ICMOVPE-XIX Program

June 4th (Monday)

4A-1 Plenary I

Noh Theatre 9:20-10:50

4A-1.1 (Plenary) 9:20 - 10:05

MOVPE as a tool for realizing sustainable smart society

Hiroshi Amano
Nagoya University, Japan

4A-1.2 (Plenary) 10:05 - 10:50

MOVPE Growth and Applications of III-V and III-Nitride Nanowires

Lars Samuelson
Lund University, NanoLund and Solid State Physics, Sweden

break	10:50 - 11:20

4B-1 Fundamental Nitride Growth

Noh Theatre 11:20-12:50

4B-1.1 (Invited) 11:20 - 11:50

Heteroepitaxy of GaN-based light emitting devices on Si

Qian Sun
Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences, China

4B-1.2 11:50 - 12:05

Growth of continuous 7.3 μm-thick GaN layers on Si substrates: Towards low cost vertical GaN devices

Jie Zhang, Xuelin Yang, Yuxia Feng, Jianfei Shen, and Bo Shen
State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, China

4B-1.3 12:05 - 12:20

Impact of AlN interlayer growth temperature on strain of GaN layer during MOVPE on Si substrates

Momoko Deura,[1] Takuya Nakahara,[1] Takeshi Momose,[1] Yoshiaki Nakano,[1] Masakazu Sugiyama,[1,2] and Yukihiro Shimogaki[1]
[1]School of Engineering, the University of Tokyo, Japan, [2]Research Center for Advanced Science and Technology, the University of Tokyo, Japan

4B-1.4 12:20 - 12:35

Bowing Control of Sputtered AlN Caused by High Temperature Annealing

Yusuke Hayashi,[1] Kentaro Tanigawa,[1] Kanako Shojiki,[2] and Hideto Miyake[1,2]
[1]Grad. School of RIS, Mie Univ., Japan, [2]Grad. School of Engineering, Mie Univ., Japan

4B-1.5 12:35 - 12:50

Stabilization of AlN/sapphire templates during high temperature annealing

Sylvia Hagedorn,[1] Sebastian Walde,[1] Dominik Jaeger,[2] and Markus Weyers[1]
[1]Ferdinand-Braun-Institut, Germany, [2]Evatec AG, Switzerland

4B-2 III-V Devices and Growth

Room 1&2 11:20-12:50

4B-2.1 (Invited) 11:20 - 11:50

Improvement of Dynamic Characteristics of 850 nm VCSELs for use in Optical Communications

Takashi Kondo,[1] Yuji Shirai ,[1] Junichiro Hayakawa,[1] Naoki Jogan,[1] Kazutaka Takeda,[1] Akemi Murakami,[1] Jun Sakurai,[1] Michiaki Murata,[1] Xiaodong Gu,[2] and Fumio Koyama[2]
[1]Fuji Xerox, Japan, [2]Laboratory for Future Interdisciplinary Research of Science and Technology (FIRST), Tokyo Institute of Technology, Japan

4B-2.2 11:50 - 12:05

InGaAs metamorphic buffers on GaAs substrates for InAs quantum dot emission in the telecom C-band

Robert Sittig, Susanne Schreier, Matthias Paul, Fabian Olbrich, Johnathan Höschele, Jan Kettler, Simone Luca Portalupi, Michael Jetter, and Peter Michler
Institut für Halbleiteroptik und Funktionelle Grenzflächen, Center for Integrated Quantum Science and Technology (IQST) and SCoPE, University Stuttgart, Germany

4B-2.3 12:05 - 12:20

Strain relaxation and compensation in InGaAs quantum wells at near critical thickness

Wei Sun,[1] Honghyuk Kim,[2] Luke J. Mawst,[2] and Nelson Tansu[1]
[1]Center for Photonics and Nanoelectronics, Department of Electrical and Computer Engineering, Lehigh University, United States of America, [2]Reed Center for Photonics, Department of Electrical and Computer Engineering, University of Wisconsin-Madison, United States of America

4B-2.4 12:20 - 12:35

Growth of high quality AlInSb film using TTBAl and TDMASb

Akira Yoshikawa,[1] Yoshitaka Moriyasu,[2] Kazuhiro Nagase,[1] and Naohiro Kuze[1]
[1]Asahi-Kasei, Japan, [2]Asahi-Kasei microdevice, Japan

4B-2.5 12:35 - 12:50

Te doping of GaAs and GaInP using DIPTe for tunnel junction applications

Jean Decobert,[1] Gwénaëlle Hamon,[2,3] Nicolas Paillet,[1] Alexandre Larrue,[1] and Jose Alvarez[4]
[1]III-V Lab, France, [2]Total S.A. Renewables, France, [3]LPICM, CNRS, Ecole Polytechnique, France, [4]GeePs, UMR CNRS 8507, Centrale Supelec, Univ. Paris-Sud, Universite Paris-Saclay, Sorbonne Universites, UPMC Univ Paris 06, France

4B-3 2D Materials

Room 3&4 11:20-12:50

4B-3.1 (Invited) 11:20 - 11:50

MOCVD Growth and Properties of Hexagonal Boron Nitride Epilayers

Hongxing Jiang and Jingyu Lin
Department of Electrical and Computer Engineering, Texas Tech University, United States of America

4B-3.2 (Invited) 11:50 - 12:20

Epitaxial growth of 2D layered chalcogenide monolayers and heterostructures

Joan M. Redwing,[1,2] Xiaotian Zhang,[1] Tanushree E. Choudhury,[2] and Mikhail Chubarov[2]
[1]Department of Materials Science and Engineering, The Pennsylvania State University, United States of America, [2]2D Crystal Consortium, Materials Research Institute, The Pennsylvania State University, United States of America

4B-3.3 12:20 - 12:35

InGaN-based solar cells on 2D h-BN grown by MOVPE for hybrid tandem photovoltaic cells

Taha Ayari,[1,2] Suresh Sundaram,[2,3] Xin Li,[1,2] Saiful Alam,[1,2] Matthew B. Jordan,[1,2] Walid El Huni,[2] Yacine Halfaya,[2] Simon Gautier,[4] Paul L. Voss,[1,2] Jean Paul Salvestrini,[1,2,3] and Abdallah Ougazzaden[1,2]

[1]Georgia Institute of Technology, School of Electrical and Computer Engineering, GT-Lorraine, 57070 Metz, France, [2]CNRS, UMI 2958, G T - CNRS, 2 rue Marconi, 57070 Metz, France, [3]GT Lorraine, UMI 2958, G T - CNRS, 2 rue Marconi, 57070 Metz, France, [4]Institut Lafayette, 2 rue Marconi, 57070 Metz, France

4B-3.4 12:35 - 12:50

Investigations of MOVPE Growth Parameters on the Nucleation and Lateral Growth of 2D MoS_2

M. Heuken,[1,2] A. Grundmann,[1] M. Marx,[1] H. Kalisch,[1] and A. Vescan[1]

[1]Compound Semiconductor Technology, RWTH Aachen University, Germany, [2]AIXTRON SE, Germany

Lunch 12:50 - 14:20

4C-1 Nitride Optical Devices Noh Theatre 14:20-16:05

4C-1.1 (Invited) 14:20 - 14:50

GaN-based vertical-cavity surface-emitting lasers with MOVPE-grown AlInN/GaN DBRs

Tetsuya Takeuchi,[1] Satoshi Kamiyama,[1] Motoaki Iwaya,[1] and Isamu Akasaki[1,2]

[1]Meijo University, Japan, [2]Nagoya University, Japan

4C-1.2 14:50 - 15:05

Dependence of micro-rod facets on diameter and impact on InGaN quantum wells

Yoann Robin,[1] Yaqiang Liao,[2] Markus Pristovsek,[1] and Hiroshi Amano[1]

[1]IMaSS, Nagoya University, Japan, [2]Department of Electrical Engineering and Computer Science, Nagoya University, Japan

4C-1.3 15:05 - 15:20

Micro-Light-Emitting Diodes with III-Nitride Tunnel Junction Contacts Grown by Metalorganic Chemical Vapor Deposition

David Hwang,[1] Asad J. Mughal,[1] Matthew S. Wong,[1] Abdullah I. Alhassan,[1] Shuji Nakamura,[1,2] and Steven P. DenBaars[1,2]

[1]Materials Department, University of California, Santa Barbara, United States of America, [2]Department of Electrical and Computer Engineering, University of California, Santa Barbara, United States of America

4C-1.4 15:20 - 15:35

Study on emission wavelength control of GaInN multi-quantum-shell/GaN nanowire

Nanami Goto,[1] Kohei Sasai,[1] Kazuyoshi Iida,[1] Naoki Sone,[1] Atushi Suzuki,[1] Kyohei Nokimura,[1] Minoru Takebayashi,[1] Satoshi Kamiyama,[1] Tetuya Takeuchi,[1] Motoaki Iwaya,[1] and Isamu Akasaki[1,2]

[1]Faculty of Science and Technology, Meijo University, Japan, [2]Akasaki Research Center, Nagoya University, Japan

4C-1.5 15:35 - 15:50

High Efficiency of III-Nitride Micro-Light-Emitting Diodes by Sidewall Passivation Using Atomic Layer Deposition

Matthew S. Wong,[1] David Hwang,[1] Abdullah I. Alhassan,[1] Changmin Lee,[1] Ryan Ley,[2] Shuji Nakamura,[1,3] and Steven P. DenBaars[1,3]

[1]Materials Department, University of California, Santa Barbara, United States of America, [2]Department of Chemical Engineering, University of California, Santa Barbara, United States of America, [3]Department of Electrical and Computer Engineering, University of California, Santa Barbara, United States of America

4C-1.6 15:50 - 16:05

GaN Rib Waveguide Directional Coupler for Waveguide Mach-Zehnder Interferometer

Junya Miwa, Masafumi Kihira, Masahiro Uemukai, Ryoken Fuji, Yasufumi Fujiwara, and Ryuji Katayama

Graduate school of engineering, Osaka University, Japan

4C-2 Patterned Growth

Room 1&2 14:20-16:05

4C-2.1 (Invited) 14:20 - 14:50

Shape engineering of InP nanostructures grown by selective area epitaxy

Naiyin Wang,[1] Philippe Caroff,[1,2] Qian Gao,[1] Bijun Zhao,[1] Li Li,[3] Mark Lockrey,[3] Xiaoming Yuan,[1,4] Chennupati Jagadish ,[1] and Hoe Tan[1]

[1]Department of Electronic Materials Engineering, The Australian National University, Australia, [2]Microsoft Station-Q at Delft University of Technology, Netherlands, [3]Australian National Fabrication Facility ACT Node, The Australian National University, Australia, [4]School of Physics and Electronics, Central South University, China

4C-2.2 14:50 - 15:05

Template assisted selective epitaxy of InP via MOVPE towards horizontal heterojunctions for tunnel field effect transistors

Simone Tommaso Šuran Brunelli,[1] Brian Markman,[1] Jun Wu,[1] Hsin-Ying Tseng,[1] Aranya Goswani,[2] Mark Rodwell,[1] Chris Palmstrøm,[2] and Jonathan Klamkin[1]

[1]Electrical and Computer Engineering Department, University of California, Santa Barbara, United States of America, [2]Materials Department, University of California, Santa Barbara, United States of America

4C-2.3 15:05 - 15:20

Size Control of InP NWs by in situ Thermal Annealing in MOVPE

Masahiro Sasaki, Kohei Chiba, Akinobu Yoshida, Katsuhiro Tomioka, and Junichi Motohisa
Graduate School of Information Science and Technology, and Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Japan

4C-2.4 15:20 - 15:35

Growth and characterization of GaAs nanowires on Ge(111) substrates by selective-area MOVPE

Yusuke Minami, Akinobu Yoshida, Katsuhiro Tomioka, and Junichi Motohisa
Graduate School of Information Science and Technology and Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Japan

4C-2.5 15:35 - 15:50

Growth evolution of polar-plane-free faceted GaN structures

Yoshinobu Matsuda, Mitsuru Funato, and Yoichi Kawakami
Department of Electronic Science and Engineering, Kyoto University, Japan

4C-2.6 15:50 - 16:05

Morphology Control of GaN/AlGaN Microfin Core-Shell-Structures for DUV Emitters

Christoph Margenfeld,[1,3] Jana Hartmann,[1,3] Hao Zhou,[1] Hendrik Spende,[1,3] Heiko Bremers,[2,3] Andreas Hangleiter,[2,3] Hans-Jürgen Lugauer,[4] Hergo-Heinrich Wehmann,[1,3] and Andreas Waag[1,3]
[1]Institute of Semiconductor Technology and epitaxy competence center ec^2, Technische Universität Braunschweig, Germany, [2]Institute of Applied Physics, Technische Universität Braunschweig, Germany, [3]Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, Germany, [4]Osram Opto Semiconductors GmbH, Germany

Break	16:05 - 16:30

4D-1 Material Improvement for Nitride Electric Devices — Noh Theatre

16:30-18:30

4D-1.1 (Invited) 16:30 - 17:00

Real potential and homework of GaN electric devices by using MOVPE grown GaN epi-layers on GaN substrates

Yohei Otoki, Fumimasa Horikiri, Takehiro Yoshida, Masatomo Shibata, Yoshinobu Narita, and Hajime Fujikura
SCIOCS, Japan

4D-1.2 (Invited) 17:00 - 17:30

Material Challenges of Al-rich AlGaN Alloys for Next Generation Power Electronics

Andrew A. Allerman, Andrew M. Armstrong, Mary H. Crawford, Greg W. Pickrell, Albert G. Baca, Brianna A. Klein, Erica A. Douglas, Jeramy R. Dickerson, and Robert J. Kaplar
Sandia National Laboratories, Albuquerque, United States of America

4D-1.3 17:30 - 17:45

Hydrogen incorporation in Mg-doped GaN with varying doing concentration

Tetsuo Narita,[1] Kazuyoshi Tomita,[1] Nobuyuki Ikarashi,[2] Keita Kataoka,[1] and Tetsu Kachi[2]
[1]Toyota Central R&D Labs. Inc., Japan, [2]Nagoya university, Japan

4D-1.4 17:45 - 18:00

100 mm wafer-scale MOVPE growth and fabrication of AlGaN/GaN HEMT devices on layered h-BN/sapphire substrates.

Suresh Sundaram,[1] Xin Li,[1] Taha Ayari,[1,2] Saiful Alam,[1,2] Youssef El Gmili,[1] Chris Bishop,[3] Simon Gautier,[3] Gilles Patriarche,[4] Paul L. Voss,[1,2] Jean Paul Salvestrini,[1,2] and Abdallah Ougazzaden[1,2]
[1]Georgia Tech Lorraine, UMI 2958, Georgia Tech - CNRS, France, [2]School of Electrical and Computer Engineering, Georgia Institute of Technology, United States of America, [3]Institut Lafayette, France, [4]Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, France

4D-1.5 18:00 - 18:15

MOVPE growth of AlGaN directly on RIE-treated GaN surface to prepare AlGaN/GaN heterostructures showing a high electron mobility (~1500 cm^2/Vs): Impacts of RIE-damage layer removal

Akio Yamamoto, Shinya Makino, Keito Kanatani, and Masaaki Kuzuhara
Graduate School of Engineering, University of Fukui, Japan

4D-1.6 18:15 - 18:30

Understanding and controlling Ga contamination in InAlN barrier layers

Mrad Mrad,[1,2] Matthew Charles,[1,2] Yann Mazel,[1,2] Joël Kanyandekwe,[1,2] and Guy Feuillet[1,2]
[1]Univ. Grenoble Alpes, F-38000, Grenoble, France, [2]CEA, LETI, MINATEC Campus, F-38054, Grenoble, France

4D-2 Modeling of MOVPE

Room 1&2 16:30-18:30

4D-2.1 (Invited) 16:30 - 17:00

Surface reconstruction and impurity incorporation in GaN MOVPE: Ab initio-based modeling

Yoshihiro Kangawa,[1,2] Pawel Kempisty,[2,3] Stanislaw Krukowski,[3] Kenji Shiraishi,[2] and Koichi Kakimoto[1]
[1]RIAM, Kyushu University, Japan, [2]IMaSS, Nagoya University, Japan, [3]Institute of High Pressure Physics, PAS, Poland

4D-2.2 (Invited) 17:00 - 17:30

Multi-Physics Simulations of GaN MOVPE Growth

Kenji Shiraishi,[1] Katsunori Yoshimatsu,[1] Naoya Okamoto,[1] Yoshihiro Kangawa,[1,2] and Koichi Kakimoto[2]
[1]Nagoya University, Japan, [2]Kyushu University, Japan

4D-2.3 17:30 - 17:45

First-principle study of ammonia decomposition and nitrogen incorporation on the GaN surface in Metal Organic Vapor Phase Epitaxy

Thi Kieu My Bui,[1] Jun-Ichi Iwata,[2] Yoshihiro Kangawa,[3,4] Kenji Shiraishi,[4] Yasuteru Shigeta,[1] and Atsushi Oshiyama[2,4]
[1]Center for Computational Science, University of Tsukuba, Japan, [2]Department of Applied Physics, The University of Tokyo, Japan, [3]Research Institute for Applied Mechanics, Kyushu University, Japan, [4]Institute of Materials and Systems for Sustainability, Nagoya University, Japan

4D-2.4 17:45 - 18:00

MOVPE simulation to realize high-quality and high-In-content InGaN alloys

Kazuhiro Ohkawa,[1] Tomomasa Watanabe,[2] and Kenichi Nakamura[2]
[1]Elec. Eng., King Abdullah University of Science and Technology (KAUST), Saudi Arabia, [2]Appl. Phys., Tokyo University of Science, Japan

4D-2.5 (Invited) 18:00 - 18:30

MOVPE process modeling for improvement of production yield and device performance

Roman Talalaev and Anna Lobanova
STR Group -SoftImpact Ltd., Russia

June 5th (Tuesday)

5A-1 Plenary II

Noh Theatre 9:00-10:30

5A-1.1 (Plenary) 9:00 - 9:45

N-polar GaN: Re-energizing GaN

Umesh K. Mishra
ECE Department, UCSB, United States of America

5A-1.2 (Plenary) 9:45 - 10:30

Selective area growth of III-V on (001) Si: challenges and opportunities for device integration

Bernardette Kunert
Imec, Belgium

Break 10:30 - 11:00

5B-1 GaN Electric Devices

Noh Theatre 11:00-12:30

5B-1.1 (Invited) 11:00 - 11:30

GaN-based Metal-Insulator-Semiconductor Transistors on Si for Power Switching Applications

Satoshi Nakazawa,[1] Hong-An Shih,[1] Naohiro Tsurumi,[1] Yoshiharu Anda,[1] Tsuguyasu Hatsuda,[1] Tetsuzo Ueda,[1] Mikito Nozaki,[2] Takahiro Yamada,[2] Takuji Hosoi,[2] Takayoshi Shimura,[2] Heiji Watanabe,[2] and Tamotsu Hashizume[3]
[1]Panasonic Corporation, Japan, [2]Graduate School of Engineering, Osaka University, Japan, [3]RCIQE and Graduate School of Information Science and Technology, Hokkaido University, Japan

5B-1.2 (Invited) 11:30 - 12:00

GaN Electronics on Large Diameter Substrate

Subramaniam Arulkumaran[1,2] and G. I. Ng[3]
[1]Temasek Laboratories, Nanyang Technological University, Singapore, [2]CIRFE, IMASS, Nagoya University, Japan, [3]School of EEE, Nanyang Technological University, Singapore

5B-1.3 12:00 - 12:15

Improvement of electrical characteristics in regrown AlGaN/GaN HFETs by suppression of the residual interface charge

Jumpei Tajima, Toshiki Hikosaka, Masahiko Kuraguchi, and Shinya Nunoue
Corporate Research & Development Center, Toshiba Corporation, Japan

5B-1.4 12:15 - 12:30

Reduction of dislocation density leading improvement of current collapse under high electric-field stress by using GaN-on-GaN structure

Akifumi Imai, Koji Yoshitsugu, Takuma Nanjo, Eiji Yagyu, Tatsuro Watahiki, and Mikio Yamamuka
Advanced Technology R&D Center, Mitsubishi Electric Corporation, Japan

5B-2 AlGaN-based UV Devices

Room 1&2 11:00-12:15

5B-2.1 (Invited) 11:00 - 11:30

Recent Progress of AlGaN UVC LEDs

Hideki Hirayama
[1]RIKEN, Japan, [2]RIKEN Center for Advanced Photonics, Japan

5B-2.2 11:30 - 11:45

Efficiency Droop Improvement of Deep-Ultraviolet Light Emitting Diodes Grown on AlN Substrate

Ryosuke Hasegawa, Akira Yoshikawa, Ziyi Zhang, Daiki Shimura, Yoshihito Hagihara, Aya Yokoyama, Tomohiro Morishita, Hiromasa Goto, and Naohiro Kuze
UVC project, Asahi kasei Corporation, Japan

5B-2.3 11:45 - 12:00

Electrical conduction in high aluminum mole fraction Mg-doped $Al_xGa_{1-x}N$ superlattices in UVC laser diode heterostructures

Christian Kuhn, Martin Guttmann, Norman Susilo, Anton Muhin, Luca Sulmoni, Tim Wernicke, and Michael Kneissl
Technische Universität Berlin, Institute of Solid State Physics, Germany

5B-2.4 12:00 - 12:15

Uniform and Reliable 4×4 GaN *p-i-p-i-n* Separate-Absorption and Multiplication Ultraviolet Avalanche Photodiodes Arrays with Large Detection Area

Mi-Hee Ji,[1] Jeomoh Kim,[2] Marzieh Bakhtiary-Noodeh,[1] Hoon Jeong,[1] Theeradetch Detchprohm,[1] Shyh-Chiang Shen,[1] and Russell Dupuis[1]

[1]School of Electrical and Computer Engineering, Georgia Institute of Technology, United States of America, [2]Materials and Devices Advanced Research Institute, LG Electronics, Republic of Korea

5B-3 Quantum Dots

Room 3&4 11:00-12:30

5B-3.1 11:00 - 11:15

Engineering flexibility of MOVPE grown site-controlled Pyramidal quantum dots (PQDs)

Gediminas Juska, Stefano T. Moroni, Simone Varo, Tung-Hsun Chung, Agnieszka Gocalinska, and Emanuele Pelucchi

Tyndall National Institute, University College Cork, Ireland

5B-3.2 11:15 - 11:30

Comparing TEIn and TMIn precursors in MOVPE of InGaAs/GaAs site-controlled pyramidal quantum dots

Alessio Miranda, Antoine Delgoffe, Bruno Rigal, Alok Rudra, Benjamin Dwir, and Eli Kapon

Laboratory of Physics of Nanostructures, Institute of Physics, Faculty of Basic Sciences, Ecole Polytechnique Fédérale de Lausanne, Switzerland

5B-3.3 11:30 - 11:45

Room temperature Lasing from Selective Area MOVPE of InAs Quantum Dots on GaAs fabricated by block-copolymer lithography

Honghyuk Kim,[1] Wei Wei,[2] Thomas F. Kuech,[3] Padma Gopalan,[2] and Luke J. Mawst[1]

[1]Department of Electrical and Computer Engineering, University of Wisconsin-Madison, United States of America, [2]Department of Material Science and Engineering, University of Wisconsin-Madison, United States of America, [3]Department of Chemical and Biological Engineering, University of Wisconsin-Madison, United States of America

5B-3.4 11:45 - 12:00

Epitaxial methods of quantum dot growth for 1550 nm operating wavelength

Elizaveta Lebedkina,[1] Artem Shikin,[1] Shima Kadkhozadeh,[2] Sokol Ndoni,[3] Kristoffer Almdal,[3] Lior Asor,[4] Uri Banin,[4] Czcibor Ciostek,[5] Marcin Syperek,[5] Kresten Yvind,[1] and Elizaveta Semenova[1]

[1]DTU Fotonik, Technical University of Denmark, Denmark, [2]DTU Cen, Technical University of Denmark, Denmark, [3]DTU Nanotech, Technical University of Denmark, Denmark, [4]The Hebrew University of Jerusalem, Israel, [5]Wroclaw University of Science and Technology, Poland

5B-3.5 12:00 - 12:15

Epitaxy of InAs QD structures on InP for single photon emitters and lasers operating at 1.55 μm and beyond

Andrey B. Krysa,[1] Joanna Skiba-Szymanska,[2] Tina Müller,[2] Jan Huwer,[2] Matthew Andreson,[2,3] Brett Harrison,[1] R. Mark Stevenson,[2] David A. Ritchie,[3] and Andrew J. Shields[2]

[1]EPSRC National Epitaxy Facility, University of Sheffield, United Kingdom, [2]Toshiba Research Europe Limited, United Kingdom, [3]Cavendish Laboratory, University of Cambridge, United Kingdom

5B-3.6 12:15 - 12:30

Analyses of Magnetic Domains in MnAs Nanoclusters Grown by Selective-Area MOVPE

Ryoma Horiguchi, Masaya Iida, Kohei Morita, and Shinjiro Hara

Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

Lunch 12:30 - 14:00

5C-1 Growth of InN and InGaN

Noh Theatre 14:00-16:00

5C-1.1 (Invited) 14:00 - 14:30

Single photon sources based on non-polar InGaN quantum dots

Tongtong Zhu,[1] John C. Jarmann,[1] Christopher X. Ren,[1] Fengzai Tang,[1] Claudius C. Kocher,[2] Stephen A Lennon,[2] Luke Nuttall,[2] Benjamin PL Reid,[2] Saroj K. Patra,[3] Stefan Schulz,[3] Robert A. Taylor,[2] and Rachel A. Oliver[1]

[1]University of Cambridge, United Kingdom, [2]University of Oxford, United Kingdom, [3]Tyndall National Institute, University College Cork, Ireland

5C-1.2 14:30 - 14:45

Effects of low-temperature capping on trench defect formation in growing multi-InGaN quantum dot layers

Chunyu ZHAO,[1,2] Chak Wah TANG,[1] Jiannong WANG,[2] and Kei May LAU[1]

[1]Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Hong Kong, [2]Department of Physics, Hong Kong University of Science and Technology, Hong Kong

5C-1.3 14:45 - 15:00

One- or two-monolayer-thick InN single quantum wells fabricated on step-free GaN surfaces by MOVPE

Tetsuya Akasaka, Andrew Berry, Chia-Hung Lin, and Hideki Yamamoto

NTT Basic Research Laboratories, NTT Corporation, Japan

5C-1.4 15:00 - 15:15

Pulse MOVPE Growth Studies of InN and its Integration into InGaN QW for Long Wavelength Emission

Ioannis Fragkos, Wei Sun, Renbo Song, and Nelson Tansu

Center for Photonics and Nanoelectronics, Department of Electrical and Computer Engineering, Lehigh University, United States of America

5C-1.5 15:15 - 15:30

Effect of the environment temperature around the wafer on InGaN grown by metalorganic vapor phase epitaxy

Zhibin Liu,[1] Shugo Nitta,[2] Shigeyoshi Usami,[1] Kentaro Nagamatsu,[2] Yoann Robin,[2] Maki Kushimoto,[2] Manato Deki,[2] Yoshio Honda,[2] and Hiroshi Amano[2,3,4]

[1]Department of Electrical Engineering and Computer Science, Nagoya University, Japan, [2]Institute of Materials and Systems for Sustainability, Nagoya University, Japan, [3]Akasaki Research Center, Nagoya University, Japan, [4]Venture Business Laboratory, Nagoya University, Japan

5C-1.6 15:30 - 15:45

MOVPE growth of thick and smooth surface GaInN films on semipolar $(10\bar{1}1)$ and $(10\bar{1}\bar{1})$ GaN substrate and its application of solar cell

Noboru Muramatsu,[1] Toru Takanishi,[1] Syun Mitsufujji,[1] Kazuya Takahashi,[1] Motoaki Iwayaya,[1] Tetsuya Takeuchi,[1] Satoshi Kamiyama,[1] and Isamu Akasaki[1,2]

[1]Department of Materials Science and Engineering, Meijo University, Japan, [2]Akasaki Research Center, Nagoya University, Japan

5C-1.7 15:45 - 16:00

MOCVD tunnel junction with in-situ activated buried p-GaN

SeungGeun Lee,[1] Charles A. Forman,[2] Changmin Lee,[2] David Hwang,[2] Abdullah I. Alhassan,[2] Daniel A. Cohen,[2] James S. Speck,[2] Shuji Nakamura,[1,2] and Steven P. DenBaars[1,2]

[1]Department of Electrical and Computer Engineering, University of California, Santa Barbara, United States of America, [2]Materials Department, University of California, Santa Barbara, United States of America

5C-2 Oxide Semiconductors

Room 1&2 14:00-15:45

5C-2.1 (Invited) 14:00 - 14:30

Evolution of Growth Technologies for Gallium Oxide Power Devices

Shizuo Fujita

Photonics and Electronics Science and Engineering Center, Kyoto University, Japan

5C-2.2 14:30 - 14:45

Influence of substrate orientation on the properties of beta-Ga_2O_3 layers deposited by MOVPE

Guenter Wagner, Martin Albrecht, Michele Baldini, Andreas Fiedler, Zbigniew Galazka, Klaus Irmscher, and Robert Schewski
Leibniz-Institute for Crystal Growth, Germany

5C-2.3 14:45 - 15:00

Thermodynamic analysis on Ga_2O_3 growth by metalorganic vapor phase epitaxy

Sakiko Yamanobe,[1] Kento Yoshida,[1] Keita Konishi,[1] and Yoshinao Kumagai[1,2]
[1]Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, [2]Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan

5C-2.4 15:00 - 15:15

MOCVD growth of high-quality epitaxial β-Ga_2O_3 and related alloy structures

Fikadu Alema,[1] Ross Miller,[1] Andrei Osinsky,[1] Akhil Mauze,[2] James Speck,[2] Maxim Bogdanov,[3] Anna Lobanova,[3] Roman Talalaev,[3] and Alex Galyukov[4]
[1]Agnitron Technology, United States of America, [2]Materials Department, University of California, United States of America, [3]STR Group Inc, Russia, [4]STR US, United States of America

5C-2.5 15:15 - 15:30

High Voltage Ga_2O_3-based Lateral Schottky Barrier Diode

Serdal Okur,[1] Tom Salagaj,[1] Digangana Khan,[2] Durga Gajula,[2] Goutam Koley,[2] Zbigniew Galazka,[3] Andreas Fiedler,[3] Klaus Irmscher,[3] Gunter Wagner,[3] and Gary Tompa[1]
[1]Structured Materials Industries, Inc., United States of America, [2]Electrical and Computer Engineering, Clemson University, United States of America, [3]Leibniz Institute for Crystal Growth, Germany

5C-2.6 15:30 - 15:45

Crystallinity Improvement of Mist CVD grown ZnMgO Thin Films by Using ZnO buffer

Phimolphan Rutthongjan,[1] Li Liu,[1] Misaki Nishi,[2] Misahito Sakamoto,[2] Shota Sato,[1] Ellawala K. C. Pradeep,[3] Giang T. Dang,[3] and Toshiyuki Kawaharamura[1,2,3]
[1]Graduate School of Engineering, Kochi University of Technology, Japan, [2]Intelligent Mechanical System Engineering, Kochi University of Technology, Japan, [3]Center for Nanotechnology, Research Institute Kochi University of Technology, Japan

5C-3 Photonic Devices

Room 3&4 14:00-16:00

5C-3.1 (Invited) 14:00 - 14:30

InP-Based Monolithic Integration Technologies for Photonic Devices in Digital Coherent Transmission

Mitsuru Ekawa

[1] Sumitomo Electric Industries, Ltd., Japan, [2]Sumitomo Electric Device Innovations, Inc, Japan

5C-3.2 14:30 - 14:45

MOVPE growth and characterization of (GaIn)As/Ga(AsSb)/(GaIn)As type-II "W"-quantum well heterostructure lasers emitting at 1.3 μm

Christian Fuchs,[1] Anja Brüggemann,[1] Maria J. Weseloh,[1] Christian Berger,[1] Christoph Möller,[1] Stefan Reinhard,[1] Jörg Hader,[2,3] Jerome V. Moloney,[2,3] Ada Bäumner,[1] Stephan W. Koch,[1] and Wolfgang Stolz[1]

[1]Materials Sciences Center and Department of Physics, Philipps-Universität Marburg, Germany, [2]Nonlinear Control Strategies Inc., United States of America, [3]College of Optical Sciences, University of Arizona, United States of America

5C-3.3 14:45 - 15:00

MOVPE grown GaInAsP/GaInAsP SCH-MQW laser diode on directly-bonded InP/Si substrate

Hirokazu Sugiyama, Naoki Kamada, Yuya Onuki, Xu Han, Gandhi Kallarasan Periyanayagam, Masaki Aikawa, Natsuki Hayasaka, Kazuki Uchida, and Kazuhiko Shimomura

Department of Engineering and Applied Sciences, Sophia University, Japan

5C-3.4 15:00 - 15:15

Investigation of InP/Si Die-to-wafer Low-Temperature Plasma Activated Bonding for Heterogeneous Integrated Substrate

Liu Bai,[1] Takehiko Kikuchi,[1,3] Junichi Suzuki,[1] Kumi Nagasaka,[1] Nobuhiko Nishiyama,[1,2] Hideki Yagi,[3] Tomohiro Amemiya,[1,2] and Shigehisa Arai[1,2]

[1]Dept. of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan, [2]Institute of Innovative Research (IIR), Tokyo Institute of Technology, Japan, [3]Transmission Devices Laboratory, Sumitomo Electric Industries, Ltd., Japan

5C-3.5 15:15 - 15:30

MOVPE-Grown Metamorphic Lasers at 1.3 μm: Solving Critical Growth, Material and Design Issues

Enrica E. Mura, Agnieszka Gocalinska, Ruggero Loi, Gediminas Juska, Stefano T. Moroni, Brian Corbett, and Emanuele Pelucchi

Tyndall National Institute, University College Cork, Ireland

5C-3.6 (Invited) 15:30 - 16:00

Overcoming lattice and polarity mismatches in MOVPE growth of (In)GaAs on Si(100) substrate

Ryo Nakao,[1,2] Tomonari Sato,[1] Hiroki Sugiyama,[1] and Shinji Matsuo[1,2]
[1]NTT Device Technology Labs., NTT Corp., Japan, [2]NTT Nanophotonics Center., NTT Corp., Japan

P1 Poster Session 1

Reception Hall 16:00-17:30

P1-1

First-Principles Calculations of GaN Surface Structures under OVPE Growth Conditions and Desorption Energies of Oxygen Impurities

Takahiro Kawamura,[1,2] Akira Kitamoto,[2] Mamoru Imade,[2] Masashi Yoshimura,[2] Yusuke Mori,[2] Yoshitada Morikawa,[2] Yoshihiro Kangawa,[3] and Koichi Kakimoto[3]
[1]Graduate School of Engineering, Mie University, Japan, [2]Graduate School of Engineering, Osaka University, Japan, [3]Research Institute for Applied Mechanics, Kyushu University, Japan

P1-2

Empirical interatomic potential approach to the stability of graphitic structure in BAlN and BGaN alloys

Yuya Hasegawa, Toru Akiyama, Tomonori Ito, Kohji Nakamura, and Abdul Muizz Pradipt
Department of Physics Engineering, Mie University, Japan

P1-3

Effect of radicals on gas phase reactions in GaN MOVPE process

Hong Zhang and Ran Zuo
School of Energy and Power, Jiangsu University, China

P1-4

GaN MOVPE using TMGa and TEGa precursors: gas-phase reaction mechanisms

Anna Lobanova, Igor Przhevalsky, and Roman Talalaev
STR Group-Soft-Impact Ltd., Russia

P1-5

High quality semi-polar $(30\bar{3}\bar{1})$ and $(20\bar{2}\bar{1})$ GaN grown by metalorganic vapor phase epitaxy

Hisashi Yamada,[1,2] Hiroshi Chonan,[2] Tokio Takahashi,[2] Toshikazu Yamada,[1] and Mistuaki Shimizu[1,2]

[1]*National Institute of Advanced Industrial Science and Technology (AIST), GaN-OIL, Japan,* [2]*National Institute of Advanced Industrial Science and Technology (AIST), ADPERC, Japan*

P1-6

Influence of TMIn, TEGa and H_2 flows on InGaN growth

Robert Czernecki,[1,2] Ewa Grzanka,[1,2] Pawel Kempisty,[1] Szymon Grzanka,[1,2] Marcin Sarzynski,[1,2] Julita Smalc-Koziorowska,[1,2] Staszek Krukowski,[1] and Mike Leszczynski[1,2]

[1]*Institue of High Pressure Physics PAS Unipress Sokolowska 29/37 Warsaw, Poland,* [2]*TopGaN Ltd. Sokolowska 29/37 Warsaw, Poland*

P1-7

Role of Thin-Ti Film in Formation Mechanism of Low-temperature-annealed Ti/Al-based Ohmic Contact on AlGaN/GaN Heterostructure

Takahiro Yoshida[1,2] and Takashi Egawa[1]

[1]*Nagoya Institute of Technology, Japan,* [2]*Tokai Rika Co., Ltd., Japan*

P1-8

High-quality AlInN films grown by MOCVD with film thicknesses up to 500 nm

Mizuki Yamanaka,[1] Makoto Miyoshi,[1] Takashi Egawa,[1] and Tetsuya Takeuchi[2]

[1]*Nagoya Institute of Technology, Japan,* [2]*Meijo University, Japan*

P1-9

Diamond/GaN Heterostructures: Stress Evaluation from Top- and Cross-sectional Raman Measurements

Tibor Izak,[1] Vít Jirásek,[1] Gabriel Vanko,[2] Oleg Babchenko,[2] Andrej Vincze,[3] Marián Vojs,[4] and Alexander Kromka[1]

[1]*Institute of Physics, Czech Academy of Sciences, Prague, Czech Republic,* [2]*Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia,* [3]*International Laser Center, Bratislava, Slovakia,* [4]*Institute of Electronics and Photonics, Slovak University Technology, Bratislava, Slovakia*

P1-10

InGaN/GaN MQW solar cells grown by MOCVD with spectral response extending out to 540nm

Hiroki Harada, Takuma Mori, Dorjdagva Bilguun, Shinya Kato, Makoto Miyoshi, and Takashi Egawa

Nagoya Institute of Technology, Japan

P1-11

Control surface orientations of semipolar GaN layers grown on 3C-SiC/(001) Si substrates

Duc V. Dinh,[1] Markus Pristovsek,[2] Hiroshi Amano,[2] and Peter J. Parbrook[1,3]

[1]Tyndall National Institute, University College Cork, Ireland, [2]Institute of Materials and Systems for Sustainability, Nagoya University, Japan, [3]School of Engineering, University College Cork, Ireland

P1-12

High-Al content AlGaN pn diode with p-AlGaN improved by the UV wet oxidation

Xiaojia Zhang, Jun Morimoto, Kazuo Uchida, and Shinji Nozaki

Graduate School of Informatics and Engineering The University of Electro-Communications, Japan

P1-13

Enhancement in blue LEDs with step graded electron injectors by InGaN stress compensation layers

Volodymyr Sheremet,[1] Negar Gheshlaghi,[1] Murat Sözen,[1] Mustafa Elçi,[1,2] Nina Sheremet,[1,3] Atilla AYDINLI,[1,4] Ismail Altuntas,[5] Kai Ding,[6] Vitaliy Avrutin,[6] Ümit Özgür,[6] and Hadis Morkoç[6]

[1]Advanced Research Laboratories, Department of Physics, Bilkent University, Turkey, [2]Institute of Applied Mathematics, Middle East Technical University, Turkey, [3]Institute of Physics, NAS of Ukraine, Ukraine, [4]Department of Electrical and Electronics Engineering, Uludag University, Turkey, [5]Department of Nanotechnology Engineering, Cumhuriyet University, Turkey, [6]Department of Electrical and Computer Engineering, School of Engineering, Virginia Commonwealth University, United States of America

P1-14

GaN-based Power Diodes and Normally-off HEMTs Grown on Si

Qian Sun

Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences, China

P1-15

Efficiency droop alleviation in GaN-based near UV light emitting diodes by asymmetric triangular multiple quantum wells

Heng Li,[1] Chia-Jui Chang,[1] Shiou-Yi Kuo,[1,2] Jun-Rong Chen,[2] and Tien-Chang Lu[1]

[1]Department of Photonics, National Chiao Tung University, Taiwan, [2]Lextar Electronics Corporation, Taiwan

P1-16

Regrowth of n-AlGaN on nanoporous template fabricated by electrochemical etching

Liang Zhang,[1,2] Jian chang Yan,[1,2] Ya nan Guo,[1,2] Qing qing Wu,[1,2] Xue cheng Wei,[1,2] Jin min Li,[1,2] and Jun xi Wang[1,2]

[1] Institute of Semiconductors, Chinese Academy of Sciences, China, [2]University of Chinese Academy of Sciences, China

P1-17

Fabrication of GaN-based green VCSELs

Bao-Ping Zhang,[1] Yang Mei,[1] Rong-Bin Xu,[1] Huan Xu,[1] Zhi-Wei Zheng,[1] Lei-Ying Ying,[1] Hao Long,[1] and Jian-Ping Liu[2]
[1]Department of Electronic Engineering, Xiamen University, China, [2]Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China

P1-18

Carbon-doping of GaN buffer layer in AlGaN/GaN HEMTs on SI-SiC substrate

Kyeongjae Lee, Uiho Choi, Jaeyeon Han, Taehoon Jang, Yongjun Nam, and Okhyun Nam
Korea polytechnic university, Republic of Korea

P1-19

AlSiO gate oxide with high stability and long lifetime for GaN-based MOS structure

Daigo Kikuta,[1] Tetsuo Narita,[1] Kenji Ito,[1] and Tetsu Kachi[2]
[1]Toyota Central R&D Labs. Inc., Japan, [2]Nagoya University, Japan

P1-20

Investigation of Large-diameter AlN Template with High Quality by High Temperature N_2 annealing

Akira Mishima,[1] Yuji Tomita,[1] Yuya Yamaoka,[1] Yoshiki Yano,[1] Toshiya Tabuchi,[1] Koh Matsumoto,[1] and Hideto Miyake[2]
[1]Taiyo Nippon Sanso corp., Japan, [2]Mie University, Japan

P1-21

Novel AlGaN-channel 2DEG heterostructures employing quaternary InAlGaN barrier layers and their thermal stability of 2DEG properties

Daiki Hosomi, Heng Chen, Takashi Egawa, and Makoto Miyoshi
Nagoya Institute of Technology, Japan

P1-22

Milliwatt power UVA LEDs developed by using AlGaN superlattice (SL) buffer layers fabricated on AlN/sapphire templates

Muhammad Ajmal Khan,[1] Takuma Matsumoto,[1,2] Yuri Itokazu,[1,2] Noritoshi Maeda,[1] Masafumi Jo,[1] Norihiko Kamata,[2] and Hideki Hirayama [1,2]
[1]RIKEN, 2-1 Hirosawa Wako, Saitama, 351-0198, Japan, Japan, [2]Saitama University, 255 Shimo-Okubo, Sakura-ku, Saitama City, Saitama 338-8570, Japan, Japan

P1-23

Evaluation of GaN-based THz-QCL structure on Si substrate grown by MOCVD

Sachie Fujikawa,[1,3] Toshiya Ishiguro,[2,3] Ke Wang,[3] Wataru Terashima,[3] Hiroki Fujishiro,[2] and Hideki Hirayama[3]
[1]Tyokyo denki university, Japan, [2]Tokyo university of sciense, Japan, [3]RIKEN, Japan

P1-24

Influence of MOCVD reactor environment on crystal quality of AlN nucleation layer in AlGaN/GaN high-electron-mobility transistor structure on Si substrate

Yuya Yamaoka,[1] Akinori Ubukata,[1] Yoshiki Yano,[1] Toshiya Tabuchi,[1] Koh Matsumoto,[1] and Takashi Egawa[2]
[1]Taiyo Nippon Sanso Corp., Japan, [2]Nagoya Insitute of technoogy, Japan

P1-25

Si-doped GaN Growth as a Drift Layer of Vertical Power Devices by Using Production-Scale Metalorganic Chemical Vapor Deposition

Guanxi Piao,[1] Yoshiki Yano,[1] Yuya Yamaoka,[1] Toshiya Tabuchi,[1] Koh Matsumoto,[1] Keisuke Sakao,[2] Kazutaka Kanegae,[3] and Jun Suda[2,3]
[1]Compound Semiconductor Equipment Divsion, Global Operations, Taiyo Nippon Sanso Corporation , Japan, [2]Graduate School of Engineering, Nagoya University, Japan, [3]Undergraduate School of Electrical and Electronic Engineering, Kyoto University, Japan

P1-26

MOVPE Growth of Fe-doped GaN Epitaxial Layers on SiC (001) for High Breakdown-Voltage Devices

Po-Jung Lin,[1,2] Che-Lin Chen,[2] Bu-Chin Chung,[2] Ray-Hua Horng,[3] and Dong-Sing Wuu[1]
[1]Department of Materials Science & Engineering, National Chung Hsing University, Taiwan, [2]Hermes-Epitek Corporation, Taiwan, [3]Institute of Electronics, National Chiao Tung University, Taiwan

P1-27

Material combination dependence of tunnel junction characteristics for improvement of electrical characteristics of VCSEL

Tomoyuki Aoyama and Tomoyuki Miyamoto
FIRST, Tokyo Institute of Technology, Japan

P1-28

AlInAs carbon doping optimization for tunnel junction applications

Stefano Soresi,[1] Gwénaëlle Hamon,[2] José Alvarez,[3] Ludovic Largeau,[4] Mauricio Pamplona Pires,[5] and Jean Decobert[1]
[1]III-V Lab, France, [2]Total S.A. Renewables, France, [3]GeePs Centrale Supélec, France, [4]C2N/CNRS-Universite Paris-Saclay, France, [5]Labsem, Pontificia Univ. Catolica, Brazil

P1-29

Quantum well and quantum dot based VCSELs emitting at 633 nm

Mona Stadler, Isabelle Reis, Michael Jetter, and Peter Michler
Institut für Halbleiteroptik und Funktionelle Grenzflächen, Center for Integrated Quantum Science and Technology (IQST) and SCoPE, University Stuttgart, Germany

P1-30

Interpretation of lattice constant and N composition in GaPN alloys through ab initio calculations and experimentations

Keisuke Yamane,[1] Yoshiki Tachihara,[1] Takashi Kittaka,[1] Hiroto Sekiguchi,[1] Hiroshi Okada,[2] and Akihiro Wakahara[1]
[1]Department of Electrical and Electronic Information Engineering, Toyohashi University of Technology, Japan, [2]Electronics-Inspired Interdisciplinary Research Institute, Toyohashi University of Technology, Japan

P1-31

PL characterization of proton implantation quantum well intermixing of MOVPE grown QW at deep position for high efficiency VCSEL

Kentoku Horikiri and Tomoyuki Miyamoto
Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan

P1-32

Metalorganic Precursors Dependence of Impurity Concentration in AlGaAsSb and Optical Characteristics of InAs / GaAsSb Superlattice

Kakeru Takahashi, Yuya Yamagata, Yuki Fujiwara, Yuki Inoue, Ryosuke Wakaki, Koji Maeda, and Masakazu Arai
University of Miyazaki, Japan

P1-33

Influence of GaP substrate quality on the MOCVD growth of AlGaP alloys

Grégoire Beaudoin,[1] Konstantinos Pantzas,[1] Gilles Patriarche,[1] Rémy Braive,[1,2] Fabrice Raineri,[1,2] and Isabelle Sagnes[1]
[1]Center for Nanoscience and Nanotechnology, CNRS, Univ. Paris-Sud, Université Paris Saclay, France, [2]Université Paris Diderot, France

P1-34

Growth of High-Ge-Composition GaAs/Si_xGe_{1-x}/GaAs Trilayers using Metal-Organic Vapor Phase Epitaxy

Omar Elleuch, Yingxin Guan, Xiaorui Cui, Abhishek Bhat, Shelley Scott, Donald Savage, Max Lagally, and Thomas Kuech
University of Wisconsin-Madison, Madison, WI 53706-1691, United States of America

P1-35

GaPN-on-Si(001): Optical constants and origin of the absorption edge

Sviatoslav Shokhovets,[1,2] Oliver Supplie,[1] Christian Koppka,[1] Stefan Krischok,[1,2] and Thomas Hannappel[1]
[1]Institute of Physics, Ilmenau University of Technology, Germany, [2]Institute of Micro- and Nanotechnologies MacroNano, Ilmenau University of Technology, Germany

P1-36

MOCVD growth of luminescent β-$FeSi_2$ film on modified Si surface by silver

Kensuke Akiyama,[1,2] Ryo Takahashi,[1] Yoshihisa Matsumoto,[1] and Hiroshi Funakubo[2]
[1]Kanagawa Institute of Industrial Science and Technology, Japan, [2]Tokyo Institute of Technology, Department of Materials Science and Engineering School, Japan

P1-37

Research and Development of ZnO Film Based Fast Decay Phosphor by MOCVD

Mohd Faiz Bin Ahmad,[1] Atsuya Tabuchi,[1] Hirokazu Nishikori,[1] Jie Lin Lin,[2] Toshiyuki Yoshida,[1] and Yasuhisa Fujita[1]
[1]Interdisciplinary Graduate School of Science and Engineering, Shimane University, Japan, [2]Center for the Promotion of Project Research, Shimane University, Japan

P1-38

Epitaxial growth of zinc oxide on m-sapphire by mist chemical vapor deposition

Tzu-I Yang, Lin-Lung Wei, Kun-An Chiu, and Li Chang
Department of Materials Science and Engineering, National Chiao Tung University, Taiwan

P1-39

Sn Concentration and Surface Morphology of GeSn Layer on GaAs (311)B Substrate grown by MOVPE

Yuki Fujiwara,[1] Kakeru Takahashi,[1] Takaeshi Fujisawa,[2] Koji Maeda,[1] and Masakazu Arai[1]
[1]University of Miyazaki, Japan, [2]Hokkaido University, Japan

P1-40

Monomolecular layer controlled deposition of ZnO thin films using a pulsed valve by catalytic reaction-assisted chemical vapor deposition

Taro Saitou,[1] Shotarou Ono,[1] Abdul Manaf Hashim,[2] and Kanji Yasui[1]
[1]Nagaoka University of Technology, Japan, [2]MJIIT, Universiti Teknologi Malaysia, Malaysia

P1-41

Nitrogen doping of ZnO films by decomposition of NO gas using heated Ir wire in catalytic reaction-assisted CVD

Yuki Adachi,[1] Syotaro Ono,[1] Ariyuki Kato,[1] Abdul Manaf Hashim,[2] and Kanji Yasui[1]
[1]Nagaoka University of Technology, Japan, [2]MJIIT, Universiti Teknologi Malaysia, Malaysia

P1-42

Single Event Effect Performance of Ga_2O_3-based Schottky Barrier Diode

Serdal Okur,[1] Tom Salagaj,[1] Digangana Khan,[2] Durga Gajula,[2] Goutam Koley,[2] and Gary Tompa[1]
[1]Structured Materials Industries, Inc., United States of America, [2]Electrical and Computer Engineering, Clemson University, United States of America

P1-43

Photoconductivity of α-Ga_2O_3 Thin Film for Solar Blind Photodetectors

Kazuyuki Uno, Chisato Umemura, Kazuyoshi Matsumoto, Sachi Nakamura, and Ichiro Tanaka
Wakayama University, Japan

P1-44

Scalable Growth of High-Quality MoS_2 and WS_2 Atomic Layers using Oxychloride Sources in MOCVD Reactor

Yoshiki Sakuma, Naoki Ikeda, Takaaki Mano, and Akihiro Ohtake
National Institute for Materials Science (NIMS), Japan

P1-45

Growth of 2D MoS_2 Monolayers on Novel Ga_2O_3 Templates For Optoelectronics Applications

Serdal Okur,[2] Sourav Garg,[1] Joseph L. Waters,[1] Seongsin Margaret Kim,[1] Tom Salagaj,[2] Gary S. Tompa,[2] and Patrick Kung[1]
[1]Department of Electrical and Computer Engineering, The University of Alabama, United States of America, [2]Structured Materials Industries, Inc., United States of America

P1-46

Electrical properties and stress optimization of AlGaN/GaN/Si HEMT-type heterostructures grown by MOVPE

Mateusz Wosko, Tomasz Szymanski, Bogdan Paszkiewicz, and Regina Paszkiewicz
Faculty of Microsystem Electronics and Photonic, Wroclaw University of Science and Technology, Poland

P1-47

Growth of InN epilayer grown on AlN/Si(111) substrate by pulsed-mode metalorganic molecular beam epitaxy

Wei-Chun Chen and Chien-Nan Hsiao
Instrument Technology Research Center, National Applied Research Laboratories, Taiwan

P1-48

Ag catalyzed growth of Indium Arsenide nanowires on Silicon (100) substrate by MOCVD

Mirwaiz Rahaman and Pallab Banerji
Materials Science Centre, IIT Kharagpur, India

P1-49

Characterization of Nanowire Light-emitting Diodes Grown by Selective-area MOVPE

Junichi Motohisa,[1,2] Hiroki Kameda,[1,2] Masahiro Sasaki,[1,2] and Katsuhiro Tomioka[1,2]
[1]Graduate School of Information Science and Technology, Hokkaido University, Japan, [2]Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

P1-50

MOVPE growth of InP/GaInAs heterostructure nanowires by self-catalytic VLS mode

Katsuaki Ishida, Kohei Takano, Satoshi Yoshimura, and Kazuhiko Shimomura
Department of Engineering and Applied Sciences, Sophia University, Japan

P1-51

Self Assisted Growth and Characterization of InGaAs Nanowire on Si Substrate without Foreign Catalysts

Sisir Chowdhury and P. Banerji
Materials Science Centre, IIT Kharagpur, India

P1-52

Growth of high-quality nonpolar shells on 3D GaN fin structures

Irene Manglano Clavero,[1,2] Jana Hartmann,[1,2] Hergo-Heinrich Wehmann,[1,2] Adrian Avramescu,[3] Martin Straßburg,[3] Hans-Jürgen Lugauer,[3] and Andreas Waag[1,2]
[1]Institute of Semiconductor Techology and epitaxy competence center, ec[2],TU Braunschweig, Germany, [2]Laboratory of Emerging Nanometrology, LENA, TU Braunschweig, Germany, [3]OSRAM Opto Semiconductors GmbH, Germany

P1-53

MOVPE Growth of GaP Nanocones for Advanced Sensor Applications

Jozef Novak,[1] Agata Laurencikova,[1] Peter Elias,[1] Stanislav Hasenohrl,[1] and Jaroslav Kovac[2]

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P1-55

Photonic integration of GaAs-based lasers by 2-step epi and in-situ etching

Pietro Della Casa, Andre Maaßdorf, Olaf Brox, and Markus Weyers

Ferdinand-Braun-Institut, Germany

P1-56

Site-controlled crystalline InN growth from V-pits of a GaN substrate

Lung-Hsing Hsu,[1,4] Yung-Yu Lai,[2] Shan-Yun Cheng,[3] Hao-Chung Kuo,[3] Chien-Chung Lin,[1] and Yuh-Jen Cheng[4]

[1]Institute of Photonic System, National Chiao Tung University, Taiwan, [2]Department of Materials Science and engineering, National Chiao Tung University, Taiwan, [3]Department of Photonics, National Chiao Tung University, Taiwan, [4]Research Center for Applied Sciences, Academia Sinica, Taiwan

P1-57

Substrate dependences of the physical properties of amorphous aluminum oxide thin film formed by atomic layer deposition

Tsukasa Motoya, Akifumi Imai, and Takuma Nanjo

Advanced Technology R&D center, Mitsubishi Electric Corporation, Japan

P1-58

Thin films of Oxide-based Materials by Atomic Layer Deposition

Marek Godlewski,[1] Rafal Pietruszka,[1] Sylwia Gieraltowska,[1] Lukasz Wachnicki,[1] Bartlomiej Witkowski,[1] Izabela Serafinska,[2,3] Joanna Cymerys,[3] Anna Slonska-Zielonka,[3,4] and Michal Marek Godlewski[3,4]

[1]Institute of Physics, Polish Academy of Sciences, Poland, [2]Department of Preclinical Sciences, Faculty of Veterinary Medicine, Warsaw University of Life Sciences - SGGW, Poland, [3]Veterinary Research Centre, Dept. of Large Animals Diseases with Clinic, Faculty of Veterinary Medicine, Warsaw Univ. of Life Sciences - SGGW, Poland, [4]Department of Physiological Sciences, Faculty of Veterinary Medicine, Warsaw University of Life Sciences - SGGW, Poland

P1-59

Numerical study of the mass transport phenomenon caused by velocity boundary layer in pulsed MOCVD process

Wei Jie Lin,[1] Jyh Chen Chen,[2] and chieh Hu[3]

[1]Department of Mechanical Engineering, National Central University, Taiwan, [2]Department of Mechanical Engineering, National Central University, Taiwan, [3]Department of Mechanical Engineering, National Central University, Taiwan

P1-60

Influence of Si doping of GaN layers surrounding InGaN quantum wells on structure photoluminescence properties

Marketa Zikova, Alice Hospodkova, Tomas Hubacek, Jiri Pangrac, Jiri Oswald, and Frantisek Hajek

Institute of Physics, Czech Academy of Sciences, v.v.i., Czech Republic

P1-61

Highly Tin Doped GaAs at Low Growth Temperatures using Tetraethyl tin by Metal Organic Vapor Phase Epitaxy

Omar Elleuch, Yingxin Guan, and Thomas Kuech

University of Wisconsin-Madison, Madison, WI 53706-1691, United States of America

P1-62

High throughput MOVPE and accelerated growth rate of GaAs for PV application

Akinori Ubukata,[1] Hassanet Sodabanlu,[2] Taketo Aihara,[3] Ryuji Oshima,[3] Takeyoshi Sugaya,[3] Yoshiki Yano,[1] Toshiya Tabuchi,[1] Koh Matsumoto,[1] Kentaroh Watanabe,[2] Yoshiaki Nakano,[4] and Masakazu Sugiyama[2]

[1]Taiyo Nippon Sanso Corporation, Japan, [2]Research Center for Advanced Science and Technology, The university of Tokyo, Japan, [3]Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology (AIST), Japan, [4]School of Engineering, The University of Tokyo, Japan

P1-63

Selective Area Regrown Ohmic Contacts to AlGaN/GaN High Electron Mobility Trasistors on Semi-Insulating Ammono-GaN Substrates

Pawel Prystawko,[1,2] Andrzej Taube,[3] Eliana Kaminska,[3] Anna Piotrowska,[3] Marek Ekielski,[3] Marcin Mysliwiec,[3] Maciej Kozubal,[3] Jakub Kaczmarski,[3] Marek Wzorek,[3] Wojciech Wojtasiak,[4] Marcin Goralczyk,[4] Dawid Kuchta,[4] Marcin Zajac,[5] and Robert Kucharski[5]

[1]Institute of High Pressure Physics, PAS, "Unipress", Poland, [2]TopGaN Ltd, Poland, [3]Institute of Electron Technology, Poland, [4]Institute of Radioelectronics and Multimedia Technology, Warsaw University of Technology, Poland, [5]Institute of High Pressure Physics, "Ammono Lab", Poland

P1-64 (Late News)

Tuning the Phase (α, β and ϵ) of Gallium Oxide by HCl-enhanced MOCVD

Haiding Sun,[1] Kuang-Hui Li,[1] C. G. Torres. Castanedo,[1] Serdal Okur,[2] Gary Tompa,[2] Tom Salagaj,[2] and Xiaohang Li[1]

[1]King Abdullah University of Science and Technology (KAUST), Saudi Arabia, [2]Structured Materials Industries, Inc., United States of America

Gagaku Concert	17:30 - 18:00

Light Meal	18:00 - 18:30

5E-2 Special Session: Power Devices Room 1&2 18:30-20:30

GaN Power Devices

Future Directions from the Viewpoint of Growth

Modelator: Jun Suda

Nagoya University, Japan

GaN has attracted much attention as a material for next generation power devices. In the last decade, extensive development efforts were carried out on AlGaN/GaN HEMTs grown on Si substrates producing cost-effective high-efficiency power switching devices. Companies in the U.S., Europe and Japan have started into production. In addition, recently, GaN MOSFETs on GaN substrates and AlGaN/AlGaN HEMTs with higher Al composition have been studied as high-voltage/high-current devices. In this session, we will have introductory talks on these devices by invited speakers. We would like to discuss what kinds of growth technology should be developed for these devices.

5E-3 Special Session: MOVPE Equipment Room 3&4 18:30-20:30

History and Future of MOVPE Equipment

Modelator: Masakazu Sugiyama

The University of Tokyo, Japan

50 years have passed since Dr. Harold M. Manasevit published the growth of III-V semiconductors by MOVPE. Intensive development of MOVPE reactors has been the basis of the invention and commercialization of III-V devices. To meet ever-increasing demand for high productivity and low cost, MOVPE reactors has been scaled up and a lot of technology has been introduced for improved reproducibility and throughput. This session aims at an overview of such development, bridging the gap between pioneers in MOVPE and younger generation for future progress. We will then discuss next directions and challenges in MOVPE equipment.

5E-3.1 (Invited) 18:30 - 19:00

Early Development of MOVPE Reactors

Christine A. Wang

Laser Technology and Applications, MIT Lincoln Laboratory, United States of America

5E-3.2 (Invited) 19:00 - 19:30

Design evolution of MOVPE reactors for improved productivity: adaptation to nitrides and feedback to classical III-V

Koh Matsumoto,[1] Akinori Ubukata,[1] Piao Guanxi,[1] Yoshiki Yano,[1] Toshiya Tabuchi,[1] Shuichi Koseki,[1] Hassanet Sodabanlu,[2] Kentaro Watanabe,[2] Yoshiaki Nakano,[2] and Masakazu Sugiyama[2]

[1]Global Operations, TAIYO NIPPON SANSO, Japan, [2]RCAST, University of Tokyo, Japan

5E-3.3 (Invited) 19:30 - 20:00

Advances in Production MOCVD Technology for Compound Semiconductor Thin Film Structures

Martin Dauelsberg

AIXTRON SE, Germany

5E-3.4 (Invited) 20:00 - 20:30

Recent Progress in MOCVD Technology for Compound Semiconductor Materials

Soo Min Lee, Bojan Mitrovic, Eric Armour, Mandar Deshpande, and Ajit Paranjpe

MOCVD Operations, Veeco Instruments Inc., United States of America

June 6th (Wednesday)

6A-1 AlGaN-Based LEDs

Noh Theatre 9:00-10:15

6A-1.1 (Invited) 9:00 - 9:30

265 nm Deep Ultraviolet Light-Emitting Diodes Grown on AlN Substrates for Disinfection Applications

Naohiro Kuze, Tomohiro Morishita, Ryosuke Hasegawa, Aya Yokoyama, Yoshihito Hagihara, Hiromasa Goto, and Shinji Miya
UVC project, Asahi Kasei Corporation, Japan

6A-1.2 9:30 - 9:45

325nm Emission From Highly Transparent AlGaN UVA LEDs grown on AlN Template in the LP-MOCVD

Muhammad Ajmal Khan,[1] Takuma Matsumoto,[1,2] Yuri Itokazu,[1,2] Noritoshi Maeda,[1] Masafumi Jo,[1] Norihiko Kamata,[2] and Hideki Hirayama [1,2]
[1]RIKEN, Japan, [2]Saitama University, Japan

6A-1.3 9:45 - 10:00

Optimization of AlGaN MOCVD growth for deep UV LED

Abdullah Almogbel,[1,2] Burhan Saifaddin,[1] Chris Zollner,[1] Michael Iza,[1] Hamad Albraithen,[2] Ahmed Alyamani,[2] Abdulrahman Albadri,[2] Steven DenBaars,[1] Shuji Nakamura,[1] and James Speck[1]
[1]University of California, Santa Barbara, United States of America, [2]King Abdulaziz City for Science and Technology, Saudi Arabia

6A-1.4 10:00 - 10:15

AlGaN-based UV LEDs with emission below 230 nm

Frank Mehnke,[1] Luca Sulmoni,[1] Martin Guttmann,[1] Tim Wernicke,[1] and Michael Kneissl[1,2]
[1]Institute of Solid State Physics, Technische Universität Berlin, Germany, [2]Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Germany

6A-2 III-V Devices on Group IV substrates

Room 1&2 9:00-10:30

6A-2.1 (Invited) 9:00 - 9:30

III-V Photonic and Electronic Devices Grown on Silicon by MOCVD

Kei May Lau
Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Hong Kong

6A-2.2 9:30 - 9:45

InAs/GaSb thin layers directly grown on nominal (001)-Si substrate by MOCVD for the fabrication of InAs FINFET

Tiphaine CERBA,[1,3,6] Mickael Martin,[1] Jeremy Moeyaert,[1] Reynald Alcotte,[1] Bassem Salem,[1] Etienne Eustache,[1] Philippe Bezard,[1] Xavier Chevalier,[2] Geoffrey Lombard,[2] Franck Bassani,[1] Sylvain David,[1] Jean-Luc Rouviere,[5] George Beainy,[1] Laurent Cerutti,[4] Jean-Baptiste Rodriguez,[4] Eric Tournié,[4] Hervé Boutry,[3] Maryline Bawedin,[6] and Thierry Baron[1]
[1]Univ. Grenoble Alpes; CNRS, France, [2]Arkema France, France, [3]Univ. Grenoble Alpes, LETI, France, [4]IES, Univ. Montpellier, CNRS, France, [5]Univ. Grenoble Alpes, INAC-CEA, France, [6]Univ. Grenoble Alpes, CNRS, Grenoble INP, IMEP-LAHC, France

6A-2.3 9:45 - 10:00

$In_{0.49}Ga_{0.51}P$ /GaAs heterojunction bipolar transistors (HBTs) fabricated on epitaxial films grown directly on Si substrates

Kwang Hong Lee,[1] Wan Khai Loke,[2] Yue Wang,[1] Soon Fatt Yoon,[1,2] Eugene A. Fitzgerald,[1,3] and Chuan Seng Tan[1,2]
[1]Low Energy Electronic Systems, Singapore-MIT Alliance for Research and Technology (SMART), Singapore, [2]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, [3]Department of Materials Science and Engineering, Massachusetts Institute of Technology, United States of America

6A-2.4 10:00 - 10:15

Hetero-epitaxial growth of high electron mobility InGaAs HEMT layers on 200 mm Si substrate for monolithic integration with Si CMOS

Xuan Sang Nguyen,[1] Sachin Yadav,[1,2] Annie Kumar,[1,2] Kwang Hong Lee,[1] Xiao Gong,[2] Kenneth Eng Kian Lee,[1] Chuan Seng Tan,[3] Soo Jin Chua,[1,2] and Engene A. Fitzgerald[1,4]
[1]Low Energy Electronic Systems IRG (LEES), Singapore-MIT Alliance for Research and Technology, Singapore, [2]Department of Electrical and computer engineering, National University of Singapore, Singapore, [3]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, [4]Department of Materials Science and Engineering, Massachusetts Institute of Technology, United States of America

6A-2.5 10:15 - 10:30

Heterogeneous integration of InGaAs nanowires with various In compositions on Ge(111) substrates for vertical transistor application

Akinobu Yoshida, Katsuhiro Tomioka, Kohei Chiba, and Junichi Motohisa

Graduate School of Information Science and Technology (GS-IST) and Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Japan

Break 10:30 - 10:45

6B-1 Growth of AlN and AlGaN

Noh Theatre 10:45-12:30

6B-1.1 (Invited) 10:45 - 11:15

Point defect control during AlGaN growth by MOVPE

Ramon Collazo,[1] Pramod Reddy,[1,2] Shun Washiyama,[1] Felix Kaess,[1] M. Hayden Breckenridge,[1] Joshua Harris,[1] Ronny Kirste,[2] Seiji Mita,[2] James Tweedie,[2] Douglas Irving,[1] and Zlatko Sitar[1]

[1]Department of Materials Science and Engineering, North Carolina State University, United States of America, [2]Adroit Materials, Inc. , United States of America

6B-1.2 11:15 - 11:30

Tuning the growth mode and polarity of AlN films via TMAl preflow of Al_2O_3

Haiding Sun,[1] Kuang-Hui Li,[1] Yong Jae Park,[2] Theeradetch Detchprohm,[2] Russell D. Dupuis,[2] and Xiaohang Li[1]

[1]King Abdullah University of Science and Technology (KAUST), Advanced Semiconductor Laboratory, Thuwal, 23955-6900, Saudi Arabia, [2]Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, United States of America

6B-1.3 11:30 - 11:45

Improved crystal quality of semipolar AlN by employing thermal annealing technique with MOVPE

Masafumi Jo, Satoshi Minami, and Hideki Hirayama

RIKEN, Japan

6B-1.4 11:45 - 12:00

Lattice Relaxation Mechanism of Nonpolar *m*-plane AlGaN Grown on AlN Bulk Substrate

Junichi Nishinaka, Yoshitaka Taniyasu, and Kazuhide Kumakura

NTT Basic Research Laboratories, NTT Corporation, Japan

6B-1.5 12:00 - 12:15

Ultrathin GaN/AlN quantum wells fabricated with a self-limiting process

Mitsuru Funato, Shuhei Ichikawa, and Yoichi Kawakami
Department of Electronic Science and Engineering, Kyoto University, Japan

6B-1.6 12:15 - 12:30

Impact of growth conditions on AlN/GaN heterostructures with in-situ SiN capping layer

Joel Kanyandekwe,[1,2] Matthew Charles,[1,2] Yannick Baines,[1,2] Mrad Mrad ,[1,2] and Cindy Wiese[1,2]
[1]Univ. Grenoble Alpes, France, [2]CEA, LETI, MINATEC Campus, France

6B-2 Growth of III-V on Si

Room 1&2 11:00-12:30

6B-2.1 (Invited) 11:00 - 11:30

III/V's on Silicon: atomic structure, local electric fields and charge densities

Kerstin Volz
Philipps-University Marburg, Department of Physics and Materials Science Center, Germany

6B-2.2 11:30 - 11:45

Lowering defect density of compliant GaAs on silicon substrates by MOCVD

Zhao Yan, Bei Shi, Qiang Li, Xu Dong, and Kei May Lau
Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Hong Kong

6B-2.3 11:45 - 12:00

In situ quantification of the Arsenic content in GaAsP graded buffer layers during MOVPE growth by reflection anisotropy spectroscopy

Oliver Supplie,[1] Alexander Heinisch,[1] Masakazu Sugiyama,[2,3] and Thomas Hannappel[1]
[1]Institute of Physics, Ilmenau University of Technology, Germany, [2]School of Engineering, The University of Tokyo, Japan, [3]Research Center for Advanced Science and Technology, The University of Tokyo, Japan

6B-2.4 12:00 - 12:15

Impact of process parameters on double-layer step formation of Si (100) surface using TBA for III-V integration on Si by MOVPE

Boram Kim,[1] Tetsuaki Okada,[1] Oliver Supplie,[2] Agnieszka Paszuk,[2] Thomas Hannappel,[2] Yoshiaki Nakano,[1] and Masakazu Sugiyama[1]
[1]The University of Tokyo, Japan, [2]Ilmenau University of Technology, Germany

6B-2.5 12:15 - 12:30

Structural and electronic properties of antiphase boundaries in GaP layers grown on Si(001)

Pascal Farin,[1] Malte Marquardt,[1] Celina S. Schulze,[1] Wjatscheslav Martyanov,[1] Andreas Beyer,[2] Kerstin Volz,[2] and Andrea Lenz[1]

[1]Institute of Solid State Physics, Technische Universität Berlin, Germany, [2]Materials Science Center, Philipps-Universität Marburg, Germany

Excursion	12:30 - 18:00

June 7th (Thursday)

7A-1 Plenary III

Noh Theatre 9:00-10:30

7A-1.1 (Plenary) 9:00 - 9:45

Growth of Indium-Including Nitride Semiconductors

Takashi Matsuoka, Shigeyuki Kuboya, and Tomoyuki Tanikawa
Institue for Materials Research, Tohoku University, Japan

7A-1.2 (Plenary) 9:45 - 10:30

Metrology for MOCVD processes - latest progress for enabling high-yield VCSEL manufacturing

Thomas Zettler,[1] Christian Kaspari,[1] Johannes Zettler,[1] and Martin Zorn[2]
[1]LayTec AG, Germany, [2]JENOPTIK Diode Lab GmbH, Germany

Break 10:30 - 11:00

7B-1 Nitride Lasers

Noh Theatre 11:00-12:30

7B-1.1 (Invited) 11:00 - 11:30

GaN-based Visible Laser Diodes

Shinichi Nagahama and Shingo Masui
Nichia corporation, Japan

7B-1.2 (Invited) 11:30 - 12:00

MOVPE growth of AlGaInN structures in violet/blue/green laser diode technology

Mike Leszczynski,[1,2] Robert Czernecki,[1,2] Ewa Grzanka,[1,2] Szymon Grzanka,[1,2] Julita Smalc-Koziorowska,[1,2] and Piotr Perlin[1,2]
[1]Institute of High Pressure Physics, Poland, [2]TopGaN, Poland

7B-1.3 12:00 - 12:15

High Efficiency CW Semipolar InGaN Lasers for Solid State Lighting

Daniel L. Becerra,[1] Shlomo Mehari,[1] Haojun Zheng,[2] Philip Chan,[2] Daniel Cohen,[1] Steven DenBaars,[1,2] and Shuji Nakamura[1,2]

[1]Materials Department, University of California, Santa Barbara, Santa Barbara, CA, United States of America, [2]Department of Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, CA, United States of America

7B-1.4 12:15 - 12:30

Design and Fabrication of GaN Monolithic Doubly-Resonant Microcavity SHG Device

Tomoaki Nambu, Masahiro Uemukai, Ryoken Fuji, Tomoya Yamada, Yasufumi Fujiwara, and Ryuji Katayama

Graduate School of Engineering, Osaka University, Japan

7B-2 In-situ Analysis

Room 1&2 11:00-12:30

7B-2.1 (Invited) 11:00 - 11:30

Observation of crystal growth of group III nitride semiconductors by using in situ X-ray diffraction attached metalorganic vapor phase epitaxial equipment

Motoaki Iwaya,[1] Tetsuya Takeuchi,[1] Satoshi Kamiyama,[1] and Isamu Akasaki[1,2]

[1]Faculty of Science and Technology, Meijo University, Japan, [2]Akasaki Research Center, Nagoya University, Japan

7B-2.2 11:30 - 11:45

Extraction of stress and dislocation density using in-situ curvature measurements for AlGaN and GaN on silicon growth

Matthew Charles,[1,2] Victor Yon,[1,2] Mrad Mrad,[1,2] and Joël Kanyandekwe[1,2]

[1]University Grenoble Alpes, France, [2]CEA-LETI, France

7B-2.3 11:45 - 12:00

Direct observation of ammonia decomposition and interaction with trimethylgallium in a metalorganic vapor phase epitaxy reactor

Shugo Nitta,[1] Kentaro Nagamatsu,[1] Zheng Ye,[2] Hirofumi Nagao,[3] Shinichi Miki,[3] Maki Kushimoto,[2] Manato Deki,[1] Atsushi Tanaka,[1] Yoshio Honda,[1] Markus Pristovsek,[1] and Hiroshi Amano[1,4,5]

[1] Institute of Materials and Systems for Sustainability, Nagoya University, Japan, [2]Department of Electrical Engineering and Computer Science, Nagoya University, Japan, [3]MSI.TOKYO, INC., Japan, [4]Akasaki Research Center, Nagoya University, Japan, [5]Venture Business Laboratory, Nagoya University, Japan

7B-2.4 12:00 - 12:15

Real time mass spectrometric MOVPE gas phase investigations on the novel metal organic As-N precursor di-tertiary-butyl-arsano-amine (DTBAA)

Oliver Maßmeyer,[1] Lukas Nattermann,[1] Eduard Sterzer,[1] Carsten von Hänisch,[2] Wolfgang Stolz,[1] and Kerstin Volz[1]

[1]Material Sciences Center and Faculty of Physics, Philipps-Universität Marburg, Germany, [2]Material Sciences Center and Faculty of Chemistry, Philipps-Universität Marburg, Germany

7B-2.5 12:15 - 12:30

Double-layer stepped low-offcut Si(100):As surfaces for APD-free III-V nucleation

Agnieszka Paszuk,[1] Oliver Supplie,[1] Manali Nandy,[1] Anja Dobrich,[1] Sebastian Brückner,[1] Peter Kleinschmid,[1] Boram Kim,[2] Yoshiaki Nakano,[2] Masakazu Sugiyama,[2] and Thomas Hannappel[1]

[1]Photovoltaics Group, Institute of Physics, Ilmenau University of Technology, Gustav-Kirchhoff-Str. 5, 98693 Ilmenau, Germany, [2]Research Center for Advanced Science and Technology, The University of Tokyo, Bunkyo-ku, Tokyo 153-8904, Japan

7B-3 Advanced Equipment and Growth Technology Room 3&4 11:00-12:30

7B-3.1 (Invited) 11:00 - 11:30

III-V solar cells - todays challenges and tomorrows opportunities

David Lackner, R. Lang, J. Schön, J. Markert, H. Helmers, and F. Dimroth

Fraunhofer Institute for Solar Energy Systems, Germany

7B-3.2 11:30 - 11:45

Study on the quality of GaAs grown by ultrafast MOVPE

Hassanet Sodabanlu,[1] Akinori Ubukata,[2] Kentaroh Watanabe,[1] Takeyoshi Sugaya,[3] Yoshiaki Nakano,[4] and Masakazu Sugiyama[1,4]

[1]Research Center for Advanced Science and Technology, The University of Tokyo, Japan, [2]Taiyo Nippon Sanso Corporation, Japan, [3]Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, Japan, [4]Department of Electrical Engineering and Informatics Systems, The University of Tokyo, Japan

7B-3.3 11:45 - 12:00

Extreme-high-temperature MOVPE design and practice for nitrides

Kuang-Hui Li,[1] Haiding Sun,[1] Che-Hao Liao,[1] Hsin-Hung Yao,[1] William Holden,[2] Aaron Feldman,[2] Tom Salagaj,[2] Gary Provost,[2] Gary Tompa,[2] and Xiaohang Li[1]

[1]Computer, Electrical and Mathematical Science & Engineering Division, King Abdullah University of Sceince and Technology, Thuwal, Makkah, Saudi Arabia, [2]Structured Materials Industries, Piscataway, New Jersey, United States of America

7B-3.4 12:00 - 12:15

InAlN/AlN/GaN HEMTs Grown on Large Diameter Si Substrate by Fast Rotating Single-Wafer MOCVD tool

Masayuki Tsukui, Hajime Nago, Kiyotaka Miyano, Yasushi Iyechika, Yoshitaka Ishikawa, and Hideshi Takahashi
NuFlare Technology, Inc., Japan

7B-3.5 12:15 - 12:30

Study of silicon nitride deposition in III-N MOVPE reactors

W. Lundin,[1] S. Rodin,[1] E. Zavarin,[1] A. Sakharov,[1] A. Nikolaev,[1] and A. Tsatsulnikov[2]
[1]Ioffe Institute, Russia, [2]Submicron Heterostructures for Microelectronics Research and Engineering Center of the Russian Academy of Science, Russia

Lunch	12:30 - 14:00

7C-1 Advanced Nitride Growth

Noh Theatre 14:00-15:30

7C-1.1 14:00 - 14:15

Morphological and optical properties of Tm-doped AlGaN on GaN and AlN templates grown by organometallic vapor phase epitaxy

Junichi Takatsu, Ryoken Fuji, Jun Tatebayashi, and Yasufumi Fujiwara
Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, Japan

7C-1.2 14:15 - 14:30

MOVPE-like Tri-Halide Vapor Phase Epitaxy of Thick GaN and AlGaN using $GaCl_3$ and $AlCl_3$

Mayuko Kobayashi, Nao Takekawa, Machi Takahashi, and Hisashi Murakami
Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan

7C-1.3 14:30 - 14:45

Study of growth conditions effect on GaN doping with carbon from propane and methane

W. Lundin,[1] E. Zavarin,[1] A. Nikolaev,[1] A. Sakharov,[1] D. Kazantsev,[1] B. Ber,[1] and A. Tsatsulnikov[2]
[1]Ioffe Institute, Russia, [2]Submicron Heterostructures for Microelectronics Research and Engineering Center of the Russian Academy of Science, Russia

7C-1.4 14:45 - 15:00

Obtaining metal-polar $(10\bar{1}3)$ GaN on directionally AlN sputtered m-plane sapphire substrate

Nan Hu,[1] Duc Van Dinh,[2] Markus Pristovsek,[2] Yoshio Honda,[1,2] and Hiroshi Amano[1,2]

[1]Department of Electronics, Nagoya University, Japan, [2]Institute of Materials and Systems for Sustainability, Nagoya University, Japan

7C-1.5 15:00 - 15:15

Fabrication and evaluation of multiple-quantum wells on high-quality relaxed InGaN template fabricated by combination of ELO and CMP

Yuki Inomata, Hideyuki Itajura, Satoru Fujimoto, Narihito Okada, and Kazuyuki Tadatomo

Grad. School of Sci. & Eng. for Innovation Yamaguchi Univ, Japan

7C-1.6 15:15 - 15:30

Limited area epitaxy and properties of InGaN quantum wells

Marcin Sarzynski,[1,2] Ewa Grzanka,[1,2] Robert Czernecki,[1,2] Shugo Nitta,[3] Zhibin Liu,[4] Mike Leszczynski,[1,2] and Hiroshi Amano[3,5,6]

[1]Institute of High Pressure Physics PAS, Poland, [2]TopGaN Ltd., Poland, [3]Institute of Materials and Systems for Sustainability, Nagoya University, Japan, [4]Department of Electrical Engineering and Computer Science, Nagoya University, Japan, [5]Akasaki Research Center, Nagoya University, Japan, [6]Venture Business Laboratory, Nagoya University, Japan

7C-2 BN Growth and Chracterization

Room 1&2 14:00-15:30

7C-2.1 (Invited) 14:00 - 14:30

Investigation of epitaxially grown AlB(Ga)N layers on AlN templates

Ferdinand Scholz,[1] Oliver Rettig,[1] Marketa Zikova,[1] Tomas Hubacek,[1] Jan-Patrick Scholz,[1,2] Natja Steiger,[1,2] Sebastian Bauer,[2] Klaus Thonke,[2] Yueliang Li,[3] Haoyuan Qi,[3] Johannes Biskupek,[3] and Ute Kaiser[3]

[1]Inst. of Optoelectronics, Ulm University, Germany, [2]Inst. Quantum Matter, Ulm University, Germany, [3]Centr. Fac. Electron Microsc., Ulm Univ., Germany

7C-2.2 14:30 - 14:45

Thermodynamic analysis of metalorganic vapor phase epitaxy of BN

Ryo Miura,[1] Kazuya Takada,[1] Keita Konishi,[1] Hisashi Murakami,[1,2] Akinori Koukitu,[1] and Yoshinao Kumagai[1,2]

[1]Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan, [2]Institute of Global Innovation Research, Tokyo University of Agriculture and Technology, Japan

7C-2.3 14:45 - 15:00

Flow modulation epitaxy of wafer scale hexagonal Boron Nitride

Dipankar Chugh,[1] Jennifer Wong-Leung,[1] Li Li,[2] Mykhaylo Lysevych,[2] Hoe Tan,[1] and Chennupati Jagadish[1,2]
[1]Department of Electronic Materials Engineering, Research School of Physics and Engineering, The Australian National University, Australia, [2]Australian National Fabrication Facility, Research School of Physics and Engineering, The Australian National University, Australia

7C-2.4 15:00 - 15:15

Wafer-scale MOVPE growth and characterization of highly ordered h-BN on patterned sapphire substrates.

Suresh Sundaram,[1] Xin Li,[1] Saiful Alam,[1,2] Yacine Halfaya,[1] Gilles Patriarche,[3] and Abdallah Ougazzaden[1,2]
[1]Georgia Tech Lorraine, UMI 2958, Georgia Tech - CNRS, 57070 Metz, , France, [2]School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, 30332, , United States of America, [3]Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, C2N - Site de Marcoussis, route de Nozay, F-91460, Marcoussis,, France

7C-2.5 15:15 - 15:30

Revealing Microstructure and Band Offsets of BAlN/AlGaN Heterostructures

Haiding Sun,[1] Kuang-Hui Li,[1] Young Jea Park,[2] Theeradetch Detchprohm,[2] Russell D. Dupuis,[2] and Xiaohang Li[1]
[1]King Abdullah University of Science and Technology (KAUST), Advanced Semiconductor Laboratory, Thuwal, 23955-6900, Saudi Arabia, [2]Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, United States of America

7C-3 Characterization

Room 3&4 14:00-15:30

7C-3.1 14:00 - 14:15

Curvature evolution of 200 mm diameter GaN-on-insulator wafer during substrate and buffer removal

Li Zhang,[1] Kwang Hong Lee,[1] Kenneth E. Lee,[1] Chuan Seng Tan,[1,2] Soo Jin Chua,[1,3] and Eugene A. Fitzgerald[1,4]
[1] Low Energy Electronic Systems, Singapore-MIT Alliance for Research and Technology, Singapore, [2]School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore, [3]Department of Electrical and Computer Engineering, National University of Singapore , Singapore, [4]Department of Materials Science and Engineering, Massachusetts Institute of Technology, United States of America

7C-3.2 14:15 - 14:30

Atomically-resolved composition and strain mappings HAADF-STEM and their applications to MOCVD

Konstantinos Pantzas and Gilles Patriarche
Center for Nanoscience and Nanotechnology, CNRS, Univ. Paris-Sud, Université Paris Saclay, France

7C-3.3 14:30 - 14:45

Morphology and parasitic defect luminescence suppression in AlGaN-based deep-UV light-emitting diode epitaxy

Chia-Yen Huang,[1] Tsung-Yen Liu,[2] Kai-Hsiang Chang,[1] Tsu-Ing Tai,[1] Ray-Ming Lin,[3] and Hao-Chung Kuo[1]

[1]Department of Photonics and Institute of Electro-Optical Engineering, National Chiao-Tung University, Taiwan, [2]Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan, [3]Department of Electronic Engineering and Institute of Electronics Engineering, Chang Gung University, Taiwan

7C-3.4 14:45 - 15:00

Slow carrier recombination in a GaN epilayer grown on a GaN substrate

Takato Asada,[1] Kenji Ito,[2] Kazuyoshi Tomita,[2] Tetsuo Narita,[2] Tetsu Kachi,[3] and Masashi Kato[1,3]

[1]Nagoya Inst. of Tech., Japan, [2]Toyota Central R&D Labs., Japan, [3]Nagoya Univ., Japan

7C-3.5 15:00 - 15:15

Influence of Self Absorption in Two-Photon-Excitation Photoluminescence of GaN

Tomoyuki Tanikawa,[1] Tatsuya Fujita,[1] Kazunobu Kojima,[2] Shigefusa F. Chichibu,[2] and Takashi Matsuoka[1]

[1]Institute for Materials Research, Tohoku University, Japan, [2]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan

7C-3.6 15:15 - 15:30

Magnetization Characterization of Two MnAs Nanoclusters at Close Range in MnAs/InAs Heterojunction Nanowires

Ryutaro Kodaira, Ryoma Horiguchi, and Shinjiro Hara

Research Center for Integrated Quantum Electronics, Hokkaido University, Japan

P2 Poster Session 2 Reception Hall 15:30-17:00

P2-1

Metal organic chemical vapor deposition of AlN on graphene: insights from density-functional ab initio molecular dynamics

Davide G. Sangiovanni,[1,2] Gueorgui K. Gueorguiev,[2] and Anelia Kakanakova-Gueorguieva[2]

[1] ICAMS, Ruhr-Universitat Bochum, Germany, [2]Department of Physics, Chemistry, and Biology (IFM) Linkoping University, Sweden

P2-2

Quantum chemical study on gas reaction path in AlN MOVPE growth

Lian Zhang, Hong Zhang, and Ran Zuo
School of Energy and Power, Jiangsu University, China

P2-3

Absolute surface energies of semipolar planes of AlN during metalorganic vapor phase epitaxy growth

Yuki Seta, Toru Akiyama, Abdul Muizz Pradipto, Kohji Nkamura, and Tomonori Ito
Department of Physics Engineering, Mie University, Japan

P2-4

Growth rate of GaN as a function of substrate miscut and temperature

Marcin Sarzynski,[1,2] Robert Czernecki,[1,2] Mike Leszczynski,[1,2] and Tadek Suski[1]
[1]Institute of High Pressure Physics PAS, Poland, [2]TopGaN Ltd., Poland

P2-5

High performance D-mode and E-mode AlGaN channel high electron mobility transistors

Ming Xiao, Jincheng Zhang, Xiaoling Duan, Weihang Zhang, and Yue Hao
Xidian University, China

P2-6

MOVPE van der Waals epitaxial growth of AlGaN/AlGaN MQW structures emitting at 292 nm on large scale 2D h-BN buffered sapphire substrates.

Suresh Sundaram,[1] Xin Li,[1] Saiful Alam,[1,2] Taha Ayari,[1,2] Yacine Halfaya,[1] Gilles Patriarche,[3] Paul L. Voss,[1,2] Jean Paul Salvestrini,[1,2] and Abdallah Ougazzaden[1,2]
[1]Georgia Tech Lorraine, UMI 2958, Georgia Tech - CNRS, 57070 Metz, , France, [2]School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, 30332, , United States of America, [3]Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, C2N - Site de Marcoussis, route de Nozay, F-91460, Marcoussis, , France

P2-7

Qualitative evaluation of annealed sputter-deposited AlN film using X-ray diffraction reciprocal space maps

Shuichi Tanaka,[1] Kanako Shojiki,[1] Yuta Yamaki,[1] Yusuke Hayashi,[2] Hideto Miyake,[1,2] and Kazumasa Hiramatsu[1]
[1]Graduate School of Engineering, Japan, [2]Graduate School of Regional Innovation Studies, Japan

P2-8

Evaluation of cubic phase formation in wurtzite type BGaN by MOVPE

Kazushi Ebara,[1] Ken Mochizuki,[1] Yoku Inoue,[1] Toru Aoki,[2] Kazunobu Kojima,[3] Shigefusa F. Chichibu,[3,4] and Takayuki Nakano[1]

[1]Department of Electronics and Materials Science, Shizuoka University, Japan, [2]Research Institute of Electronics, Shizuoka University, Japan, [3]Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan, [4]Institute of Materials and Systems for Sustainability, Nagoya University, Japan

P2-9

High quality GaN grown on (1 0 0) Ga_2O_3 by facet controlled MOVPE

Emroj Hossain, Azizur A. Rahman, Mahesh Gokhale, Ruta Kulkarni, Rajib Mondal, Arumugum Thamizhavel, and Arnab Bhattacharya

Department of Condensed Matter Physics and Materials Science (CMPMS), Tata Institute of Fundamental Research, India

P2-10

The impact of the channel layer thickness in quaternary barrier DH-HEMTs: from MOVPE growth to RF power performance

Piero Gamarra,[1] Anna Malmros,[2] Cédric Lacam,[1] NIklas Rorsman,[2] and Sylvain-Laurent Delage[1]

[1]III-V Lab, France, [2]Chalmers University of Technology, Sweden

P2-11

High-quality AlN grown on nano-patterned sapphire or AlN templates prepared by nano-imprint lithography

Nan Xie, Fujun Xu, Lisheng Zhang, Mingxing Wang, Yuanhao Sun, Baiyin Liu, and Bo Shen

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

P2-12

Growth and characterization of AlGaN films by metal organic chemical vapor deposition for high voltage electronic devices application

JunShuai Xue, JinCheng Zhang, and Yue Hao

Key Laboratory of Wide Bandgap Semiconductor Materials and Devices, School of Microelectronics, Xidian University, China

P2-13

Growth of InGaN/GaN quantum well structures on N-face GaN and the fabrication of spatially separated light emitters for the improvement of the internal quantum efficiency

Uwe Rossow,[1] Fedor Alexej Ketzer,[1] Angelina Vogt,[2] Tobias Voss,[2] Hendrik Spende,[2] Andreas Waag,[2] Philipp Horenburg,[1] Heiko Bremers,[1] and Andreas Hangleiter[1]

[1]Institut f. Angewandte Physik, TU Braunschweig, 38106 Braunschweig, Germany, [2]Institut f. Halbleitertechnik, TU Braunschweig, 38106 Braunschweig, Germany

P2-14

High Breakdown Voltage AlGaN/GaN HEMT with AlN Back Barrier on Sapphire Substrate

Bo Wang, Yulong Fang, Jiayun Yin, Nan Gao, Yanmin Guo, Zhirong Zhang, Jia Li, Weili Lu, and Zhihong Feng
National Key Laboratory of ASIC, Hebei Semiconductor Research Institute, China

P2-15

Characterization of strain relaxation behavior of annealed sputter-deposited AlN films on SiC substrates

Kenjiro Uesugi,[1] Yusuke Hayashi,[2] Kanako Shojiki,[3] Shiyu Xiao,[2] Harumasa Yoshida,[1] and Hideto Miyake[2,3]
[1]Organization for the Promotion of Regional Innovation, Mie University, Japan, [2]Graduate School of Regional Innovation Studies, Mie University, Japan, [3]Graduate School of Engineering, Mie University, Japan

P2-16

MOCVD growth and device performances of semi-polar channel AlGaN/GaN HEMTs

Xiaoling Duan, Jincheng Zhang, Ming Xiao, Weihang Zhang, and Yue Hao
Xidian University, China

P2-17

Optimization of GaN-based gas and bio sensor structures

Martin Franz Schneidereit,[1] Paulette Iskander,[1] Jassim Shahbaz,[1] Murat Cankaya,[1] Nilanjon Naskar,[2] Sabyasachi Chakrabortty,[2] Florian Huber,[3] Klaus Thonke,[3] Tanja Weil,[2] and Ferdinand Scholz[1]
[1]Institute of Optoelectronics, Ulm University, Germany, [2]Institute of Organic Chemistry III, Ulm University, Germany, [3]Institute of Quantum Matter / Semiconductor Physics Group, Ulm University, Germany

P2-18

Homogenization and Decomposition of InGaN Quantum Wells at Elevated Temperatures

Ewa Grzanka,[1,2] Szymon Grzanka,[1,2] Julita Smalc-Koziorowska,[1,2] Robert Czernecki,[1,2] Slawomir Kret,[3] Artur Lachowski,[1,4] Tadeusz Suski,[1] Piotr Perlin,[1,2] Dario Schiavon,[1,2] and Mike Leszczynski[1,2]
[1]Institute of High Pressure Physics, Polish Academy of Sciences, Poland, [2]TopGaN Ltd., Poland, [3]Institute of Physics, Polish Academy of Sciences, Poland, [4]Department of Materials Science and Engineering, , Poland

P2-19

GaN Growth on Ceramics by Low Temperature RP-MOCVD

Robert Dubreuil, Jonny Tot, and Dimiter Alexandrov
Lakehead University, Canada

P2-20

MOVPE grown GaN on large area CVD WS_2 films

Emroj Hossain, Azizur A. Rahman, Amit P. Shah, Bagyshri A. Chalke, and Arnab Bhattacharya
Department of Condensed Matter Physics and Materials Science (CMPMS), Tata Institute of Fundamental Research, India

P2-21

MetalOrganic Vapour Phase Epitaxy of GaN-based structures grown on Si(115) for piezo-electric component-separated HEMT

Tomasz Szymanski,[1] Mateusz Wosko,[1] Bartlomiej Paszkiewicz,[1] Bogdan Paszkiewicz,[1] Iwona Sankowska,[2] and Regina Paszkiewicz[1]
[1]Faculty of Microsystem Electronics and Photonic, Wroclaw University of Science and Technology, Poland, [2]The Institute of Electron Technology, Poland

P2-22

Growth of the vertical Schottky' and p-n diodes on bulk GaN substrates for power electronic applications

Pawel Prystawko,[1,2] Piotr Kruszewski,[1,2] and Mikolaj Grabowski[1]
[1]Institute of High Pressure Physics, PAS, "Unipress", Poland, [2]TopGaN Ltd, Poland

P2-23

InGaN-based light-emitting diodes grown on concave nanopattern sapphire substrate

Wen-Cheng Ke and Chih-Yung Chiang
Dept. of Materials Science and Engineering, National Taiwan University of Science and Technology , Taiwan

P2-24

Growth of thick (-600 nm) $Al_{0.82}In_{0.18}N$ by temperature-modulated epitaxy for realization of GaN-based photonic crystal slab nanocavities

Tomohiro Inaba, Jun Tatebayashi, and Yasufumi Fujiwara
Osaka university, Japan

P2-25

AlGaN-based deep UV LEDs grown on sputtered and high temperature annealed AlN/sapphire

Norman Susilo,[1] Sylvia Hagedorn,[2] Dominik Jaeger,[3] Hideto Miyake,[4] Ute Zeimer,[2] Christoph Reich,[1] Bettina Neuschulz,[1] Luca Sulmoni,[1] Martin Guttmann,[1] Frank Mehnke,[1] Christian Kuhn,[1] Tim Wernicke,[1] Markus Weyers,[2] and Michael Kneissl[1,2]
[1]Technische Universität Berlin, Institute of Solid State Physics, Germany, [2]Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Germany, [3]Evatec AG, Switzerland, [4]Department of Electrical and Electronic Engineering, Mie University, Japan

P2-26

Strong suppression of In desorption from InGaN QW by a barrier growth

Alice Hospodková, Tomas Hubacek, Markéta Zíková, Jiri Oswald, Filip Dominec, Jiri Pangrác, Karla Kuldová, and František Hájek

Institute of Physics, CAS, v.v.i., Cukrovarnická 10, Prague 6, Czech Republic

P2-27

Effects of V/III-Modulated Superlattice Structure on Improvement of AlN Templates on Nano-Patterned Sapphire Substrates by MOVPE

Chi-Tsung Tsai, Tzu-Yu Wang, Ku-Yen Lin, and Dong-Sing Wuu

Department of Materials Science & Engineering, National Chung Hsing University, Taiwan

P2-28

Investigation of Zn diffusion profiles in InGaAsP and InGaAlAs for precise control of capacitance in high-speed optical communication devices

Takeshi Kitatani, Kaoru Okamoto, Kenji Uchida, and Shigehisa Tanaka

Oclaro Japan, Inc., Japan

P2-29

Influence of nitrogen content and RTA process on dark current and Schottky barrier height of GaAsN MSM photodetectors made by AP-MOVPE

Beata Sciana,[1] Wojciech Dawidowski,[1] Iwona Zborowska-Lindert,[1] Katarzyna Bielak,[1] Mikolaj Badura,[1] Marek Tlaczala,[1] and Lubica Stuchlikova[2]

[1]Faculty of Microsystem Electronics and Photonics, Wroclaw University of Science and Technology, Poland, [2]Institute of Electronics and Photonics, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Slovakia

P2-30

MOVPE Growth of AlGaInP Distributed Bragg Reflector on GaAs (311)B for Resonant Cavity Photovoltaic Receiver for Laser Light

Masakazu Arai, Shinnosuke Tsuboyama, Kensuke Hiwada, Masaya Kamikado, Ryosuke Wakaki, and Koji Maeda

University of Miyazaki, Japan

P2-31

Elaboration of MOVPE grown claddings deposited in wide range of temperatures for InGaAs/InAlAs/InP quantum cascade laser

Mikolaj Badura,[1] Beata Sciana,[1] Damian Radziewicz,[1] Katarzyna Bielak,[1] Wojciech Dawidowski,[1] Lukasz Kosior,[1] Piotr Gutowski,[2] Dorota Pierscinska,[2] Kamil Pierscinski,[2] Maciej Bugajski,[2] and Marek Tlaczala[1]

[1]Faculty of Microsystem Electronics and Photonics, Wroclaw Univeristy of Science and Technology, Poland, [2]Institute of Electron Technology, Poland

P2-32

Regrown Source / Drain in InGaAs Multi-Gate MOSFET

Yasuyuki Miyamoto,[1,2] Toru Kanazawa,[1,2] Nobukazu Kise,[1] Haruki Kinoshita,[2] and Kazuto Ohsawa[1]

[1]Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Japan, [2] Department of Physical Electronics, Tokyo Institute of Technology, Japan

P2-33

Lasing characteristics of GaInAsP/InP ridge waveguide laser diode grown on InP/Si substrate

Kazuki Uchida, Naoki Kamada, Yuya Onuki, Xu Han, Gandhi Kallarasan Periyanayagam, Hirokazu Sugiyama, Masaki Aikawa, Natsuki Hayasaka, and Kazuhiko Shimomura

Dept. Engineering and Applied Sciences, Sophia University, Japan

P2-34

Semiconductor membrane laser concept (MECSEL) applicable to various materials towards new emission wavelengths

Roman Bek,[1] Hermann Kahle,[2] Cherry May Mateo,[3] Uwe Brauch,[3] Michael Jetter,[1] Thomas Graf,[3] and Peter Michler[1]

[1]Institut für Halbleiteroptik und Funktionelle Grenzflächen, Center for Integrated Quantum Science and Technology (IQST) and research center SCoPE, University of Stuttgart, Germany, [2]Laboratory of Photonics, Optoelectronics Research Centre (ORC) Tampere University of Technology, Finland, [3]Institut für Strahlwerkzeuge, research center SCoPE, University of Stuttgart, Germany

P2-35

Thermodynamic Stability Analysis of Bi-containing III-V Quaternary Alloys Using the Delta Lattice Parameter Model

Yingxin Guan,[1] Guangfu Luo,[1] Susan E. Babcock,[1] Dane Morgan,[1] and Thomas F. Kuech[2]

[1]Department of Materials Science and Engineering, University of Wisconsin-Madison, United States of America, [2]Department of Chemical and Biological Engineering, University of Wisconsin-Madison, United States of America

P2-36

Growth of SiGeSn Alloys Using Plasma Enhanced Chemical Vapor Deposition (CVD) Method

Arul Chakkaravarthi Arjunan,[1] Jignesh Vanjaria,[2] Thomas Salagaj,[1] Aaron Feldman,[1] Nick Sbrockey,[1] Hongbin Yu,[2] Sergey Maximenko,[3] and Gary Tompa[1]

[1]Structured Materials Industries, Piscataway, New Jersey, USA, United States of America, [2]School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, USA, United States of America, [3]Naval Research Laboratory, Washington, DC, 20375, USA, United States of America

P2-37

MOVPE growth of ZnMgSeTe alloys on (100) GaAs substrates

Katsuhiko Saito,[1,2] Yusei Matsuo,[2] Akihiro Tomota,[2] Tatsuki Hamada,[2] Yuken Oishi,[2] Tooru Tanaka,[2] and Qixin Guo[1,2]

[1]Synchrotron Light Application Center, Saga University, Japan, [2]Department of Electrical and Electronic Engineering, Saga University, Japan

P2-38

Shallow and heavy doping of Ge by MOVPE

Katsuhiro Tomioka, Akinobu Yoshida, and Junichi Motohisa

Graduate School of Information Science and Technology, and Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Japan

P2-39

GeSn quantum dots grown using isobutylgermane and tin chloride

Konstantinos Pantzas, Grégoire Beaudoin, Gilles Patriarche, Moustafa El Kurdi, Phillipe Boucaud, and Isabelle Sagnes

Center for Nanoscience and Nanotechnology, CNRS, Univ. Paris-Sud, Université Paris Saclay, France

P2-40

Temperature-dependent Ga_2O_3 epitaxial growth on C-plane Sapphire by MOVPE

Kuang-Hui Li,[1] Haiding Sun,[1] Carlos Torres-Castanedo,[1] Che-Hao Liao,[1] Hsin-Hung Yao,[1] Serdal Okur,[2] Tom Salagaj,[2] Aaron Feldman,[2] Gary Tompa,[1,2] and Xiaohang Li[1]

[1]Computer, Electrical and Mathematical Science & Engineering Division, King Abdullah University of Sceince and Technology, Thuwal, Makkah, Saudi Arabia, [2]Structured Materials Industries, Piscataway, New Jersey, United States of America

P2-42

Epitaxial growth of NiO thin films on α-Al_2O_3 substrates by using mist CVD method

Takumi Ikenoue, Masao Miyake, and Tetsuji Hirato

Graduate School of Energy Science, Kyoto University, Japan

P2-43

Thermodynamics on $(Al_xGa_{1-x})_2O_3$ growth by ozone molecular beam epitaxy

Natsuki Ueda, Yohei Sawada, Keita Konishi, and Yoshinao Kumagai
Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Japan

P2-44

Growth of wafer-scale two-dimensional MoS_2 using metal organic chemical vapor deposition

Taemyung Kwak, Juhun Lee, Byeongchan So, and Okhyun Nam
Department of Nano-Optical Engineering, Korea Polytechnic University, Republic of Korea

P2-45

Metalorganic chemical vapor deposition of MoS_2 and WS_2 from bis(tert-butylimido)-bis(dialkylamido) compounds in a single-wafer impinging flow reactor

Berc Kalanyan,[1] James E. Maslar,[1] William A. Kimes,[1] Brent A. Sperling,[1] and Ravindra Kanjolia[2]
[1]National Institute of Standards and Technology (NIST), United States of America, [2]EMD Performance Materials, United States of America

P2-46

Comprehensive MOVPE growth and characterization study on GaAs/Ge heterostructures

Ilkay Demir,[1] Ismail Altuntas,[1] Baris Bulut,[2] Yusuf Kocak,[3] Ahmet Emre Kasapoglu,[3] Aliye Alev Kizilbulut,[2] Emre Gur,[3] and Sezai Elagoz[1]
[1]Department of Nanotechnology Engineering, Nanophotonics Research and Application Center, Cumhuriyet University, Turkey, [2]Optoelectronic R&D Center, Ermaksan, Turkey, [3]East Anatolian High Technological Application and Research Center, Department of Physics, Ataturk University, Turkey

P2-47

InGaAs/GaAs dislocation filter layers epitaxially grown on 200 mm Ge-on-Si wafer

Bing Wang,[1] Kwang Hong Lee,[1] Yue Wang,[1] Kenneth Eng Kian Lee,[1] Eugene A. Fitzgerald,[2] and Jurgen Michel[3]
[1]Low Energy Electronic Systems IRG (LEES), Singapore-MIT Alliance for Research and Technology, Singapore, [2]Department of Materials Science and Engineering, Massachusetts Institute of Technology, United States of America, [3]Microphotonics Centre, Massachusetts Institute of Technology, United States of America

P2-48

Growth of Indium Gallium Arsenide on Indium Phosphide Buffered Silicon Substrate by MOCVD Technique

Sisir Chowdhury and P. Banerji
Materials Science Centre, IIT Kharagpur, India

P2-49

Effect of Al content of AlGaN interlayer for strain of GaN layer on Si

Takuya Nakahara,[1] Momoko Deura,[1] Takeshi Momose,[1] Yoshiaki Nakano,[1] Masakazu Sugiyama,[2] and Yukihiro Shimogaki[1]
[1] School of Engineering, the University of Tokyo, Japan, [2]Research Center for Advanced Science and Technology, the University of Tokyo, Japan

P2-50

Incorporation of Sb into MOCVD-grown InAs/GaAs submonolayer stacks

David Quandt,[1] Jürgen Bläsing,[2] and André Strittmatter[1,2]
[1]Institute of Solid State Physics, Technical University of Berlin, Germany, [2]Otto-von-Guericke University Magdeburg, Germany

P2-51

ZnMgO Nanowire-based UV Photodiode

Serdal Okur,[1] Nick Sbrockey,[1] Tom Salagaj,[1] Jignesh Vanjaria,[2] Ebraheem Azhar,[2] Hongbin Yu,[2] and Gary Tompa[1]
[1]Structured Materials Industries, Inc., United States of America, [2]Arizona State University, United States of America

P2-52

MOVPE growth and characterization of wurtzite phase InAs nanoneedles on Si (111)

Mahesh Gokhale, Carina Maliakkal, Emroj Hossain, A, Azizur Rahman, Bhagyashree Chalke, Rudheer Bapat, Jayesh Parmar, and Arnab Bhattacharya
DCMP & MS, Tata Institute of Fundamental Research, Mumbai 400005, India

P2-53

Selective-area growth of pulse-doped InAs related nanowire-channels on Si

Hironori Gamo, Katsuhiro Tomioka, Akinobu Yoshida, and Junichi Motohisa
Graduate School of Information Science and Technology and Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Japan

P2-54

Formation and optical properties of Tm,Yb-codoped ZnO nanowires grown by sputtering-assisted metalorganic chemical vapor deposition

Genya Yoshii, Tokuhito Nakajima, Masao Mishina, Jun Tatebayashi, and Yasufumi Fujiwara
Osaka University, Japan

P2-55

Fabrication of submicron active-region-buried GaN hexagonal frustum structures by selective area growth for directional micro-LEDs

Naoto Kumagai,[1,2] Tokio Takahashi,[3] Hisashi Yamada,[1,3] Guangwei Cong,[2] Xue-lun Wang,[1,2] and Mitsuaki Shimizu[1,3]
[1]GaN-OIL, AIST, Japan, [2]ESPRIT, AIST, Japan, [3]AMRI, AIST, Japan

P2-56

Monolithic integration of immersed InP on Si

Dmitrii V. Viazmitinov, Lars H. Frandsen, Kresten Yvind, and Elizaveta Semenova
Department of Photonics Engineering, Technical University of Denmark, Denmark

P2-57

Influence of sacrificial layer structure on the undercut etching rate for nitride epitaxy transfer

Xi-Cheng Huang,[1] Yung-Hsiang Lin,[2] and Chia-Yen Huang[1]
[1]Department of Photonics and Institute of Electro-Optical Engineering, National Chiao-Tung University, Taiwan, [2]Research and Development Center, Epistar Corporation, Taiwan

P2-58

Three-dimensional numerical simulation of the slit injector effect on the GaN deposition rate and uniformity in the vertical rotating-disk MOCVD reactor

Chieh Hu Hu, Jyh-Chen Chen, and Wei-Jie Lin
Department of Mechanical Engineering, National Central University, Taiwan

P2-59

Ammonia Decomposition and Reaction by High-Resolution Mass Spectrometry for Group III-Nitrides Epitaxial Growth

Zheng Ye,[1] Shugo Nitta,[2] Kentaro Nagamatsu,[2] Naoki Fujimoto,[2] Maki Kushimoto,[1] Manato Deki,[2] Atsushi Tanaka,[2] Yoshio Honda,[2] Markus Pristovsek,[2] and Hiroshi Amano[2,3,4]
[1]Department of Electrical Engineering and Computer Science, Nagoya University, Japan, [2]Institute of Materials and Systems for Sustainability, Nagoya University, Japan, [3]Akasaki Research Center, Nagoya University, Japan, [4]Venture Business Laboratory, Nagoya University, Japan

P2-60

Suppressed contamination of InGaN/GaN MQW region by growing the buffer at low temperature

Alice Hospodkova, Filip Dominec, Tomas Hubacek, Marketa Zikova, Jiri Oswald, Jiri Pangrac, Karla Kuldova, Frantisek Hajek, and Eduard Hulicius
Institute of Physics, Czech Academy of Sciences, v.v.i., Czech Republic

P2-61

Current transport mechanism in AP-MOVPE grown GaAsN p-i-n solar cell

Wojciech Dawidowski,[1] Beata Sciana,[1] Iwona Zborowska-Lindert,[1] Miroslav Mikolasek,[2] Arpad Kosa,[2] Katarzyna Bielak,[1] Mikolaj Badura,[1] Lubica Stuchlikova,[2] Jaroslav Kovac,[2] and Marek Tlaczala[1]

[1]Faculty of Microsystem Electronics and Photonics, Wroclaw University of Science and Technology, Poland, [2]Institute of Electronics and Photonics, Faculty of Electrical Engineering and Information Technology, Slovak University of Technology, Slovakia

P2-62

Multidimensional high-k oxide nanolayers by ALD for medical applications

Michal M. Godlewski,[1,2] Anna Slonska-Zielonka,[1,2] Bartlomiej S. Witkowski,[3] Rafal Pietruszka,[3] Joanna Cymerys,[4] Zdzislaw Gajewski,[2] and Marek Godlewski[3]

[1]Department of Physiological Sciences, Faculty of Veterinary Medicine, WULS-SGGW, Poland, [2]Veterinary Research Centre, Centre for Biomedical Research, Department of Large Animals Diseases with Clinic, Faculty of Veterinary Medicine, WULS-SGGW, Poland, [3]Institute of Physics, Polish Academy of Sciences, Poland, [4]Department of Preclinical Sciences, Faculty of Veterinary Medicine, WULS-SGGW, Poland

P2-63 (Late News)

Structural disorder and in-gap states of Mg-implanted GaN films evaluated by photothermal deflection spectroscopy

Masatomo Sumiya,[1] Kiyotaka Fukuda,[1,2] Shinya Takashima,[3] Tomohiro Yamaguchi,[2] Takeyoshi Onuma,[2] Tohru Honda,[2] and Akira Uedono[4]

[1]National Institute for Materials Science, Japan, [2]Kougakuin University., Japan, [3]Fuji Electric Co., Ltd., Japan, [4]University of Tsukuba, Japan

P2-64 (Late News)

Atomic step-flow epitaxy of low defect InGaAs islands on Si(111) by micro-channel selective area MOVPE

Yufeng Fu,[1] Nobuyuki Otake,[1] Yoshihide Tachino,[1] Tohma Watanabe,[2] and Masakazu Sugiyama[2]

[1]DENSO CORPORATION, Japan, [2]The University of Tokyo, Japan

P2-65 (Late News)

GaN seed layers grown by MOVPE reactor for the purpose of GaN self-separation from sapphire substrate in HVPE reactor

Sepideh Faraji,[1] Christopher Schröter,[2] Elke Meissner,[1,2] and Jochen Friedrich[1,2]

[1]Fraunhofer Institute for Integrated Systems and Device Technology (IISB), Department Materials, Germany, [2]Fraunhofer Institute for Technology of Semiconductor Materials (THM), Germany

Banquet	18:30 - 21:00

June 8th (Friday)

8A-1 Nitride LEDs

Noh Theatre 9:00-11:00

8A-1.1 (Invited) 9:00 - 9:30

MOCVD growth and LED applications of GaN-based materials on Ga_2O_3 single crystal substrates

Akito Kuramata,[1,2] Kazuyuki Iizuka,[2] Yoshihiro Yamashita,[2] Yoshikatsu Morishima,[2] and Shigenobu Yamakoshi[1,2]

[1]Novel Crystal Technology, Inc., Japan, [2]Tamura Corporation, Japan

8A-1.2 9:30 - 9:45

4-inch stacking-fault-free semipolar GaN as a pathway for the commercialization of semipolar photonics

Jie Song[1,2] and Jung Han[1]

[1] Department of Electrical Engineering, Yale University, United States of America, [2]Saphlux Inc, United States of America

8A-1.3 9:45 - 10:00

MOCVD growth of high-quality GaN on Si(110) substrates using ultra-thin AlN/GaN superlattice buffer layer and its LED demonstration

Xuqiang Shen,[1] Tokio Takahashi,[1] Toshihide Ide,[1,2] Xuelun Wang,[2] and Mitsuaki Shimizu[2]

[1]Advanced Power Electronics Research Center (ADPERC), National Institute of Advanced Industrial Science and Technology (AIST), Japan, [2]GaN Advanced Device Open Innovation Laboratory (GaN-OIL), National Institute of Advanced Industrial Science and Technology (AIST), Japan

8A-1.4 10:00 - 10:15

Temperature-dependent photoluminescence of green ($20\bar{2}1$) InGaN-based light-emitting diodes: insights into active region design for efficient device performance

Christopher D. Pynn,[1] David Hwang,[1] James S. Speck,[1] Shuji Nakamura,[1,2] and Steven P. DenBaars[1,2]

[1]Materials Department, University of California, Santa Barbara, United States of America, [2]Department of Electrical and Computer Engineering, University of California, Santa Barbara, United States of America

8A-1.5 10:15 - 10:30

Growth of GaInN yellow-green LEDs

Junya Yoshinaga,[1] Tatsuya Ichikawa,[1] Tetsuya Takeuchi,[1] Motoaki Iwaya,[1] Satoshi Kamiyama,[1] and Isamu Akasaki[1,2]

[1]Fac.Sci.&Eng., Meijo Univ., Japan, [2]Akasaki Research Center, Nagoya Univ. , Japan

8A-1.6 10:30 - 10:45

Improving emission intensity and efficiency of InGaN/InGaN multi-quantum-well emitting in cyan spectrum by growing on novel high quality "semi-bulk" InGaN buffer

Saiful Alam,[1,2,3] Suresh Sundaram,[2] Yacine Halfaya,[2] Jean-Paul Salvestrini,[1,2] Paul L. Voss,[1,2] and Abdallah Ougazzaden[1,2]
[1]School of ECE, Georgia Institute of Technology, United States of America, [2]UMI 2958, Georgia Tech-CNRS, France, [3]CEA-LETI, Minatec Campus, France

8A-1.7 10:45 - 11:00

Active region optimization for high performance long-wavelength c-plane III-Nitride Light-Emitting Diodes

Abdullah I. Alhassan,[1] Stacia keller,[2] Ahmed Alyamani,[3] Shuji Nakamura,[1,2] Steven P. DenBaars,[1,2] and James S. Speck[1]
[1]Materials Department, University of California Santa Barbara, United States of America, [2]Department of Electrical and Computer Engineering, University of California Santa Barbara, United States of America, [3]National Center for Nanotechnology, King Abdulaziz City for Science and Technology, Saudi Arabia

8A-2 III-V Nanowires

Room 1&2 9:00-11:00

8A-2.1 (Invited) 9:00 - 9:30

Efficient green emission from wurtzite $Al_xIn_{1-x}P$ nanowires

Luca Gagliano,[1] Marijn Kruijsse,[1] Joris Schefold,[2] Abderrazak Belabbes,[3] Marcel A. Verheijen,[1,4] Sophie Meuret,[2] Sebastian Koelling,[1] Albert Polman,[2] Friedrich Bechstedt,[3] Jos E.M. Haverkort,[1] and Erik P.A.M. Bakkers[1,5]
[1]Eindhoven University of Technology, Netherlands, [2]Center for Nanophotonics, AMOLF, Amsterdam, Netherlands, [3]Institut für Festkörpertheorie und -optik, Friedrich-Schiller-Universitat, Jena, Germany, [4]Philips Innovation Labs Eindhoven, Netherlands, [5]Kavli Institute of Nanoscience, Delft , Netherlands

8A-2.2 9:30 - 9:45

Characterization of GaAs-InGaP core-multishell nanowires on Si by selective-area MOVPE

Katsuhiro Tomioka and Junichi Motohisa
Graduate School of Information Science and Technology, and Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Japan

8A-2.3 9:45 - 10:00

Impact of Rotational Twin Boundaries and Lattice Mismatch on III-V Nanowire Growth

Matthias Steidl,[1] Christian Koppka,[1] Lars Winterfeld,[2] Katharina Peh,[1] Beatriz Galiana,[3] Oliver Supplie,[1] Peter Kleinschmidt,[1] Erich Runge,[2] and Thomas Hannappel[1]
[1]Department of Photovoltaics, Institute of Physics, TU Ilmenau, Germany, [2]Department of Theoretical Physics I, Institute of Physics, TU Ilmenau, Germany, [3]Physics Department, Universidad Carlos III de Madrid, Spain

8A-2.4 10:00 - 10:15

High temperature selective area MOVPE of GaAs nanowires using N_2 as carrier gas

Alok Rudra,[1] Dmitry Mikulik,[2] Pablo Romero Gomez,[2] Lucas Güniat,[2] Benjamin Dwir,[1] Anna Fontcuberta i Morral,[2] and Eli Kapon[1]

[1]Laboratory of Physics of Nanostructures, Institute of Physics, Ecole Polytechnique Fédérale de Lausanne, Switzerland, [2]Laboratory of Semiconductor Materials, Institute of Materials, Ecole Polytechnique Fédérale de Lausanne, Switzerland

8A-2.5 10:15 - 10:30

InAs(Sb)/GaSb core-shell nanowire arrays grown on Si substrates by metal-organic chemical vapor deposition

Tao Yang,[1,2] Xianghai Ji,[1,2] and Xiaoguang Yang[1,2]

[1]Key Laboratory of Semiconductor Materials Science, Beijing Key Laboratory of Low Dimensional Semiconductor Materials and Devices, Institute of Semiconductors, Chinese Academy of Sciences, China, [2]College of Materials Science and Opto-Electronic Technology, University of Chinese Academy of Sciences, China

8A-2.6 10:30 - 10:45

Fabrication of star shaped InP/GaInAs core-multi shell nanowires by self-catalytic VLS mode

Satoshi Yoshimura, Kohei Takano, Katsuaki Ishida, and Kazuhiko Shimomura

Department of Engineering and Applied Sciences, Sophia University, Japan

8A-2.7 10:45 - 11:00

Low-temperature growth of self-catalyzed rectangular InAs nanowires

Vladislav Khayrudinov,[1] Tuomas Haggren,[1] Veer Dhaka,[1] Hua Jiang,[2] Ali Shah,[1] Maria Kim,[1] and Harri Lipsanen[1]

[1]Department of Micro- and Nanosciences, Aalto University, Finland, [2]Department of Applied Physics, Aalto University, Finland

Break	11:00 - 11:30

8B-1 Plenary IV

Noh Theatre 11:30-12:45

8B-1.1 (Plenary) 11:30 - 12:15

Growth and Characterization of III-N Ultraviolet Vertical-Cavity Surface Emitting Lasers and Avalanche Photodiodes by MOCVD

Russell Dupuis,[1] Young Jae Park,[1] Mi-Hee Ji,[1] Yuh-Shiuan Liu,[1] Jeomon Kim,[1,5] Hoon Jeong,[1] Theeradetch Detchprohm,[1] Shyh-Chiang Shen,[1] Karan Mehta,[1] Paul Douglas Yoder,[1] Shuo Wang,[2] Shanthan Alugubelli,[2] Fernando Ponce,[2] Ashok Sood,[3] and Nibir Dhar[4]

[1]Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, United States of America, [2]Department of Physics and Astronomy, Arizona State University, United States of America, [3]Magnolia Optical Technologies, United States of America, [4]Night Vision Sensors and Electronic Division, United States of America, [5]Now with LG Electronics, Republic of Korea

8B-1.2 (2018 Harold M. Manasevit Young Investigator Award Winner's Talk) 12:15 - 12:45

Material, physics, device, and equipment research for emerging semiconductor technologies

Xiaohang Li

King Abdullah University of Science and Technology (KAUST), Saudi Arabia

Closing

Noh Theatre 12:45-13:00

ICMOVPE-XIX Author Index

— A —

Adachi, Y. P1-41
Ahmad, M.B. P1-37
Aihara, T. P1-62
Aikawa, M. 5C-3.3
Aikawa, M. P2-33
Akasaka, T. 5C-1.3
Akasaki, I. 4C-1.1
Akasaki, I. 4C-1.4
Akasaki, I. 5C-1.6
Akasaki, I. 7B-2.1
Akasaki, I. 8A-1.5
Akiyama, K. P1-36
Akiyama, T. P1-2
Akiyama, T. P2-3
Alam, S. 4B-3.3
Alam, S. 4D-1.4
Alam, S. 7C-2.4
Alam, S. 8A-1.6
Alam, S. P2-6
Albadri, A. 6A-1.3
Albraithen, H. 6A-1.3
Albrecht, M. 5C-2.2
Alcotte, R. 6A-2.2
Alema, F. 5C-2.4
Alexandrov, D. P2-19
Alhassan, A.I. 4C-1.3
Alhassan, A.I. 4C-1.5
Alhassan, A.I. 5C-1.7
Alhassan, A.I. 8A-1.7
Allerman, A.A. 4D-1.2
Almdal, K. 5B-3.4
Almogbel, A. 6A-1.3
Altuntas, I. P1-13
Altuntas, I. P2-46
Alugubelli, S. 8B-1.1
Alvarez, J. 4B-2.5
Alvarez, J. P1-28
Alyamani, A. 6A-1.3
Alyamani, A. 8A-1.7
Amano, H. 4A-1.1
Amano, H. 4C-1.2
Amano, H. 5C-1.5
Amano, H. 7B-2.3
Amano, H. 7C-1.4
Amano, H. 7C-1.6
Amano, H. P1-11
Amano, H. P2-59
Amemiya, T. 5C-3.4
Anda, Y. 5B-1.1
Andreson, M. 5B-3.5
Aoki, T. P2-8
Aoyama, T. P1-27
Arai, M. P1-32
Arai, M. P1-39
Arai, M. P2-30
Arai, S. 5C-3.4
Arjunan, A. P2-36
Armour, E. 5E-3.4
Armstrong, A.M. 4D-1.2
Arulkumaran, S. 5B-1.2
Asada, T. 7C-3.4
Asor, L. 5B-3.4
Avramescu, A. P1-52
Avrutin, V. P1-13
Ayari, T. 4B-3.3
Ayari, T. 4D-1.4
Ayari, T. P2-6
AYDINLI, A. P1-13
Azhar, E. P2-51

— B —

Babchenko, O. P1-9
Babcock, S.E. P2-35
Baca, A.G. 4D-1.2
Badura, M. P2-29
Badura, M. P2-31
Badura, M. P2-61
Bai, L. 5C-3.4
Baines, Y. 6B-1.6
Bakhtiary-Noodeh, M. 5B-2.4
Bakkers, E.P. 8A-2.1
Baldini, M. 5C-2.2
Banerji, P. P1-48
Banerji, P. P1-51
Banerji, P. P2-48
Banin, U. 5B-3.4
Bapat, R. P2-52
Baron, T. 6A-2.2
Bassani, F. 6A-2.2
Bauer, S. 7C-2.1
Bäumner, A. 5C-3.2
Bawedin, M. 6A-2.2
Beainy, G. 6A-2.2
Beaudoin, G. P1-33
Beaudoin, G. P2-39
Becerra, D.L. 7B-1.3
Bechstedt, F. 8A-2.1
Bek, R. P2-34
Belabbes, A. 8A-2.1
Ber, B. 7C-1.3
Berger, C. 5C-3.2
Berry, A. 5C-1.3
Beyer, A. 6B-2.5
Bezard, P. 6A-2.2
Bhat, A. P1-34
Bhattacharya, A. P2-20
Bhattacharya, A. P2-52
Bhattacharya, A. P2-9
Bielak, K. P2-29
Bielak, K. P2-31
Bielak, K. P2-61
Bilguun, D. P1-10
Bishop, C. 4D-1.4
Biskupek, J. 7C-2.1
Bläsing, J. P2-50
Bogdanov, M. 5C-2.4
Boucaud, P. P2-39
Boutry, H. 6A-2.2
Braive, R. P1-33
Brauch, U. P2-34
Breckenridge, M.H. 6B-1.1
Bremers, H. 4C-2.6
Bremers, H. P2-13
Brox, O. P1-55
Brückner, S. 7B-2.5
Brüggemann, A. 5C-3.2
Bugajski, M. P2-31
Bui, T. 4D-2.3
Bulut, B. P2-46

— C —

Cankaya, M. P2-17
Caroff, P. 4C-2.1
Castanedo, C. P1-64
CERBA, T. 6A-2.2
Cerutti, L. 6A-2.2
Chakrabortty, S. P2-17
Chalke, B. P2-52
Chalke, B.A. P2-20
Chan, P. 7B-1.3
Chang, C.-J. P1-15
Chang, K.-H. 7C-3.3
Chang, L. P1-38
Charles, M. 4D-1.6
Charles, M. 6B-1.6
Charles, M. 7B-2.2
Chen, C.-L. P1-26
Chen, H. P1-21
Chen, J. P1-59
Chen, J.-C. P2-58
Chen, J.-R. P1-15
Chen, W.-C. P1-47
Cheng, S.-Y. P1-56
Cheng, Y.-J. P1-56

Chevalier, X. 6A-2.2
Chiang, C.-Y. P2-23
Chiba, K. 4C-2.3
Chiba, K. 6A-2.5
Chichibu, S.F. 7C-3.5
Chichibu, S.F. P2-8
Chiu, K.-A. P1-38
Choi, U. P1-18
Chonan, H. P1-5
Choudhury, T.E. 4B-3.2
Chowdhury, S. P1-51
Chowdhury, S. P2-48
Chua, S. 6A-2.4
Chua, S. 7C-3.1
Chubarov, M. 4B-3.2
Chugh, D. 7C-2.3
Chung, B.-C. P1-26
Chung, T.-H. 5B-3.1
Ciostek, C. 5B-3.4
Cohen, D. 7B-1.3
Cohen, D.A. 5C-1.7
Collazo, R. 6B-1.1
Cong, G. P2-55
Corbett, B. 5C-3.5
Crawford, M.H. 4D-1.2
Cui, X. P1-34
Cymerys, J. P1-58
Cymerys, J. P2-62
Czernecki, R. 7B-1.2
Czernecki, R. 7C-1.6
Czernecki, R. P1-6
Czernecki, R. P2-18
Czernecki, R. P2-4

— D —

Dang, G.T. 5C-2.6
Dauelsberg, M. 5E-3.3
David, S. 6A-2.2
Dawidowski, W. P2-29
Dawidowski, W. P2-31
Dawidowski, W. P2-61
Decobert, J. 4B-2.5
Decobert, J. P1-28
Deki, M. 5C-1.5
Deki, M. 7B-2.3
Deki, M. P2-59
Delage, S.-L. P2-10
Delgoffe, A. 5B-3.2
Della Casa, P. P1-55
Demir, I. P2-46
DenBaars, S. 6A-1.3
DenBaars, S. 7B-1.3
DenBaars, S.P. 4C-1.3
DenBaars, S.P. 4C-1.5
DenBaars, S.P. 5C-1.7
DenBaars, S.P. 8A-1.4
DenBaars, S.P. 8A-1.7
Deshpande, M. 5E-3.4
Detchprohm, T. 5B-2.4
Detchprohm, T. 6B-1.2
Detchprohm, T. 7C-2.5
Detchprohm, T. 8B-1.1
Deura, M. 4B-1.3
Deura, M. P2-49
Dhaka, V. 8A-2.7
Dhar, N. 8B-1.1
Dickerson, J.R. 4D-1.2
Dimroth, F. 7B-3.1
Ding, K. P1-13
Dinh, D.V. 7C-1.4
Dinh, D.V. P1-11
Dobrich, A. 7B-2.5
Dominec, F. P2-26
Dominec, F. P2-60
Dong, X. 6B-2.2
Douglas, E.A. 4D-1.2
Duan, X. P2-16
Duan, X. P2-5
Dubreuil, R. P2-19
Dupuis, R. 5B-2.4
Dupuis, R. 8B-1.1
Dupuis, R.D. 6B-1.2
Dupuis, R.D. 7C-2.5
Dwir, B. 5B-3.2
Dwir, B. 8A-2.4

— E —

Ebara, K. P2-8
Egawa, T. P1-10
Egawa, T. P1-21
Egawa, T. P1-24
Egawa, T. P1-7
Egawa, T. P1-8
Ekawa, M. 5C-3.1
Ekielski, M. P1-63
El Gmili, Y. 4D-1.4
El Huni, W. 4B-3.3
El Kurdi, M. P2-39
Elagoz, S. P2-46
Elçi, M. P1-13
Elias, P. P1-53
Elleuch, O. P1-34
Elleuch, O. P1-61
Eustache, E. 6A-2.2

— F —

Fang, Y. P2-14
Faraji, S. P2-65
Farin, P. 6B-2.5
Feldman, A. 7B-3.3
Feldman, A. P2-36
Feldman, A. P2-40
Feng, Y. 4B-1.2
Feng, Z. P2-14
Feuillet, G. 4D-1.6
Fiedler, A. 5C-2.2
Fiedler, A. 5C-2.5
Fitzgerald, E. 7C-3.1
Fitzgerald, E.A. 6A-2.3
Fitzgerald, E.A. 6A-2.4
Fitzgerald, E.A. P2-47
Fontcuberta i Morral, A. 8A-2.4
Forman, C.A. 5C-1.7
Fragkos, I. 5C-1.4
Frandsen, L.H. P2-56
Friedrich, J. P2-65
Fu, Y. P2-64
Fuchs, C. 5C-3.2
Fuji, R. 4C-1.6
Fuji, R. 7B-1.4
Fuji, R. 7C-1.1
Fujikawa, S. P1-23
Fujikura, H. 4D-1.1
Fujimoto, N. P2-59
Fujimoto, S. 7C-1.5
Fujisawa, T. P1-39
Fujishiro, H. P1-23
Fujita, S. 5C-2.1
Fujita, T. 7C-3.5
Fujita, Y. P1-37
Fujiwara, Y. 4C-1.6
Fujiwara, Y. 7B-1.4
Fujiwara, Y. 7C-1.1
Fujiwara, Y. P1-32
Fujiwara, Y. P1-39
Fujiwara, Y. P2-24
Fujiwara, Y. P2-54
Fukuda, K. P2-63
Funakubo, H. P1-36
Funato, M. 4C-2.5
Funato, M. 6B-1.5

— G —

Gagliano, L. 8A-2.1
Gajewski, Z. P2-62
Gajula, D. 5C-2.5
Gajula, D. P1-42
Galazka, Z. 5C-2.2
Galazka, Z. 5C-2.5
Galiana, B. 8A-2.3
Galyukov, A. 5C-2.4
Gamarra, P. P2-10
Gamo, H. P2-53
Gao, N. P2-14
Gao, Q. 4C-2.1
Garg, S. P1-45

Gautier, S. 4B-3.3
Gautier, S. 4D-1.4
Gheshlaghi, N. P1-13
Gieraltowska, S. P1-58
Gocalinska, A. 5B-3.1
Gocalinska, A. 5C-3.5
Godlewski, M. P1-58
Godlewski, M. P2-62
Godlewski, M.M. P1-58
Godlewski, M.M. P2-62
Gokhale, M. P2-52
Gokhale, M. P2-9
Gomez, P.R. 8A-2.4
Gong, X. 6A-2.4
Gopalan, P. 5B-3.3
Goralczyk, M. P1-63
Goswani, A. 4C-2.2
Goto, H. 5B-2.2
Goto, H. 6A-1.1
Goto, N. 4C-1.4
Grabowski, M. P2-22
Graf, T. P2-34
Grundmann, A. 4B-3.4
Grzanka, E. 7B-1.2
Grzanka, E. 7C-1.6
Grzanka, E. P1-6
Grzanka, E. P2-18
Grzanka, S. 7B-1.2
Grzanka, S. P1-6
Grzanka, S. P2-18
Gu, X. 4B-2.1
Guan, Y. P1-34
Guan, Y. P1-61
Guan, Y. P2-35
Guanxi, P. 5E-3.2
Gueorguiev, G.K. P2-1
Güniat, L. 8A-2.4
Guo, Q. P2-37
Guo, Y. P2-14
Guo, Y.n. P1-16
Gur, E. P2-46
Gutowski, P. P2-31
Guttmann, M. 5B-2.3
Guttmann, M. 6A-1.4
Guttmann, M. P2-25

— H —

Hader, J. 5C-3.2
Hagedorn, S. 4B-1.5
Hagedorn, S. P2-25
Haggren, T. 8A-2.7
Hagihara, Y. 5B-2.2
Hagihara, Y. 6A-1.1
Hajek, F. P1-60
Hájek, F. P2-26
Hajek, F. P2-60
Halfaya, Y. 4B-3.3
Halfaya, Y. 7C-2.4
Halfaya, Y. 8A-1.6
Halfaya, Y. P2-6
Hamada, T. P2-37
Hamon, G. 4B-2.5
Hamon, G. P1-28
Han, J. 8A-1.2
Han, J. P1-18
Han, X. 5C-3.3
Han, X. P2-33
Hangleiter, A. 4C-2.6
Hangleiter, A. P2-13
Hannappel, T. 6B-2.3
Hannappel, T. 6B-2.4
Hannappel, T. 7B-2.5
Hannappel, T. 8A-2.3
Hannappel, T. P1-35
Hao, Y. P2-12
Hao, Y. P2-16
Hao, Y. P2-5
Hara, S. 5B-3.6
Hara, S. 7C-3.6
Harada, H. P1-10
Harris, J. 6B-1.1
Harrison, B. 5B-3.5
Hartmann, J. 4C-2.6
Hartmann, J. P1-52
Hasegawa, R. 5B-2.2
Hasegawa, R. 6A-1.1
Hasegawa, Y. P1-2
Hasenohrl, S. P1-53
Hashim, A.M. P1-40
Hashim, A.M. P1-41
Hashizume, T. 5B-1.1
Hatsuda, T. 5B-1.1
Haverkort, J.E. 8A-2.1
Hayakawa, J. 4B-2.1
Hayasaka, N. 5C-3.3
Hayasaka, N. P2-33
Hayashi, Y. 4B-1.4
Hayashi, Y. P2-15
Hayashi, Y. P2-7
Heinisch, A. 6B-2.3
Helmers, H. 7B-3.1
Heuken, M. 4B-3.4
Hikosaka, T. 5B-1.3
Hiramatsu, K. P2-7
Hirato, T. P2-42
Hirayama, H. 5B-2.1
Hirayama, H. 6A-1.2
Hirayama, H. 6B-1.3
Hirayama, H. P1-22
Hirayama, H. P1-23
Hiwada, K. P2-30
Holden, W. 7B-3.3
Honda, T. P2-63
Honda, Y. 5C-1.5
Honda, Y. 7B-2.3
Honda, Y. 7C-1.4
Honda, Y. P2-59
Horenburg, P. P2-13
Horiguchi, R. 5B-3.6
Horiguchi, R. 7C-3.6
Horikiri, F. 4D-1.1
Horikiri, K. P1-31
Horng, R.-H. P1-26
Höschele, J. 4B-2.2
Hosoi, T. 5B-1.1
Hosomi, D. P1-21
Hospodkova, A. P1-60
Hospodková, A. P2-26
Hospodkova, A. P2-60
Hossain, E. P2-20
Hossain, E. P2-52
Hossain, E. P2-9
Hsiao, C.-N. P1-47
Hsu, L.-H. P1-56
Hu, C. P2-58
Hu, N. 7C-1.4
Huang, C.-Y. 7C-3.3
Huang, C.-Y. P2-57
Huang, X.-C. P2-57
Hubacek, T. 7C-2.1
Hubacek, T. P1-60
Hubacek, T. P2-26
Hubacek, T. P2-60
Huber, F. P2-17
Hu, c. P1-59
Hulicius, E. P2-60
Huwer, J. 5B-3.5
Hwang, D. 4C-1.3
Hwang, D. 4C-1.5
Hwang, D. 5C-1.7
Hwang, D. 8A-1.4

— I —

Ichikawa, S. 6B-1.5
Ichikawa, T. 8A-1.5
Ide, T. 8A-1.3
Iida, K. 4C-1.4
Iida, M. 5B-3.6
Iizuka, K. 8A-1.1
Ikarashi, N. 4D-1.3
Ikeda, N. P1-44
Ikenoue, T. P2-42
Imade, M. P1-1
Imai, A. 5B-1.4
Imai, A. P1-57
Inaba, T. P2-24
Inomata, Y. 7C-1.5
Inoue, Y. P1-32

Inoue, Y. P2-8
Irmscher, K. 5C-2.2
Irmscher, K. 5C-2.5
Irving, D. 6B-1.1
Ishida, K. 8A-2.6
Ishida, K. P1-50
Ishiguro, T. P1-23
Ishikawa, Y. 7B-3.4
Iskander, P. P2-17
Itajura, H. 7C-1.5
Ito, K. 7C-3.4
Ito, K. P1-19
Ito, T. P1-2
Ito, T. P2-3
Itokazu, Y. 6A-1.2
Itokazu, Y. P1-22
Iwata, J.-I. 4D-2.3
Iwaya, M. 4C-1.1
Iwaya, M. 4C-1.4
Iwaya, M. 7B-2.1
Iwaya, M. 8A-1.5
Iwayaya, M. 5C-1.6
Iyechika, Y. 7B-3.4
Iza, M. 6A-1.3
Izak, T. P1-9

— J —

Jaeger, D. 4B-1.5
Jaeger, D. P2-25
Jagadish, C. 4C-2.1
Jagadish, C. 7C-2.3
Jang, T. P1-18
Jarmann, J.C. 5C-1.1
Jeong, H. 5B-2.4
Jeong, H. 8B-1.1
Jetter, M. 4B-2.2
Jetter, M. P1-29
Jetter, M. P2-34
Ji, M.-H. 5B-2.4
Ji, M.-H. 8B-1.1
Ji, X. 8A-2.5
Jiang, H. 4B-3.1
Jiang, H. 8A-2.7
Jirásek, V. P1-9
Jo, M. 6A-1.2
Jo, M. 6B-1.3
Jo, M. P1-22
Jogan, N. 4B-2.1
Jordan, M.B. 4B-3.3
Juska, G. 5B-3.1
Juska, G. 5C-3.5

— K —

Kachi, T. 4D-1.3
Kachi, T. 7C-3.4
Kachi, T. P1-19
Kaczmarski, J. P1-63
Kadkhozadeh, S. 5B-3.4
Kaess, F. 6B-1.1
Kahle, H. P2-34
Kaiser, U. 7C-2.1
Kakanakova-Gueorguieva, A. P2-1
Kakimoto, K. 4D-2.1
Kakimoto, K. 4D-2.2
Kakimoto, K. P1-1
Kalanyan, B. P2-45
Kalisch, H. 4B-3.4
Kamada, N. 5C-3.3
Kamada, N. P2-33
Kamata, N. 6A-1.2
Kamata, N. P1-22
Kameda, H. P1-49
Kamikado, M. P2-30
Kaminska, E. P1-63
Kamiyama, S. 4C-1.1
Kamiyama, S. 4C-1.4
Kamiyama, S. 5C-1.6
Kamiyama, S. 7B-2.1
Kamiyama, S. 8A-1.5
Kanatani, K. 4D-1.5
Kanazawa, T. P2-32
Kanegae, K. P1-25
Kangawa, Y. 4D-2.1
Kangawa, Y. 4D-2.2
Kangawa, Y. 4D-2.3
Kangawa, Y. P1-1
Kanjolia, R. P2-45
Kanyandekwe, J. 4D-1.6
Kanyandekwe, J. 6B-1.6
Kanyandekwe, J. 7B-2.2
Kaplar, R.J. 4D-1.2
Kapon, E. 5B-3.2
Kapon, E. 8A-2.4
Kasapoglu, A.E. P2-46
Kaspari, C. 7A-1.2
Kataoka, K. 4D-1.3
Katayama, R. 4C-1.6
Katayama, R. 7B-1.4
Kato, A. P1-41
Kato, M. 7C-3.4
Kato, S. P1-10
Kawaharamura, T. 5C-2.6
Kawakami, Y. 4C-2.5
Kawakami, Y. 6B-1.5
Kawamura, T. P1-1
Kazantsev, D. 7C-1.3
Ke, W.-C. P2-23
keller, S. 8A-1.7
Kempisty, P. 4D-2.1
Kempisty, P. P1-6
Kettler, J. 4B-2.2
Ketzer, F.A. P2-13
Khan, D. 5C-2.5
Khan, D. P1-42
Khan, M.A. 6A-1.2
Khan, M.A. P1-22
Khayrudinov, V. 8A-2.7
Kihira, M. 4C-1.6
Kikuchi, T. 5C-3.4
Kikuta, D. P1-19
Kim, B. 6B-2.4
Kim, B. 7B-2.5
Kim, H. 4B-2.3
Kim, H. 5B-3.3
Kim, J. 5B-2.4
Kim, J. 8B-1.1
Kim, M. 8A-2.7
Kim, S.M. P1-45
Kimes, W.A. P2-45
Kinoshita, H. P2-32
Kirste, R. 6B-1.1
Kise, N. P2-32
Kitamoto, A. P1-1
Kitatani, T. P2-28
Kittaka, T. P1-30
Kizilbulut, A.A. P2-46
Klamkin, J. 4C-2.2
Klein, B.A. 4D-1.2
Kleinschmid, P. 7B-2.5
Kleinschmidt, P. 8A-2.3
Kneissl, M. 5B-2.3
Kneissl, M. 6A-1.4
Kneissl, M. P2-25
Kobayashi, M. 7C-1.2
Kocak, Y. P2-46
Koch, S. 5C-3.2
Kocher, C.C. 5C-1.1
Kodaira, R. 7C-3.6
Koelling, S. 8A-2.1
Kojima, K. 7C-3.5
Kojima, K. P2-8
Koley, G. 5C-2.5
Koley, G. P1-42
Kondo, T. 4B-2.1
Konishi, K. 5C-2.3
Konishi, K. 7C-2.2
Konishi, K. P2-43
Koppka, C. 8A-2.3
Koppka, C. P1-35
Kosa, A. P2-61
Koseki, S. 5E-3.2
Kosior, L. P2-31
Koukitu, A. 7C-2.2
Kovac, J. P1-53
Kovac, J. P2-61
Koyama, F. 4B-2.1

Kozubal, M. P1-63
Kret, S. P2-18
Krischok, S. P1-35
Kromka, A. P1-9
Kruijsse, M. 8A-2.1
Krukowski, S. 4D-2.1
Krukowski, S. P1-6
Kruszewski, P. P2-22
Krysa, A.B. 5B-3.5
Kuboya, S. 7A-1.1
Kucharski, R. P1-63
Kuchta, D. P1-63
Kuech, T. P1-34
Kuech, T. P1-61
Kuech, T.F. 5B-3.3
Kuech, T.F. P2-35
Kuhn, C. 5B-2.3
Kuhn, C. P2-25
Kuldová, K. P2-26
Kuldova, K. P2-60
Kulkarni, R. P2-9
Kumagai, N. P2-55
Kumagai, Y. 5C-2.3
Kumagai, Y. 7C-2.2
Kumagai, Y. P2-43
Kumakura, K. 6B-1.4
Kumar, A. 6A-2.4
Kunert, B. 5A-1.2
Kung, P. P1-45
Kuo, H.-C. 7C-3.3
Kuo, H.-C. P1-56
Kuo, S.-Y. P1-15
Kuraguchi, M. 5B-1.3
Kuramata, A. 8A-1.1
Kushimoto, M. 5C-1.5
Kushimoto, M. 7B-2.3
Kushimoto, M. P2-59
Kuze, N. 4B-2.4
Kuze, N. 5B-2.2
Kuze, N. 6A-1.1
Kuzuhara, M. 4D-1.5
Kwak, T. P2-44

— L —

Lacam, C. P2-10
Lachowski, A. P2-18
Lackner, D. 7B-3.1
Lagally, M. P1-34
Lai, Y.-Y. P1-56
Lang, R. 7B-3.1
Largeau, L. P1-28
Larrue, A. 4B-2.5
LAU, K. 5C-1.2
Lau, K. 6A-2.1
Lau, K. 6B-2.2
Laurencikova, A. P1-53
Lebedkina, E. 5B-3.4
Lee, C. 4C-1.5
Lee, C. 5C-1.7
Lee, J. P2-44
Lee, K. 6A-2.3
Lee, K. 6A-2.4
Lee, K. 6A-2.4
Lee, K. 7C-3.1
Lee, K. 7C-3.1
Lee, K. P1-18
Lee, K. P2-47
Lee, K. P2-47
Lee, S. 5C-1.7
Lee, S. 5E-3.4
Lennon, S.A. 5C-1.1
Lenz, A. 6B-2.5
Leszczynski, M. 7B-1.2
Leszczynski, M. 7C-1.6
Leszczynski, M. P1-6
Leszczynski, M. P2-18
Leszczynski, M. P2-4
Ley, R. 4C-1.5
Li, H. P1-15
Li, J. P2-14
Li, J.m. P1-16
Li, K.-H. 6B-1.2
Li, K.-H. 7B-3.3
Li, K.-H. 7C-2.5
Li, K.-H. P1-64
Li, K.-H. P2-40
Li, L. 4C-2.1
Li, L. 7C-2.3
Li, Q. 6B-2.2
Li, X. 4B-3.3
Li, X. 4D-1.4
Li, X. 6B-1.2
Li, X. 7B-3.3
Li, X. 7C-2.4
Li, X. 7C-2.5
Li, X. 8B-1.2
Li, X. P1-64
Li, X. P2-40
Li, X. P2-6
Li, Y. 7C-2.1
Liao, C.-H. 7B-3.3
Liao, C.-H. P2-40
Liao, Y. 4C-1.2
Lin, C.-C. P1-56
Lin, C.-H. 5C-1.3
Lin, J. 4B-3.1
Lin, J. P1-37
Lin, K.-Y. P2-27
Lin, P.-J. P1-26
Lin, R.-M. 7C-3.3
Lin, W. P1-59
Lin, W.-J. P2-58
Lin, Y.-H. P2-57
Lipsanen, H. 8A-2.7
Liu, B. P2-11
Liu, J.-P. P1-17
Liu, L. 5C-2.6
Liu, T.-Y. 7C-3.3
Liu, Y.-S. 8B-1.1
Liu, Z. 5C-1.5
Liu, Z. 7C-1.6
Lobanova, A. 4D-2.5
Lobanova, A. 5C-2.4
Lobanova, A. P1-4
Lockrey, M. 4C-2.1
Loi, R. 5C-3.5
Loke, W. 6A-2.3
Lombard, G. 6A-2.2
Long, H. P1-17
Lu, T.-C. P1-15
Lu, W. P2-14
Lugauer, H.-J. 4C-2.6
Lugauer, H.-J. P1-52
Lundin, W. 7B-3.5
Lundin, W. 7C-1.3
Luo, G. P2-35
Lysevych, M. 7C-2.3

— M —

Maaßdorf, A. P1-55
Maeda, K. P1-32
Maeda, K. P1-39
Maeda, K. P2-30
Maeda, N. 6A-1.2
Maeda, N. P1-22
Makino, S. 4D-1.5
Maliakkal, C. P2-52
Malmros, A. P2-10
Manglano Clavero, I. P1-52
Mano, T. P1-44
Margenfeld, C. 4C-2.6
Markert, J. 7B-3.1
Markman, B. 4C-2.2
Marquardt, M. 6B-2.5
Martin, M. 6A-2.2
Martyanov, W. 6B-2.5
Marx, M. 4B-3.4
Maslar, J.E. P2-45
Maßmeyer, O. 7B-2.4
Masui, S. 7B-1.1
Mateo, C.M. P2-34
Matsuda, Y. 4C-2.5
Matsumoto, K. 5E-3.2
Matsumoto, K. P1-20
Matsumoto, K. P1-24
Matsumoto, K. P1-25
Matsumoto, K. P1-43
Matsumoto, K. P1-62

Matsumoto, T. 6A-1.2
Matsumoto, T. P1-22
Matsumoto, Y. P1-36
Matsuo, S. 5C-3.6
Matsuo, Y. P2-37
Matsuoka, T. 7A-1.1
Matsuoka, T. 7C-3.5
Mauze, A. 5C-2.4
Mawst, L.J. 4B-2.3
Mawst, L.J. 5B-3.3
Maximenko, S. P2-36
Mazel, Y. 4D-1.6
Mehari, S. 7B-1.3
Mehnke, F. 6A-1.4
Mehnke, F. P2-25
Mehta, K. 8B-1.1
Mei, Y. P1-17
Meissner, E. P2-65
Meuret, S. 8A-2.1
Michel, J. P2-47
Michler, P. 4B-2.2
Michler, P. P1-29
Michler, P. P2-34
Miki, S. 7B-2.3
Mikolasek, M. P2-61
Mikulik, D. 8A-2.4
Miller, R. 5C-2.4
Minami, S. 6B-1.3
Minami, Y. 4C-2.4
Miranda, A. 5B-3.2
Mishima, A. P1-20
Mishina, M. P2-54
Mishra, U.K. 5A-1.1
Mita, S. 6B-1.1
Mitrovic, B. 5E-3.4
Mitsufujji, S. 5C-1.6
Miura, R. 7C-2.2
Miwa, J. 4C-1.6
Miya, S. 6A-1.1
Miyake, H. 4B-1.4
Miyake, H. P1-20
Miyake, H. P2-15
Miyake, H. P2-25
Miyake, H. P2-7
Miyake, M. P2-42
Miyamoto, T. P1-27
Miyamoto, T. P1-31
Miyamoto, Y. P2-32
Miyano, K. 7B-3.4
Miyoshi, M. P1-10
Miyoshi, M. P1-21
Miyoshi, M. P1-8
Mochizuki, K. P2-8
Moeyaert, J. 6A-2.2
Möller, C. 5C-3.2
Moloney, J. 5C-3.2
Momose, T. 4B-1.3
Momose, T. P2-49
Mondal, R. P2-9
Morgan, D. P2-35
Mori, T. P1-10
Mori, Y. P1-1
Morikawa, Y. P1-1
Morimoto, J. P1-12
Morishima, Y. 8A-1.1
Morishita, T. 5B-2.2
Morishita, T. 6A-1.1
Morita, K. 5B-3.6
Moriyasu, Y. 4B-2.4
Morkoç, H. P1-13
Moroni, S.T. 5B-3.1
Moroni, S.T. 5C-3.5
Motohisa, J. 4C-2.3
Motohisa, J. 4C-2.4
Motohisa, J. 6A-2.5
Motohisa, J. 8A-2.2
Motohisa, J. P1-49
Motohisa, J. P2-38
Motohisa, J. P2-53
Motoya, T. P1-57
Mrad, M. 4D-1.6
Mrad, M. 6B-1.6
Mrad, M. 7B-2.2
Mughal, A.J. 4C-1.3
Muhin, A. 5B-2.3
Müller, T. 5B-3.5
Mura, E.E. 5C-3.5
Murakami, A. 4B-2.1
Murakami, H. 7C-1.2
Murakami, H. 7C-2.2
Muramatsu, N. 5C-1.6
Murata, M. 4B-2.1
Mysliwiec, M. P1-63

— N —

Nagahama, S. 7B-1.1
Nagamatsu, K. 5C-1.5
Nagamatsu, K. 7B-2.3
Nagamatsu, K. P2-59
Nagao, H. 7B-2.3
Nagasaka, K. 5C-3.4
Nagase, K. 4B-2.4
Nago, H. 7B-3.4
Nakahara, T. 4B-1.3
Nakahara, T. P2-49
Nakajima, T. P2-54
Nakamura, K. 4D-2.4
Nakamura, K. P1-2
Nakamura, S. 4C-1.3
Nakamura, S. 4C-1.5
Nakamura, S. 5C-1.7
Nakamura, S. 6A-1.3
Nakamura, S. 7B-1.3
Nakamura, S. 8A-1.4
Nakamura, S. 8A-1.7
Nakamura, S. P1-43
Nakano, T. P2-8
Nakano, Y. 4B-1.3
Nakano, Y. 5E-3.2
Nakano, Y. 6B-2.4
Nakano, Y. 7B-2.5
Nakano, Y. 7B-3.2
Nakano, Y. P1-62
Nakano, Y. P2-49
Nakao, R. 5C-3.6
Nakazawa, S. 5B-1.1
Nam, O. P1-18
Nam, O. P2-44
Nam, Y. P1-18
Nambu, T. 7B-1.4
Nandy, M. 7B-2.5
Nanjo, T. 5B-1.4
Nanjo, T. P1-57
Narita, T. 4D-1.3
Narita, T. 7C-3.4
Narita, T. P1-19
Narita, Y. 4D-1.1
Naskar, N. P2-17
Nattermann, L. 7B-2.4
Ndoni, S. 5B-3.4
Neuschulz, B. P2-25
Ng, G.I. 5B-1.2
Nguyen, X. 6A-2.4
Nikolaev, A. 7B-3.5
Nikolaev, A. 7C-1.3
Nishi, M. 5C-2.6
Nishikori, H. P1-37
Nishinaka, J. 6B-1.4
Nishiyama, N. 5C-3.4
Nitta, S. 5C-1.5
Nitta, S. 7B-2.3
Nitta, S. 7C-1.6
Nitta, S. P2-59
Nkamura, K. P2-3
Nokimura, K. 4C-1.4
Novak, J. P1-53
Nozaki, M. 5B-1.1
Nozaki, S. P1-12
Nunoue, S. 5B-1.3
Nuttall, L. 5C-1.1

— O —

Ohkawa, K. 4D-2.4
Ohsawa, K. P2-32
Ohtake, A. P1-44
Oishi, Y. P2-37
Okada, H. P1-30
Okada, N. 7C-1.5

Okada, T. 6B-2.4
Okamoto, K. P2-28
Okamoto, N. 4D-2.2
Okur, S. 5C-2.5
Okur, S. P1-42
Okur, S. P1-45
Okur, S. P1-64
Okur, S. P2-40
Okur, S. P2-51
Olbrich, F. 4B-2.2
Oliver, R.A. 5C-1.1
Ono, S. P1-40
Ono, S. P1-41
Onuki, Y. 5C-3.3
Onuki, Y. P2-33
Onuma, T. P2-63
Oshima, R. P1-62
Oshiyama, A. 4D-2.3
Osinsky, A. 5C-2.4
Oswald, J. P1-60
Oswald, J. P2-26
Oswald, J. P2-60
Otake, N. P2-64
Otoki, Y. 4D-1.1
Ougazzaden, A. 4B-3.3
Ougazzaden, A. 4D-1.4
Ougazzaden, A. 7C-2.4
Ougazzaden, A. 8A-1.6
Ougazzaden, A. P2-6
Özgür, Ü. P1-13

— P —

Paillet, N. 4B-2.5
Palmstrøm, C. 4C-2.2
Pangrac, J. P1-60
Pangrác, J. P2-26
Pangrac, J. P2-60
Pantzas, K. 7C-3.2
Pantzas, K. P1-33
Pantzas, K. P2-39
Paranjpe, A. 5E-3.4
Parbrook, P.J. P1-11
Park, Y. 6B-1.2
Park, Y. 7C-2.5
Park, Y. 8B-1.1
Parmar, J. P2-52
Paszkiewicz, B. P1-46
Paszkiewicz, B. P2-21
Paszkiewicz, B. P2-21
Paszkiewicz, R. P1-46
Paszkiewicz, R. P2-21
Paszuk, A. 6B-2.4
Paszuk, A. 7B-2.5
Patra, S.K. 5C-1.1
Patriarche, G. 4D-1.4
Patriarche, G. 7C-2.4
Patriarche, G. 7C-3.2
Patriarche, G. P1-33
Patriarche, G. P2-39
Patriarche, G. P2-6
Paul, M. 4B-2.2
Peh, K. 8A-2.3
Pelucchi, E. 5B-3.1
Pelucchi, E. 5C-3.5
Periyanayagam, G. 5C-3.3
Periyanayagam, G. P2-33
Perlin, P. 7B-1.2
Perlin, P. P2-18
Piao, G. P1-25
Pickrell, G.W. 4D-1.2
Pierscinska, D. P2-31
Pierscinski, K. P2-31
Pietruszka, R. P1-58
Pietruszka, R. P2-62
Piotrowska, A. P1-63
Pires, M.P. P1-28
Polman, A. 8A-2.1
Ponce, F. 8B-1.1
Portalupi, S.L. 4B-2.2
Pradeep, E.K. 5C-2.6
Pradipt, A.M. P1-2
Pradipto, A.M. P2-3
Pristovsek, M. 4C-1.2
Pristovsek, M. 7B-2.3
Pristovsek, M. 7C-1.4
Pristovsek, M. P1-11
Pristovsek, M. P2-59
Provost, G. 7B-3.3
Prystawko, P. P1-63
Prystawko, P. P2-22
Przhevalsky, I. P1-4
Pynn, C.D. 8A-1.4

— Q —

Qi, H. 7C-2.1
Quandt, D. P2-50

— R —

Radziewicz, D. P2-31
Rahaman, M. P1-48
Rahman, A. P2-52
Rahman, A.A. P2-20
Rahman, A.A. P2-9
Raineri, F. P1-33
Reddy, P. 6B-1.1
Redwing, J.M. 4B-3.2
Reich, C. P2-25
Reid, B.P. 5C-1.1
Reinhard, S. 5C-3.2
Reis, I. P1-29
Ren, C.X. 5C-1.1
Rettig, O. 7C-2.1
Rigal, B. 5B-3.2
Ritchie, D.A. 5B-3.5
Robin, Y. 4C-1.2
Robin, Y. 5C-1.5
Rodin, S. 7B-3.5
Rodriguez, J.-B. 6A-2.2
Rodwell, M. 4C-2.2
Rorsman, N. P2-10
Rossow, U. P2-13
Rouviere, J.-L. 6A-2.2
Rudra, A. 5B-3.2
Rudra, A. 8A-2.4
Runge, E. 8A-2.3
Rutthongjan, P. 5C-2.6

— S —

Sagnes, I. P1-33
Sagnes, I. P2-39
Saifaddin, B. 6A-1.3
Saito, K. P2-37
Saitou, T. P1-40
Sakamoto, M. 5C-2.6
Sakao, K. P1-25
Sakharov, A. 7B-3.5
Sakharov, A. 7C-1.3
Sakuma, Y. P1-44
Sakurai, J. 4B-2.1
Salagaj, T. 5C-2.5
Salagaj, T. 7B-3.3
Salagaj, T. P1-42
Salagaj, T. P1-45
Salagaj, T. P1-64
Salagaj, T. P2-36
Salagaj, T. P2-40
Salagaj, T. P2-51
Salem, B. 6A-2.2
Salvestrini, J. 4B-3.3
Salvestrini, J. 4D-1.4
Salvestrini, J. P2-6
Salvestrini, J.-P. 8A-1.6
Samuelson, L. 4A-1.2
Sangiovanni, D.G. P2-1
Sankowska, I. P2-21
Sarzynski, M. 7C-1.6
Sarzynski, M. P1-6
Sarzynski, M. P2-4
Sasai, K. 4C-1.4
Sasaki, M. 4C-2.3
Sasaki, M. P1-49
Sato, S. 5C-2.6
Sato, T. 5C-3.6
Savage, D. P1-34
Sawada, Y. P2-43
Sbrockey, N. P2-36
Sbrockey, N. P2-51

Schefold, J. 8A-2.1
Schewski, R. 5C-2.2
Schiavon, D. P2-18
Schneidereit, M.F. P2-17
Scholz, F. 7C-2.1
Scholz, F. P2-17
Scholz, J.-P. 7C-2.1
Schön, J. 7B-3.1
Schreier, S. 4B-2.2
Schröter, C. P2-65
Schulz, S. 5C-1.1
Schulze, C.S. 6B-2.5
Sciana, B. P2-29
Sciana, B. P2-31
Sciana, B. P2-61
Scott, S. P1-34
Sekiguchi, H. P1-30
Semenova, E. 5B-3.4
Semenova, E. P2-56
Serafinska, I. P1-58
Seta, Y. P2-3
Shah, A. 8A-2.7
Shah, A.P. P2-20
Shahbaz, J. P2-17
Shen, B. 4B-1.2
Shen, B. P2-11
Shen, J. 4B-1.2
Shen, S.-C. 5B-2.4
Shen, S.-C. 8B-1.1
Shen, X. 8A-1.3
Sheremet, N. P1-13
Sheremet, V. P1-13
Shi, B. 6B-2.2
Shibata, M. 4D-1.1
Shields, A.J. 5B-3.5
Shigeta, Y. 4D-2.3
Shih, H.-A. 5B-1.1
Shikin, A. 5B-3.4
Shimizu, M. 8A-1.3
Shimizu, M. P1-5
Shimizu, M. P2-55
Shimogaki, Y. 4B-1.3
Shimogaki, Y. P2-49
Shimomura, K. 5C-3.3
Shimomura, K. 8A-2.6
Shimomura, K. P1-50
Shimomura, K. P2-33
Shimura, D. 5B-2.2
Shimura, T. 5B-1.1
Shirai, Y. 4B-2.1
Shiraishi, K. 4D-2.1
Shiraishi, K. 4D-2.2
Shiraishi, K. 4D-2.3
Shojiki, K. 4B-1.4
Shojiki, K. P2-15
Shojiki, K. P2-7
Shokhovets, S. P1-35
Sitar, Z. 6B-1.1
Sittig, R. 4B-2.2
Skiba-Szymanska, J. 5B-3.5
Slonska-Zielonka, A. P1-58
Slonska-Zielonka, A. P2-62
Smalc-Koziorowska, J. 7B-1.2
Smalc-Koziorowska, J. P1-6
Smalc-Koziorowska, J. P2-18
So, B. P2-44
Sodabanlu, H. 5E-3.2
Sodabanlu, H. 7B-3.2
Sodabanlu, H. P1-62
Sone, N. 4C-1.4
Song, J. 8A-1.2
Song, R. 5C-1.4
Sood, A. 8B-1.1
Soresi, S. P1-28
Sözen, M. P1-13
Speck, J. 5C-2.4
Speck, J. 6A-1.3
Speck, J.S. 5C-1.7
Speck, J.S. 8A-1.4
Speck, J.S. 8A-1.7
Spende, H. 4C-2.6
Spende, H. P2-13
Sperling, B.A. P2-45
Stadler, M. P1-29
Steidl, M. 8A-2.3
Steiger, N. 7C-2.1
Sterzer, E. 7B-2.4
Stevenson, R.M. 5B-3.5
Stolz, W. 5C-3.2
Stolz, W. 7B-2.4
Straßburg, M. P1-52
Strittmatter, A. P2-50
Stuchlikova, L. P2-29
Stuchlikova, L. P2-61
Suda, J. P1-25
Sugaya, T. 7B-3.2
Sugaya, T. P1-62
Sugiyama, H. 5C-3.3
Sugiyama, H. 5C-3.6
Sugiyama, H. P2-33
Sugiyama, M. 4B-1.3
Sugiyama, M. 5E-3.2
Sugiyama, M. 6B-2.3
Sugiyama, M. 6B-2.4
Sugiyama, M. 7B-2.5
Sugiyama, M. 7B-3.2
Sugiyama, M. P1-62
Sugiyama, M. P2-49
Sugiyama, M. P2-64
Sulmoni, L. 5B-2.3
Sulmoni, L. 6A-1.4
Sulmoni, L. P2-25
Sumiya, M. P2-63
Sun, H. 6B-1.2
Sun, H. 7B-3.3
Sun, H. 7C-2.5
Sun, H. P1-64
Sun, H. P2-40
Sun, Q. 4B-1.1
Sun, Q. P1-14
Sun, W. 4B-2.3
Sun, W. 5C-1.4
Sun, Y. P2-11
Sundaram, S. 4B-3.3
Sundaram, S. 4D-1.4
Sundaram, S. 7C-2.4
Sundaram, S. 8A-1.6
Sundaram, S. P2-6
Supplie, O. 6B-2.3
Supplie, O. 6B-2.4
Supplie, O. 7B-2.5
Supplie, O. 8A-2.3
Supplie, O. P1-35
Šuran Brunelli, S. 4C-2.2
Susilo, N. 5B-2.3
Susilo, N. P2-25
Suski, T. P2-18
Suski, T. P2-4
Suzuki, A. 4C-1.4
Suzuki, J. 5C-3.4
Syperek, M. 5B-3.4
Szymanski, T. P1-46
Szymanski, T. P2-21

— T —

Tabuchi, A. P1-37
Tabuchi, T. 5E-3.2
Tabuchi, T. P1-20
Tabuchi, T. P1-24
Tabuchi, T. P1-25
Tabuchi, T. P1-62
Tachihara, Y. P1-30
Tachino, Y. P2-64
Tadatomo, K. 7C-1.5
Tai, T.-I. 7C-3.3
Tajima, J. 5B-1.3
Takada, K. 7C-2.2
Takahashi, H. 7B-3.4
Takahashi, K. 5C-1.6
Takahashi, K. P1-32
Takahashi, K. P1-39
Takahashi, M. 7C-1.2
Takahashi, R. P1-36
Takahashi, T. 8A-1.3
Takahashi, T. P1-5
Takahashi, T. P2-55
Takanishi, T. 5C-1.6
Takano, K. 8A-2.6

Takano, K. P1-50
Takashima, S. P2-63
Takatsu, J. 7C-1.1
Takebayashi, M. 4C-1.4
Takeda, K. 4B-2.1
Takekawa, N. 7C-1.2
Takeuchi, T. 4C-1.1
Takeuchi, T. 4C-1.4
Takeuchi, T. 5C-1.6
Takeuchi, T. 7B-2.1
Takeuchi, T. 8A-1.5
Takeuchi, T. P1-8
Talalaev, R. 4D-2.5
Talalaev, R. 5C-2.4
Talalaev, R. P1-4
Tan, C. 6A-2.3
Tan, C. 6A-2.4
Tan, C. 7C-3.1
Tan, H. 4C-2.1
Tan, H. 7C-2.3
Tanaka, A. 7B-2.3
Tanaka, A. P2-59
Tanaka, I. P1-43
Tanaka, S. P2-28
Tanaka, S. P2-7
Tanaka, T. P2-37
TANG, C. 5C-1.2
Tang, F. 5C-1.1
Tanigawa, K. 4B-1.4
Tanikawa, T. 7A-1.1
Tanikawa, T. 7C-3.5
Taniyasu, Y. 6B-1.4
Tansu, N. 4B-2.3
Tansu, N. 5C-1.4
Tatebayashi, J. 7C-1.1
Tatebayashi, J. P2-24
Tatebayashi, J. P2-54
Taube, A. P1-63
Taylor, R.A. 5C-1.1
Terashima, W. P1-23
Thamizhavel, A. P2-9
Thonke, K. 7C-2.1
Thonke, K. P2-17
Tlaczala, M. P2-29
Tlaczala, M. P2-31
Tlaczala, M. P2-61
Tomioka, K. 4C-2.3
Tomioka, K. 4C-2.4
Tomioka, K. 6A-2.5
Tomioka, K. 8A-2.2
Tomioka, K. P1-49
Tomioka, K. P2-38
Tomioka, K. P2-53
Tomita, K. 4D-1.3
Tomita, K. 7C-3.4
Tomita, Y. P1-20
Tomota, A. P2-37
Tompa, G. 5C-2.5
Tompa, G. 7B-3.3
Tompa, G. P1-42
Tompa, G. P1-64
Tompa, G. P2-36
Tompa, G. P2-40
Tompa, G. P2-51
Tompa, G.S. P1-45
Torres-Castanedo, C. P2-40
Tot, J. P2-19
Tournié, E. 6A-2.2
Tsai, C.-T. P2-27
Tsatsulnikov, A. 7B-3.5
Tsatsulnikov, A. 7C-1.3
Tseng, H.-Y. 4C-2.2
Tsuboyama, S. P2-30
Tsukui, M. 7B-3.4
Tsurumi, N. 5B-1.1
Tweedie, J. 6B-1.1

— U —

Ubukata, A. 5E-3.2
Ubukata, A. 7B-3.2
Ubukata, A. P1-24
Ubukata, A. P1-62
Uchida, K. 5C-3.3
Uchida, K. P1-12
Uchida, K. P2-28
Uchida, K. P2-33
Ueda, N. P2-43
Ueda, T. 5B-1.1
Uedono, A. P2-63
Uemukai, M. 4C-1.6
Uemukai, M. 7B-1.4
Uesugi, K. P2-15
Umemura, C. P1-43
Uno, K. P1-43
Usami, S. 5C-1.5

— V —

Vanjaria, J. P2-36
Vanjaria, J. P2-51
Vanko, G. P1-9
Varo, S. 5B-3.1
Verheijen, M.A. 8A-2.1
Vescan, A. 4B-3.4
Viazmitinov, D.V. P2-56
Vincze, A. P1-9
Vogt, A. P2-13
Vojs, M. P1-9
Volz, K. 6B-2.1
Volz, K. 6B-2.5
Volz, K. 7B-2.4
von Hänisch, C. 7B-2.4
Voss, P. 4D-1.4
Voss, P. P2-6
Voss, P.L. 4B-3.3
Voss, P.L. 8A-1.6
Voss, T. P2-13

— W —

Waag, A. 4C-2.6
Waag, A. P1-52
Waag, A. P2-13
Wachnicki, L. P1-58
Wagner, G. 5C-2.2
Wagner, G. 5C-2.5
Wakahara, A. P1-30
Wakaki, R. P1-32
Wakaki, R. P2-30
Walde, S. 4B-1.5
Wang, B. P2-14
Wang, B. P2-47
Wang, C.A. 5E-3.1
WANG, J. 5C-1.2
Wang, J.x. P1-16
Wang, K. P1-23
Wang, M. P2-11
Wang, N. 4C-2.1
Wang, S. 8B-1.1
Wang, T.-Y. P2-27
Wang, X. 8A-1.3
Wang, X.-l. P2-55
Wang, Y. 6A-2.3
Wang, Y. P2-47
Washiyama, S. 6B-1.1
Watahiki, T. 5B-1.4
Watanabe, H. 5B-1.1
Watanabe, K. 5E-3.2
Watanabe, K. 7B-3.2
Watanabe, K. P1-62
Watanabe, T. 4D-2.4
Watanabe, T. P2-64
Waters, J.L. P1-45
Wehmann, H.-H. 4C-2.6
Wehmann, H.-H. P1-52
Wei, L.-L. P1-38
Wei, W. 5B-3.3
Wei, X.c. P1-16
Weil, T. P2-17
Wernicke, T. 5B-2.3
Wernicke, T. 6A-1.4
Wernicke, T. P2-25
Weseloh, M. 5C-3.2
Weyers, M. 4B-1.5
Weyers, M. P1-55
Weyers, M. P2-25
Wiese, C. 6B-1.6
Winterfeld, L. 8A-2.3
Witkowski, B. P1-58

Witkowski, B.S. P2-62
Wojtasiak, W. P1-63
Wong-Leung, J. 7C-2.3
Wong, M.S. 4C-1.3
Wong, M.S. 4C-1.5
Wosko, M. P1-46
Wosko, M. P2-21
Wu, J. 4C-2.2
Wu, Q.q. P1-16
Wuu, D.-S. P1-26
Wuu, D.-S. P2-27
Wzorek, M. P1-63

— X —

Xiao, M. P2-16
Xiao, M. P2-5
Xiao, S. P2-15
Xie, N. P2-11
Xu, F. P2-11
Xu, H. P1-17
Xu, R.-B. P1-17
Xue, J. P2-12

— Y —

Yadav, S. 6A-2.4
Yagi, H. 5C-3.4
Yagyu, E. 5B-1.4
Yamada, H. P1-5
Yamada, H. P2-55
Yamada, T. 5B-1.1
Yamada, T. 7B-1.4
Yamada, T. P1-5
Yamagata, Y. P1-32
Yamaguchi, T. P2-63
Yamaki, Y. P2-7
Yamakoshi, S. 8A-1.1
Yamamoto, A. 4D-1.5
Yamamoto, H. 5C-1.3
Yamamuka, M. 5B-1.4
Yamanaka, M. P1-8
Yamane, K. P1-30
Yamanobe, S. 5C-2.3
Yamaoka, Y. P1-20
Yamaoka, Y. P1-24
Yamaoka, Y. P1-25
Yamashita, Y. 8A-1.1
Yan, J.c. P1-16
Yan, Z. 6B-2.2
Yang, T. 8A-2.5
Yang, T.-I. P1-38
Yang, X. 4B-1.2
Yang, X. 8A-2.5
Yano, Y. 5E-3.2
Yano, Y. P1-20
Yano, Y. P1-24
Yano, Y. P1-25
Yano, Y. P1-62
Yao, H.-H. 7B-3.3
Yao, H.-H. P2-40
Yasui, K. P1-40
Yasui, K. P1-41
Ye, Z. 7B-2.3
Ye, Z. P2-59
Yin, J. P2-14
Ying, L.-Y. P1-17
Yoder, P.D. 8B-1.1
Yokoyama, A. 5B-2.2
Yokoyama, A. 6A-1.1
Yon, V. 7B-2.2
Yoon, S. 6A-2.3
Yoshida, A. 4C-2.3
Yoshida, A. 4C-2.4
Yoshida, A. 6A-2.5
Yoshida, A. P2-38
Yoshida, A. P2-53
Yoshida, H. P2-15
Yoshida, K. 5C-2.3
Yoshida, T. 4D-1.1
Yoshida, T. P1-37
Yoshida, T. P1-7
Yoshii, G. P2-54
Yoshikawa, A. 4B-2.4
Yoshikawa, A. 5B-2.2
Yoshimatsu, K. 4D-2.2
Yoshimura, M. P1-1
Yoshimura, S. 8A-2.6
Yoshimura, S. P1-50
Yoshinaga, J. 8A-1.5
Yoshitsugu, K. 5B-1.4
Yu, H. P2-36
Yu, H. P2-51
Yuan, X. 4C-2.1
Yvind, K. 5B-3.4
Yvind, K. P2-56

— Z —

Zajac, M. P1-63
Zavarin, E. 7B-3.5
Zavarin, E. 7C-1.3
Zborowska-Lindert, I. P2-29
Zborowska-Lindert, I. P2-61
Zeimer, U. P2-25
Zettler, J. 7A-1.2
Zettler, T. 7A-1.2
Zhang, B.-P. P1-17
Zhang, H. P1-3
Zhang, H. P2-2
Zhang, J. 4B-1.2
Zhang, J. P2-12
Zhang, J. P2-16
Zhang, J. P2-5
Zhang, L. 7C-3.1
Zhang, L. P1-16
Zhang, L. P2-11
Zhang, L. P2-2
Zhang, W. P2-16
Zhang, W. P2-5
Zhang, X. 4B-3.2
Zhang, X. P1-12
Zhang, Z. 5B-2.2
Zhang, Z. P2-14
Zhao, B. 4C-2.1
ZHAO, C. 5C-1.2
Zheng, H. 7B-1.3
Zheng, Z.-W. P1-17
Zhou, H. 4C-2.6
Zhu, T. 5C-1.1
Zikova, M. 7C-2.1
Zikova, M. P1-60
Zíková, M. P2-26
Zikova, M. P2-60
Zollner, C. 6A-1.3
Zorn, M. 7A-1.2
Zuo, R. P1-3
Zuo, R. P2-2