lightwave Technology, Beijing Jiaotong University, China

K4 17:15 - 17:30

Title Polarization effects in 2-DEG and 2-DHG AlGa_N/AlN/GaN multi-heterostructures measured by electron holography

Q. Y. Wei¹, Z. H. Wu¹, K. W. Sun¹ and F. A. Ponce¹ and J. Hertkorn² and F. Scholz²

¹Department of Physics, Arizona State University, USA

²Institute of Optoelectronics, Ulm University, Germany

K5 17:30 - 17:45

Title Photoluminescence properties of ZnSe_{1-x}Te_x thin films on GaAs/ITO substrates by electron beam evaporation technique

J. Suthagar¹, M. Balasubramaniam², K. Perumal³, N. J. Suthan Kissinger^{4*}

¹Department of Physics, Karunya University, India

²Department of Physics, Kongunadu College of Arts & Science, India

³Department of Physics, Sri Ramakrishna Mission Vidyalaya College of Arts & Science, India.

⁴Department of Physics, Loyola Institute of Technology & Science, India.

K6 17:45 - 18:00

Title Accurate characterization of long range magnetic order in GaN:Mn by magnetic force microscope

Y. H. Zhang^{1, a}, Z.Y.Lin^{1,b} and Z.T.Chen¹, Y.Z.Qian¹, X.L.Yang¹, D.Li¹, F.F.Zhang¹, T.Dai¹, Z. C. Wen², B. S. Han², C.D.Wang¹, G.Y.Zhang^{1,c}

¹ State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, China.

² State Key Laboratory of Magnetism, Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, Chinese Academy of Science, China

K7 18:00 - 18:15

Title Comparison of growth mechanisms between self-organized and selective area growth of GaN nanorods by MOVPE

X. Wang, S. Fuending, S. F. Li, S. Merzsch, M. A. M. Al-Suleiman, J. D. Wei, H.-H. Wehmann, A. Waag

Institut für Halbleitertechnik, TU Braunschweig, Germany

Thursday, May 20

Excursion

(8:30 - 18:00)

Banquet

(18:00 - 21:00, Zhonghua Hall, the Lake View Hotel)

Friday, May 21

Session L: LEDs

(8:30 - 11:00, Zhonghua Hall, the Lake View Hotel)

Chairs: D. J. Smith (Arizona State Univ. USA)

J. Y. Kang (Xiamen Univ. China)

L1 (Invited) 8:30 - 9:00

Title Green LEDs for color mixing white light using lattice- mismatched GaInP alloys

Angelo J. Mascarenhas

National Renewable Energy Laboratory, USA

L2 (Invited) 9:00 - 9:30

Title II-VI Semiconductor Alloy Nanowires for Full-Color Light Emitting and lasing

C.Z. Ning^{1,a}, A.L. Pan^{1,2}, M.H. Sun¹, R.B. Liu^{1,3}, E.S.P. Leong^{1,4}, A.H. Chin¹, W.C. Zhou^{1,2}, B.S. Zou³

¹School of Electrical, Computer and Energy Engineering, Center of Nanophotonics, Arizona State University, USA

²State Key Laboratory CBSC and Micro-Nanotechnology Research Center, Hunan University, China

³School of Material Science and Engineering, Beijing Institute of Technology, China

⁴Institute of Materials Research and Engineering, Singapore

L3 9:30 - 9:45

Title Surface Modification of (0001)GaN and its application to RGB pixels based on UV Schottky-type LEDs

Tohru Honda*, Naoki Sakai and Tadashi Nozaki

Department of Electrical Engineering and Electronics, Graduate School of Engineering, Kogakuin University, Japan

L4 9:45 - 10:00

Title Selective Area Growth of GaN Nanorods on Patterned SiO₂/sapphire Templates by

MOVPE

S. F. Li^{1, a}, S. Fuendling¹, X. Wang¹, S. Merzsch¹, M. Al- Suleiman¹, J. D. Wei¹, H. –H. Wehmann¹, A. Waag¹, W. Bergbauer^{2, b} and M. Strassburg²

¹Institut für Halbleitertechnik, TU Braunschweig, Germany.

²Osram Opto Semiconductors GmbH, Germany.

L5 10:00 - 10:15

Title PL and structural studies of GaInN MQWs grown on Si substrates

Hrioyasu Ishikawa^{1, a} and Naoto Mori^{2, b}

¹Dept. of Electronic Engineering, Shibaura Institute of Technology, Japan

²Dept. of Engineering Physics, Electronics and Mechanics, Nagoya Institute of Technology, Japan

L6 10:15 - 10:30

Title High Efficiency Green, Yellow, and Red Emission from InGaN/GaN Dot-in-a-Wire Nanoscale Heterostructures on Si

Y. L. Chang, F. Li, and Z. Mi

Department of Electrical and Computer Engineering, McGill University, Canada

Coffee Break (10:30-10:45)

Session M: Nitrides on Si

(10:45 – 11:45, Zhonghua Hall, the Lake View Hotel)

Chairs: J. Christen (Otto Von Guericke U., Germany)

X. D. Hu (Peking Univ. China)

M1 (Invited) 10:45 - 11:15

Title GaN on Si optoelectronics - status and challenges

Armin Dadgar

University of Magdeburg, Germany

M2 (Invited) 11:15 - 11:45

Title Nitride LEDs on Si substrates

Nobuhiko Sawaki^{1, a}, Yoshio Honda^{2, b}

¹AICHI INSTITUTE OF TECHNOLOGY, JAPAN

²NAGOYA UNIVERSITY, JAPAN

Closing Remarks (11:45-12:00)

Poster

(Mon. 18:00 - 20:00, the hallway outside Zhonghua Banquet Hall, the Lake View Hotel)

P1

Title InAlN-based Schottky Diode with Low Leakage Current

Z. T. Chen and T. Egawa

Research Center for Nano-Device and System, Nagoya Institute of Technology, Japan

P2

Title Electrical Properties of GaN-based thin film LEDs fabricated by Laser Lift-off

Yongjian Sun, Tongjun Yu, Zhizhong Chen, Guoyi Zhang

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, Peking University, China

P3

Title Reduction of the Efficiency Droop Effect of a Light-emitting Diode through Surface Plasmon Coupling with the Quantum Wells

Chih-Feng Lu^a, Che-Hao Liao, Chih-Yen Chen, Chieh Hsieh, and C. C. Yang^b

Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan

P4

Title Surface Plasmon Coupled Light-emitting Diode - An Alternative Light-emitting Channel

Kun-Ching Shen, Chih-Feng Lu, Cheng-Hung Lin, Che-Hao Liao, Chih-Yen Chen, and C. C. Yang^a

Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan

P5

Title Synthesis and Luminescence of Single Crystalline Bi₂O₃ Nanosheets

G. L. Fang, G. Chen, X. Wang, J. Q. Liu

Engineering Research Center of Materials Behavior and Design, Ministry of Education, Joint Laboratory of Nanostructured Materials and Technology, Nanjing University of Science and Technology, China

P6

Title Comparison for Epitaxial Growth and Characterizations of AlN Thin Films on Si(111) and Si(100) Substrates

Fu Yuechun^a, Xie Shangsheng, Meng Xianghai, He Huan and Shen Xiaoming

Key Laboratory of New Processing Technology for Nonferrous Metal materials, Ministry of Education, College of Material Science and Engineering, Guangxi University, China

P7

Title Analysis on the Process of ZAO films by DC magnetron reactive sputtering

LU Feng¹, XU Cheng-hai², WEN Li-shi³

¹School of Transportation and Mechanical Engineering, Shenyang Jianzhu University, Shenyang, 110168, China;

²School of Mechanical Engineering & Automation, Northeastern University, Shenyang 110004, China;

³Institute of Metal Research, The Chinese Academy of Sciences, Shenyang 110015, China.

P8

Title Lattice Constant Effects of Photonic Crystal on the extraction of Guided mode of GaN based Light Emitting Diodes

XingXing Fu^a, Bei Zhang^{b,*}, XiangNing Kang, Jun Xu, Chang Xiong, and GuoYi Zhang
School of Physics and State Key Laboratory for Artificial Microstructures and Mesoscopic Physics, Peking University, China

P9

Title The lattice-parameter effects on diffracted transmission of GaN two-dimensional square-lattice photonic crystals

Chang Xiong, Bei Zhang,^{*} XiangNing Kang, XingXing Fu, and GuoYi Zhang
School of Physics and State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, Peking University, People's Republic of China

P10

Title Coupled thermal and electrical simulation of AC LED array

O.V. Khokhlev^a, I.Yu. Evstratov^b, M.V. Bogdanov^c, K.A. Bulashevich^d, S.Yu. Karpov^e, and M.S. Ramm^f

STR Group – Soft-Impact, Ltd., Russia

P11

Title Strain effects on optical polarization properties of different Al contents in AlGaIn

Wu Chao, Yu Tongjunb, Jia Chuanyu, and Zhang Guoyi
State Key Laboratory for Mesoscopic Physics, School of Physics, Peking University, China

P12

Title Barrier effect on the optoelectronic properties of GaN-based irregular multiple quantum wells for dichromatic white LEDs

Gen-Xiang Chen^a and Hui-Min Lu^b
Institute of Lightwave Technology, Beijing Jiaotong University, China

P13

Title Simulation and Fabrication of High-Voltage 4H-SiC P-i-N Diode With JTE

Zhang Fasheng^{1,2} Zhang Yuming²

¹School of Computer and Information Engineering, Central South University of Forestry and Technology, China

²School of Microelectronics, Xidian University, Key Laboratory of Wide Band-Gap Semiconductor Materials and Devices, China

P14

Title In-plane polarization of low-dimensional InGaN/GaN heterostructures

Q. Y. Wei, T. Li, and F. A. Ponce

Department of Physics, Arizona State University, USA

P15

Title STUDY ON THE INTERFACE OF ALN AND METAL

Xue-mei Cai

College of Electronic Engineering, Chongqing University of Posts and Telecommunications, China

P16

Title Fabrication of c-axis oriented MgZnO transparent electrodes by molecular precursor method

Takuto Oda¹, Hiroki HARA², Chihiro MOCHIZUKI²,
Mitsunobu SATO² and Tohru Honda^{*1}

¹Department of Electrical Engineering and Electronics, Graduate School of Engineering, Kogakuin University, Japan

²Coordination Laboratory, Graduate School of Engineering, Kogakuin University, Japan

P17

Title Temperature dependent efficiency droop behaviors studied by pulsed laser excitation

Yuanping Sun^{1,2}, Lihua Jin², Yong-Hoon Cho², E. -K. Suh³, H. J. Lee³, R. J. Choi⁴ and Y. B Hahn⁴

¹Institute of Science and Technology for Opto-electronic information, Yantai University, China

²Department of Physics, Korea Advanced Institute of Science and Technology, Republic of Korea

³Department of Semiconductor Science and Technology and Semiconductor Physics Research Center, Chonbuk National University, Korea

⁴School of Chemical Engineering, Chonbuk National University, Korea

P18

Title Thin film GaN LEDs epi-structure transferring to Cu substrate by novel chemical lift-off technology

Cheng-Ying Yen^{1,a}, Ray-Hua Horng^{2,b,*}, Chia-Cheng Wu^{3,c},
and Dong-Sing Wu^{3,d}

¹Institute of Precision Engineering, National Chung Hsing University, Taiwan

²Department of Electro-Optical Engineering, National Cheng Kung University, Taiwan

³Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

P19

Title Fabrication of GaN-based vertical LEDs and the improved light output power by using current blocking layers

Hwan Hee Jeong,¹ Sang Youl Lee,¹ Young Kyu Jeong,¹ Kwang Ki Choi,¹ June-O Song,¹ Yong-Hyun Lee,² and Tae-Yeon Seong^{3,a}

¹Department of LED Business, Chip Development Group, LG Innotek, Korea

²School of Electronic and Electrical Engineering, Kyungpook National University, Korea

³Department of Materials Science and Engineering, Korea University, Korea

P20

Title Laser- induced etching Parameters impact on optical properties of the silicon nanostructures

Asmiet Ramizy*, Z. Hassan, Khalid Omar

Nano-Optoelectronics Research and Technology Laboratory, School of Physics, Universiti Sains Malaysia, Malaysia

P21

Title Highly uniform characteristics of the GaN nanorods grown on Si(111) by using MOCVD

Yong-Ho Ra, R. Navamathavan, Ki-Young Song, Young-Ho Ko,

Ji-Hyeon Park, Dong-Wook Kim and Cheul-Ro Lee*

School of Advanced Materials Engineering, College of Engineering, Research Center for Advanced Materials Development (RCAMD), Chonbuk National University, South Korea

P22

Title Synthesis of InN nanowires grown on droplets formed with Au and self-catalyst on Si(111) by using MOCVD

Ji-Hyeon Park, Ki-Young Song, Dong Wook Kim, R. Navamathavan, Hong-Chul Lim, Young-Ho Ko, Byung-Joon Baek and Cheul-Ro Lee*

School of Advanced Materials Engineering, Engineering College, Research Center for Advanced Materials Development (RCAMD), Chonbuk National University, South Korea

P23

Title A Parametric Study for Efficient Thermal Dissipation in LED Back Light Unit

Byung Joon Baek^{a,*}, Cheul RO Lee^b, Jin Taek Kim^a, in Kim^a, Bo-Ra Yeom^b, Jae-kwan Sim^b

^a School of Mechanical System Engineering, Chonbuk National University, Korea

^b School of Advanced Materials Engineering, Chonbuk National University, Korea

P24

Title Improvements in Optical Power and Emission Angle of Blue Light Emitting Diodes Using Patterned Sapphire Substrates with Low Threading Dislocation Densities

Hong-Chul Lim, Jae-Kwan Sim, Suthan Kissinger, Jun-Ho Cha, Bo-Ra Yeom, Byung-Joon Baek, Young-Ho Ko and Cheul-Ro Lee *
School of Advanced Materials Engineering, College of Engineering, Research Center for Advanced Materials Development (RCAMD), Chonbuk National University, South Korea

P25

Title A Novel Low Power Consumption and Quasilinear CMOS Optically Coupled Isolation Amplifier

Li Cheng^a, Ning Yang^b, Xiaodi Zhou, Ming Yan
Institute of Electricity and Information, Jiangsu University, China

P26

Title Investigation of GaInP quantum dots in the AlGaInP-based light emitting diodes

Hwa Sub Oh^{1,2}, Sang Mook Kim¹, Huyn Haeng Lee¹, Joon Seop Kwak², and Jong Hyeob Baek^{1,a}

¹LED Device Team, Korea Photonics Technology Institute (KOPTI), 971-35 Wolchul-dong, Buk-gu, Gwangju 500-460, Korea

² Department of Printed Electronics Engineering, Sunchon National University, Chonnam 540-742, Korea

P27

Title AlGaN deep-ultraviolet light-emitting diodes with the EL wavelength between 262-317 nm

Liwen Sang^{1, a}, Zhixin Qin^{1, b}, Yanzhao Zhang¹, Tao Li¹, Zhengyu Xu¹, Shuping Li², Weihuang Yang², Hanyang Chen², Dayi Liu², Zhijian Yang¹, Junyong Kang², Bo Shen¹ and Guoyi Zhang¹

¹State Key Laboratory for Mesoscopic Physics, Department of Physics, Peking University, P. R. China

²Department of Physics and Semiconductor Photonics Research Center, Xiamen University, P. R. China

P28

Title Smooth and high optical quality single crystal ZnO thin film grown by sputtering on annealed ZnO buffer layer

Octolia Tambunan^a and Chunli Liu^b
Department of Physics, Hankuk University of Foreign Studies, Korea

P29

Title EPITAXIAL LATERAL OVERGROWTH OF GaN ON SAPPHIRE SUBSTRATES USING IN-SITU CARBONIZED PHOTORESIST MASK

Sang-il Kim^{1, a}, Bumjoon Kim^{1, b}, Samseok Jang^{1, c}, Jihun Park^{2, a} and Dongjin Byun^{1, d}

¹Korea University, KOREA

²Korea Institute of Science and Technology, KOREA

P30

Title Study of 3C-SiC heteroepitaxial growth on Si substrate

Chen Da, Zhang Yu-Ming, Zhang Yi-Men, Wang Yue-Hu

Key Laboratory of Wide Band-Gap Semiconductor Materials and Devices, School of Microelectronics, Xidian University, China

P31

Title Low temperature cathodoluminescence investigation of the strain relaxation in prestrained InGaN/GaN quantum wells

Lei Wang^a, Rui Li^b, Ding Li^c, Ningyang Liu^d, Lei Liu^e, and Xiaodong Hu^f.

State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, People's Republic of China

P32

Title Optical and Morphological Properties of Semipolar GaN Light-Emitting Diodes on Miscut m-Plane Sapphire Substrates

S. Y. Bae¹, S. B. Choi¹, D. S. Lee^{1,a}, J. F. Kaeding², S. Nakamura², S. P. DenBaars², J. S. Speck²

¹Gwangju Institute of Science and Technology, Korea

²University of California, Santa Barbara, USA

P33

Title Quantum Cascade Lasers Operating About 3 THz

Junqi Liu^{1,a}, Jianyan Chen¹, Lu Li¹, Fengqi Liu¹, Lijun Wang¹ and Zhanguo Wang¹

¹ Key Laboratory of Semiconductor Materials Science, Institute of Semiconductors, Chinese Academy of Sciences, People's Republic of China

P34

Title Influence of the TEGa flow on the optical and structure properties of InGaN/GaN multiple quantum wells grown by MOCVD

Shanjin Huang, Yulun Xian, Bingfeng Fan, Zhiyuan zheng, Zhisheng Wu, Hao Jiang^{a)} and Gang Wang

State Key Laboratory of Optoelectronic Materials and Technology, Sun Yat-sen University, P. R. China

P35

Title Rutherford Backscattering on AlGaN Thin Film With High Al Composition

Hasnain Khan^{1,a}, Lin Li^{1,b}, Yee Ling Chung^{2,c}, Shude Yao^{1,d}, Ray-Hua Horng^{3,e}, Dong-Sing Wu^{4,f}, Zhe Chuan Feng^{2,g}

¹ State Key Laboratory of Nuclear Physics and Technology, Peking University, China

² Institute of Photonics & Optoelectronics, and Department of Electrical Engineering, National Taiwan University, Taiwan

³ Department of Electro-Optical Engineering, Cheng Kung University, Taiwan

⁴Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

P36

Title Growth of GaN epilayers on nanoporous GaN templates generated by electrochemical etching at defect sites

Ah Hyun Park,¹ Tae Su Oh,² Yong Seok Lee,¹ Hyun Jeong,¹ Tae Hoon Seo,¹ Hun Kim,¹ Kang Jea Lee,¹ and Eun Kyung Suh^{1,a}

¹ School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

² Department of Nano Semiconductor and Display, Semiconductor Physics Research Center, Chonbuk National University, Korea

P37

Title Morphology and structural evolution of nonpolar a-plane GaN epilayers by controlled growth dynamics and two-layer sequences

Yong Seok Lee¹, Hun Kim¹, Tae Su Oh², Hyun Jeong¹, Tae Hoon Seo¹, Ah Hyun Park¹, Kang Jea Lee¹ and Eun-Kyung Suh^{1,2,a}

¹ School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

² Department of Nano Semiconductor and Display, Semiconductor Physics Research Center, Chonbuk National University, Korea

P38

Title Stress analysis of X-ray diffraction and Raman scattering in GaN inserted by an AlN interlayer

Ni Jinyu

National Key Laboratory of Monolithic Integrated Circuits and Modules, Nanjing Electronic Devices Institute, China

P39

Title Anisotropic Etching of Crystalline Silicon in Alkaline Solutions for PERL Silicon LED

Li Xiaoyun^{1a}, Liu Guorui¹, Liu Wei¹, Guo Weilian^{1,2}

¹School of Information and Communication Eng., Tianjin Polytechnic University, P.R China

²School of Electronic Information Eng., Tianjin University, P.R China

P40

Title Life-Time Estimation Of Blue InGaN/GaN LEDs Based On Analysis Of Thermal And Optical Properties

Jae Hyoung Ryu^{1,a}, Bong Jun Kim^{2,b}, Hee Yun Kim^{3,c}, Hyun Kyu Kim^{4,d}, Min Han^{5,e} and Chang-Hee Hong^{6,f}

¹⁻⁶School of Semiconductor and Chemical Engineering and Semiconductor Physics Research Center, Chonbuk National University, South Korea.

P41

Title InGaN/GaN light emitting diodes on a stripe patterned silica spheres on sapphire substrate

Nam Han, Hyung-Gu Kim, Hee-Yun Kim, Hyun-Kyu Kim, Ji-Hye Kang, Jae-Hyung Ryu, Young-Jae Park, Mi-So Lee, Beo-Deul Ryu, Min Han and Chang-Hee Hong*
School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center (SPRC), Chonbuk National University, Republic of Korea

P42

Title Optical Analysis of InGaN/GaN Multi-Quantum Well for Blue Laser Applications

C. H. Huang¹, L. Liu², Y. C. Lee³, X. D. Hu² and Z. C. Feng¹

¹Institute of Photonics & Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taiwan

²The Research Center for Wide Bandgap Semiconductors, Peking University, China

³ Department of Electronic Engineering and Research Center for Micro/Nano Technology, Tunghnan University, Taiwan

P43

Title InGaN multiple quantum well structures grown on (1122) facet GaN/sapphire templates

L. S. Wang¹, S. Liu¹, C. H. Huang², C. C. Wei² and Z. C. Feng²

¹Wuhan National Laboratory for Optoelectronics, and School of Mechanical Science and Engineering, Huazhong University of Science and Technology, China

²Institute of Photonics & Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taiwan

P44

Title Effect of Hemispherically Convex-Patterned Substrate on Defect Structure and Local luminescence Distribution of GaN-Light Emitting Diodes

Tae Su Oh¹, Hyun Jeong², Yong Seok Lee², Tae Hoon Seo², Hun Kim², Ah Hyun Park², Kang Jea Lee², Mun Seok Jeong³, and Eun-Kyung Suh^{1,2*}

¹Department of Nano Semiconductor & Display, and Semiconductor Physics Research Center, Chonbuk National University, Korea

²School of Semiconductor & Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

³Advanced Photonic Research Institute, Kwangju Institute of Science and Technology, Korea

P45

Title Nanoscale lateral epitaxial overgrowth of GaN epilayers on nanoporous-ordered GaN/sapphire template

Ah Hyun Park,¹ Tae Su Oh,² Yong Seok Lee,¹ Hyun Jeong,¹ Jan Di Kim,¹ Tae Hoon Seo,¹ Hun Kim,¹ Kang Jea Lee,¹ and Eun-Kyung Suh^{1,2 a)}

¹ School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

² Department of NanoSemiconductor and Display, Semiconductor Physics Research Center, Chonbuk National University, Korea

P46

Title Enhancement of light output in InGaN blue light emitting diodes with self-assembled ZnO nanorod arrays

Tae Hoon Seo¹, Hyun Jeong^{1, 3}, Tae Su Oh², Yong Seok Lee¹, Hun Kim¹, Ah Hyun Park¹, Kang Jea Lee¹, Yong-Hwan Kim³, Mun Seok Jeong^{3, a}, Eun-Kyung Suh^{1, b}

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²Department of Nano Semiconductor and Display, Chonbuk National University, Korea

³Advanced Photonics Research Institute, Gwangju Institute of Science and Technology, Korea

P47

Title Investigation of Ultraviolet AlGaIn Light-Emitting Diodes with Ga- and N-Polarity
Man-Fang Huang^{1, a}, Miao-Chan Tsai^{1, b}, Pei-Wen Tsai¹ and Yen-Kuang Kuo^{2, c}

¹Institute of Photonics, National Changhua University of Education, Taiwan

²Department of Physics, National Changhua University of Education, Taiwan

P48

Title Novel Polygon LEDs for Higher Light Extraction

X.H. Wang^a, K.Y. Lam, P.T. Lai and H.W. Choi

Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong

P49

Title Photo-voltaic characteristics of Photodetector with Nanostructure on the Surface

Jing Zhang^{1, a}, Yoshiki Naoi¹, Shiro Sakai¹, Atsuyuki Fukano^{2, b} and Satoru Tanaka²

¹Department of Electrical and Electronic Engineering, The University of Tokushima, Japan

² SCIVAX Corporation, Japan

P50

Title Fabrication of the GaN-based LEDs with embedded overcut hole structure on the wet etch patterned sapphire substrate

Hyun Kyu Kim, Hyung Gu Kim, Hee Yun Kim, Jae Hyoung Ryu, Ji hye Kang, Nam Han, Bong Jun Kwon, Yun Seon Baek and Chang-Hee Hong*

School of Semiconductor and Chemical Engineering, Chonbuk National University, KOREA

P51

Title Selective defect blocking by self-assembled silica nanospheres in high quality GaN epitaxial growth

Young Jae Park ^a, Hyung Gu Kim^b, Jae Hyoung Ryu^c, Hyun Kyu Kim^d, Hee Yun Kim^e, Ji Hye Kang^f, Nam Han^g, Min Han^h, Sung Min Kimⁱ and Chang-Hee Hong^j
School of Semiconductor and Chemical Engineering, Chonbuk National University,
Korea

P52

Title Improved light output power of GaN-based light emitting diodes with double layer textured surfaces

Ji Hye Kang^a, Hyung Gu Kim^b, Jae Hyoung Ryu^c, Hyun Kyu Kim^d, Hee Yun Kim^e, Mi So Lee^f, Beo Deul Ryu^g, and Chang-Hee Hong^h
School of Semiconductor and Chemical Engineering, Chonbuk National University,
Korea

P53

Title Fabrication and characterization of GaN-based LEDs grown on nano patterned sapphire substrate using ITO sphere etch mask

Hee Yun Kim¹, Hyung Gu Kim¹, Jae Hyoung Ryu¹, Hyun Kyu Kim¹, Ji Hye Kang¹, Nam Han¹, Young Jae Park¹, Min Han¹, Chang-Hee Hong^{1,a}
¹School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

P54

Title Enhancement of light output power in InGaN/GaN LEDs with micro polygon column shaped transparent

Mi So Lee, Hyung Gu Kim, Ji Hye Kang, Jae Hyoung Ryu, Hyun Kyu Kim, Hee Yun Kim, Periyayya Uthirakumar, and Chang-Hee Hong*
School of Semiconductor and Chemical Engineering, Chonbuk National University,
Korea

P55

Title Electrical and optical study of Al_{0.2}Ga_{0.8}N/GaN superlattice with and without AlN interlayer grown by metalorganic chemical vapor deposition

Ningyang Liu^a, Ding Li, Lei Wang, Lei Liu, Weihua Chen, Rui Li, Xiaodong Hu^b
State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, People's Republic of China

P56

Title High Quality a-plane GaN grown on r-plane sapphire using a SiN_x Interlayer by Metal Organic Chemical Vapor Deposition

K.H. Bang^{1,a}, S. Jung^{1,b}, S.M. Hwang^{2,c}, MinSoo Noh^{1,d}, and Jeong Soo Lee¹
¹Materials & Devices Lab., LG Electronics, Korea
²Optoelectronics Lab., Korea Electronics Institute Technology, Korea

P57

Title Improvement of Carrier Distribution in Active Region of Blue InGaN Light-Emitting Diodes

Miao-Chan Tsai^{1,a}, Shu-Jeng Chang^{1,b}, Sheng-Horng Yen^{2,c}, and Yen-Kuang Kuo^{3,d}

¹Institute of Photonics, National Changhua University of Education, Taiwan

²R&D division, Epistar Co., Ltd., Science-based Industrial Park, Taiwan

³Department of Physics, National Changhua University of Education, Taiwan

P58

Title Structural characteristics of epitaxial lateral overgrown a-plane GaN on r-plane sapphire substrate

Hun Kim¹, Yong Seok Lee¹, Tae Su Oh², Hyun Jeong¹, Tae Hoon Seo¹, Ah Hyun Park¹, Kang Jea Lee¹, and Eun-Kyung Suh^{1,2,a}

¹School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

²Department of Nano Semiconductor and Display, Semiconductor Physics Research Center, Chonbuk National University, Korea

P59

Title Anisotropic and parasitic growth of (1120) a-plane GaN on stripe patterned (1012) r-plane sapphire substrate

Hun Kim¹, Yong Seok Lee¹, Tae Su Oh², Hyun Jeong¹, Tae Hoon Seo¹, Ah Hyun Park¹, Kang Jea Lee¹, and Eun-Kyung Suh^{1,2,a}

¹School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Korea

²Department of Nano Semiconductor and Display, Semiconductor Physics Research Center, Chonbuk National University, Korea

P60

Title Investigation of structural and optical properties in GaN thin film and LED structure grown on cone shaped patterned sapphire substrates

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P61

Title Actual surface temperatures on patterned sapphire substrate for III-nitride compounds growth with metal organic chemical vapor deposition

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P62

Title Enhancement of internal quantum efficiency in InGaN/GaN light-emitting diode based on multiple quantum wells of resonantly absorbing Bragg reflector structure

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P63

Title Growth of c-GaN Films via an AlGaAs Intermediate Layer on GaAs(001) Substrates by MOVPE

Hiroaki Kato, Yuki Seki, Quang Tu Thieu, Shigeyuki Kuboya and Kentaro Onabe
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P64

Title Voids formation in eutectic AuSn layer in GaN-based vertical structure light emitting diodes

Pengfei Tian, Zhizhong Chen, Yongjian Sun, Shengli Qi, Junjing Deng, Feng Yu, Tongjun Yu, Xiangning Kang, Zhixin Qin, and Guoyi Zhang
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P65

Title Growth and Characterization of Phosphorus doped ZnO Thin Films

YuanJie Li¹, JiangBo Ren and ZiLong Liu
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P66

Title Degradation behaviors of high power GaN-based LED on sapphire substrate and on free-standing GaN

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P67

Title A self-limiting ion erosion technology to open window on the GaN-LD ridge

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P68

Title Effect of the thickness of n-GaN underlayer to InGaN-based multi-quantum well grown on Si(111) substrate

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P69

Title Effects of indium ambient on the optical properties of p-GaN using an In-assisted growth method

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INDEX

Ager, J. W.	F6
Akasaki, I.	J5
Alam, A.	B7
Al-Suleiman, M.	L4 K7
Altoukhov, A.	H1
Amano, H.	J5 J7 PL1
Araki, T.	F6
Armour, Eric	G6
Asai, T.	J5
Avrutin, V.	D6
Bae, S. Y.	P32
Baek, Byung Joon	P23 P22 P24
Baek, Jong Hyeob	P26
Baek, Yun Seon	P50
Balasubramaniam, M.	K5
Bang, K. H.	P56
Bergbauer, W.	L4
Bertram, F.	D3 D6
Bockowski, M.	J3
Bogdanov, M.V.	G7 P10
Boyd, A.	B7
Brandt, O	C6
Bruckbauer, J.	D2
Brunner, F.	C4
Bulashevich, K. A.	G7 P10
Butte, R.	H1
Byun, Dongjin	P29
Cai, L.E.	H2
Cai, Xue-mei	P15
Carlin, J.-F.	H1 H6
Castiglia, A.	H1 H6
Cha, Jun-Ho	P24
Chang, Shu-Jeng	P57
Chang, Y. L.	L6
Chen, C.Q.	J5
Chen, Changqing	P62
Chen, Cheng-Yen	H3 B3
Chen, Chih-Yen	D1 P3 P4
Chen, Da	P30
Chen, G.	P5

Chen, Gen-Xiang	K3 P12
Chen, Hangyang	I2
Chen, Hanyang	P27
Chen, Hung-Ruei	F3
Chen, Jianyan	P33
Chen, Weihua	P55
Chen, Y. S.	A4
Chen, Ying-Chen	E5
Chen, Yiren	C3 I4
Chen, Z.T.	P1 K6
Chen, Zhizhong	P2 P61 P64
Cheng, Chao-Cheng	E4
Cheng, Hao-Chun	E4
Cheng, Li	P25
Chiang, S. Y.	A4
Chin, A.H.	L2
Cho, Chu-Young	A3 K2
Cho, Yong-Hoon	G5 K1 K2 P60
Choi, H.W.	P48
Choi, Hoi-Wai	D7
Choi, Kwang Ki	P19
Choi, R. J.	P17
Choi, S. B.	P32
Choi, Yong-Seok	A3 K2
Chou, M.C.	A4
Chou, S.T.	A4
Christen, Juergen	A5 D3 D6
Chu, Chen-Fu	E4
Chu, Jiunn-Yi	E4
Chu, Mu-Tao	F3
Chu, Sheng	G1
Chung, Yee Ling	P35
Cosendey, G.	H1 H6
Dadgar, Armin	M1
Dai, Jiangnan	P62
Dai, T.	K6
Dawson, M.	A1
DenBaars, S. P.	P32
Deng, Junjing	P64
Detchprohm, T.	B4
Doan, Trung	E4

Dogan, P	C6
Dorsaz, Julien	H6
Du, Honglin	J6
Du, Yanhao	J6
Duelk, Marcus	H6
Durnev, M.	D4
Edwards, P.R.	D2
Egawa, T.	P1 P68
Evstratov, I. Yu.	D4 G7 P10
Fan, Feng-Hsu	E4
Fang, G. L.	P5
Fang, Hao	D5
Fang, Yanyan	P62
Feltin, E.	H1 H6
Feng, Z. C.	P42 P43 P35
Fey, Thomas	A5
Figge, S.	B5
Fischer, A. M.	B4 J7
Fu, XingXing	P8 P9
Fu, Yuechun	P6
Fuendling, S.	K7 L4
Fujita, Kohei	J4
Fukano, Atsuyuki	P49
Fukuhara, Yujiro	B6
Fukuyo, Fumitsugu	E2 I3
Funato, Mitsuru	B1
Gao, Yumin	C1
Geelhaar, L	C6
Ghazai, A.J.	H4
Goldsmith, John	J6
Grandjean, N.	H1 H6
Grzegory, I.	J2 J3
Guo, Weilian	P39
Gutowski, J.	B5
Haberland, K.	C4
Hahn, Y. B.	P17
Han, B. S.	K6
Han, Min	P40 P41 P51 P53
Han, Myung-Soo	G5
Han, Nam	P41 P50 P51 P53
Han, P.	A2

HARA, Hiroki	P16
Hashiya, Akira	B1
Hassan, H.Abu	H4
Hassan, Z.	F4 H4 P20
He, Huan	P6
Hempel, Thomas	A5
Hertkorn, J.	K4
Heuken, M.	B7
Hiramatsu, Kazumasa	E2 I3 J4
Hirayama, Hideki	E3 I5 J4
Ho, C. Y.	A4
Hommel, D.	B5
Honda, Tohru	L3 P16
Honda, Yoshio	M2
Hong, Chang-Hee	P40 P53 P50 P51 P52 P54 P41
Hornng, Ray-Hua	E5 F3 P18 P35
Hsieh, Chieh	P3
Hsieh, M. F.	A4
Hu, X. D.	P31 P55 P42 P67
Hu, X. L.	H2
Huang, C. H.	P42 P43
Huang, Jingyun	G2
Huang, Man-Fang	P47
Huang, Shih-Cheng	E5
Huang, Shih-Yung	E5
Hui, Xiong	P62
Hwang, S. M.	P56
Iida, D.	J7
Ishikawa, Hrioyasu	L5
Ishitani, Yoshihiro	F2
Ito, Shun	F7
Iwamoto, R.	F6
Iwaya, M.	J5 J7
Jahn, U	C6
Jang, Samseok	P29
Jeong, Hwan Hee	P19
Jeong, Hyun	P36 P37 P44 P45 P46 P58 P59
Jeong, Mun Seok	P44 P46
Jeong, Young Kyu	P19
Jia, Chuanyu	P11 P61

Jiang, H.X.	B2
Jiang, Hong	C3 I4
Jin, Li-Hua	G5 P17
Jin, Yixin	C3
Jung, S.	P56
Kaeding, J. F.	P32
Kakuda, Masahiro	B6
Kalden, J.	B5
Kamata, Norihiko	E3 I5
Kamiyama, S.	J5
Kamler, G.	J2 J3
Kaneta, Akio	B1
Kang, Jang-Won	A3 K2
Kang, Ji Hye	P41 P50 P51 P52 P53 P54
Kang, Junyong	F7 I2 P27
Kang, Xiangning	P8 P9 P64
Karpov, S. Yu.	D4 G7 P10
Kato, Hiroaki	P63
Kawai, Y.	J5
Kawakami, Yoichi	B1
Khan, Hasnain	P35
Khokhlev, O.V.	G7 P10
Kiang, Yean-Woei	H3
Kikuchi, Akihiko	H5
Kim, Bong Jun	P40
Kim, Bumjoon	P29
Kim, Dong Wook	P21 P22
Kim, Hee Yun	P40 P50 P51 P52 P53 P54 P41
Kim, Hun	P37 P44 P45 P46 P58 P59 P36
Kim, Hyun Kyu	P40 P50 P51 P52 P53 P54 P41
Kim, Hyung Gu	P41 P50 P51 P52 P53 P54
Kim, in	P23
Kim, Jan Di	P45
Kim, Jin Taek	P23
Kim, Sang Mook	P26
Kim, Sang-i	P29
Kim, Sung Min	P51
Kim, Yong-Chun	P60
Kim, Yong-Hwan	P46

Kishino, Katsumi	H5
Kissinger, Suthan	P24
Ko, Young-Ho	P21 P22 P24
Kobayashi, Keisuke	F5
Kong, Jieying	G1
Kouno, Tetsuya	H5
Kruse, C.	B5
Krysko, M.	J2 J3
Kuboya, Shigeyuki	B6 P63
Kuo, Yen-Kuang	P47 P57
Kusakabe, Kazuhide	F2
Kwack, Ho-Sang	G5 P60
Kwak, Joon Seop	P26
Kwon, Bong Jun	P50
Kwon, Bong-Joon	G5 K2
Lai, Pui-To	D7 P48
Lahnemann, J	C6
Lam, K. Y.	P48
Lee, Cheul-Ro	P21 P22 P23 P24
Lee, Ching-Ting	C5 G4
Lee, D. L.	A4
Lee, D. S.	P32
Lee, Dong	G6
Lee, G. H.	A4
Lee, H. J.	P17
Lee, Hsin-Ying	G4
Lee, Huyn Haeng	P26
Lee, J.	D6
Lee, Jae-Hoon	P60
Lee, Jeong Soo	P56
Lee, Kang Jea	P36 P37 P44 P45 P46 P58 P59
Lee, Kyu-Seung	P60
Lee, Mi-So	P41 P52 P54
Lee, Sang Youl	P19
Lee, Sang-Jun	K2
Lee, Y. C.	P42
Lee, Yong Seok	P36 P37 P44 P45 P46 P58 P59
Lee, Yong-Hyun	P19
Leong, E.S.P.	L2
Levrat, J.	H1

Li, D.	K6
Li, Dabing	C3 I4
Li, Ding	P31 P55
Li, F.	L6
Li, L.	A2
Li, Lin	G1 P35
Li, Lu	P33
Li, Rui	P31 P55 P67
Li, S. F.	K7 L4
Li, Shuping	F7 I2 P27
Li, Song-Mei	G5
Li, T.	B4 P14
Li, Tao	P27
Li, X.	D6
Li, Xiaoyun	P39
Li, YuanJie	P65
Li, Zheng	P61
Li, Zhiming	C3 I4
Liang, T. W.	A4
Liao, Che-Hao	P3 P4 D1
Liao, Wen-Yih	F3
Liao, Yitao	E1
Lim, Hong-Chul	P22 P24
Lin, Cheng-Hung	D1 B3 H3 P4
Lin, Chia-Feng	E4
Lin, Chih-Chien	C5
Lin, J. Y.	B2
Lin, Po-Rung	E5
Lin, Wei	F7
Lin, Y. T.	A4
Lin, Z. Y.	K6
Liu, B.	A2
Liu, Chunli	P28
Liu, Dayi	I2 P27
Liu, Fengqi	P33
Liu, Guorui	P39
Liu, J. Q.	P5
Liu, Jianlin	G1
Liu, Junqi	P33
Liu, L.	P42 P31 P55
Liu, Ningyang	P31 P55

Liu, R. B.	L2
Liu, S.	D6 P43
Liu, Wei	P39
Liu, Wen-Huan	E4
Liu, Zilong	P65
Long, Hao	D5
Lozack, Mickeal	F5
Lu, Chih-Feng	D1 P3 P4
Lu, Cimang	P67
Lu, Feng	P7
Lu, Frank	G6
Lu, Hui-Min	K3 P12
Lu, L.	P68
Lucznik, B.	J2 J3
Luo, Weike	J6
Maeda, Noritoshi	E3
Martin, R. W.	D2
Mascarenhas, A. J.	L1
Matulionis, A.	D6
Mayer, M.	F6
Meng, Xianghai	P6
Merzsch, S.	K7 L4
Mi, Z.	L6
Miao, Guoqing	C3 I4
Miller, N.	F6
Miyake, Hideto	E2 I3 J4
Mochizuki, Chihiro	P16
Mori, Naoto	L5
Morko ç H.	D3 D6
Moustakas, T. D.	J1 E1
Nakamura, Keito	B6
Nakamura, S.	P32
Nanishi, Y.	F6
Naoi, Yoshiki	P49
Navamathavan, R.	P21 P22
Ni, Jinyu	P38
Ni, X.	D3 D6
Ning, C. Z.	L2
Noh, MinSoo	P56
Nonaka, K.	J5
Norimatsu, Jyun	J4

Nozaki, Tadashi	L3
Oda, Takuto	P16
Oh, Hwa Sub	P26
Oh, Tae Su	P36 P37 P44 P45 P46 P58 P59
Okada, Tomoyuki	E2 I3
Okuura, Kazuteru	J4
Omar, Khalid	F4 P20
Omelchenko, A.	D4 G7
Onabe, Kentaro	B6 P63
Ozgur, U.	D6
Pan, A. L.	L2
Pan, Xinhua	G2
Park, Ah Hyun	P36 P37 P44 P45 P46 P58 P59
Park, Jihun	P29
Park, Ji-Hyeon	P21 P22
Park, Seong-Ju	A3 K2
Park, Tae-Young	A3
Park, Young-Jae	P41 P51 P53
Park, Young-Sik	G5
Park, Young-Sin	G5
Perumal, K.	K5
Pfuller, C	C6
Ponce, F. A.	B4 J5 J7 K4 P14
Porowski, S.	J2 J3
Qi, Shengli	D5 P64
Qian, Y. Z.	K6
Qin, Zhixin	P27 P64 P69
Quinn, Bill	G6
Ra, Yong-Ho	P21
Ramizy, Asmiet	F4 P20
Ramm, M. S.	G7 P10
Ren, JiangBo	P65
Rezzonico, Raffaele	H6
Riechert, H	C6
Roder, C	C6
Rosenauer, A.	B5
Rossetti, Marco	H6
Ryu, Beo Deul	P52 P41
Ryu, Jae Hyoung	P40 P50 P51 P52 P53 P54
Ryu, Jae-Hyung	P41

Sakai, Masaru	H5
Sakai, Naoki	L3
Sakai, Shiro	P49
Sakota, Kazuaki	F5
Sang, Li-wen	D5 P27 P69
Sarzynski, M.	J2
SATO, Mitsunobu	P16
Sawaki, Nobuhiko	M2
Schenk, T.	C4
Schineller, B.	B7
Scholz, F.	K4
Sebald, K.	B5
Seki, Yuki	P63
Senda, R.	J7
Seo, Tae Hoon	P36 P37 P44 P45 P46 P58 P59
Seong, Tae-Yeon	P19
Shen, Bo	P27 P69
Shen, Chun-Cheng	E5
Shen, Kun-Ching	D1 H3 P4
Shen, Xiaoming	P6
Shimahara, Yuki	I3
Shimahara, Yuuki	E2
Sim, Jae-kwan	P23 P24
Smith, D. J.	J1
Sochacki, T.	J2 J3
Song, Hang	C3 I4
Song, June-O	P19
Song, Ki-Young	P21 P22
Speck, J.S	PL2 P32
Strassburg, M.	L4
Suh, Eun Kyung	P17 P36 P37 P44 P45 P46 P58 P59
Sumiya, Masatomo	F5
Sun, K. W.	K4
Sun, M. H.	L2
Sun, Xiaojuan	C3 I4
Sun, Xiaowei	G3
Sun, Yongjian	P2 P64
Sun, Yuanping	P17
Suthagar, J.	K5
Suthan-Kissinger, N.J.	K5
Suzuki, Takuto	H5

Takaoka, Hidetsugu	E2 I3
Taketomi, Hiroyuki	E2 I3
Tambunan, Octolia	P28
Tanaka, Satoru	P49
Tao, Yuebin	P61
Tessarek, C.	B5
Thahab, S. M.	H4
Thieme, T.	C4
Thieu, Quang Tu	P63
Thomidis, Christos	E1
Tian, Pengfei	P64
Trampert, A	C6
Tran, Chuong Anh	E4
Tsai, Miao-Chan	P47 P57
Tsai, Pei-Wen	P47
Tsukada, Yusuke	E3 I5
Tu, C.W.	A3
Tu, Jen-Hung	E5
Tu, Li-Wei	A4
Ueda, Shigenori	F5
Uthirakumar, Periyayya	P54
Velez, Christian	H6
Waag, A.	K7 L4
Walsh, Aron	C2
Walukiewicz, Wladek	F1,F6
Wang, C. D.	K6
Wang, Jyh-Yang	H3
Wang, K.	F6
Wang, L. S.	P43
Wang, Lei	P31 P55 P67
Wang, Lijun	P33
Wang, T.	D2
Wang, Tao	I1
Wang, X.	K7 L4 P5
Wang, X.H.	P48
Wang, Yue-Hu	P30
Wang, Zhanguo	P33
Wehmann, H.H.	K7 L4
Wei, C.C.	P43
Wei, J.D.	K7 L4

Wei, Q. Y.	B4 K4 P14
Wei, Su-Huai	C2
WEN, Li-shi	P7
Wen, Z. C.	K6
Wetzel, C.	B4
Weyers, M.	C4
Weyher, J.	J2 J3
Wu, Chao	P11
Wu, Chia-Cheng	P18
Wu, Jiejun	J6
Wu, Ming-Hsien	F3
Wu, Z. H.	J5 J7 K4
Wu, Zhihao	P62
Wuu, Dong-Sing	P18 P35 E5 F3
Xiang, Hong-Jun	C2
Xie, Shangsheng	P6
Xie, Z. L.	A2
Xiong, Chang	P8 P9 D5
Xiu, X.Q.	A2
Xu, Cheng-hai	P7
Xu, Jun	P8
Xu, Zhengyu	P27 P69
Yamgauchi, T.	F6
Yan, Jheng-Tai	G4
Yan, Jian	P66
Yan, Ming	P25
Yang, C. C.	D1 H3 B3 P3 P4
Yang, Ning	P25
Yang, Weihuang	P27 I2
Yang, X. L.	K6
Yang, Zheng	G1
Yang, Zhijian	D5 J6 P27 P61 P66
Yao, Shude	P35
Ye, Zhizhen	G2
Yeh, Dong-Ming	H3 B3
Yen, Cheng-Ying	P18
Yen, Sheng-Horng	P57
Yen, Shiu-Fang	C5
Yen, W. J.	A4
Yeom, Bo-Ra	P23 P24
Yoshida, Harumasa	E2 I3

Yoshikawa, Akihiko	F2
Yoshikawa, Hideki	F5
Yu, Chenhui	P62
Yu, Feng	P64
Yu, K. M.	F6
Yu, Shuzhen	C3
Yu, Tongjun	D5 P2 P11 P61 P64 P66
Zettler, J.-T.	C4
Zhang, B. P.	H2
Zhang, Bei	P8 P9
Zhang, F.F.	K6
Zhang, Fasheng	P13
Zhang, Guoyi	K6 J6 P2 P8 P9 P11 P27 P61 P64 P66 P69 D5
Zhang, J. Y.	H2
Zhang, Jing	P49
Zhang, R.	A2
Zhang, Y.H.	K6
Zhang, Yanzhao	P27
Zhang, Yi-Men	P30
Zhang, Yinzhu	G2
Zhang, Yuming	P13 P30
Zhao, H.	A2
Zheng, Y. D.	A2
Zhou, Lin	J1
Zhou, W. C.	L2
Zhou, Xiaodi	P25
Zhu, Ling	D7
Zhu, Y. H.	P68
Zou, B. S.	L2