PL.1: Plenary I Monday Morning, October 3, 2016 Room: International South and Center

8:45 AM OPENING REMARKS

9:00 AM *PL.1.01

Perspectives of III-N Optoelectronics <u>Martin Strassburg</u>; OSRAM Opto Semiconductors GmbH, Munich, Germany

9:45 AM *PL.1.02

Current Status and Future Directions in GaN-Based Electronics <u>Umesh Mishra</u>; Electrical and Computer Engineering Department, University of California, Santa Barbara, Santa Barbara, California, United States

10:30 AM BREAK

11:00 AM *PL.1.03

Current Status and Future of III-Nitride Ultraviolet and THz Emitters Hideki Hirayama; RIKEN, Wako, Japan

11:45 AM *PL.1.04

Wafer Scale Integration of GaN with Si CMOS for RF Applications <u>Thomas E. Kazior</u>; Raytheon Company, Andover, Massachusetts, United States

A1.1: Bulk Growth I: Bulk Crystal Growth Monday Afternoon, October 3, 2016 Room: Azalea/Begonia

2:00 PM *A1.1.01

Recent Progress in Bulk GaN Growth by HVPE on Native Substrates Michal Bockowski; Crystal Growth Laboratory, Institute of High Pressure Physics PAS, Warsaw, Poland

2:30 PM A1.1.02

Low-Dislocation Density and 4 Inch GaN Substrates Grown by Hydride Vapor Phase Epitaxy <u>Jianfeng</u> <u>Wang^{1, 2}</u>, Guoqiang Ren¹, Yu Xu¹, Demin Cai², Mingyue Wang¹, Yuming Zhang¹, Xiaojian Hu² and Ke Xu^{1, 2}; ¹Suzhou Institute of Nano-Tech and Nano-Bionics Chinese Academy of Science, Suzhou, China; ²Suzhou Nanowin Science and Technology Co. Ltd, Suzhou, China

2:45 PM A1.1.03

Bulk GaN Substrate with Overall Dislocation Density in the Order of 10⁴ – 10⁵/cm² by Hydride Vapor Phase Epitaxy Shin Goubara¹, Kota Yukizane¹, Naoki Arita¹, Tohoru Matsubara^{1, 2}, Keisuke Yamane³, Ryo Inomoto¹, Narihito Okada¹ and Kazuyuki Tadatomo¹; ¹Graduate School of Science and Engineering, Yamaguchi University, Ube, Japan; ²UBE Scientific Analysis Laboratory, Ube, Japan; ³Toyohashi University of Technology, Toyohashi, Japan

3:00 PM A1.1.04

Study of Homoepitaxial Non-Polar and Semi-Polar Growth of GaN by HVPE—Influence of Lateral Growth on HVPE-GaN Grown in the c-Direction Mikolaj Amilusik, Tomasz Sochacki, Boleslaw Lucznik, Malgorzata Iwinska, Michal Fijalkowski, Izabella Grzegory and Michal Bockowski; Institute of High Pressure Physics PAS, Warsaw, Poland

3:15 PM A1.1.05

Development of GaN Substrate with Large Diameter and Low Orientation Deviation <u>Takehiro Yoshida</u>, Toshio Kitamura, Kenji Othaka and Masatomo Shibata; SCIOCS, Hitachi, Japan

3:30 PM A1.1.06

Highly Conductive HVPE-GaN Grown on Native Seeds <u>Tomasz Sochacki</u>, Malgorzata Iwinska, Boleslaw Lucznik, Mikolaj Amilusik, Michal Fijalkowski, Izabella Grzegory and Michal Bockowski; Institute of High Pressure Physics PAS, Warsaw, Poland

3:45 PM BREAK

4:15 PM *A1.1.07

High Quality Bulk GaN Crystal Grown by Acidic Ammonothermal Method Makoto Saito^{1, 2}, Quanxi Bao^{1, 3}, Kohei Kurimoto^{1, 3}, Daisuke Tomida¹, Kazunobu Kojima¹, Yuji Kagamitani², Rinzo Kayano³, Toru Ishiguro¹ and Shigefusa F. Chichibu¹; ¹Tohoku University, Miyagi, Japan; ²Mitsubishi Chemical, Ushiku, Japan; ³The Japan Steel Works, Tokyo, Japan

4:45 PM *A1.1.08

Recent Developments on Growth and Applications of Ammonothermal GaN Substrates Marcin Zajac and R. Kurcharsk; Ammono, Nieporet, Poland

5:15 PM <u>A1.1.09</u>

Optical, Electrical, and Thermal Properties of N-Type Bulk Ammono-Acidic GaN Mark P. D'Evelyn¹, Wenkan Jiang¹, Jonathan Cook¹, Derrick S. Kamber¹, Rajeev T. Pakalapati¹, Dirk Ehrentraut¹, Tanja Heikkinen², Filip Tuomisto², Luke Yates³ and Samuel Graham³; ¹Soraa, Inc., Goleta, California, United States; ²Department of Applied Physics, Aalto University, FI-00076 Aalto Espoo, Finland; ³School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States

5:30 PM A1.1.10

Enhancement of Lateral Growth of GaN Crystal with Extremely Low Dislocation Density by Na-Flux Point Seed Technique Masatoshi Hayashi, Masayuki Imanishi, Takumi Yamada, Daisuke Matsuo, Kosuke Murakami, Mihoko Maruyama, Mamoru Imade, Masashi Yoshimura and Yusuke Mori; Engineering, Osaka University, Suita, Japan

5:45 PM A1.1.11

Free-Standing HVPE-GaN Crystals—Slicing, Wafering and Preparation of Seeds Michal Fijalkowski; Institute of High Pressure Physics PAS, Warszawa, Poland

A2.1: Epitaxial Growth I Monday Afternoon, October 3, 2016 Room: Camelia/Dogwood

2:00 PM *A2.1.01

Low Dislocation Density AlGaN Epilayers on Sapphire for UV Laser Diodes and Power Electronics Andrew Allerman, Mary H. Crawford, Andrew M. Armstrong, Albert G. Baca, Jeramy R. Dickerson, Michael P. King, Robert J. Kaplar and Stephen R. Lee; Sandia National Laboratories, Albuquerque, New Mexico, United States

2:30 PM A2.1.02

Phase Diagram for Island Growth, Step Flow Growth, and Step Bunching Growth of AlN Layers Konrad Bellmann, Tim Wernicke, Christian Kuhn and Michael Kneissl; Institute of Solid State Physics, Technical University of Berlin, Berlin, Germany

2:45 PM <u>A2.1.03</u>

Fabrication of High-Quality AlN Template on Sapphire by High-Temperature Annealing <u>Hideto</u> <u>Miyake</u>^{2,1}, Chia-Hung Lin¹, Yikang Liu¹ and Kazumasa Hiramatsu¹; ¹Electrical and Electronic Engineering, Mie University, Tsu, Japan; ²Graduate School of Regional Innovation Studies, Mie University, Tsu, Japan

3:00 PM A2.1.04

N-Face InN/GaN (000-1) Double Heterostructures Grown by Metalorganic Vapor Phase Epitaxy <u>Tetsuya Akasaka</u>, Monika Schied, Hideki Yamamoto and Kazuhide Kumakura; NTT Basic Research Laboratories, NTT Corporation, Atsugi, Japan

3:15 PM <u>A2.1.05</u>

Green and Amber Emission Thanks to Full InGaN Structure on Relaxed InGaN Substrate Armelle Even¹, Gautier Laval¹, Olivier Ledoux², Pierre Ferret¹, David Sotta², Eric Guiot², Francois Levy¹, Ivan-Christophe Robin¹ and Amelie Dussaigne¹; ¹CEA, LETI, MINATEC Campus, University of Grenoble-Alpes, Grenoble, France; ²Soitec, Bernin, France

3:30 PM A2.1.06

High Internal Quantum Efficiency Long Wavelength Semipolar Quantum Wells with and without Strain Controlling AllnN Layers Fedor A. Ketzer¹, Philipp Horenburg¹, Heiko Bremers¹, Uwe Rossow¹, Florian Tendille², Philippe Vennegues², Philippe De Mierry², Jesus Zuniga-Perez² and Andreas Hangleiter¹;
¹Institute of Applied Physics, Braunschweig University of Technology, Braunschweig, Germany; ²Centre de Recherche sur l'Hétéro-Epitaxie (CRHEA), Valbonne, France

3:45 PM BREAK

B1.1: Visible Devices I: Visible Light Emitters Monday Afternoon, October 3, 2016 Room: International South and Center

2:00 PM *B1.1.01

High Power Blue and Green AlInGaN Laser Diodes Shingo Masui, Yoshitaka Nakatsu, Daiji Kasahara and Shin-ichi Nagahama; LD Development Department, Nichia Corporation, Tokushima, Japan

2:30 PM *B1.1.02

Recombination and Transport Dynamics of III-Nitride LEDs—New Experimental Insights <u>Aurelien David</u>, Christophe Hurni, Nathan G. Young and Michael D. Craven; Soraa Inc., Fremont, California, United States

3:00 PM B1.1.03

Nonpolar III-Nitride Vertical-Cavity Surface-Emitting Lasers Charles A. Forman¹, John T. Leonard¹, Erin C. Young¹, Seunggeun Lee², Daniel A. Cohen¹, Benjamin P. Yonkee¹, Robert M. Farrell¹, Tal Margalith¹, Steven P. DenBaars^{1, 2}, James S. Speck¹ and Shuji Nakamura^{1, 2}; ¹Materials, University of California, Santa Barbara, California, United States; ²Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States

3:15 PM B1.1.04

3-mW RT-CW GaN-Based VCSELs and Their Temperature Dependence Kenjo Matsui¹, Takashi Furuta¹, Natsumi Hayashi¹, Yugo Kozuka¹, Takanobu Akagi¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹, Motoaki Iwaya¹ and Isamu Akasaki^{1, 2}; ¹Meijo University, Nagoya, Japan; ²Akasaki Research Center, Nagoya, Japan

3:30 PM B1.1.05

Thresholdless Lasing of Nitride Nanobeam Cavities on Silicon Stefan Jagsch¹, Noelia Vico Trivino², Gordon Callsen¹, Stefan Kalinowski¹, Ian M. Rousseau², Jean-Francois Carlin², Raphael Butte², Axel Hoffmann¹, Nicolas Grandjean² and <u>Stephan Reitzenstein</u>¹; ¹Technische Universität Berlin, Berlin, Germany; ²EPFL Laussanne, Laussanne, Switzerland

3:45 PM BREAK

C0.1: Electronic Devices I Monday Afternoon, October 3, 2016 Room: Narcissus/Orange Blossom

2:00 PM INVITED TALK BY ANDREA CORRION

2:30 PM *C0.1.02

Key Reliability Issues and Degradation Mechanisms of GaN-Based Power HEMTs Matteo Meneghini, Gaudenzio Meneghesso and Enrico Zanoni; Department of Information Engineering, University of Padova, Padova, Italy

3:00 PM CO.1.03

Transferred-Substrate AlGaN/GaN HEMTs with Thermal Resistance Comparable with HEMTs on SiC Substrate Masanobu Hiroki, Kazuhide Kumakura and Hideki Yamamoto; NTT Basic Research Laboratories, Atsugi, Japan

3:15 PM C0.1.04

Q-Band High Power Aln/GaN HEMTs With Over 45% PAE Riad Kabouche, Ezgi Dogmus, Etienne Okada, Malek Zegaoui and Farid Medjdoub; IEMN-CNRS, Villeneuve d'Ascq, France

3:30 PM C0.1.05

Dependence of Resonant Tunneling Current on Barrier Thickness in GaN/AIN Resonant Tunneling Diodes Operating at Room Temperature Jimy J. Encomendero¹, S.M. M. Islam¹, Vladimir Protasenko¹, Patrick Fay², Debdeep Jena^{1, 3} and Huili G. Xing^{1, 3}; ¹Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; ²Electrical Engineering, University of Notre Dame, South Bend, Indiana, United States; ³Materials Science, Cornell University, Ithaca, New York, United States

3:45 PM BREAK

4:15 PM *C0.1.06

Rethinking Power Density—How GaN is Changing the Game in Power Electronics Steven R. Tom; GaN Technology, Texas Instruments, Dallas, Texas, United States

4:45 PM *C0.1.07

Current Status of Vertical GaN Power Devices <u>Tetsu Kachi</u>; Institute of Materials and System for Sustainability, Nagoya University, Nagoya, Japan

5:15 PM C0.1.08

GaN MOSHEMT on Free-Standing GaN Substrate with p-Al_xGa_{1-x}N Back Barrier and 10¹⁰ On/Off Ratio Mingda Zhu^{3, 1}, Bo Song^{3, 1}, Zongyang Hu^{3, 1}, Kazuki Nomoto^{3, 1}, Ming Pan⁴, Xiang Gao⁴, Debdeep Jena^{3, 2, 1} and Huili G. Xing^{3, 2, 1}; ¹Electrical Engineering, University of Notre Dame, NOTRE DAME, Indiana, United States; ²Material Science and Engineering, Cornell University, ITHACA, New York, United States; ³Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States; ⁴IQE RF LLC., Somerset, New Jersey, United States

5:30 PM <u>C0.1.09</u>

Regrown Mg Doped GaN Interlayer to Enhance Breakdown Voltage in Trench MOSFET Chirag Gupta¹, Yuuki Enatsu¹, Silvia Chan¹, Anchal Agarwal¹, Davide Bisi^{2, 1}, Stacia Keller¹ and Umesh Mishra¹; ¹Electrical and Computer Engineering, University of California, Santa Barbara, Goleta, California, United States; ²University of Padova, Padova, Italy

5:45 PM CO.1.10

Time-Dependent Dielectric Breakdown in High-Voltage GaN MIS-HEMTs—The Role of Temperature Shireen Warnock, Allison Lemus and Jesus A. del Alamo; Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

D2.1: Theory and Simulation I: Basic Materials Properties - Theory Monday Afternoon, October 3, 2016 Room: International North

2:00 PM *D2.1.01

Correct Implementation of Polarization Constants in Nitride Semiconductors Chris G. Van de Walle; Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States

2:30 PM *D2.1.02

Ab Initio-Based Approach to Crystal Growth of Nitride Semiconductors—Contribution of Growth Orientation and Surface Reconstruction Yoshihiro Kangawa¹, Kenji Shiraishi², Koichi Kakimoto¹ and Akinori Koukitu³; ¹Research Institute for Applied Mechanics, Kyushu University, Fukuoka, Japan; ²Institute of Materials and System for Sustainability, Nagoya University, Nagoya, Japan; ³Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Tokyo, Japan

3:00 PM D2.1.03

Nonlinear Thermoelectromechanical Analysis of III-N Devices <u>Mario Ancona</u>; Naval Research Laboratory, Washington, District of Columbia, United States

3:15 PM D2.1.04

Tuning the Topological Character of Wurtzite III-Nitrides—Interplay of Crystal-Field Splitting, Spin-Orbit Coupling, and *p-d* Hybridization Induced Repulsion Parijat Sengupta, Masahiko Matsubara and Enrico Bellotti; Electrical and Computer Engineering, Boston University, Boston, Massachusetts, United States

3:30 PM D2.1.05

Self-Compensation Due to Point Defects in Mg-Doped GaN <u>Giacomo Miceli</u>; École polytechnique fédérale de Lausanne, Lausanne, Switzerland

3:45 PM BREAK

F0.1: Novel Materials and Devices I Monday Afternoon, October 3, 2016 Room: Poinsettia/Quince

2:00 PM *F0.1.01

AlScN, AlYN, and InYN—Emerging Nitride Solid Solutions Agne Zukauskaite¹, Christopher Tholander², Jens Birch², Lars Hultman², Yuan Lu¹, Anli Ding³, Markus Reusch⁴, Volker Cimalla¹ and Vadim Lebedev¹; ¹Sensors, Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany; ²Department of Physics, Chemistry and Biology, Linköping University, Linköping, Sweden; ³Technology, Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany; ⁴IMTEK - Department of Microsystems Engineering, University of Freiburg, Freiburg, Germany

2:30 PM *F0.1.02

Gallium Nitride Sensing Technology for Extreme Harsh Environments <u>Debbie G. Senesky</u>; Aeronautics and Astronautics, Stanford University, Stanford, California, United States

3:00 PM F0.1.03

Many-Particle Complexes Stabilized by a Degenerate Electron Gas in Highly Ge-Doped, Bulk GaN Gordon Callsen¹, Christian Nenstiel¹, Felix Nippert¹, Thomas Kure¹, Markus R. Wagner¹, Sarah Schlichting¹, Nadja Jankowski¹, Marcus Mueller², Frank Bertram², Peter Veit², Marc Hoffmann², Stefanie Fritze², Armin Dadgar², Alois Krost², Axel Hoffmann¹ and Friedhelm Bechstedt³; ¹Insitut für Festkörperphysik, Technische Universität Berlin, Berlin, Germany; ²Insitut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Magdeburg, Germany; ³Insitut für Festkörpertheorie und optik, Friedrich-Schiller-Universität, Jena, Germany

3:15 PM F0.1.04

Gallium Nitride-on-Silicon Photonic Crystal Platform for Second Harmonic Generation Mohamed S. Mohamed 1, Angelica Simbula 2, Dario Gerace 2, Matteo Galli 2, Momchil Minkov 1, Vincenzo Savona 1, Jean-Francois Carlin 1, Nicolas Grandjean 1 and Romuald Houdre 1; 1 Institute of Physics, EPFL, Lausanne, Switzerland; 2 Dipartimento di Fisica, Università di Pavia, Pavia, Italy

3:30 PM <u>F0.1.05</u>

Excitonic Properties of Hexagonal BN Grown by High-Temperature Metal-Organic Vapor-Phase Epitaxy Mary Crawford¹, Andrew Allerman¹, Thomas Beechem¹, Taisuke Ohta¹, Douglas Medlin², Catalin Spataru³, Anthony Rice¹, Jeffrey Figiel¹ and Michael Smith¹; ¹Physical, Chemical, and Nanosciences Center, Sandia National Laboratories, Albuquerque, New Mexico, United States; ²Energy Nanomaterials Department, Sandia National Laboratories, Livermore, California, United States; ³Materials Physics Department, Sandia National Laboratories, Livermore, California, United States

B2.1: UV Devices I: UV Emitters Monday Afternoon, October 3, 2016 Room: International South and Center

4:15 PM *B2.1.01

Exploring the Limits of AlGaN-Based Deep UV LEDs Michael Kneissl^{1,2}, Johannes Enslin¹, Martin Guttmann¹, Christian Kuhn¹, Frank Mehnke¹, Christoph Reich¹, Luca Sulmoni¹, Tim Wernicke¹, Joerg Jeschke², Johannes Glaab², Sylvia Hagedorn², Arne Knauer², Tim Kolbe², Mikael Lapeyrade², Neyhsa Lobo-Ploch², Carsten Netzel², Jens Rass², Christoph Stoelmacker², Ute Zeimer², Sven Einfeldt² and Markus Weyers²; ¹Institute of Solid State Physics, Technische Universitaet Berlin, Berlin, Germany; ²Ferdinand-Braun-Institut, Leibniz Institut fuer Hoechstfrequenztechnik, Berlin, Germany

4:45 PM B2.1.02

Engineering of Hole Transport in Tunneling Injected UV-A LEDs <u>Yuewei Zhang</u>¹, Sriram Krishnamoorthy¹, Fatih Akyol¹, Zane Jamal-Eddine¹, Andrew Allerman², Michael Moseley², Andrew Armstrong² and Siddharth Rajan¹; ¹Electrical and Computer Engineering, Ohio State University, Columbus, Ohio, United States; ²Sandia National Laboratories, Albuquerque, New Mexico, United States

5:00 PM B2.1.03

Optical Polarization Control of Photo-Pumped Stimulated Emission at 238 nm from AlGaN Multiple Quantum Wells on Bulk AlN Mohamed Lachab¹, Wenhong Sun¹, Rakesh Jain¹, Alex Dobrinsky¹, Mikhail Gaevski¹, Sergey Rumyantsev², Michael Shur² and Max Shatalov¹; ¹Sensor Electronic Technology Inc., Columbia, South Carolina, United States; ²Rensselaer Polytechnic Institute, Troy, New York, United States

5:15 PM B2.1.04

Pseudomorphic LEDs on AlN Substrates Emitting at 235 nm <u>Craig G. Moe</u>¹, James Grandusky¹, Jumpei Kasai² and Leo Schowalter¹; ¹Crystal IS, Green Island, New York, United States; ²Asahi Kasei, Fuji, Japan

5:30 PM <u>B2.1.05</u>

Ultraviolet Micro-Cavity Light Emitting Diodes with an Electrically Conducting *n*-AlGaN/GaN DBR Grown by Metalorganic Chemical Vapor Deposition Yuh-Shiuan Liu¹, Tsung-Ting Kao¹, Karan Mehta¹, Xiaojia Jia¹, Shuo Wang², Shyh-Chiang Shen¹, Paul D. Yoder¹, Fernando Ponce², <u>Theeradetch Detchprohm</u>¹ and Russell D. Dupuis¹; ¹Georgia Institute of Technology, Atlanta, Georgia, United States; ²Arizona State University, Tempe, Arizona, United States

5:45 PM <u>B2.1.06</u>

Defect-Resistant Emission Properties of Nonpolar *m*-Plane Al_{1-x}In_xN Epilayers for Deep-Ultraviolet to **Visible Polarized-Light-Emitting Vacuum Fluorescent Display Devices** Shigefusa F. Chichibu¹, Kazunobu Kojima¹, Akira Uedono² and Yoshitaka Sato³; ¹Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan; ²University of Tsukuba, Tsukuba, Japan; ³Futaba Corporation, Chosei-gun, Japan

B3.1: Photodetectors, Photovoltaics, Intersubband Devices I:

Photodetectors and Photovoltaics I Monday Afternoon, October 3, 2016

Room: Poinsettia/Quince

4:15 PM *B3.1.01

Key Factors for Improvement of InGaN Photovoltaic Performance Masatomo Sumiya¹ and Liwen Sang²; ¹Widegap Materials Group, National Institute for Materials Science, Tsukuba, Japan; ²National Institute for Materials Science, Tsukuba, Japan

4:45 PM *B3.1.02

III-Nitride Based Avalanche Photodetectors Manijeh Razeghi and Ryan McClintock; Center for Quantum Devices, Department of Electrical Engineering and Computer Science, Northwestern University, Evanston, Illinois, United States

5:15 PM B3.1.03

Demonstration of Uniform and Reliable GaN p-i-n Ultraviolet Avalanche Photodiode Arrays with Large **Detection Area on Free-Standing GaN Substrates** Mi-Hee Ji¹, Jeomoh Kim¹, Theeradetch Detchprohm¹, Russell D. Dupuis¹, Ashok Sood², Nibir Dhar³ and Jay Lewis⁴; ¹Georgia Institute of Technology, Atlanta, Georgia, United States; ²Magnolia Optical Technologies, Woburn, Massachusetts, United States; ³Night Vision and Electronic Sensors Directorate, Fort Belvoir, Virginia, United States; ⁴DARPA/MTO, Arlington, Virginia, United States

5:30 PM B3.1.04

Influence of the Active Region Thickness on the Performance of InGaN/GaN Multi-Quantum-Well Solar Cells Anna Mukhtarova^{2, 1}, Sirona Valdueza-Felip^{2, 1}, Luca Redaelli^{2, 1}, Christophe Durand^{2, 1}, Catherine Bougerol^{2, 3}, Eva Monroy^{2, 1} and Joel Eymery^{2, 1}; ¹CEA/INAC, Grenoble, France; ²University Grenoble Alpes, Grenoble, France; ³CNRS - Institut Néel, Grenoble, France

5:45 PM B3.1.05

Optimization of (AI)GaN Based Betavoltaic Device Kasey Hogan, Jonathan Marini, Isra Mahaboob and Fatemeh (Shadi) Shahedipour-Sandvik; Nanoscale Engineering, SUNY Polytechnic Institute, Colleges of Nanoscale Science and Engineering, Albany, New York, United States

D1.1: Materials Characterization I: Basic Materials Properties - Characterization Monday Afternoon, October 3, 2016 Room: Camelia/Dogwood

4:15 PM *D1.1.01

Cathodoluminescence Characteristic of InGaN/GaN MQWs Grown on Polar and Semi-Polar Substrates Mi-Hyang Sheen³, Sung-Dae Kim¹, Jongjin Jang², Okhyun Nam², Jong-In Shim³ and Youngwoon Kim¹; ¹Materials Science and Engineering, Seoul National University, Seoul, Korea (the Republic of); ²Korea Polytechnic University, Siheung, Korea (the Republic of); ³Department of Electronics and Communications, Hanyang University, Ansan, Korea (the Republic of)

4:45 PM *D1.1.02

Positron Spectroscopy of III-Nitrides <u>Filip Tuomisto</u>; Department of Applied Physics, Aalto University, Espoo, Finland

5:15 PM D1.1.03

Basal Stacking Fault Domains as a Source of a-Type Threading Dislocations in Nitride Epitaxial Layers

Julita Smalc-Koziorowska^{1, 2}, Calliope Bazioti³, Martin Albrecht⁴ and George P. Dimitrakopulos³;

Laboratory of Semiconductors, Institute of High Pressure Physics, Warsaw, Poland; ²TopGaN Ltd,

Warsaw, Poland; ³Department of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece;

Leibniz Institute for Crystal Growth, Berlin, Germany

5:30 PM D1.1.04

Spatial Variations of Photoluminescence Polarization in *m*-Plane InGaN Quantum Wells <u>Ruslan Ivanov</u>¹, Mounir D. Mensi¹, Leah Y. Kuritzky², Daniel J. Myers², Saulius Marcinkevicius^{1, 2}, Oscar Martinez^{3, 1}, Shuji Nakamura² and James S. Speck²; ¹Department of Materials and Nano Physics, KTH Royal Institute of Technology, Kista, Sweden; ²Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States; ³GdS Optronlab, Universidad de Valladolid, Valladolid, Spain

5:45 PM <u>D1.1.05</u>

Localization of Individual Electrons and Holes in Submonolayer InN Quantum Sheets Embedded in GaN Felix Feix, Timur Flissikowski, Caroline Cheze, Raffaella Calarco, Holger T. Grahn and Oliver Brandt; Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany

E0.1: Nanostructures I Monday Afternoon, October 3, 2016 Room: International North

4:15 PM *E0.1.01

MBE Growth of Ordered InGaN/GaN Nanocolumns—Applications to Classical/Quantum Light Sources and Pseudosubstrates Enrique Calleja Pardo; Electronic Engineering, ISOM-Universidad Politecnica de Madrid, Madrid, Spain

4:45 PM E0.1.02

The Extreme Emission Properties of III-Nitride Quantum Dots and the Effects of Extreme Environments on Those Properties Mark J. Holmes¹, Satoshi Kako², Kihyun Choi¹, Munetaka Arita¹ and Y. Arakawa^{1, 2}; ¹Institute for Nano Quantum Information Electronics, University of Tokyo, Meguro-ku, Japan; ²Institute of Industrial Science, University of Tokyo, Tokyo, Japan

5:00 PM E0.1.03

Optical Pumped Lasing at Amber Region in Short Period Nanocolumn Arrays Yuzo Matsui¹, Shunsuke Ishizawa¹, Kai Motoyama¹ and Katsumi Kishino^{1, 2}; ¹Sophia University, Tokyo, Japan; ²Nanotechnology Research Center, Sophia University, Tokyo, Japan

5:15 PM E0.1.04

Nanoscale Cathodoluminescence Mapping of Three-Dimensional InGaN/GaN Core-Shell Microrod Light Emitting Diodes Marcus Mueller¹, Sebastian Metzner¹, Peter Veit¹, Frank Bertram¹, Christian Nenstiel², Gordon Callsen², Matin S. Mohajerani³, Jana Hartmann³, Hao Zhuo³, Hergo H. Wehmann³, Axel Hoffmann², Andreas Waag³ and Juergen Christen¹; ¹Institute of Experimental Physics, Otto-von-Guericke Universität Magdeburg, Magdeburg, Germany; ²Institut für Festkörperphysik, Technische Universität Berlin, Berlin, Germany; ³Institut für Halbleitertechnik, Technische Universität Braunschweig, Braunschweig, Germany

5:30 PM <u>E0.1.05</u>

Closely-Packed Two-Dimensional Arrangement of Microscopic Area (10×10 mm²) InGaN-Based Nanocolumn LEDs with Different Emission Colors Naoki Sakakibara¹, Tatsuya Kano¹, Jun Yoshida¹, Rin Miyagawa¹, Takao Oto¹ and Katsumi Kishino¹,²; ¹Sophia university, Chiyoda-ku, Japan; ²Nanotechnology Research Center, Sophia University, Tokyo, Japan

5:45 PM <u>E0.1.06</u>

Optical Properties of Externally Biased AlGaN/GaN Nanowire Heterostructures Jan Mussener¹, Pascal Hille¹, Jorg Schormann¹, Joerg Teubert¹, Joel Bleuse², Bruno Gayral², Eva Monroy², Maria de la Mata³, Jordi Arbiol^{3, 4} and Martin Eickhoff¹; ¹Institute of Physics, Justus-Liebig Universität Giessen, Giessen, Germany; ²INAC-PHELIQS, CEA Grenoble, Grenoble, France; ³Catalan Institute of Nanoscience and Nanotechnology, Autonomous University of Barcelona, Bellaterra, Spain; ⁴Catalan Institution for Research and Advanced Studies, Barcelona, Spain

A2.2: Epitaxial Growth II: Epitaxial Growth for UV Emitters
Tuesday Morning, October 4, 2016
Room: International South

8:30 AM *A2.2.01

Progress and Remaining Challenges in UVC Laser Development Zlatko Sitar^{2, 1}, Ramon Collazo², Ronny Kirste¹, Biplab Sarkar², Felix Kaess², Isaac Bryan², Zachary Bryan², Seiji Mita¹ and James Tweedie¹; ¹Adroit Materials Inc., Cary, North Carolina, United States; ²North Carolina State University, Raleigh, North Carolina, United States

9:00 AM A2.2.02

AlGaN Material Structures for UV-LEDs Based on Dislocation-Free GaN Platelets Maryam Khalilian¹, David Lindgren¹, Filip Lenrick², Reine Wallenberg², Anders Gustafsson¹, B. J. Ohlsson¹ and Lars Samuelson¹; ¹Solid State Physics, Lund University, Lund, Sweden; ²Centre for Analysis and Synthesis, Lund, Sweden

9:15 AM A2.2.03

Effect of Optimized Buffers on Electro-Optical Characteristics of AlGaN-Based Deep-Ultraviolet PIN Photodetectors Mohammad Tollabi Mazraehno^{2, 1}, Peter Stauss¹, Alvaro Gomez-Iglesias¹, Lutz Hoeppel¹, Alexander Pfeuffer¹, Simon Englisch¹, Michael Hirmer¹, Georg Brüderl¹, Michael Binder¹ and Thomas Pertsch²; ¹OSRAM Opto Semiconductors GmbH, Regensburg, Germany; ²Friedrich-Schiller-University Jena, Institute of Applied Physics, Jena, Germany

9:30 AM <u>A2.2.04</u>

Growth of Deep-UV (11-22) AlGaN Quantum Wells on m-Plane (1-100) Sapphire Substrates <u>Takuma</u> <u>Matsumoto</u>^{1, 2}, Issei Oshima^{1, 2}, Noritoshi Maeda¹, Masafumi Jo¹, Norihiko Kamata² and Hideki Hirayama¹; ¹RIKEN, Wako, Japan; ²Saitama University, Sakura-ku, Japan

9:45 AM A2.2.05

Boron Containing AlGaN Layers for UV Lighting Oliver Rettig¹, Jan-Patrick Scholz², Sebastian Bauer², Ferdinand Scholz¹ and Klaus Thonke²; ¹Institute of Optoelectronics, Ulm University, Ulm, Germany; ²Institute of Quantum Matter / Semiconductor Physics Group, Ulm University, Ulm, Germany

10:00 AM A2.2.06

Ge Doping of AlGaN—Growth, Characterization and Applications Ronny Kirste^{1, 2}, Marc P. Hoffmann¹, Alexander Franke¹, Ramon Collazo¹ and Zlatko Sitar¹; ¹North Carolina State University, Raleigh, North Carolina, United States; ²Adroit Materials, Cary, North Carolina, United States

10:15 AM BREAK

B1.2: Visible Devices II: Long Wavelength Emitters Tuesday Morning, October 4, 2016 Room: International Center

8:30 AM *B1.2.01

Green Gap and Droop in InGaN/GAN LEDs—The Role of Random Alloy Fluctuations Matthias Auf der Maur¹, Alessandro Pecchia², Gabriele Penazzi³, Walter Rodrigues¹ and Aldo Di Carlo¹; ¹Electronics Engineering, University of Rome Tor Vergata, Rome, Italy; ²ISMN, Consiglio Nazionale delle Ricerche, Monterotondo, Italy; ³BCCMS, University of Bremen, Bremen, Germany

9:00 AM B1.2.02

High Luminous Efficacy InGaN/AlGaN LED in the Green Spectral Region Abdullah I. Alhassan¹, Robert M. Farrell¹, Burhan Saifaddin¹, Asad Mughal¹, Feng Wu¹, Shuji Nakamura^{1, 2}, Steven P. DenBaars¹ and James S. Speck¹; ¹Materials, University of California, Santa Barbara, Goleta, California, United States; ²Department of Electrical and Computer Engineering, University of California Santa Barbara, Goleta, California, United States

9:15 AM B1.2.03

What Limits the Efficiency of Green (0001) InGaN LEDs Markus Pristovsek¹, Rachel A. Oliver¹, Tom Badcock², Muhammad Ali² and Andrew Shields²; ¹Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ²Cambridge Research Laboratory, Toshiba Research Europe Ltd., Cambridge, United Kingdom

9:30 AM B1.2.04

The Comparative Internal Quantum Efficiency and Thresholds for Auger Recombination in Green, Yellow and Red InGaN-Based Light Emitters Grown along the Polar Direction <u>Huong T. Ngo</u>; University of Montpellier, Laboratory Charles Coulomb, Montpellier, France

9:45 AM B1.2.05

Cubic InGaN MQWs for Efficient Green LEDs <u>David Wallis</u>¹, Suman-Lata Sahonta¹, Martin Frentrup¹, Lok Yi Lee¹, Menno J. Kappers¹, Rachel A. Oliver¹, Daniel Nilsson², Jill Shaw², Peter Ward² and Colin J. Humphreys¹; ¹University of Cambridge, Cambridge, United Kingdom; ²Anvil Semiconductors Ltd, Coventry, United Kingdom

10:00 AM B1.2.06

Suppressing the Incorporation of Carbon Impurity in AlGaN:Mg for Green LDs with Low Operation Voltage <u>Jianping Liu</u>; Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, Suzhou, China

10:15 AM BREAK

C1.1: RF/mm Wave Devices I: Electronic Devices for RF Applications
Tuesday Morning, October 4, 2016
Room: Narcissus/Orange Blossom

8:30 AM *C1.1.01

High Frequency GaN HEMTs and MMICs with AIN-Interlayer Epitaxy Peter Brueckner¹, Dirk Schwantuschke², Ruediger Quay², Michael Mikulla² and Oliver Ambacher²; ¹III-V Technology, Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg im Breisgau, Germany; ²Fraunhofer Institute for Applied Solid State Physics IAF, Freiburg, Germany

9:00 AM C1.1.02

Ultra-Wide Bandgap AlGaN Channel MISFET with Low-Resistance Ohmics Sanyam Bajaj¹, Fatih Akyol¹, Sriram Krishnamoorthy¹, Yuewei Zhang¹, Andrew Armstrong², Andrew Allerman² and Siddharth Rajan¹; ¹Electrical and Computer Engineering, Ohio State University, Columbus, Ohio, United States; ²Sandia National Laboratories, Albuquerque, New Mexico, United States

9:15 AM C1.1.03

Control of Polarization Charges for Leakage Current Reduction in InAlN/AlN/GaN Heterostructures with In Situ AlN Cap Junji Kotani, Atsushi Yamada, Tetsuro Ishiguro and Norikazu Nakamura; Devices and Materials Laboratory, Fujitsu Laboratories. Ltd., Atsugi, Japan

9:30 AM C1.1.04

Anomalous Source-Side Degradation of InAlN/GaN HEMTs under ON-State Stress <u>Yufei Wu</u> and Jesus del Alamo; EECS, MIT, Cambridge, Massachusetts, United States

9:45 AM C1.1.05

Planar-Nanostrip-Channel InAIN/GaN HEMTs on Si with Improved g_m and f_T Linearity Weichuan Xing^{1, 2}, Zhihong Liu¹, Haodong Qiu², Geok Ing Ng^{1, 2} and Tomas Palacios³; ¹Low Energy Electronic Systems, Singapore-MIT Alliance for Research and Technology, Singapore, Singapore; ²Electrical and Electronic Engineering, Nanyang Technological University, Singapore, Singapore; ³Microsystems Technology Laboratories, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

10:00 AM LATE NEWS

10:15 AM BREAK

D1.2: Materials Characterization II: Characterization of InGaN Films and QWs
Tuesday Morning, October 4, 2016
Room: International North

8:30 AM *D1.2.01

Electronic and Optical Properties of c- and m-Plane InGaN Quantum Wells—Influence of Structural Inhomogeneities and Random Alloy Fluctuations Stefan Schulz¹, Rachel A. Oliver², Colin J. Humphreys² and Philip Dawson³; ¹Tyndall National Institute, Cork, Ireland; ²Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ³University of Manchester, Manchester, United Kingdom

9:00 AM D1.2.02

Carrier Diffusion in m-Plane InGaN Single Quantum Well Measured by Dual Mode Scanning Near-Field Optical Microscopy Saulius Marcinkevicius^{1, 2}, Mounir Mensi¹, Ruslan Ivanov¹, Leah Y. Kuritzky², Shuji Nakamura² and James S. Speck²; ¹Materials and Nano Physics, KTH Royal Institute of Technology, Kista, Sweden; ²Materials, University of California, Santa Barbara, Santa Barbara, California, United States

9:15 AM D1.2.03

Anisotropic Photo-Induced Bleaching of the Polarization-Dependent Absorption in a Strain-Compensated *a*-Plane InGaN/AlGaN Superlattice Antonio Llopis, Ryan W. Enck, Gregory A. Garrett, Blair C. Connelly, Grace D. Metcalfe, Paul Shen and Michael Wraback; Sensors and Electron Devices Directorate, Army Research Laboratory, Adelphi, Maryland, United States

9:30 AM D1.2.04

Influence of Inhomogeneous Broadening on the Optical Polarization Properties of m-Plane, (20-2-1) and (20-21) InGaN Quantum Wells Christian Mounir¹, Ingrid L. Koslow^{2, 3}, Tim Wernicke², Michael Kneissl^{2, 3}, Leah Y. Kuritzky⁴, Nicholas L. Adamski⁴, Sang H. Oh⁴, Christopher D. Pynn⁴, Steven P. DenBaars⁴, Shuji Nakamura⁴, James S. Speck⁴ and Ulrich T. Schwarz⁵; ¹IMTEK, University of Freiburg, Freiburg, Germany; ²Institute of Solid State Physics, Technische Universität Berlin, Berlin, Germany; ³Ferdinand-Braun-Institut, Berlin, Germany; ⁴Solid State Lighting and Energy Electronics Center, University of California, Santa Barbara, California, United States; ⁵Experimentelle Sensorik, Technische Universität Chemnitz, Chemnitz, Germany

9:45 AM D1.2.05

Probing the Inhomogeneity of In-Rich InGaN Layers on Top of InGaN Compositional Grades by Nanoscale Cathodoluminescence Gordon Schmidt¹, Max Trippel¹, Peter Veit¹, Frank Bertram¹, Karine Hestroffer², Cory Lund², Haoran Li², Stacia Keller², Umesh Mishra² and Juergen Christen¹; ¹Otto-von-Guericke-University Magdeburg, Magdeburg, Germany; ²University of California Santa Barbara, Santa Barbara, California, United States

10:00 AM D1.2.06

Strain Relaxation via (a+c)-Type Misfit Dislocation Formation in InGaN Epilayers Grown on (0001) GaN by Plasma-Assisted Molecular Beam Epitaxy Joanna Moneta^{1, 2}, Tobias Schulz¹, Toni Markurt¹, Thilo Remmele¹, Albert Kwasniewski¹, Czeslaw Skierbiszewski^{2, 3}, Marcin Siekacz^{2, 3}, Torsten Ernst³, Julita Smalc-Koziorowska^{2, 3} and Martin Albrecht¹; ¹Leibniz Institute for Crystal Growth, Berlin, Germany; ²Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; ³Top GaN Ltd, Warsaw, Poland

10:15 AM BREAK

E0.2: Nanostructures II: GaN Nanostructure Synthesis and Characterization Tuesday Morning, October 4, 2016 Room: Camelia/Dogwood

8:30 AM *E0.2.01

Advanced Nanofocus X-Ray Diffraction and Electron Microscopy Study of 3D GaN Nanostructures Achim Trampert; Microstructure, Paul-Drude-Institute for Solid State Electronics, Berlin, Germany

9:00 AM <u>E0.2.02</u>

GaN Nanowire p-n Junctions Investigated by Kelvin Probe Force Microscopy Ana Cros¹, Albert Minj^{1, 2}, Thomas Auzelle^{3, 5}, Julien Pernot^{4, 6, 7} and Bruno Daudin^{3, 5}; ¹Institute of Materials Science, University of Valencia, Paterna, Spain; ²ENSICAEN, Caen, France; ³INAC-SP2M, CEA, Grenoble, France; ⁴ Institut NEEL, Community Grenoble Alpes University, Grenoble, France; ⁵INAC-PHELIQS, CEA, Grenoble, France; ⁶CNRS, Inst NEEL, Grenoble, France; ⁷Institut Universitaire de France, Paris, France

9:15 AM E0.2.03

P-Type Doping of GaN Nanowires Characterized by Photoelectrochemical Measurements <u>Jumpei</u> <u>Kamimura</u>¹, Peter Bogdanoff², Manfred Ramsteiner¹, Pierre Corfdir¹, Felix Feix¹, Lutz Geelhaar¹ and Henning Riechert¹; ¹Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; ²Institute for Solar Fuels, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany

9:30 AM E0.2.04

Selective Area Growth and Optical Characterization of Ordered GaN Nanowire Arrays Matt Brubaker, Alexana Roshko, Bryan T. Spann, Paul T. Blanchard, Todd E. Harvey, Joel C. Weber, Norman A. Sanford and Kris A. Bertness; NIST, Boulder, Colorado, United States

9:45 AM E0.2.05

MOCVD of GaN Micro- and Nanowires on Sapphire Substrates Initiated by Ti Thin Film Mariia Rozhavskaia¹, Wsevolod Lundin², Elena Lundina², Valery Davydov², Vladimir Popok¹, Sergey Troshkov², Aleksandr Vasilyev², Pavel Brunkov², Aleksandr Baklanov², Andrey Tsatsulnikov² and Vladimir Dubrovskii ^{2,3,4}; ¹Nano department, Aalborg University, Denmark, Aalborg, Denmark; ²Ioffe Institute, Saint-Petersburg, Russian Federation; ³St. Petersburg Academic University, Nanotechnology Centre, Saint-Petersburg, Russian Federation; ⁴ITMO University, International laboratory "Laser Systems", Saint-Petersburg, Russian Federation

10:00 AM E0.2.06

GaN Nanowires Free of Inhomogeneous Strain Grown on a Metallic TiN Film <u>Gabriele Calabrese</u>, David Van Treeck, Pierre Corfdir, Bernd Jenichen, Vladimir M. Kaganer, Lutz Geelhaar, Sergio Fernandez-Garrido and Oliver Brandt; Paul-Drude-Institut for Solid State Electronics, Berlin, Germany

10:15 AM BREAK

10:45 AM *E0.2.07

STEM-CL Analysis of 3D GaN Nanostructures <u>J. Christen</u>, F. Bertram, G. Schmidt, M. Mueller and P. Veit; Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, Madgeburg, Germany

11:15 AM E0.2.08

Ultra-Thin GaN-Based Nanowires Fabricated via a Selective Area Sublimation Approach Benjamin Damilano, Stephane Vezian, <u>Blandine Alloing</u>, Marc Portail, Julien Brault, Virginie Brandli and Jean Massies; CRHEA, CNRS, Valbonne, France

11:30 AM <u>E0.2.09</u>

Growth of Self-Organized Vertical GaN Nanocolumns Utilizing AlN as Nucleation Sites on Single Layer Graphene/Silica Glass by Molecular Beam Epitaxy Andreas Liudi Mulyo¹, Yuta Konno¹, Bjørn-Ove Fimland², Helge Weman^{1, 2} and Katsumi Kishino¹; ¹Department of Engineering and Applied Sciences, Sophia University, Tokyo, Japan; ²Department of Electronics and Telecommunications, Norwegian University of Science and Technology, Trondheim, Norway

11:45 AM E0.2.10

Epitaxy of GaN Nanowires on Graphene <u>Vishnuvarthan Kumaresan</u>¹, Ludovic Largeau¹, Ali Madouri¹, Frank Glas¹, Hezhi Zhang², Fabrice Oehler¹, Antonella Cavanna¹, Andrey Babichev^{2, 3}, Noelle Gogneau¹, Maria Tchernycheva² and Jean-Christophe Harmand¹; ¹CNRS - Laboratoire de Photonique et de Nanostructures, Marcoussis, France; ²Institut d'Electronique Fondamentale, University Paris, Saclay, Saclay, France; ³ITMO University, St. Petersburg 197101, Russian Federation

12:00 PM E0.2.11

Molecular Beam Epitaxy of GaN Nanowires on Graphene Layer Structures Synthesized on SiC Sergio Fernandez-Garrido¹, Manfred Ramsteiner¹, Lauren A. Galves¹, Bharat Sharma¹, Joao Marcelo J. Lopes¹, Pierre Corfdir¹, Ziani d. Shiaber², Guanhui Gao¹, Oliver Brandt¹ and Lutz Geelhaar¹; ¹Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; ²Paulista São Paulo State University, Bauru, Brazil

12:15 PM E0.2.12

Comprehensive Study of the Growth Mode of InGaN Nanoparasols Xin Zhang^{2, 1, 3}, Benedikt Haas^{2, 1}, Eric Robin^{2, 1}, Jean-Luc Rouviere^{2, 1} and <u>Bruno Daudin^{1, 2}</u>; ¹CEA-Grenoble, Grenoble, France; ²University Grenoble Alpes, Grenoble, France; ³ALEDIA, Grenoble, France

F0.2: Novel Materials and Devices II:
Nitride MEMS and Other Novel GaN Device Architectures
Tuesday Morning, October 4, 2016
Room: Azalea/Begonia

8:30 AM F0.2.01

A GaN Technology for High-Performance MEMS Accelerometers Marc Faucher¹, Christophe Morelle¹, Paul Leclaire^{1, 2}, Yvon Cordier², Isabelle Roch¹, Eric Frayssinet², Bertrand Grimbert¹, Etienne Okada¹, Vanessa Avramovic¹, Lionel Buchaillot¹ and Didier Theron¹; ¹NAM6 group, Institute of Electronics Microelectronics and Nanotechnology, CNRS UMR 8520, Villeneuve d'Ascq, France; ²ELECTRO group, Centre de Recherches sur l'HeteroEpitaxie et ses Applications, CRHEA CNRS UPR 10, Sophia Antipolis, France

8:45 AM F0.2.02

Two- and Three-Dimensional Micro/Nano-Architectures on GaN for Electronic and Photonic Applications Ion Tiginyanu^{1, 2}; ¹Academy of Sciences of Moldova, Chisinau, Moldova (the Republic of); ²Technical University of Moldova, Chisinau, Moldova (the Republic of)

9:15 AM F0.2.03

Monolithically-Integrated GaN Photonic Systems Kwai H. Li¹, Yuk Fai Cheung¹, Kei May Lau² and <u>Hoi Wai Choi</u>¹; ¹University of Hong Kong, Hong Kong, Hong Kong; ²Hong Kong University of Science and Technology, Hong Kong, Hong Kong

9:30 AM F0.2.04

Second Harmonic Generation from a Three Dimensional GaN Micro-Cavity Emitter Arup Neogi¹, Sween Butler¹, Hongxing Jiang² and Jingyu Lin²; ¹Physics, University of North Texas, Denton, Texas, United States; ²Texas Tech University, Lubbock, Texas, United States

9:45 AM <u>F0.2.05</u>

Polarization-Free Integrated Gallium Nitride Photonics <u>Can Bayram</u>^{1, 2} and Richard Liu^{1, 2}; ¹Electrical and Computer Engineering, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States; ²Micro and Nanotechnology Laboratory, Urbana, Illinois, United States

10:00 AM LATE NEWS

10:15 AM BREAK

A1.2: Bulk Growth II:

Bulk (Al,Ga)N Growth and Optoelectronic Devices on Bulk AlN Substrates
Tuesday Morning, October 4, 2016
Room: Azalea/Begonia

10:45 AM *A1.2.01

Recent Progress in the Growth of AIN by HVPE on Native AIN Substrates Toru Kinoshita¹, Toru Nagashima¹, T. Obata¹, Rie Togashi², R. Schlesser³, Ramon Collazo⁴, Akinori Koukitu², Y. Kumagai² and Zlatko Sitar⁴; ¹Tsukuba Research Laboratories, Ibaraki, Japan; ²Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Tokyo, Japan; ³HexaTech, Inc., Morrisville, North Carolina, United States; ⁴Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States

11:15 AM A1.2.02

2-inch AlN Single Crystal Growth With Low UV Absorption Jianfeng J. Chen; Crystal IS, Inc., Ballston Lake, New York, United States

11:30 AM A1.2.03

Epitaxial Growth and Characterization of Deep UV AlGaN Devices on Bulk AlN Substrates Carsten Hartmann¹, Arne Knauer², Juergen Wollweber¹, Tobias Schulz¹, Sakari Sintonen¹, Andrea Dittmar¹, Joerg Jeschke², Christian Kuhn³, Martin Guttmann³, Martin Martens³, Luca Sulmoni³, Tim Wernicke³, Knut Peters⁴, Markus Weyers², Michael Kneissl³ and Matthias Bickermann¹; ¹Leibniz-Institute for Crystal Growth, Berlin, Germany; ²Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany; ³Institute of Solid State Physics, Technische Universität Berlin, Berlin, Germany; ⁴CrysTec GmbH, Berlin, Germany

11:45 AM A1.2.04

AlGaN Layers Grown on Patterned Sapphire by HVPE Simon Fleischmann, Anna Mogilatenko, Eberhard Richter, Deepak Prasai, Markus Weyers and Gunther Trankle; Materials Technology, Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany

12:00 PM A1.2.05

<u>Sintonen</u>, Carsten Hartmann, Juergen Wollweber, Martin Naumann, Matthias Bickermann and Martin Albrecht; Leibniz Institute for Crystal Growth, Berlin, Germany

12:15 PM A1.2.06

Nanopipe Formation via a Boron Impurity Segregation in GaN Grown by Halogen-Free Vapor Phase Epitaxy <u>Taishi Kimura</u>, Daisuke Nakamura, Yuko Aoki and Kayo Horibuchi; Toyota Central R&D Labs., Inc., Nagakute, Japan

A2.3: Epitaxial Growth III: Growth of Semipolar and Cubic GaN Tuesday Morning, October 4, 2016 Room: International South

10:45 AM *A2.3.01

Progress in Heteroepitaxy of Semipolar GaN on Sapphire Jie Song^{1, 2} and <u>Jung Han</u>¹; ¹Electrical Engineering, Yale University, New Haven, Connecticut, United States; ²Saphlux Inc., New Haven, Connecticut, United States

11:15 AM A2.3.02

Effect of Nano-Porous SiN_x Interlayer on Propagation of Extended Defects in Semi-Polar (11-22)-Orientated GaN Morteza Monavarian¹, Natalia Izyumskaya¹, Marcus Muller², Sebastian Metzner², Peter Veit², Saikat Das¹, Umit Ozgur¹, Frank Bertram², Juergen Christen², Hadis Morkoc¹ and Vitaliy Avrutin¹; ¹Department of Electrical and Computer Engineering, Virginia Commonwealth University, Richmond, Virginia, United States; ²Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, Magdeburg, Germany

11:30 AM A2.3.03

Defect Reduction via Laterally Induced Growth of Semipolar (10-11) GaN on Patterned Silicon Substrates Michel Khoury^{1, 2}, Nicolas Mante^{2, 3}, Mathieu Leroux¹, Vincent Delaye^{2, 3}, Guy Feuillet², Philippe Vennegues¹ and Jesus Zuniga-Perez¹; ¹CRHEA, CNRS, Valbonne, France; ²LETI, CEA, Grenoble, France; ³Grenoble Alpes University, Grenoble, France

11:45 AM A2.3.04

Reduction of Basal Plane Stacking Faults in (11-22) Semipolar InGaN/GaN MQWs Fabricated on Patterned Si(113) Substrates by Introducing AlGaN Barrier Layers Kenjiro Uesugi, Toshiki Hikosaka, Hiroshi Ono, Tatsunori Sakano and Shinya Nunoue; Corporate Research and Development Center, Toshiba Corporation, Kawasaki-Shi, Japan

12:00 PM <u>A2.3.05</u>

Investigations about Parasitic n-Type Doping in Semipolar GaN <u>Ferdinand Scholz</u>, Marian Caliebe and Tobias Meisch; Institute of Optoelectronics, Ulm University, Ulm, Germany

12:15 PM A2.3.06

Structural and Morphological Characterisation of Cubic GaN Grown on 3C-SiC/Si Substrates Lok Yi Lee¹, Martin Frentrup¹, Suman-Lata Sahonta¹, Menno J. Kappers¹, L. J. Shaw², Peter J. Ward², Daniel Nilsson², Colin J. Humphreys¹, Rachel A. Oliver¹ and David J. Wallis¹; ¹Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ²Anvil Semiconductors, Cambridge, United Kingdom

B1.3: Visible Devices III: Visible LEDs and LDs Tuesday Morning, October 4, 2016 Room: International Center

10:45 AM *B1.3.01

InGaN/GaN Quantum Dot Visible Lasers <u>Thomas Frost</u> and Pallab Bhattacharya; Electrical Engineering, University of Michigan, Ann Arbor, Michigan, United States

11:15 AM B1.3.02

Ultra-Efficient Solid-State Lighting Using III-Nitride Quantum Dots <u>Jonathan J. Wierer</u>², Nelson Tansu² and Jeffrey Y. Tsao¹; ¹Sandia National Laboratories, Albuquerque, New Mexico, United States; ²ECE, Lehigh University, Bethlehem, Pennsylvania, United States

11:30 AM B1.3.03

Flexible White Light Emitting Diodes Based on Nitride Nanowires and Nanophosphors Nan Guan¹, Xing Dai¹, Agnes Messanvi^{1, 2, 3}, Hezhi Zhang¹, Jianchang Yan^{1, 4}, Eric Gautier^{2, 5}, Catherine Bougerol^{2, 6}, Martin Vallo^{2, 3}, Francois H. Julien¹, Christophe Durand^{2, 3}, Joel Eymery^{2, 3} and Maria Tchernycheva¹; ¹Institut d'Electronique Fondamentale, Université Paris-Sud, Orsay, France; ²Université Grenoble Alpes, Grenoble, France; ³Nanophysique et Semiconducteurs Group, INAC-PHELIQS, CEA, Grenoble, France; ⁴Institute of Semiconductors, Chinese Academy of Sciences, Beijing, China; ⁵INAC-SPINTEC, CEA, Grenoble, France; ⁶Nanophysique et Semiconducteurs Group, Institut Néel,CNRS, Grenoble, France

11:45 AM B1.3.04

Nitride-on-Silicon Microdisk Lasers Covering the Blue to UV-C Spectral Range Julien Selles¹, Valentin Crepel¹, Christelle Brimont¹, Bruno Gayral², Meletios Mexis³, Benjamin Damilano³, Stephanie Rennesson³, Fabrice Semond³, Iannis Roland⁴, Yijia Zeng⁴, Xavier Checoury⁴, Philippe Boucaud⁴ and Thierry Guillet¹; ¹Laboratoire Charles Coulomb (L2C), Université de Montpellier, Montpellier, France; ²INAC-PHELIQS, CEA, Grenoble, France; ³CNRS-CRHEA, Valbonne, France; ⁴Institut d'Electronique Fondamentale, Université Paris-Sud, Orsay, France

12:00 PM B1.3.05

Ultra-Low-Threshold Quantum Dot Micro-Ring Lasers <u>Danqing Wang</u>¹, Tongtong Zhu², Rachel A. Oliver² and Evelyn L. Hu¹; ¹John A. Paulson School of Engineering and Applied Sciences, Harvard University, Cambridge, Massachusetts, United States; ²Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom

12:15 PM B1.3.06

III-Nitride Laser Diode with Nanoporous GaN as Cladding Layers <u>Ge Yuan</u>, Kanglin Xiong, Cheng Zhang and Jung Han; Electrical Engineering, Yale University, New Haven, Connecticut, United States

C2.1: Power Devices I: Devices for Power Electronics I Tuesday Morning, October 4, 2016

Room: Narcissus/Orange Blossom

10:45 AM *C2.1.01

Challenges in GaN Technology for Automobile Applications <u>Toshihide Kikkawa</u>; Transphorm, Kohokuku, Kanagawa, Japan

11:15 AM C2.1.02

GaN-on-Si Power HEMTs with Blocking Field >70V/μm Yuanzheng Yue¹, Jianyi Gao¹, Saptarshi Mandal¹, Shirong Zhao¹, Dong Ji¹, Wenwen Li¹ and Srabanti Chowdhury²; ¹Arizona State University, Tempe, Arizona, United States; ²University of California, Davis, Davis, California, United States

11:30 AM C2.1.03

Optimization of Epitaxial Growth and Processing for High-Breakdown, Low-Leakage and Fast-Switching GaN High Voltage Transistors on Si Subtrates Patrick Waltereit, Richard Reiner, Matthias Wespel, Beatrix Weiss, Heiko Czap, Michael Dammann, Stefan Muller, Steffen Breuer, Ruediger Quay, Michael Mikulla and Oliver Ambacher; Fraunhofer IAF, Freiburg, Germany

11:45 AM C2.1.04

600 V GaN MOSHEMTs Fabricated on a 200 mm-Diameter 725 μ m-Thick Si(111) Substrate Using CMOS-Compatible Process Zhihong Liu¹, Weichuan Xing^{2, 1}, Haowen Hou^{3, 1}, Chieh-Chih Huang¹, Geok Ing Ng^{2, 1} and Tomas Palacios⁴; ¹Singapore-MIT Alliance for Research and Technology, Singapore, Singapore; ²Nanyang Technological University, Singapore, Singapore; ³National University of Singapore, Singapore, Singapore; ⁴Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

12:00 PM C2.1.05

High Temperature Performances of 600V AlGaN/GaN and AlInN/GaN (MIS)HFETs on Silicon Substrates—A Comparative Study Kean B. Lee¹, Sheng Jiang¹, Syed Zaffar Haider Zaidi¹, Hongtu Qian¹, Ivor Guiney², David Wallis², Colin Humphreys² and Peter Houston¹; ¹Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom; ²Department of Material Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom

12:15 PM C2.1.06

AlN Filled Trenches for Thermal Improvement in Etched Back GaN-on-Si HEMTs Georges Pavlidis¹, Luke Yates¹, Farid Medjdoub² and Samuel Graham¹; ¹Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; ²Institute of Electronics, Microelectronics and Nanotechnology, Villeneuve d'Ascq, France

12:30 PM C2.1.07

High Voltage All GaN Integrated Cascode MISHFETs Sheng Jiang¹, Kean B. Lee¹, Pablo Fernandez², Ivor Guiney³, Syed Zaffar Haider Zaidi¹, Hongtu Qian¹, David Wallis³, Andrew Forsyth², Colin Humphreys³ and Peter Houston¹; ¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom; ²School of Electrical and Electronic Engineering, University of Manchester, Manchester, United Kingdom; ³Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom

D1.3: Materials Characterization III: Characterization of (Al,Ga,In)N films and QWs Tuesday Morning, October 4, 2016 Room: International North

10:45 AM *D1.3.01

Structural Characterization of GaInN Quantum Wells using Transmission Electron Microscope and Atom Probe Tomography Shigetaka Tomiya; Advanced Materials Laboratories, Sony Corporation, Kanagawa, Japan

11:15 AM D1.3.02

Bandgap Dependence of InGaN/GaN Short Period Superlattices Grown by Metal-Organic Vapor Phase Epitaxy (MOVPE) Grzegorz Staszczak¹, Robert Czernecki^{1, 2}, Grzegorz Targowski², Marcin Siekacz^{1, 2}, Izabela Gorczyca¹, Ewa Grzanka^{1, 2}, Julita Smalc-Koziorowska^{1, 2}, Szymon Grzanka^{1, 2}, Czeslaw Skierbiszewski^{1, 2} and Tadeusz Suski¹; ¹Institute of High Pressure Physics, Unipress, Warsaw, Poland; ²TopGaN Ltd, Warsaw, Poland

11:30 AM D1.3.03

Limitations for Indium Incorporation in Coherently Grown (In,Ga)N Layers Tobias Schulz¹, Mariia Anikeeva¹, Martin Albrecht¹, Christoph Freysoldt², Liverios Lymperakis², Jorg Neugebauer², Caroline Cheze³, Marcin Siekacz⁴, Czeslaw Skierbiszewski⁴ and Xinqiang Wang⁵; ¹Leibniz-Institute for Crystal Growth, Berlin, Germany; ²Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany; ³Paul Drude Institut, Berlin, Germany; ⁴Institute of High Pressure Physics Unipress, Warsaw, Poland; ⁵School of Physics, Peking University, Peking, China

11:45 AM <u>D1.3.04</u>

Mechanism of Thermal Degradation of InGaN Quantum Wells Julita Smalc-Koziorowska^{1, 2}, Ewa Grzanka^{1, 2}, Slawomir Kret³, Robert Czernecki^{1, 2}, Dario Schavion^{1, 2}, Lucja Marona^{1, 2}, Grzegorz Staszczak¹, Izabella Grzegory⁴, Piotr Perlin^{1, 2}, Michal Leszczynski^{1, 2} and Tadeusz Suski¹; ¹Laboratory of Semiconductors, Institute of High Pressure Physics, Warsaw, Poland; ²TopGaN Ltd., Warsaw, Poland; ³Institute of Physics PAS, Warsaw, Poland; ⁴Laboratory of Crystal Growth, Institute of High Pressure Physics, Warsaw, Poland

12:00 PM D1.3.05

Atom Probe Tomography Characterization of Alloy Fluctuations in InAlN Grown by Plasma Assisted Molecular Beam Epitaxy Bastien Bonef, Erin Kyle, Richard Kramer and James S. Speck; Department of

Materials, University of California, Santa Barbara, Santa Barbara, California, United States

12:15 PM D1.3.06

Local Structural Analysis around In Atoms in Al_{0.82}In_{0.18}N alloy by Using X-Ray Absorption Fine-Structure Measurements Ryoma Seiki¹, Daisuke Komori¹, Kazuki Ikeyama¹, Toshiaki Ina², Takeyoshi Onuma³, Takao Miyajima¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹, Motoaki Iwaya¹ and Isamu Akasaki¹; ¹Meijo University, Nagoya, Japan; ²Japan Synchrotron Radiation Research Institute, Sayo-cho, Japan; ³Kogakuin University, Hachioji, Japan

> D2.2: Theory and Simulation II: Theory: Carrier Localization, Ordering Phenomena and Crystal Growth Tuesday Afternoon, October 4, 2016 Room: Camelia/Dogwood

2:00 PM *D2.2.01

A New Approach to Carrier Localization in Disordered Random Alloy Structures Marcel Filoche¹, Svitlana Mayboroda², Marco Piccardo¹, Yuh-Renn Wu³, James Speck⁴ and Claude Weisbuch⁴; ¹Physique de la Matière Condensée, Ecole Polytechnique, Palaiseau, France; ²School of Mathematics, University of Minnesota, Minneapolis, Minnesota, United States; ³Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan; ⁴Materials Department, University of California, Santa Barbara, California, United States

2:30 PM *D2.2.02

Ordering Phenomena in InGaN Alloys—An Ab-Initio Thermodynamics Study <u>Liverios Lymperakis</u>¹, Christoph Freysoldt¹, Tobias Schulz², Sascha Maisel¹, Martin Albrecht² and Jorg Neugebauer¹; ¹Computational Materials Design, MPIE, Düsseldorf, Germany; ²Leibniz-Institut für Kristallzüchtung, Berlin, Germany

3:00 PM D2.2.03

Consideration of MOVPE Growth Process of GaN by First Principles Calculations and Thermodynamic Analysis Kazuki Sekiguchi¹, Hiroki Shirakawa¹, Yoshihiro Yamamoto¹, Masaaki Araidai^{2, 1}, Yoshihiro Kangawa³, Koichi Kakimoto³ and Kenji Shiraishi^{2, 1}; ¹Graduate School of Engineering, Nagoya University, Nagoya, Japan; ²Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan; ³Research Institute for Applied Mechanics, Kyushu University, Kasuga, Japan

3:15 PM D2.2.04

Influence of Growth Orientation on Driving Force for InN Deposition by MOVPE Akira Kusaba¹, Yoshihiro Kangawa², Michael von Spakovsky³, Kenji Shiraishi⁴, Koichi Kakimoto² and Akinori Koukitu⁵; ¹Department of Aeronautics and Astronautics, Kyushu University, Fukuoka, Japan; ²Research Institute for Applied Mechanics, Kyushu University, Kasuga, Japan; ³Department of Mechanical Engineering, Virginia Tech, Blacksburg, Virginia, United States; ⁴Institute of Materials and System for Sustainability, Nagoya University, Nagoya, Japan; ⁵Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Koganei, Japan

3:30 PM D2.2.05

First-Principles Study of Surface Phase Diagrams of GaN(0001) and (000-1) under the Oxide Vapor Phase Epitaxy Growth Conditions <u>Takahiro Kawamura</u>^{1, 2}, Akira Kitamoto², Mamoru Imade², Masashi Yoshimura², Yusuke Mori², Yoshitada Morikawa², Yoshihiro Kangawa³ and Koichi Kakimoto³; ¹Graduate School of Engineering, Mie University, Tsu, Japan; ²Graduate School of Engineering, Osaka University, Suita, Japan; ³Research Institute for Applied Mechanics, Kyushu University, Kasuga, Japan

3:45 PM BREAK

4:15 PM *D2.2.06

Radiative and Non-Radiative Processes in InGaN-Based LEDs Sergey Karpov; STR Group - Soft-Impact, Ltd., St. Petersburg, Russian Federation

4:45 PM *D2.2.07

Role of Auger Recombination and Extreme Quantum Confinement in Nitrides Emmanouil Kioupakis; Materials Science and Engineering, University of Michigan, Ann Arbor, Michigan, United States

5:15 PM D2.2.08

Electrical Properties of III-Nitride LEDs—Recombination-Based Injection Model and Theoretical Limits to Electrical Efficiency and Electroluminescent Cooling Aurelien David, Christophe H. Hurni, Nathan G. Young and Michael D. Craven; Soraa Inc., Fremont, California, United States

5:30 PM <u>D2.2.09</u>

Solutions to Carrier Leakage in III-N Based Light Emitters by Numerical Simulation Karan Mehta¹, Yuh-Shiuan Liu¹, Tsung-Ting Kao¹, Theeradetch Detchprohm¹, Young Jae Park¹, Shuo Wang², Shyh-Chiang Shen¹, Russell D. Dupuis¹, Fernando Ponce² and Paul D. Yoder¹; ¹Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; ²Physics and Astronomy, Arizona State University, Tempe, Arizona, United States

5:45 PM D2.2.10

Simulation of Carrier-Exciton-Phonon Dynamics in GaN in Non-Equilibrium State Bei Ma and Yoshihiro Ishitani; Graduate Course of Electrical and Electronic Engineering, Chiba University, Chiba, Japan

A2.4: Epitaxial Growth IV: Growth of Light Emitters and (In,Ga)N Tuesday Afternoon, October 4, 2016 Room: International South

2:00 PM *A2.4.01

Characteristics of GaN-Based LED on Alumina Cavity Engineered Sapphire Substrate Yongjo Park¹, Daeyoung Moon², Yoon Jong Moon³, Jeonghwan Jang², Jin Young Na³, Jung-Hwan Song⁴, Min-Kyo Seo⁴, Sunghee Kim⁵, Dukkyu Bae⁵, Eun Hyun Park⁶, Sun-Kyung Kim³ and Euijoon Yoon^{2, 1}; ¹Energy Semiconductor Center, Advanced Institute of Convergence Technology, Suwon, Korea (the Republic of); ²Department of Materials Science and Engineering, Seoul National University, Seoul, Korea (the Republic of); ³Department of Applied Physics, Kyung Hee University, Suwon, Korea (the Republic of); ⁴Department of Physics, KAIST, Daejeon, Korea (the Republic of); ⁵Hexa Solution Co., Ltd., Suwon, Korea (the Republic of); ⁶Semicon Light Co., Ltd., Yongin, Korea (the Republic of)

2:30 PM A2.4.02

Polarization Control for Direct Emitting LEDs across the Visible Spectrum—Nanopatterning and Cubic Structure Growth John Howell-Clark, Adam Bross, Mark Durniak, David Elsaesser and Christian Wetzel; Rensselaer Polytechnic Institute, Troy, New York, United States

2:45 PM A2.4.03

Grouped and Multistep Nanoheteroepitaxy—Towards High-Quality GaN on Quasi-Periodic Nano-Mask Xiaohui Feng¹, Tongjun Yu¹, Yang Wei², Cheng Ji¹, Yutian Cheng¹, Hua Zong¹, Kun Wang¹, Zhijian Yang¹, Xiangning Kang¹, Guoyi Zhang¹ and Shoushan Fan²; ¹School of Physics, Peking University, Beijing, China; ²Physics and Tsinghua-Foxconn Nanotechnology Research Center, Tsinghua University, Beijing, China

3:00 PM A2.4.04

Direct Growth of Single-Crystal-Like III-Nitride Structures on Metal Tape for Flexible Wide-Bandgap Semiconductor Devices Shahab Shervin¹, Kamrul Alam¹, Kaveh Shervin¹, Seung-Hwan Kim^{1, 2}, Tae-Hoon Chung³, Ruiteng Li¹, Jie Chen¹, Bharath Dixit¹, Mojtaba Asadirad¹, Weijie Wang¹, Sara Pouladi¹, Rebecca Forrest¹, Jiming Bao¹ and Jae-Hyun Ryou¹; ¹University of Houston, Houston, Texas, United States; ²Hongik University, Seoul, Korea (the Republic of); ³Korea Photonics Technology Institute, Gwangju, Korea (the Republic of)

3:15 PM A2.4.05

Compositionally Graded InGaN Layers on Vicinal N-Face GaN Substrates Karine Hestroffer¹, Cory Lund¹, Onur Koksaldi¹, Gordon Schmidt², Max Trippel², Peter Veit², Frank Bertram², Ning Lu³, Qingxiao Wang³, Haoran Li¹, Moon Kim³, Juergen Christen², Umesh Mishra¹ and Stacia Keller¹; ¹Electrical and Computer Engineering, University of California - Santa Barbara, Santa Barbara, California, United States; ²Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, Magdeburg, Germany; ³Department of Materials Science and Engineering, University of Texas at Dallas, Richardson, Texas, United States

3:30 PM A2.4.06

Compositional Pulling Effect of InGaN Films Grown on ScAlMgO 4 (0001) Substrates by Metal-Organic Vapor Phase Epitaxy <u>Takuya Ozaki</u>, Mitsuru Funato and Yoichi Kawakami; Electronic Science and Engineering, Kyoto University, Kyoto-shi, Japan

3:45 PM BREAK

B2.2: UV Devices II: UV LEDs Tuesday Afternoon, October 4, 2016 Room: International Center

2:00 PM *B2.2.01

Status of DUV LED on Sapphire and their Applications Cyril Pernot¹, Tetsuhiko Inazu¹, Hiroyasu Ichinokura¹, Tetsumi Ochi¹, Hidemasa Tomozawa², Hisanori Ishiguro¹, Hiroshi Amano³ and Isamu Akasaki⁴; ¹UV-LED Division, NIKKISO GIKEN, Hakusan, Japan; ²Hakusan Factory, NIKKISO, Hakusan, Japan; ³Center for Integrated Research of Future Electronics, Nagoya University, Nagoya, Japan; ⁴Faculty of Science and Technology, Meijo University, Nagoya, Japan

2:30 PM B2.2.02

Underfilling and Encapsulation for AlGaN-Based DUV-LED <u>Yoshihiko Sakane</u>³, Ko Aosaki², Akira Hirano¹, Yosuke Nagasawa¹, Kiho Yamada¹, Shoko Nagai¹, Masamichi Ippommatsu¹, Yoshio Honda⁴, Hiroshi Amano^{4, 5} and Isamu Akasaki^{4, 5}; ¹UV Craftory Co., Ltd., Nagoya, Japan; ²Asahi Glass Co.,Ltd., Tokyo, Japan; ³ Research and Development, Asahi Glass Co., Ltd., Yokohama, Japan; ⁴Nagoya University, Nagoya, Japan; ⁵Meijo University, Nagoya, Japan

2:45 PM B2.2.03

Improved Performance of AlGaN-Based Deep Ultraviolet Light-Emitting Diodes with Nano-Patterned AlN/Sapphire Substrates Donghyun Lee¹, Jong Won Lee², Jeonghwan Jang¹, In-Su Shin¹, Lu Jin¹, Jun Hyuk Park², Jungsub Kim³, Jinsub Lee³, Hye-Seok Noh³, Yong-Il Kim³, Youngsoo Park³, Gun-Do Lee¹, Yongjo Park^{1, 4}, Jong Kyu Kim² and Euijoon Yoon^{1, 4}; ¹Department of Materials Science and Engineering, Seoul National University, Seoul, Korea (the Republic of); ²Department of Materials Science and Engineering, Pohang University of Science and Technology, Pohang, Korea (the Republic of); ³LED business, Samsung Electronics, Yongin, Korea (the Republic of); ⁴Energy Semiconductor Research Center, Advanced Institutes of Convergence Technology, Suwon, Korea (the Republic of)

3:00 PM B2.2.04

Close Coupled Showerhead MOCVD Tool for AlGaN UVC LEDs H. Behmenburg¹, A. R. Boyd¹, O. Rockenfeller¹, Arne Debald², F. Crawley¹, T. Korst¹, Holger Kalisch², Andrei Vescan² and Michael Heuken¹; ¹AIXTRON SE, Herzogenrath, Germany; ²GaN Device Technology, RWTH Aachen University, Aachen, Germany

3:15 PM B2.2.05

Development of Deep UV LEDs for Nitrogen Oxide Sensing Frank Mehnke¹, Martin Guttmann¹, Johannes Enslin¹, Christian Kuhn¹, Christoph Reich¹, Jakob Jordan¹, Simon Kapanke¹, Arne Knauer², Sylvia Hagedorn², Mikael Lapeyrade², Hendrik Krueger³, Marian Rabe³, Sven Einfeldt², Tim Wernicke¹, Markus Weyers² and Michael Kneissl^{1, 2}; ¹Institute of Solid State Physics, Technische Universität Berlin, Berlin, Germany; ²Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany; ³Institut für Allgemeine Elektrotechnik, Universität Rostock, Rostock, Germany

3:30 PM <u>B2.2.06</u>

Efficient UV Emission from Simple Tunnelling MIS Diodes Chen-Sheng Lin¹, Kate Cavanagh², Duncan Allsopp² and Michelle Moram¹; ¹Imperial College London, London, United Kingdom; ²University of Bath, Bath, United Kingdom

3:45 PM BREAK

B3.2: Photodetectors, Photovoltaics, Intersubband Devices II:
Photovoltaics and Photodetectors II
Tuesday Afternoon, October 4, 2016
Room: Azalea/Begonia

2:00 PM <u>B3.2.01</u>

High Indium-Content MBE-Grown InGaN Solar Cells <u>Evan Clinton</u>, Chloe Fabien, Joseph Merola, Brendan Gunning and William A. Doolittle; Georgia Institute of Technology, Atlanta, Georgia, United States

2:15 PM B3.2.02

Theoretical Study on Efficiency Limits and Loss Analysis for Single-Junction InGaN Solar Cells Using a Semi-Analytical Model Xuanqi Huang, Houqiang Fu, Hong Chen, Ding Ding and Yuji Zhao; School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, Arizona, United States

2:30 PM B3.2.03

Nitride Photovoltaic—Exploring the Concept <u>Szymon Grzanka</u>¹, Piotr R. Laskowski², Lucja Marona^{1, 3}, Grzegorz Targowski³, Barbara Zareba², Krzysztof Wincel², Marcin Klimasz², Tomasz Lotz², Piotr Perlin^{1, 3} and Tadeusz Suski¹; ¹Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; ²National Centre for Nuclear Research, Otwock, Poland; ³TopGaN Ltd, Warsaw, Poland

2:45 PM <u>B3.2.04</u>

Ultrafast Indium Nitride Based VIS-NIR Photo-Detector Shibin Krishna^{1, 2}, Alka Sharma^{2, 3}, Neha Aggarwal^{1, 2}, Sudhir C. Husale³ and <u>Govind Gupta</u>^{1, 2}; ¹Physics of Energy Harvesting, CSIR-National Physical Laboratory, New Delhi, India; ²Academy of Science & Innovative Research (AcSIR), CSIR- NPL Campus, New Delhi, India; ³Quantum Phenomena and Applications, CSIR-National Physical Laboratory, New Delhi, India

3:00 PM B3.2.05

Record High Responsivity in III-Nitride Solar Blind MSM Photodetectors Shashwat Rathkanthiwar, Swanand Solanke, Anisha Kalra, Srinivasan Raghavan and Digbijoy N. Nath; Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore, India, Bangalore, India

3:15 PM B3.2.06

Impact of Internal Interfaces on AlGaN Metal-Semiconductor-Metal Photodetectors Moritz Brendel, Andrea Knigge, Viola Kueller, Arne Knauer, Frank Brunner, Sven Einfeldt, Ute Zeimer and Markus Weyers; Ferdinand-Braun-Institut, Leibniz-Institut fuer Hoechstfrequenztechnik, Berlin, Germany

3:30 PM B3.2.07

Highest Responsivity in III-Nitride sub-260 nm Photodetectors <u>Anisha Kalra</u>, Shashwat Rathkanthiwar, Swanand Solanke, Srinivasan Raghavan and Digbijoy N. Nath; Centre for Nanoscience and Engineering, Indian Institute of Science, Bangalore, India

3:45 PM BREAK

C0.2: Electronic Devices II: Electronic Devices for RF and Power Applications
Tuesday Afternoon, October 4, 2016
Room: Narcissus/Orange Blossom

2:00 PM *C0.2.01

Recent Work of GaN Devices/Circuits for RF and Power Electronics Applications Shuichi Nagai, Yasuhiro Yamada, Yasufumi Kawai, Osamu Tabata, Songbaek Choe and Noboru Negoro; Panasonic Corporation, Moriguchi, Japan

2:30 PM C0.2.02

NBTI in GaN MOSFETs—**SiO₂ vs. SiO₂/Al₂O₃ Gate Dielectric** <u>Alex Guo</u> and Jesus del Alamo; EECS, MIT, Cambridge, Massachusetts, United States

2:45 PM C0.2.03

High Breakdown, Low Interface State PEALD Al₂O₃/SiO₂ Gate Stack for AlGaN/GaN MOS-HEMT <u>Jianyi</u> <u>Gao</u>¹, Yuanzheng Yue², Mei Hao¹, Wenwen Li¹, Dong Ji¹, Robert Nemanich¹ and Srabanti Chowdhury³; ¹Arizona State University, Tempe, Arizona, United States; ²NXP Semiconductor, Chandler, Arizona, United States; ³University of California, Davis, Davis, California, United States

3:00 PM C0.2.04

Effect of Surface Plasma Treatments on Hysteresis and Threshold Voltage Stability in AlGaN/GaN Metal-Semiconductor-Insulator (MIS) HEMTs Syed Zaffar Haider Zaidi¹, Kean B. Lee¹, Joseph Roberts², Sheng Jiang¹, Ivor Guiney³, Hongtu Qian¹, David Wallis³, Colin Humphreys³, Paul Chalker² and Peter Houston¹; ¹Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom; ²Centre for Materials and Structures, University of Liverpool, Liverpool, United Kingdom; ³Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom

3:15 PM C0.2.05

Lossless Turn-off Switching Projection of Lateral and Vertical GaN Power Field-effect Transistors Zhibo Guo, Collin Hitchcock and T. Paul Chow; Rensselaer Polytechnic Institute, Troy, New York, United States

3:30 PM C0.2.06

Electric Field Control Using a Distributed Impedance "Field Cage" to Extend AlGaN/GaN HEMT

Operation to the Kilovolt Regime Brian D. Tierney¹, Sandeepan Dasgupta², Sukwon F. Choi³, Jeramy

Dickerson¹, Shahed Reza¹, Sapan Agarwal¹, Albert G. Baca¹, Robert J. Kaplar¹ and Matthew J. Marinella¹;

Sandia National Laboratories, Albuquerque, New Mexico, United States; Intel Corporation, Santa Clara, California, United States; The Pennsylvania State University, State College, Pennsylvania, United States

3:45 PM BREAK

D1.4: Materials Characterization IV: Atomic Structure and Dislocation Effects
Tuesday Afternoon, October 4, 2016
Room: International North

2:00 PM *D1.4.01

The Atomic Structure of Polar and Non-Polar InGaN Quantum Wells Revealed by Combining Different Microscopy and Spectroscopy Methods Colin J. Humphreys¹, James T. Griffiths¹, Philip Dawson², Stefan Schulz³ and Rachel A. Oliver¹; ¹Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ²Physics and Astronomy, University of Manchester, Manchester, United Kingdom; ³Photonics Theory Group, Tyndall National Institute, Cork, Ireland

2:30 PM <u>D1.4.02</u>

Pronounced Blue-Shift at Threading Dislocations in a Thick, Nanostripe-Patterned InGaN/GaN MQW Stack Directly Evidenced by Nano-Cathodoluminescence Frank Bertram¹, Max Trippel¹, Gordon Schmidt¹, Peter Veit¹, Cory Lund², Stacia Keller², Umesh K. Mishra² and Juergen Christen¹; ¹Experimental Physics, Otto-von-Guericke-University Magdeburg, Magdeburg, Germany; ²Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States

2:45 PM D1.4.03

A Comparative Study of the Optoelectronic Properties of Dislocations in AlGaN and InGaN <u>F.C.P.</u>

<u>Massabuau</u>¹, T.J. O'Hanlon¹, M.S. Zielinski², Menno J. Kappers¹, Colin J. Humphreys¹ and Rachel A.

Oliver¹; ¹University of Cambridge, Cambridge, United Kingdom; ²Attolight AG, Lausanne, Switzerland

3:00 PM D1.4.04

Quantitative Analysis of Threading Dislocations in Si-Doped Low Resistivity AlGaN Layers Using Electron Channeling Contrast Imaging M. Nouf-Allehiani¹, G. Kusch¹, Frank Mehnke³, G. Naresh-Kumar¹, Tim Wernicke³, S. Kraeusel¹, E. Pascal¹, Ben Hourahine¹, Paul R. Edwards¹, Johannes Enslin³, Christian Kuhn³, Robert W. Martin¹, Michael Kneissl^{3, 2} and Carol Trager-Cowan¹; ¹Department of Physics, University of Strathclyde, Glasgow, United Kingdom; ²Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany; ³Institute of Solid State Physics, Technische Universität Berlin, Berlin, Germany

3:15 PM <u>D1.4.05</u>

Effect of Dislocations on the Growth of p-Type GaN and Device Characteristics Shigeyoshi Usami¹, Ryosuke Miyagoshi¹, Kentaro Nagamatsu², Atsushi Tanaka², Manato Deki², Shugo Nitta², Yoshio Honda² and Hiroshi Amano^{2, 3, 4}; ¹Electrical Engineering and Computer Science, Nagoya University, Nagoya-shi, Nakagawa-ku, Japan; ²Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan; ³Akasaki Research Center, Nagoya University, Nagoya, Japan; ⁴Venture Business Laboratory, Nagoya University, Nagoya, Japan

3:30 PM LATE NEWS

3:45 PM BREAK

A2.5: Epitaxial Growth V: Growth for Electronic Devices & Basic Growth Studies
Tuesday Afternoon, October 4, 2016
Room: International South

4:15 PM A2.5.01

AlN/GaN HEMTs Grown by MBE and MOCVD—Impact of Al Distribution Birte-Julia Godejohann, Erdin Ture, Stefan Mueller, Mario Prescher, Lutz Kirste, Rolf Aidam, Vladimir Polyakov, Peter Brueckner, Steffen Breuer, Klaus Koehler, Ruediger Quay and Oliver Ambacher; Fraunhofer Institute for Applied Solid State Physics, Freiburg, Germany

4:30 PM <u>A2.5.02</u>

Pure N-Polar AlN in GaN/AlN/GaN Heterostructures Grown by Metal-Organic Chemical Vapor Deposition Haoran Li¹, Baishakhi Mazumder², Stacia Keller¹, Steven Wienecke¹, Steven P. DenBaars¹ and Umesh K. Mishra¹; ¹Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States; ²Intel Corporation, Hillsboro, Oregon, United States

4:45 PM A2.5.03

Characterization of AlGaN/GaN Heterostructure by *In Situ* X-Ray Diffraction Attached Metal Organic Vapor Phase Epitaxy Ryousuke Kanayama¹, Junya Osumi¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹ and Isamu Akasaki^{1, 2}; ¹Faculty of Science and Technology, Meijo University, Nagoya, Japan; ²Akasaki Research Center, Nagoya University, Nagoya, Japan

5:00 PM A2.5.04

Growth of 10 nm-Thick AllnN/GaN Heterostructure with High Electron Mobility and Low Sheet Resistance Jeong-Gil Kim, Chul-Ho Won, Yong Soo Lee and Jung-Hee Lee; School of Engineering, Kyungpook National University, Daegu, Korea (the Republic of)

5:15 PM A2.5.05

Development of Stretchable Geometry AlGaN/GaN HEMTs with Selective Area Epitaxial Growth Technique <u>Isra Mahaboob</u>¹, Jonathan Marini¹, Kasey Hogan¹, Randy P. Tompkins², Nathan Lazarus² and Fatemeh(Shadi) Shahedipour-Sandvik¹; ¹Colleges of Nanoscale Science and Engineering, SUNY Polytechnic Institute, Albany, New York, United States; ²U.S. Army Research Laboratory, Adelphi, Maryland, United States

5:30 PM A2.5.06

In Situ Studies of the Atomic Layer Epitaxial Growth Process for III-N Semiconductors Charles R. Eddy¹, Neeraj Nepal¹, Virginia R. Anderson², Scooter D. Johnson¹, Zachary R. Robinson³, Alex C. Kozen², Alex DeMasi⁴ and Karl F. Ludwig⁴; ¹U.S. Naval Research Laboratory, Washington, District of Columbia, United States; ²American Society for Engineering Education, Washington, District of Columbia, United States; ³Department of Physics, State University of New York at Brockport, Brockport, New York, United States; ⁴Physics Department, Boston University, Boston, Massachusetts, United States

5:45 PM <u>A2.5.07</u>

Atomic Level C-AFM Characterization of GaN Grown Under Spiral Mode <u>Kazuki Komura</u>¹, Tsutomu Araki¹, Yasushi Nanishi¹ and Tetsuya Akasaka²; ¹Ritsumeikan University, Kusatsu, Japan; ²NTT Basic Research Laboratories, Atsugi, Japan

6:00 PM LATE NEWS

B2.3: UV Devices III: UV Lasers and Lasing Tuesday Afternoon, October 4, 2016 Room: International Center

4:15 PM *B2.3.01

Toward Deep-UV AlGaN-Based Lasers via Electron-Beam Excitation Noble M. Johnson; Palo Alto Research Center, Palo Alto, California, United States

4:45 PM B2.3.02

Opposing Approaches for Low Threshold in AlGaN-Based UV-C Laser—High Internal Quantum Efficiency vs Homogeneity Carsten Netzel¹, Ute Zeimer¹, Martin Martens², Christian Kuhn², Arne Knauer¹, Viola Kuller¹, Tim Wernicke², Michael Kneissl^{2, 1} and Markus Weyers¹; ¹Materials Technology, Ferdinand-Braun-Institute, Berlin, Germany; ²Institute of Solid State Physics, Technical University of Berlin, Berlin, Germany

5:00 PM B2.3.03

AlGaN Nanowire Deep UV LEDs and Lasers Operating Below 240 nm Songrui Zhao¹, X. Liu¹, S. Y. Woo², Y. Wu¹, S. Sadaf¹, R. Rashid¹, Y. Wang¹, D. Laleyan¹, G. A. Botton² and Zetian Mi¹; ¹McGill University, Montreal, Canada; ²McMaster University, Hamilton, Canada

5:15 PM B2.3.04

Stimulated Emission at 250 nm from Optically-Pumped Semipolar (1-102) AlGaN/AlN Quantum Wells Shuhei Ichikawa, Mitsuru Funato and Yoichi Kawakami; Kyoto University, Kyoto, Japan

5:30 PM B2.3.05

Observation of Stimulated Emission of AlGaN-Based GRINSCH Structures Grown by MBE Emitting in Deep UV Spectrum <u>Haiding Sun</u> and Theodore Moustakas; Electrical and Computer Engineering, Boston University, Boston, Massachusetts, United States

5:45 PM B2.3.06

Second Harmonic Generation of UV Laser Light in AlN Periodic Lateral Polar Structures <u>Dorian E. Alden</u>^{1, 2}, Tinkara Troha³, Ronny Kirste¹, Felix Kaess¹, Alexander Franke¹, Michael Gerhold⁴, Axel Hoffmann², Marko Zgonik³, Ramon Collazo¹ and Zlatko Sitar¹; ¹Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; ²Fakultät für Festkörperphysik, Technische Universität Berlin, Berlin, Germany; ³Faculty of Mathematics and Physics, University of Ljubljana, Ljubljana, Slovenia; ⁴Engineering Science Directorate, Army Research Office, Research Triangle Park, North Carolina, United States

C0.3: Electronic Devices III: Devices for Power Electronics, Traps and Dielectrics
Tuesday Afternoon, October 4, 2016
Room: Narcissus/Orange Blossom

4:15 PM *C0.3.01

Low-Cost High-Voltage GaN Lateral-Superjunction Power Transistors Hiroji Kawai¹, Syuichi Yagi¹, Shoko Hirata¹, Fumihiko Nakamura¹, Takeshi Saito¹, Yusuke Kamiyama¹, Masayoshi Yamamoto² and Hiroshi Amano³; ¹Powdec K.K., Oyama, Japan; ²Shinane University, Interdisciplinary Graduate School of Science and Engineering, Matsue, Japan; ³Institute of Material and Systems for Sustainability, Nagoya University, Nagoya, Japan

4:45 PM C0.3.02

Processes behind Suppressed Current Collapse Buffer Architectures Ben Rackauskas¹, Michael J. Uren¹, Martin Kuball¹ and Steve Stoffels²; ¹University of Bristol, Bristol, United Kingdom; ²imec, Heverlee, Belgium

5:00 PM C0.3.03

Identification of Electron Trap Energy at Different Spatial Locations and Dynamics of Charge Redistribution in AlGaN/GaN HEMT Structures Shlomo Mehari¹, Arkady Gavrilov¹, Moshe Eizenberg² and Dan Ritter¹; ¹Electrical Engineering, Technion - Israel Institute of Technology, Haifa, Israel; ²Materials Science and Engineering, Technion - Israel Institute of Technology, Haifa, Israel

5:15 PM C0.3.04

On the Origin of Surface Donors in AlGaN/GaN Metal-Oxide-Semiconductor Heterostructures with Al₂O₃ Gate Dielectric—Correlation of Electrical, Structural, and Chemical Properties Milan Tapajna¹, Roman Stoklas^{1, 2}, Dagmar Gregusova¹, Lukas Valik¹, Filip Gucmann¹, Kristina Husekova¹, Stefan Hascik¹, Karol Frohlich¹, Lajos Toth³, Bela Pecz³, Matej Micusik⁴, Frank Brunner⁵, Tamotsu Hashizume² and Jan Kuzmik¹; ¹Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; ²Research Center for Integrated Quantum Electronics (RCIQE), Hokkaido University, Sapporo, Japan; ³Institute of Technical Physics and Materials Sciences, EK MTA, Budapest, Hungary; ⁴Institute of Polymers, Slovak Academy of Sciences, Bratislava, Slovakia; ⁵Ferdinand-Braun-Institut, Berlin, Germany

5:30 PM C0.3.05

AlGaN/GaN MOSHEMT with P_{OUT}=4.18 W/mm at f=35 GHz Enabled by Atomic Layer Epitaxy MgCaO Dielectric Hong Zhou; ECE, Purdue University, West Lafayette, Indiana, United States

5:45 PM C0.3.06

Effect of Proton Irradiation on the Characteristics of AlGaN/GaN MISHEMT—Comparison between Al2O3 and Si3N4 Gate Insulator Jun-Hyeok Lee¹, Hee-Sung Kang¹, Won-Sang Park¹, Jeong-Gil Kim¹, Chul-Ho Won¹, Youngho Bae² and Jung-Hee Lee¹; ¹School of Electronics Engineering, Kyungpook National University, Daegu, Korea (the Republic of); ²Division of steel IT, Uiduk University, Gyeongju, Korea (the Republic of)

D1.5: Materials Characterization V: Characterization of GaN and InN Tuesday Afternoon, October 4, 2016

Room: International North

4:15 PM D1.5.01

Quantifying Absolute Value of Quantum Efficiency of Radiation in High Quality GaN Single Crystals <u>Kazunobu Kojima</u>¹, Tomomi Ohtomo¹, Makoto Saito^{1, 2}, Hirotaka Ikeda², Kenji Fujito² and Shigefusa F. Chichibu¹; ¹Tohoku University, Sendai, Japan; ²Mitsubishi Chemical Corporation, Ibaraki, Japan

4:30 PM <u>D1.5.02</u>

Infrared Absorption of Hydrogen-Related Defects in Ammonothermal GaN Sami Suihkonen¹ and Siddha Pimputkar²; ¹Department of Micro- and Nanosciences, Aalto University, Espoo, Finland; ²Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States

4:45 PM D1.5.03

Optical and Electronic Properties HVPE GaN Wafers with Improved Crystallinity <u>Jaime A. Freitas</u>; ESTD, Naval Research Laboratory, Washington, District of Columbia, United States

5:00 PM D1.5.04

Thermal Conductivity of Bulk GaN Grown by HVPE—Effect of Si Doping Michael Slomski¹, Plamen P. Paskov^{2, 1}, Jacob Leach³, John Muth¹ and Tania Paskova¹; ¹ECE, North Carolina State University, Raleigh, North Carolina, United States; ²Linkoping University, Linkoping, Sweden; ³Kyma Technology, Raleigh, North Carolina, United States

5:15 PM D1.5.05

Raman Scattering Study of the High-Pressure Wurtzite to Rocksalt Phase Transition of GaN Grown on Serpentine Channel Patterned Sapphire Substrate Qingbin Ji; School of Physics, Peking University, Beijing, China

5:30 PM D1.5.06

Surface and Bulk Electronic Structures of Heavily Mg-Doped InN Epilayer by Hard X-Ray Photoelectron Spectroscopy Masataka Imura¹, Shunsuke Tsuda¹, Takahiro Nagata¹, Anli Yang¹, Yoshiyuki Yamashita^{1, 4}, Hideki Yoshikawa^{1, 4}, Yasuo Koide¹, Keisuke Kobayashi^{4, 2}, Tomohiro Yamaguchi^{3, 5}, Masamitsu Kaneko⁵, Nao Uematsu⁵, Ke Wang⁵, Tsutomu Araki⁵ and Yasushi Nanishi⁵; ¹National Institute for Materials Science, Tsukuba, Japan; ²Japan Atomic Energy Agency, Sayo-gun, Japan; ³Kogakuin University, Hachiouji, Japan; ⁴Spring-8 (NIMS), Sayo-gun, Japan; ⁵Ritsumeikan University, Kusatsu, Japan

5:45 PM D1.5.07

Tunneling Spectroscopy at Clean Non-Polar InN Surfaces—Absence of Electron Accumulation Holger Eisele¹, Michael Schnedler², Andrea Lenz¹, M. Duchamp², Verena Portz¹, Christian Nenstiel¹, Axel Hoffmann¹ and Philipp Ebert²; ¹Institut für Festkörperphysik, Technische Universität Berlin, Berlin, Germany; ²Forschungszentrum Jülich, Jülich, Germany

F0.3: Novel Materials and Devices III: Epitaxial Lift Off and Group-V Alloys
Tuesday Afternoon, October 4, 2016
Room: Azalea/Begonia

4:15 PM *F0.3.01

GaN-Based Epitaxial Lift-off for Device Applications Patrick Fay; University of Notre Dame, Notre Dame, Indiana, United States

4:30 PM F0.3.02

Realization of GaN, InGaN/GaN MQW and Semi-Bulk Based PIN Structures on the Ultrathin 2D Layered h-BN for Simple Mechanical Lift-Off Suresh Sundaram¹, Taha Ayari^{1, 2}, Xin Li¹, Saiful Alam^{1, 2}, Youssef El Gmili¹, Paul L. Voss^{1, 2}, Jean Paul Salvestrini³ and Abdallah Ougazzaden^{1, 2}; ¹Georgia Tech Lorraine, Metz, France; ²School of Electrical and Computer Engineering, Georgia Institute of technology, Atlanta, Georgia, United States; ³LMOPS, Université de Lorraine and Centrale Supélec, Metz, France

4:45 PM F0.3.03

Determination of the Site of Sb Occupation in MOCVD-Grown GaN_{1-x}Sb_x Using X-Ray Absorption Fine-Structure Measurements <u>Takao Miyajima</u>¹, Daisuke Komori¹, Toshiaki Ina², Ryoma Seiki¹, Kiyofumi Nitta², Tetsuya Takeuchi¹, Tomoya Uruga², Satoshi Kamiyama¹, Motoaki Iwaya¹ and Isamu Akasaki¹; ¹Meijo University, Nagoya, Japan; ²Japan Synchrotron Radiation Research Institute, Sayo-cho, Japan

5:00 PM F0.3.04

Nanoscale Electrical Characterisation of GaNAs/GaN PN Junction Diode Fung Sing Choi¹, Ivor Guiney¹, Shahrzad H. Vajargah¹, Siyuan Zhang¹, James T. Griffiths¹, Sergei Novikov², Hongtu Qian³, Kean B. Lee³, David Wallis¹, Tom Foxon², Colin Humphreys¹ and Rachel Oliver¹; ¹Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ²Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom; ³Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom

5:15 PM <u>F0.3.05</u>

Behavior of Arsenic in GaN at Densities Ranging from Isovalent Doping to Dilute Ternary Alloys Louis J. Guido^{1, 2}, Timothy A. Ciarkowski², Eric P. Carlson² and Noah P. Allen¹; ¹Electrical and Computer Engineering, Virginia Tech, Blacksburg, Virginia, United States; ²Materials Science and Engineering, Virginia Tech, Blacksburg, Virginia, United States

5:30 PM F0.3.06

How Can Dilute-Anion III-Nitride Be Used for Light Emitters Chee-Keong Tan, Wei Sun, Damir Borovac, Jonathan J. Wierer and Nelson Tansu; Center for Photonics and Nanoelectronics, Department of Electrical and Computer Engineering, Lehigh University, Bethlehem, Pennsylvania, United States

A1.3: Bulk Growth III: Bulk Growth Wednesday Morning, October 5, 2016 Room: Azalea/Begonia

8:00 AM *A1.3.01

Chemistry of the Ammonothermal Method for Growth of Nitrides as GaN, InN and Zn₃N₂ Rainer Niewa¹, Jan Hertrampf¹, Theresia M. Richter¹, Nicolas S. Alt² and Eberhard Schluecker²; ¹Institut für Anorganische Chemie, Universität Stuttgart, Stuttgart, Germany; ²Institute of Process Machinery and System Engineering, University Erlangen-Nuremberg, Erlangen, Germany

8:30 AM A1.3.02

GaN Solubility and Dissolution Kinetics Investigated Using Direct Insight into Ammonothermal Autoclaves by In Situ X-Ray Imaging Saskia Schimmel¹, Martina Koch¹, Philipp Macher¹, Thomas G. Steigerwald^{2, 3}, Anna C. Kimmel², Nicolas S. Alt², Eberhard Schluecker² and Peter J. Wellmann¹; ¹Materials Department, Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany; ²Institute of Process Machinery and Systems Engineering, Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany; ³Erlangen Graduate School in Advanced Optical Technologies, Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany

8:45 AM A1.3.03

Detailed Study of Homoepitaxial HVPE-GaN Growth in c-Direction <u>Boleslaw Lucznik</u>, Mikolaj Amilusik, Tomasz Sochacki, Malgorzata Iwinska, Michal Fijalkowski, Izabella Grzegory and Michal Bockowski; Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland

9:00 AM A1.3.04

Gradient of Silicon Concentration in HVPE-GaN Malgorzata Iwinska, Mikolaj Amilusik, Michal Fijalkowski, Tomasz Sochacki, Boleslaw Lucznik, Izabella Grzegory and Michal Bockowski; Crystal Growth Laboratory, Institute of High Pressure Physics PAS, Warsaw, Poland

9:15 AM A1.3.05

Study on Reduction of H₂O in OVPE Process for Improving GaN Crystallinity Yohei Yamaguchi¹, Hirokazu Gunji¹, Yuuki Taniyama¹, Akira Kitamoto¹, Mamoru Imade¹, Masashi Yoshimura¹, Masashi Isemura² and Yusuke Mori¹; ¹Osaka University, Suita, Japan; ²Itochu Plastics Inc., Shibuya-ku, Japan

9:30 AM A1.3.06

Na-Flux Growth on the Tiling HVPE Wafer for the Suppression of V-Shape Valley Formation at the Coalescence Boundary Masayuki Imanishi¹, Kosuke Murakami¹, Masatomo Honjo¹, Hiroki Imabayashi¹, Daisuke Matsuo¹, Mihoko Maruyama¹, Mamoru Imade¹, Masashi Yoshimura¹, Takehiro Yoshida², Toshio Kitamura², Masatomo Shibata² and Yusuke Mori¹; ¹Osaka University, Osaka, Japan; ²Sciocs Company Limited, Hitachi, Ibaraki, Japan

9:45 AM A1.3.07

Evaluation of Freestanding GaN Substrates by Dissolution of Sapphire Substrates Using Li after the Na-Flux Growth Yamada Takumi, Imanishi Masayuki, Kosuke Nakamura, Kosuke Murakami, Hiroki Imabayashi, Daisuke Matsuo, Masatomo Honjo, Mihoko Maruyama, Mamoru Imade, Masashi Yoshimura and Yusuke Mori; Osaka University, Osaka, Japan

10:00 AM BREAK

A2.6: Epitaxial Growth VI: Molecular Beam Epitaxy of III-Nitrides Wednesday Morning, October 5, 2016 Room: International South

8:00 AM *A2.6.01

Atomic Level Manipulation in Molecular Beam Epitaxy of III-Nitrides Xinqiang Wang; Peking University, Beijing, China

8:30 AM A2.6.02

The Impact of Barrier Width on Photoluminescence Wavelength in InGaN/InGaN Short Period Superlattices Grown by Plasma Assisted MBE Marcin Siekacz^{1,2}, Grzegorz Staszczak², Tadeusz Suski², Ewa Grzanka^{2,1}, Izabela Gorczyca², Henryk Turski², Torsten Ernst¹, Mariia Anikeeva³, Tobias Schulz³, Martin Albrecht³ and Czeslaw Skierbiszewski^{2,1}; ¹TopGaN Ltd., Warsaw, Poland; ²Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; ³Leibniz-Institute for Crystal Growth, Berlin, Germany

8:45 AM A2.6.03

Ge Doping of GaN beyond Mott Transition Using Plasma Assisted Molecular Beam Epitaxy Akhil Ajay^{1, 2}, Jorg Schormann³, Marco Jimenez-Rodriguez⁴, Caroline B. Lim^{1, 2}, Martien den Hertog^{1, 5}, Felix Walther³, Marcus Rohnke⁶, Martin Eickhoff³ and Eva Monroy^{1, 2}; ¹Université Grenoble-Alpes, Grenoble, France; ²INAC-PHELIQS, CEA-Grenoble, Grenoble, France; ³I. Physikalisches Institut, Justus-Liebig-Universität Gießen and Center for Materials Science, Heinrich-Buff-Ring, Gießen, Germany; ⁴Department of Electrónica, University of Alcalá, Madrid, Spain; ⁵CNRS-Institute Néel, 25 av. des Martyrs, Grenoble, France; ⁶Physikalisch-Chemisches Institut and Center for Materials Science, Justus-Liebig-Universität Gießen, Heinrich-Buff-Ring, Gießen, Germany

9:00 AM A2.6.04

Metal Modulated Epitaxy of High Carrier Concentration Mg Doped p-Type and Ge Doped n-Type AlGaN Evan Clinton, Joseph Merola, Brendan Gunning and William A. Doolittle; Georgia Institute of Technology, Atlanta, Georgia, United States

9:15 AM A2.6.05

Impact of Substrate Temperature on Magnesium Incorporation in MBE Grown Al-rich Al_xGa_{1-x}N <u>S.M.</u> <u>M. Islam</u>, Kazuki Nomoto, Vladimir Protasenko, Shyam Bharadwaj, Grace Xing and Debdeep Jena; Electrical and Computer Engineering, Cornell University, Ithaca, New York, United States

9:30 AM A2.6.06

Impact of Surfactant Gallium on the Morphology of III-Nitrides Grown by MBE Christopher Hein, Andreas Kraus, Heiko Bremers, Uwe Rossow and Andreas Hangleiter; Institute of Applied Physics, Braunschweig University of Technology, Braunschweig, Germany

9:45 AM <u>A2.6.07</u>

Combining High Hole Concentration in p-GaN and High Hole Mobility in u-GaN for High p-Type Conductivity in a p-GaN/u-GaN Alternating-Layer Nanostructure Hao-Tsung Chen, Charng-Gan Tu, Yu-Feng Yao, Chun-Han Lin, Yuh-Renn Wu, Yean-Woei Kiang and Chih-Chung Yang; National Taiwan University, Taipei, Taiwan

10:00 AM BREAK

B1.4: Visible Devices IV:
Visible Emitters: Alloy Disorder, Loss Mechanisms, and Strain Engineering
Wednesday Morning, October 5, 2016
Room: International Center

8:00 AM *B1.4.01

Impact of Atomic Disorder in InGaN MQW LEDs Yuh-Renn Wu¹, Chi-Kang Li¹, Marco Piccardo², Lucio Martinelli², Marcel Filoche², James S. Speck³ and Claude Weisbuch^{2, 3}; ¹Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taipei, Taiwan; ²Physique de la Matière Condensée, Ecole Polytechnique, Palaiseau, France; ³Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States

8:30 AM *B1.4.02

Recombination Coefficients in InGaN Quantum Well Light-Emitting Diodes Felix Nippert¹, Sergey Y. Karpov², Bastian Galler³, Gordon Callsen¹, Thomas Kure¹, Christian Nenstiel¹, Martin Strassburg³, Hans-Juergen Lugauer³ and <u>Axel Hoffmann</u>¹; ¹TU Berlin, Institute of Solid State Physics, Berlin, Germany; ²STR Group -- Soft-Impact Ltd., St. Petersburg, Russian Federation; ³OSRAM Opto Semiconductors GmbH, Regensburg, Germany

9:00 AM B1.4.03

Performance of InGaN-Based Light Emitting Diodes under High Current Density on Low Dislocation Density Liquid Phase Grown GaN Substrates Tomohiko Sugiyama¹, Yoshitaka Kuraoka¹, Makoto Iwai¹, Takashi Yoshino¹, Shigeyoshi Usami², Yoshio Honda³ and Hiroshi Amano^{3, 4}; ¹Corporate R&D, NGK Insulators, Ltd., Nagoya, Japan; ²Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya, Japan; ³Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan; ⁴Akasaki Research Center, Nagoya University, Nagoya, Japan

9:15 AM B1.4.04

Is the Electron Blocking Layer Still Needed in Modern Designs of InGaN Laser Diodes Agata Bojarska¹, Jakub Goss¹, Irina Makarowa², Robert Czernecki^{1, 2}, Tadeusz Suski¹ and Piotr Perlin^{1, 2}; ¹Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; ²TopGaN Limited, Warsaw, Poland

9:30 AM <u>B1.4.05</u>

Relaxed InGaN Engineered Substrate for LED Droop Reduction Eric Guiot, <u>David Sotta</u> and Olivier Ledoux; Soitec, Bernin, France

9:45 AM <u>B1.4.06</u>

Vertical Thin Film LEDs from Island Patterned Epilayers Grown on Relaxed InGaN Engineered Substrates Francois Levy^{2, 1}, Christophe Largeron^{2, 1}, Yohan Desieres^{2, 1}, Marc Rabarot^{2, 1}, Raphael Caulmilone³, Quentin Lalauze^{2, 1}, Jonathan Garcia^{2, 1}, Carole Granier^{2, 1}, Maryse Reymermier^{2, 1}, Gaid Moulin^{2, 1}, Olivier Ledoux³ and Eric Guiot³; ¹CEA, LETI, MINATEC, Grenoble, France; ²University of Grenoble, Grenoble, France; ³SOITEC S.A., Bernin, France

10:00 AM BREAK

C2.2: Power Devices II: Devices for Power Electronics II Wednesday Morning, October 5, 2016 Room: Narcissus/Orange Blossom

8:00 AM *C2.2.01

AlGaN/GaN-on-Si Power Device Technology—From Simple 1D Characterization Techniques to Reliable and Current-Collapse Free Large Area Power Devices Peter Moens, Abhishek Banerjee, Peter Coppens, Markus Caesar, Aurore Constant, Zilan Li and Marnix Tack; Corporate R&D, ON Semiconductor, Oudenaarde, Belgium

8:30 AM C2.2.02

Low-Cost and High-Performance Vertical GaN Power Transistors on Bulk GaN Substrates Min Sun¹, Ming Pan², Xiang Gao² and Tomas Palacios¹; ¹Massachusetts Institute of Technology, Cambridge, Massachusetts, United States; ²IQE RF LLC, Somerset, New Jersey, United States

8:45 AM C2.2.03

Demonstration of Normally off GaN Trench-CAVET for High Power Application <u>Dong Ji</u>¹, Matthew A. Laurent², Anchal Agarwal², Stacia Keller², Umesh K. Mishra² and Srabanti Chowdhury³; ¹School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, Arizona, United States; ²Electrical and Computer Engineering, University of California, Santa Barbara, California, United States; ³Electrical and Computer Engineering, University of California, Davis, California, United States

9:00 AM C2.2.04

Vertical GaN Transistors on Bulk-GaN Substrates <u>Anneli Munkholm</u>; Avogy Inc., San Jose, California, United States

9:15 AM C2.2.05

Novel GaN-Based Vertical Heterostructure Field Effect Transistor Structures Using Crystallographic KOH Etching and Channel Overgrowth Hongtu Qian¹, Kean B. Lee¹, Shahrzad H. Vajargah², Sergei V. Novikov³, Ivor Guiney², Syed Zaffar Haider Zaidi¹, Sheng Jiang¹, David Wallis², Tom Foxon³, Colin Humphreys² and Peter Houston¹; ¹Electronic and Electrical Engineering, University of Sheffield, United Kingdom; ²Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ³Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom

9:30 AM C2.2.06

Electrical and Thermal Characterization of Vertical GaN PIN Diodes Georges Pavlidis¹, Tsung-Ting Kao², Jeomoh Kim², Mi-Hee Ji², Sukwon Choi³, Theeradetch Detchprohm², Russell D. Dupuis², Shyh-Chiang Shen² and Samuel Graham¹; ¹Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; ²Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; ³Mechanical and Nuclear Engineering, The Pennsylvania State University, University Park, Pennsylvania, United States

9:45 AM C2.2.07

Towards Vertical GaN Power Electronics—Nanowire Arrays for Vertical Field-Effect Transistors Feng Yu^{1, 2}, Shengbo Yao¹, Friedhard Roemer³, Bernd Witzigmann³, <u>Hutomo Suryo Wasisto</u>^{1, 2} and Andreas Waag^{1, 2}; ¹Institute of Semiconductor Technology, Technische Universitaet Braunschweig, Braunschweig, Germany; ²Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, Braunschweig, Germany; ³Computational Electronics and Photonics, Universität Kassel, Kassel, Germany

10:00 AM BREAK

D1.6: Materials Characterization VI: Characterization of Electronic Devices Wednesday Morning, October 5, 2016 Room: International North

8:00 AM D1.6.01

Physical Explanation of Richardson Constant Values Observed in J-V-T Measurements of III-N Schottky Diodes Matthew Laurent^{1, 2}, Onur Koksaldi¹, Donald Suntrup^{1, 3} and Umesh Mishra¹; ¹University of California, Santa Barbara, Santa Barbara, California, United States; ²University of California, Davis, Davis, California, United States; ³Infinera, Sunnyvale, California, United States

8:15 AM D1.6.02

Determination of Polarization Fields in (0001) AllnN/GaN and AlGaN/GaN Heterostructures by Capacitance-Voltage-Measurements Monir Rychetsky¹, Baran Avinc¹, Konrad Bellmann¹, Ingrid Koslow¹, ², Tim Wernicke¹, Veit Hoffmann², Markus Weyers², Bernd Witzigmann³ and Michael Kneissl¹, ²; ¹Technical University of Berlin, Berlin, Germany; ²Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztech, Berlin, Germany; ³Computational Electronics and Photonics Group and CINSaT, University of Kassel, Kassel, Germany

8:30 AM D1.6.03

Electromodulation Spectroscopy of N-Polar GaN HEMT Structures <u>Lukasz Janicki</u>¹, Marta Gladysiewicz¹, Karol Kulinowski¹, Haoran Li², Stacia Keller², Umesh K. Mishra² and Robert Kudrawiec¹; ¹Faculty of Fundamental Problems of Technology, Wroclaw University of Technology, Wroclaw, Poland; ²Department of Electrical and Computer Engineering, University of California, Santa Barbara, California, United States

8:45 AM D1.6.04

Characterization of Electrical Properties of n-Type GaN Layer Using Terahertz Time-Domain Spectroscopic Ellipsometry Kohei Tachi¹, Shiho Asagami¹, Takashi Fujii^{1, 2}, Takeshi Nagashima³, Toshiyuki Iwamoto², Yoshinori Sato², Naotake Morita⁴, Ryuichi Sugie⁴, Satoshi Kamiyama⁵, Tsutomu Araki¹ and Yasushi Nanishi¹; ¹Ritsumeikan University, Nishikyo-ku, Japan; ²Nippo Precision Co., Ltd, Nirasaki-shi, Japan; ³Setsunan University, Neyagawa-shi, Japan; ⁴Toray Research Center, Inc, Otsu-shi, Japan; ⁵Meijo University, Nagoya-shi, Japan

9:00 AM D1.6.05

Band Offset Characterization of Atomic Layer Deposited Al₂O₃ on m-Plane GaN by X-Ray Photoelectron Spectroscopy Ye Jia¹, Joshua S. Wallace², Elena Echeverria³, Joseph A. Gardella² and Uttam Singisetti¹; ¹Department of Electrical Engineering, The State University of New York at Buffalo, Buffalo, New York, United States; ²Department of Chemistry, The State University of New York, University at Buffalo, Buffalo, New York, United States; ³Department of Physics and Astronomy, University of Nebraska, Lincoln, Nebraska, United States

9:15 AM D1.6.06

Band Offsets at Diamond/III-Nitride Heterojunctions Olaf Weidemann¹, Martin Hetzl¹, Martin Eickhoff² and Martin Stutzmann¹; ¹Walter Schottky Institute, Technical University Munich, Garching, Germany; ²Justus Liebig University, I. Physical Institute, Giessen, Germany

9:30 AM LATE NEWS

9:45 AM LATE NEWS

10:00 AM BREAK

E0.3: Nanostructures III: Characterization of Nanostructures Including Tomography Wednesday Morning, October 5, 2016
Room: Camelia/Dogwood

8:00 AM <u>E0.3.01</u>

Electron Microscopy and Tomography of Nitride Micro- and Nano-Devices Rachel A. Oliver¹, Christopher Ren¹, Fengzai Tang¹, Tim J. Puchtler¹, Tongtong Zhu¹, Igor Aharonovich², Alexander Woolf², Kasey J. Russell², Danqing Wang², Qimin Quan², Nan Niu² and Evelyn L. Hu²; ¹Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom; ²School of Engineering and Applied Science, Harvard University, Cambridge, Massachusetts, United States

8:15 AM E0.3.02

Laser-Assisted Atom Probe Tomography Study of InGaN and Mg:GaN Test Structures Norman A. Sanford¹, Paul T. Blanchard¹, Matt Brubaker¹, Sergei Krylyuk², Alexana Roshko¹, Kris A. Bertness¹ and Albert Davydov²; ¹Applied Physics Division, National Institute of Standards and Technology, Boulder, Colorado, United States; ²Materials Measurement Laboratory, National Institute of Standards and Technology, Gaithersburg, Maryland, United States

8:30 AM E0.3.03

Transition Energies and Charge Carriers Localization Study of GaN/AlN Stranski-Krastanov Quantum Dots by Atom Probe-Based Correlative Multi-Microscopy Lorenzo Mancini; GPM, University of Rouen, Saint Etienne du Rouvray, France

8:45 AM E0.3.04

High Quantum Efficiency UVC AlxGa1-xN/AlyGa1-yN Multiple Quantum Wells Grown on AlN Nanostructures with Polarization Free Non-Polar Facet Jinwan Kim, Uiho Choi, Jaedo Pyeon and Ohnam Nam; Nano-optics, Korea Polytechnic University, Siheung, Korea (the Republic of)

9:00 AM E0.3.05

UV Photosensing Characteristics of Nanowire-Based GaN/AIN Superlattices <u>Jonas Laehnemann</u>^{2, 1}, Martien den Hertog^{2, 3}, Pascal Hille⁴, Maria de la Mata⁵, Thierry Fournier^{2, 3}, Jorg Schormann⁴, Jordi Arbiol⁵, Martin Eickhoff⁴ and Eva Monroy^{2, 1}; ¹INAC / PHELIQS / SP2M, CEA Grenoble, Grenoble, France; ²Université Grenoble-Alpes, Grenoble, France; ³CNRS - Institut Néel, Grenoble, France; ⁴I. Physikalisches Institut, Justus-Liebig-Universität Gießen, Gießen, Germany; ⁵CSIC, BIST & ICREA, Catalan Institute of Nanoscience and Nanotechnology, Barcelona, Spain

9:15 AM E0.3.06

Molecular Beam Epitaxial Growth and Characterization of B(Ga,Al)N Nanowire Heterostructures <u>D.</u>
<u>Laleyan</u>, Songrui Zhao and Zetian Mi; Electrical and Computer Engineering, McGill University, Montreal,
Canada

9:30 AM E0.3.07

Quantum Dot-Like Behavior of Compositional Fluctuations in AlGaN Nanowires Matthias Belloeil, Bruno Gayral and Bruno Daudin; PHELIQS\"Nanophysics and semiconductors" group, CEA Grenoble\INAC, Grenoble, France

9:45 AM E0.3.08

Visualization and Quantitative Analysis of Axial p-n Junction on Single GaN Nanowire by Three Electron Beam Based Techniques Zhihua Fang^{1, 2, 3}, Fabrice Donatini^{1, 3}, Eric Robin^{3, 4}, Julien Pernot^{3, 1, 5} and Bruno Daudin^{2, 3}; ¹Institut Neel, Grenoble, France; ²CEA, INAC-SP2M, "Nanophysique et semiconducteurs" group, Grenoble, France; ³University of Grenoble Alpes, Grenoble, France; ⁴CEA, INAC, MINATEC Campus, Grenoble, France; ⁵Institut Universitaire de France, Paris, France

10:00 AM BREAK

F0.4: Novel Materials and Devices IV: Boron Containing and Computational Nitrides
Wednesday Morning, October 5, 2016
Room: Poinsettia/Quince

8:00 AM *F0.4.01

Indirect Excitons, Electron-Phonon Interaction and Intervalley Scatteringin Hexagonal Boron Nitride Guillaume Cassabois; Laboratoire Charles Coulomb , Université de Montpellier, Montpellier, France

8:30 AM F0.4.02

Layered Hexagonal BN Thin Films Grown by MOVPE for UV Optical Applications Xin Li^{1,2}, Suresh Sundaram², Youssef El Gmili², Taha Ayari^{1,2}, Gilles Patriarche³, Paul L. Voss^{1,2}, Jean Paul Salvestrini^{2,4} and Abdallah Ougazzaden^{1,2}; ¹Georgia Institute of Technology, School of Electrical and Computer Engineering, GT-Lorraine, 57070, Metz, France; ²UMI 2958, Georgia Tech - CNRS, 57070, Metz, France; ³Laboratoire de Photonique et de Nanostructures (LPN), CNRS, Université Paris-Saclay, 91460, Marcoussis, France; ⁴Université de Lorraine, LMOPS, EA 4423, 57070, Metz, France

8:45 AM F0.4.03

Phase Degradation in B_xGa_{1-x}N Films Grown at Low Temperature by Metalorganic Vapor Phase Epitaxy Brendan Gunning, Michael Moseley, Daniel Koleske, Andrew Allerman and Stephen Lee; Sandia National Laboratories, Albuquerque, New Mexico, United States

9:00 AM F0.4.04

100-nm Thick Single-Phase Wurtzite BAIN with B Contents up to 11.6% Grown by MOCVD <u>Xiaohang Li</u>^{1,}
², Shuo Wang³, Hanxiao Liu³, Fernando A. Ponce³, Theeradetch Detchprohm² and Russell D. Dupuis²;

¹King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; ²Georgia Institute of Technology, Atlanta, Georgia, United States; ³Arizona State University, Tempe, Arizona, United States

9:15 AM F0.4.05

High-Temperature Molecular Beam Epitaxy of Boron-Nitride Layers Y. Cho¹, T. Cheng¹, A. Summerfield¹, A. Davies^{1, 2}, J. Diez Albar¹, C. Mellor¹, A. Khlobystov², T. Taniguchi³, K. Watanabe³, Tom Foxon¹, L. Eaves¹, P. Beton¹ and Sergei V. Novikov¹; ¹School of Physics and Astronomy, University of Nottingham, Nottingham, United Kingdom; ²School of Chemistry, University of Nottingham, Nottingham, United Kingdom; ³The National Institute for Materials Science, Tsukuba, Japan

9:30 AM F0.4.06

Computational Discovery of Novel Stable and Metastable Nitride Semiconductors Wenhao Sun^{2, 1}, Aaron Holder³, Bernardo Ourmananos², Andriy Zakutayev³, Stephan Lany³ and Gerbrand Ceder^{1, 2};
¹Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California, United States;
²Massachusetts Institute of Technology, Cambridge, Massachusetts, United States;
³National Renewable Energy Laboratory, Denver, Colorado, United States

9:45 AM LATE NEWS

10:00 AM BREAK

A2.7: Epitaxial Growth VII: Epitaxial Growth of (Al,Ga)N Thursday Morning, October 6, 2016 Room: International South

8:00 AM *A2.7.01

Low Defect Density AIN and AIGaN for deep UV Emitters <u>Markus Weyers</u>; Ferdinand-Braun-Institut, Berlin, Germany

8:30 AM A2.7.02

Strain Controls of High-Quality AIN Layers by Misfit Dislocations Introduced at Step Edges of SiC(0001) Substrates Mitsuaki Kaneko, Tsunenobu Kimoto and Jun Suda; Electronic Science and Engineering, Kyoto University, Kyoto, Japan

8:45 AM A2.7.03

High-Quality AlN Epitaxy on Nano-Patterned Sapphire Substrates Prepared by Nano-Imprint Lithography Lisheng Zhang; State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing, China

9:00 AM A2.7.04

Improved Nucleation of AIN Template Layer on Sapphire Substrate by Using TMGa Pulse Flow Hualong Wu, Hailong Wang, Yingda Chen, Lingxia Zhang, Zimin Chen, Zhisheng Wu and Hao Jiang; State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, Guangzhou, China

9:15 AM A2.7.05

Low Etch Pit Density AlN on Sapphire <u>Daniel D. Koleske</u>¹, Darrell L. Alliman¹, J. R. Creighton³, Brendan P. Gunning¹, Jeffrey J. Figiel¹, Andrew A. Allerman¹, Akira Mishima² and Kazutada Ikenaga²; ¹Sandia National Laboratories, Albuquerque, New Mexico, United States; ²TAIYO NIPPON SANSO Corporation, Tokyo, Japan; ³JR Creighton Consulting LLC, Albuquerque, New Mexico, United States

9:30 AM A2.7.06

Improvement of AIN Crystal Quality on Si Substrate for Deep UV-LED Applications <u>Tinh B. Tran</u>¹, Hideki Hirayama¹, Noritoshi Maeda¹, Masafumi Jo¹, Daishi Inoue² and Tomoka Kikitsu²; ¹Quantum Optodevice Laboratory, RIKEN, Wako, Japan; ²Materials Characterization Support Unit, Center for Emergent Matter Science, RIKEN, Wako, Japan

9:45 AM BREAK

B1.5: Visible Devices V:
Visible Light Emitters: Contacts, Tunnel Junctions, and Monolithic Integration
Thursday Morning, October 6, 2016
Room: International Center

8:00 AM *B1.5.01

Transparent Conductive Nitride p-Contacts <u>Nicolas Grandjean</u>; École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

8:30 AM <u>B1.5.02</u>

Buried Tunnel Junctions Using Low Resistive GalnN Tunnel Junctions with High Si Concentrations Yasuto Akatsuka¹, Daiki Takasuka¹, Takanobu Akagi¹, Tetsuya Takeuchi¹, Motoaki Iwaya¹, Satoshi Kamiyama¹ and Isamu Akasaki^{1, 2}; ¹Meijo University, Nagoya, Japan; ²Akasaki Research Center, Nagoya University, Nagoya, Japan

8:45 AM <u>B1.5.03</u>

Ultra-Low Resistance GaN/InGaN/GaN Tunnel Junctions with Indium Content < 15% <u>Fatih Akyol</u>; Electrical and Computer Engineering Department, Ohio State University, Columbus, Ohio, United States

9:00 AM B1.5.04

MOVPE Growth of GaN-Based Tunnel Junctions for Lateral Current Spreading in InGaN LEDs Silvio Neugebauer, Aqdas Fariza, Marc P. Hoffmann, Christopher Kahrmann, Gordon Schmidt, Sebastian Metzner, Hartmut Witte, Juergen Blasing, Frank Bertram, Juergen Christen, Armin Dadgar and Andre Strittmatter; Otto-von-Guericke-University Magdeburg, Magdeburg, Germany

9:15 AM B1.5.05

Light Emitting Diodes with Tunnel Junctions for Hole Injection Grown by Plasma-Assisted MBE Czeslaw Skierbiszewski^{1, 2}, Grzegorz Muziol¹, Krzesimir Szkudlarek¹, Jakub Goss¹, Krzysztof Gibasiewicz¹, Anna Feduniewicz-Zmuda¹, Anna Nowakowska-Siwinska^{1, 2}, Szymon Grzanka^{1, 2} and Marcin Siekacz^{1, 2};

¹Institute of High Pressure Physics PAS, Warsaw, Poland; ²TopGaN Ltd, Warsaw, Poland

9:30 AM B1.5.06

Voltage-Controlled Light Modulation Enabled by Monolithically Integrated HEMT-LED Device <u>Yuefei Cai</u>¹, Xinbo Zou^{1, 2}, Chao Liu¹ and Kei May Lau^{1, 2}; ¹Electronic and Computer Engineering, Hong Kong University of Science and Technology, Kowloon, Hong Kong; ²HKUST Jockey Club Institute of Advanced Study, Kowloon, Hong Kong

9:45 AM BREAK

B3.3: Photodetectors, Photovoltaics, Intersubband Devices III/F0.5: Novel Materials and Devices V: Photodetectors and Novel Devices

Thursday Morning, October 6, 2016

Room: Poinsettia/Quince

8:00 AM *B3.3.01/F.5.01

Progress in Research on III-Nitride Based Quantum Cascade Detectors <u>Gad Bahir</u>¹, Matias Katz¹, Ofir Sorias¹, Lior Gal¹, Meir Ornstein¹, Piotr M. Mensz¹, Etienne Giraud², Nicolas Grandjean² and Eva Monroy³; ¹Department of Electrical Engineering, Technion-Israel Institute of Technology, Haifa, Israel; ²Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; ³CEA, Grenoble, France

8:30 AM B3.3.02/F.5.02

High Photocurrent of (In,Ga)N Nanowire Photoanodes Mediated by a Radial Stark Effect Jumpei Kamimura¹, Peter Bogdanoff², Pierre Corfdir¹, Oliver Brandt¹, Henning Riechert¹ and <u>Lutz Geelhaar</u>¹; ¹Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; ²Institute for Solar Fuels, Helmholtz-Zentrum Berlin für Materialien und Energie, Berlin, Germany

8:45 AM B3.3.03/F.5.03

Physical Property of the High Photosensitive Field Effect Transistor Type UV Photosensors with AlGaN/AlGaN Hetero Structure Akira Yoshikawa^{1, 2}, Saki Ushida¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹ and Isamu Akasaki^{1, 3}; ¹Faculty of Science and Technology, Meijo University, Fuji Shizuoka, Japan; ²UVC project, Asahi Kasei, Fuji, Japan; ³Akasaki Research Center, Nagoya, Japan

9:00 AM B3.3.04/F.5.04

Temperature Dependence in AlGaN-Based Heterostructure Field-Effect Transistor Type UV Photosensors Saki Ushida³, Akira Yoshikawa^{3, 1}, Motoaki Iwaya³, Satoshi Kamiyama³, Tetsuya Takeuchi³ and Isamu Akasaki^{3, 2}; ¹Asahi-Kasei, Fuji, Japan; ²Akasaki Research Center, Nagoya University, Nagoya, Japan; ³Faculty of Science and Technology, Meijo University, Nagoya, Japan

9:15 AM <u>B3.3.05/F.5.05</u>

AlGaN/GaN Micro-Hall Devices for Current Sensing <u>Gregory Salamo</u>¹, Morgan Ware², Thomas White² and Alan Mantooth²; ¹Physics, University of Arkansas, Fayetteville, Arkansas, United States; ²EE, University of Arkansas, Fayetteville, Arkansas, United States

9:30 AM B3.3.06/F.5.06

Investigation of Thermoelectric Properties in III-Nitride Based Semiconductors Bahadir Kucukgok¹, Na Lu¹ and Ian T. Ferguson²; ¹Lyles School of Civil Engineering, Purdue University, West Lafayette, Indiana, United States; ²College of Engineering and Computing, Missouri University of Science and Technology, Rolla, Missouri, United States

9:45 AM BREAK

C0.4: Electronic Devices IV: Quantum Devices and Sensors Thursday Morning, October 6, 2016 Room: Narcissus/Orange Blossom

8:00 AM *C0.4.01

Nanostructured GaN Devices—From Ballistic Transport to Superior Device Performance Elison Matioli; Ecole Polytechnique Federale de Lausanne, Lausanne, Switzerland

8:30 AM CO.4.02

III-Nitride Tunneling Hot Electron Transistors with Current Gain above 10 Zhichao Yang¹, Yuewei Zhang¹, Sriram Krishnamoorthy¹, Digbijoy N. Nath¹, Jacob B. Khurgin² and Siddharth Rajan¹; ¹Electrical and Computer Engineering, Ohio State University, Columbus, Ohio, United States; ²Electrical and Computer Engineering, Johns Hopkins University, Baltimore, Maryland, United States

8:45 AM CO.4.03

Modeling and Demonstration of High Current MoS₂/GaN Interband Tunnel Junctions <u>Sriram</u>

<u>Krishnamoorthy</u>¹, Yuewei Zhang¹, Edwin Lee¹, Choong Hee Lee¹, William D. McCulloch², Jared M.

Johnson³, Jinwoo Hwang³, Yiying Wu² and Siddharth Rajan^{1,3}; ¹Electrical and Computer Engineering,

Ohio State University, Columbus, Ohio, United States; ²Department of Chemistry and Biochemistry, Ohio

State University, Columbus, Ohio, United States; ³Department of Material Science and Engineering, Ohio

State University, Columbus, Ohio, United States

9:00 AM C0.4.04

A Sub-THz Broadband Detector Based on GaN HEMTs with Nano Antennas Haowen Hou^{1, 2}, Zhihong Liu², Jinghua Teng³, Tomas Palacios⁴ and Soo jin Chua^{1, 2}; ¹Department of Electrical and Computer Engineering, National University of Singapore, Singapore, Singapore; ²Singapore-MIT Alliance for Research and Technology Center, Singapore, Singapore; ³Institute of Materials Research and Engineering, Singapore, Singapore; ⁴Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

9:15 AM C0.4.05

Single Crystal III-N Materials for Bulk Acoustic Wave Resonator Applications Shawn R. Gibb, Ramakrishna Vetury, Michael D. Hodge, Pinal Patel, Alexander Y. Feldman, Michael P. Lewis, Mark D. Boomgarden and Jeffrey B. Shealy; Akoustis, Inc., Huntersville, North Carolina, United States

9:30 AM LATE NEWS

9:45 AM BREAK

10:45 AM C0.4.07

Near-Junction Thermal Management of GaN-on-SiC HEMTs via Wafer Bonding Robert M. Radway¹, Kevin R. Bagnall², Evelyn N. Wang² and Tomas Palacios¹; ¹Microsystems Technology Laboratories, Massachusetts Institute of Technology, Boston, Massachusetts, United States; ²Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

11:00 AM C0.4.08

Thermal and Mechanical Characterisation of GaN-on-Diamond Interfaces—Uniformity and Robustness <u>James W. Pomeroy</u>¹, Huarui Sun¹, Dong Liu¹, Roland B. Simon¹, Daniel Francis², Firooz Faili², Daniel J. Twitchen² and Martin Kuball¹; ¹Center for Device Thermography and Reliability, H.H. Wills Physics Laboratory, University Of Bristol, Bristol, United Kingdom; ²Element Six Technologies U.S. Corporation, Santa Clara, California, United States

11:15 AM <u>C0.4.09</u>

High Temperature Operation of Diamond Coated AlGaN/GaN High Electron Mobility Transistor Gabriel Vanko¹, Tibor Izak², Jaroslav Dzuba¹, Oleg Babchenko¹, Vit Jirasek², Tibor Lalinsky¹, Marian Vojs³ and Alexander Kromka²; ¹Department of Microelectronics and Sensors, Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia; ²Institute of Physics AS CR, Prague, Czech Republic; ³Institute of Electronics and Photonics STU, Bratislava, Slovakia

11:30 AM <u>C0.4.10</u>

Low Thermal Resistance GaN Grown on Polycrystalline Diamond <u>Huarui Sun</u>^{2, 1}, Richard F. Webster², Quanzhong Jiang³, Ian Griffiths², David Cherns², Duncan Allsopp³ and Martin Kuball²; ¹Harbin Institute of Technology (Shenzhen), Shenzhen, China; ²H.H. Wills Physics Laboratory, University of Bristol, Bristol, United Kingdom; ³Department of Electronic and Electrical Engineering, University of Bath, Bath, United Kingdom

11:45 AM C0.4.11

Thermal Time Constants of GaN HEMTs Kevin R. Bagnall and Evelyn N. Wang; Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States

12:00 PM C0.4.12

Thermal Management in GaN HEMTs—Power Switching versus RF Devices James W. Pomeroy, Maire Power, Michael J. Uren and Martin Kuball; Center for Device Thermography and Reliability, H.H. Wills Physics Laboratory, University of Bristol, Bristol, United Kingdom

12:15 PM CO.4.13

Investigation of the Thermal Properties of Bulk GaN and High Growth Rate MBE GaN <u>Luke Yates</u>¹, Wenkan Jiang², Jonathan Cook², Derrick S. Kamber², Rajeev T. Pakalapati², Dirk Ehrentraut², Mark D'Evelyn², Evan Clinton³, Brendan Gunning³, Alan Doolittle³ and Samuel Graham¹; ¹Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; ²Soraa Inc., Goleta, California, United States; ³Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States

D1.7: Materials Characterization VII: Characterization of Electronic Devices
Thursday Morning, October 6, 2016
Room: International North

8:00 AM *D1.7.01

Traps and Their Effects in High Voltage GaN/Si HEMTs and Ultra-Wide Bandgap Semiconductors Steven A. Ringel and Aaron Arehart; Electrical and Computer Engineering, Ohio State University, Columbus, Ohio, United States

8:30 AM D1.7.02

Analysis of Carrier Trapping and Emission in AlGaN/GaN HEMT with Bias-Controllable Field Plate Suguru Mase, Akio Wakejima and Takashi Egawa; Nagoya Institute of Technology, Nagoya, Japan

8:45 AM D1.7.03

Wafer-Level Mapping of Net Donor and Deep-Level Trap Concentrations in MOVPE-Grown Homoepitaxial n-Type GaN Masahiro Horita¹, Tetsuo Narita², Tetsu Kachi², Tsutomu Uesugi² and Jun Suda¹; ¹Electronic Science and Engineering, Kyoto University, Kyoto, Japan; ²Toyota Central R&D Labs., Inc., Nagakute, Japan

9:00 AM D1.7.04

Spatially Correlating the E_c-0.57 eV Trap in GaN with Edge Dislocations Kevin Galiano¹, Julia Deitz², Santino Carnevale³, Darryl A. Gleason¹, Zeng Zhang³, Brian McSkimming⁴, James S. Speck⁴, Steven A. Ringel³, Tyler J. Grassman², Aaron A. Arehart³ and Jonathan P. Pelz¹; ¹Physics, Ohio State University, Columbus, Ohio, United States; ²Materials Science and Engineering, Ohio State University, Columbus, Ohio, United States; ³Electrical & Computer Engineering, Ohio State University, Columbus, Ohio, United States; ⁴Materials, University of California, Santa Barbara, Santa Barbara, California, United States

9:15 AM D1.7.05

Photocurrent Induced by Sub-Bandgap-Wavelength Light Absorption due to Franz-Keldysh Effect in n-Type GaN Schottky Barrier Diode under Large Reverse Bias <u>Takuya Maeda</u>¹, Masaya Okada², Masaki Ueno², Yoshiyuki Yamamoto², Masahiro Horita¹ and Jun Suda¹; ¹Kyoto University, Kyoto, Japan; ²Sumitomo Electric Industries, Ltd., Itami, Hyogo 664-0016, Japan

9:30 AM D1.7.06

Hot Electron Electroluminescence in GaN-Based Transistors—Origin of the Emission Tommaso

Brazzini¹, Huarui Sun¹, Francesco Sarti², James W. Pomeroy¹, Chris Hodges¹, Massimo Gurioli², Anna
Vinattieri², Michael J. Uren¹ and Martin Kuball¹; ¹H. H. Wills Physics Laboratory, University of Bristol,
Bristol, United Kingdom; ²Dipartimento di Fisica e Astronomia and LENS, University of Florence, Firenze,
Italy

9:45 AM BREAK

D2.3: Theory and Simulation III:
Theory of Point Defects and Modeling of Optoelectronic Devices
Thursday Morning, October 6, 2016
Room: Azalea/Begonia

8:00 AM *D2.3.01

Point-Defect-Assisted Nonradiative Recombination in Nitride Light Emitters <u>Audrius Alkauskas</u>; Center for Physical Sciences and Technology, Vilnius, Lithuania

8:30 AM D2.3.02

Predicting the Influence of Point Defects on the Optoelectronic Properties of Gallium Nitride using a First-Principles Approach <u>Kirk Lewis</u>, Masahiko Matsubara, Enrico Bellotti and Sahar Sharifzadeh; Boston University, Lexington, Massachusetts, United States

8:45 AM D2.3.03

Implications of Point Defects on III-Nitride Tunnel Devices <u>Darshana Wickramaratne</u>¹, John L. Lyons^{1, 2}, Cyrus E. Dreyer^{1, 3}, Leigh Weston¹ and Chris G. Van de Walle¹; ¹Materials Department, University of California, Santa Barbara, Santa Barbara, California, United States; ²Brookhaven National Laboratory, Upton, New York, United States; ³Department of Physics and Astronomy, Rutgers University, Piscataway, New Jersey, United States

9:00 AM D2.3.04

First Principles Study of the Formation Energies and Diffusion Barriers of Carbon and Native Defects in GaN <u>Alexandros Kyrtsos</u>, Masahiko Matsubara and Enrico Bellotti; Electrical and Computer Engineering, Boston University, Boston, Massachusetts, United States

9:15 AM D2.3.05

Carbon in Gallium Nitride—Resolving of a Longstanding Mystery <u>Dimiter Alexandrov</u>; Electrical Engineering, Lakehead University, Thunder Bay, Canada

9:30 AM D2.3.06

Enhancement of Optical Gain by Controlling Waveguide Modes in Semipolar InGaN Quantum Well Laser Diodes Shigeta Sakai, Keigo Matsuura and Atsushi A. Yamaguchi; Kanazawa Institute of Technology, Nonoichi, Japan

9:45 AM BREAK

10:15 AM D2.3.07

Model to Explain the Behavior of 2DEG Mobility with Respect to Charge Density in N-Polar and Ga-Polar AlGaN-GaN Heterostructures Elaheh Ahmadi, Matthew Guidry, Stacia Keller and Umesh K. Mishra; University of California, Santa Barbara, Santa Barbara, California, United States

10:30 AM D2.3.08

The Effects of Non-Equilibrium Phonons on Transport in GaN Angela Dyson¹, Daniel R. Naylor¹ and Brian K. Ridley²; ¹Physics and Math, University of Hull, Hull, United Kingdom; ²Department of Computer Science and Electronic Engineering, University of Essex, Colchester, United Kingdom

10:45 AM <u>D2.3.09</u>

Multiscale Modeling of Thermal and Electrical Transport in Gallium Nitride High Electron Mobility Transistor Ajit K. Vallabhaneni, Man P. Gupta and Satish Kumar; ME, Georgia Institute of Technology, Atlanta, Georgia, United States

11:00 AM D2.3.10

Challenges and Opportunities in Modeling Gallium Nitride High Electron Mobility Transistors— From Numerical Simulations to Compact Transistor Model Shaloo Rakheja^{1, 2} and Parijat Sengupta³; ¹Electrical and Computer Engineering, New York University, Brooklyn, New York, United States; ²NYU Wireless, New York University, Brooklyn, New York, United States; ³Photonics Center, Boston University, Boston, Massachusetts, United States

11:15 AM D2.3.11

GaN-Based Digital Electronics beyond '3.5 nm' Technology Node Nadim Chowdhury¹, Giuseppe Iannaccone², Gianluca Fiori² and Tomas Palacios¹; ¹EECS, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States; ²Dipartimento di Ingegneria dell'Informazione, Università di Pisa, Pisa, Italy

11:30 AM D2.3.12

Multifunctional Flexible III-Nitride-Based Electronic and Photonic Devices—Numerical Study on Device Performance Characteristics and New Functionality by External Bending Strain Shahab Shervin¹, Seung-Hwan Kim^{1, 2}, Mojtaba Asadirad¹, Keon-Hwa Lee¹ and Jae-Hyun Ryou¹; ¹University of Houston, Houston, Texas, United States; ²Hongik University, Seoul, Korea (the Republic of)

11:45 AM LATE NEWS

E0.4: Nanostructures IV: (In,Ga)N Nanostructures: Optoelectronic Devices and Properties
Thursday Morning, October 6, 2016
Room: Camelia/Dogwood

8:00 AM *E0.4.01

Nanowire-Based Blue-, Green- and Red-Emitting LEDs for Displays and Lighting Lars Samuelson; NanoLund/Solid State Physics, Lund University, Lund, Sweden

8:30 AM E0.4.02

Interplay of Internal and Build-In Fields in GaN/InGaN Core-Shell Nanocolumn Devices Wolf Quitsch¹, Sebastian Beuel¹, Moritz Loewenich¹, Tilman Schimpke², Adrian Avramescu², Martin Strassburg² and Gerd Bacher¹; ¹Electronic Materials and Nanostructures and CeNIDE, University Duisburg-Essen, Duisburg, Germany; ²OSRAM Opto Semiconductors GmBH, Regensburg, Germany

8:45 AM E0.4.03

Correlated Electroluminescence, Cathodoluminescence and Electron Beam Induced Current Mapping of Core-Shell Nanowire InGaN/GaN LEDs Valerio Piazza¹, Hezhi Zhang¹, Vladimir Neplokh¹, Gwenole Jacopin², Olga Kryliouk³, Ludovic Largeau⁴, Pierre Rale⁴, Stephane Collin⁴ and Maria Tchernycheva¹; ¹IEF, Université Paris Sud, Orsay, France; ²EPFL, Lausanne, Switzerland; ³GLO-USA, Sunnyvale, California, United States; ⁴LPN, Université Paris Sud, Marcoussis, France

9:00 AM E0.4.04

Anomalous Behavior of Temperature-Dependent Photoluminescence in GaN/InGaN Core-Shell Nanostructures Mohsen Nami², Serdal Okur³, Rhett. Eller², Ashwin Rishinaramangalam³, Sheng Liu¹, Igal Brener¹ and Daniel Feezell³; ¹Center for Integrated Nanotechnologies, Albuquerque, New Mexico, United States; ²Physics and Astronomy, University of New Mexico, Albuquerque, New Mexico, United States; ³Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, United States

9:15 AM E0.4.05

Systematic Investigation of Influence of Nanostructural Effect on Optical Properties in InGaN Nanocolumns <u>Takao Oto</u>¹, Yutaro Mizuno¹, Ai Yanagihara¹, Rin Miyagawa¹, Tatsuya Kano¹, Jun Yoshida¹, Naoki Sakakibara¹ and Katsumi Kishino^{1, 2}; ¹Sophia University, Tokyo, Japan; ²Sophia Nanotechnology Research Center, Tokyo, Japan

9:30 AM E0.4.06

Recombination Dynamics in Planar and 3D InGaN/GaN LED Structures Angelina Vogt¹, Jana Hartmann¹, Hao Zhou¹, Matin S. Mohajerani¹, Sonke Fuendling¹, Manuela Gerken¹, Hergo H. Wehmann¹, Martin Strassburg², Tilman Schimpke², Andreas Waag¹ and Tobias Voss¹; ¹Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, Braunschweig University of Technology, Braunschweig, Germany; ²OSRAM Opto Semiconductors GmbH, Regensburg, Germany

9:45 AM BREAK

10:45 AM *E0.4.07

Group III-Nitride Nanostructures for Solid State Lighting and Quantum Photonics <u>Yong-Hoon Cho</u>; Department of Physics, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea (the Republic of)

11:15 AM E0.4.08

Spectrally-Resolved Internal Quantum Efficiency and Carrier Dynamics in Semipolar (10-11) Triangular Nanostripe InGaN/GaN LEDs Serdal Okur¹, Ashwin K. Rishinaramangalam¹, Saadat M. Ul Masabih¹, Sheng Liu², Igal Brener² and Daniel F. Feezell¹; ¹Electrical and Computer Engineering, University of New Mexico, Albuquerque, New Mexico, United States; ²Center of Integrated Nanotechnologies, Sandia National Laboratories, Albuquerque, New Mexico, United States

11:30 AM E0.4.09

Fabrication and Control of III-Nitride Nanowire Lasers George T. Wang¹, Changyi Li², Sheng Liu¹, Qiming Li¹, Jeremy B. Wright¹, Benjamin Leung¹, Huiwen Xu², Daniel D. Koleske¹, Jeffrey J. Figiel¹, Ganapthi Subramania¹, Ting S. Luk¹, Igal Brener¹, Ganesh Balakrishnan², Daniel Feezell² and Steven R. Brueck²; ¹Sandia National Laboratories, Albuquerque, New Mexico, United States; ²Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, United States

11:45 AM <u>E0.4.10</u>

Optimisation of the Fabrication of InGaN/GaN Nanoring/Nanotube for Whispering Gallery Modes (WGMs) Based Laser <u>Pierre-Marie Coulon</u>, Emmanuel Le Boulbar, Philip Shields and Duncan Allsopp; Electronic and Electrical Engineering, University of Bath, Bath, United Kingdom

12:00 PM E0.4.11

Far-Field Enhancement in High-Q Blue III-Nitride Photonic Crystal Nanobeam Cavities on Silicon Ian
Rousseau, Irene Sanchez-Arribas, Jean-Francois Carlin, Raphael Butte and Nicolas Grandjean; Institute of Physics, EPFL, Lausanne, Switzerland

12:15 PM <u>E0.4.12</u>

Facet Evolution in GaN Chemical Etching for 3D Structures and Optical Microcavities Miao-Chan Tsai¹, Benjamin Leung², Changyi Li¹, Ganesh Balakrishnan¹ and George T. Wang²; ¹Center for High Technology Materials, University of New Mexico, Albuquerque, New Mexico, United States; ²Sandia National Laboratories, Albuquerque, New Mexico, United States

A1.4: Bulk Growth IV/A2.8: Epitaxial Growth VIII: Tri-Halide Vapor Epitaxy of (In,Ga)N and Doping of GaN Thursday Morning, October 6, 2016 Room: International South

10:45 AM *A1.4.01/A2.8.01

Recent Progress in Tri-Halide Vapor Phase Epitaxy of Thick GaN and InGaN <u>Hisashi Murakami</u>; Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Tokyo, Japan

11:15 AM A1.4.02/A2.8.02

Carbon Doping by Propane for the Compensation of n-Type GaN Layers Andreas Lesnik, Marc P. Hoffmann, Juergen Blasing, Hartmut Witte, Florian Horich, Peter Veit, Jonatan Meiske, Aqdas Fariza, Jonas Hennig, Armin Dadgar and Andre Strittmatter; Institut für Experimentelle Physik, Magdeburg, Germany

11:30 AM <u>A1.4.03/A2.8.03</u>

Control of Carbon in MOCVD-Grown GaN for Power Devices by Supersaturation and Fermi Level Control Felix Kaess^{1, 2}, Seiji Mita¹, Jinqiao Xie³, Pramod Reddy¹, Andrew Klump¹, Luis H. Hernandez-Balderrama¹, Shun Washiyama¹, Alexander Franke¹, Ronny Kirste¹, Axel Hoffmann², Ramon Collazo¹ and Zlatko Sitar¹; ¹Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; ²Solid State Physics Institute, Technical University Berlin, Berlin, Germany; ³HexaTech Inc., Morrisville, North Carolina, United States

11:45 AM A1.4.04/A2.8.04

Mg Blocking by GaN Grown via Low Temperature Flow Modulation Epitaxy Anchal Agarwal, Maher Tahhan, Stacia Keller and Umesh K. Mishra; Electrical and Computer Engineering, University of California, Santa Barbara, Goleta, California, United States

12:00 PM A1.4.05/A2.8.05

Electrical Characteristics and Control of Compensating Point Defects for Mg-Doped GaN Andrew Klump, Felix Kaess, Seiji Mita, Ronny Kirste, Ramon Collazo and Zlatko Sitar; MSE, North Carolina State University, Raleigh, North Carolina, United States

12:15 PM A1.4.06/A2.8.06

High Hole Mobility p-Type GaN with Extremely Low Residual Hydrogen Concentration Prepared by Pulsed Sputtering Kohei Ueno¹, Y. Arakawa¹, Atsushi Kobayashi¹, Jitsuo Otha^{1, 2} and Hiroshi Fujioka^{1, 3}; ¹Institute of Industrial Science, University of Tokyo, Tokyo, Japan; ²JST-PRESTO, Tokyo, Japan; ³JST-ACCEL, Tokyo, Japan

B1.6: Visible Devices VI: Light Emitters: Lasers Thursday Morning, October 6, 2016 Room: International Center

10:45 AM B1.6.01

GaN-on-Si UV LED and Blue/Violet Laser Diode Qian Sun; Nano-Device Division, Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou, China

11:00 AM <u>B1.6.02</u>

Design and Fabrication of Modulation-Doped GaN-Based Vertical Cavities for Blue Surface-Emitting Lasers Junichiro Ogimoto, Yugo Kozuka, Takanobu Akagi, Natsumi Hayashi, Tetsuya Takeuchi, Satoshi Kamiyama, Motoaki Iwaya and Isamu Akasaki; Factory of Science and Engineering, Meijo University, Nagoya, Japan

11:15 AM B1.6.03

Aluminum-Free Blue Laser Diodes Grown by Plasma Assisted Molecular Beam Epitaxy Grzegorz Muziol¹, Marcin Siekacz^{1, 2}, Henryk Turski¹, Szymon Grzanka^{1, 2}, Marcin Krysko¹, Jolanta Borysiuk^{3, 4}, Piotr Perlin^{1, 2} and Czeslaw Skierbiszewski^{1, 2}; ¹Institute of High Pressure Physics Polish Academy of Sciences, Warsaw, Poland; ²TopGaN Ltd, Warsaw, Poland; ³Institute of Physics Polish Academy of Sciences, Warsaw, Poland; ⁴Faculty of Physics, University of Warsaw, Warsaw, Poland

11:30 AM B1.6.04

All-Nitride, Optically Pumped VCSELs in Blue and Near UV Cheng Zhang, Kanglin Xiong, Ge Yuan and Jung Han; Electrical Engineering, Yale University, New Haven, Connecticut, United States

11:45 AM B1.6.05

Optically Pumped Distributed Feedback Lasers Based on GaN with 10th-Order Laterally Coupled Surface Gratings Ji Hye Kang², Martin Martens¹, Hans Wenzel², Veit Hoffmann², Wilfred John², Sven Einfeldt², Tim Wernicke¹ and Michael Kneissl^{2, 1}; ¹Technische Universität Berlin, Berlin, Germany; ²Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Berlin, Germany

12:00 PM B1.6.06

Opto-Electrical Properties of (Al,In)GaN Laser Diodes with Tapered Waveguide Szymon Stanczyk¹, Anna Kafar¹, Anna Nowakowska-Siwinska², Irina Makarowa², Marcin Sarzynski^{1, 2}, Jaroslaw Walczak³, Robert P. Sarzala³, Tadeusz Suski¹ and Piotr Perlin^{1, 2}; ¹Institute of High Pressure Physics Polish Academy of Science, Warsaw, Poland; ²TopGaN Ltd., Warsaw, Poland; ³Institute of Physics, Lodz University of Technology, Lodz, Poland

12:15 PM <u>B1.6.07</u>

Impact of Mode-Hopping Noise on InGaN Edge Emitting Laser RIN Properties Antoine Congar¹, Kamal Hussain¹, Christelle Pareige¹, Jean-Michel Lamy², Eric Feltin³, Raphael Butte², Nicolas Grandjean², Pascal Besnard¹ and Stephane Trebaol¹; ¹Laboratory Foton CNRS UMR 6082, Lannion, France; ²LASPE EPFL, Lausanne, Switzerland; ³Novagan, Lausanne, Switzerland

D1.8: Materials Characterization VIII: Characterization of (Al,Ga)N Thursday Morning, October 6, 2016 Room: International North

10:45 AM *D1.8.01

Radiative and Nonradiative Recombination Processes in AlGaN-Based Quantum Wells Yoichi Kawakami and Mitsuru Funato; Electronic Science and Engineering, Kyoto University, Kyoto, Japan

11:15 AM D1.8.02

Well Width Dependence of Radiative Lifetime in Ultrathin Al-Rich AlGaN/AlN Multiple Quantum Wells Chelsea R. Haughn¹, Thomas Wunderer², Zhihong Yang², Noble M. Johnson², Michael Wraback¹ and Gregory A. Garrett¹; ¹Sensors and Electron Devices Directorate, U.S. Army Research Laboratory, Adelphi, Maryland, United States; ²Palo Alto Research Center, Palo Alto, California, United States

11:30 AM D1.8.03

Confinement-Enhanced Biexciton Binding Energy in AlGaN-Based Quantum Wells Taira Izumi¹, Shumpei Fukuchi¹, Nobuto Imura¹, Hideaki Murotani¹, Hideto Miyake², Kazumasa Hiramatsu² and <u>Yoichi Yamada</u>¹; ¹Yamaguchi University, Ube, Japan; ²Mie University, Tsu, Japan

11:45 AM D1.8.04

Surface-Related Effects on the Temporal Change in (Al)GaN Photoluminescence Intensity <u>Carsten Netzel</u>, Joerg Jeschke, Frank Brunner and Markus Weyers; Materials Technology, Ferdinand-Braun-Institute, Berlin, Germany

12:00 PM D1.8.05

Investigation of Deep Levels in High-Al Mole Fraction Al _{0.75}Ga _{0.25}N <u>Towhidur Razzak</u>, Christine M. Jackson, Sanyam Bajaj, Fatih Akyol, Siddharth Rajan, Aaron R. Arehart and Steven A. Ringel; Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, United States

12:15 PM D1.8.06

Detailed Photoluminescence Excitation Study of the 3.9 eV and 2.7 eV Defect Luminescence Bands and the Commonly Observed Deep UV Absorption at 4.7 eV <u>Dorian E. Alden</u>¹, Joshua Harris¹, Zachary Bryan¹, Isaac Bryan¹, Benjamin Gaddy¹, Gordon Callsen², Axel Hoffmann², Douglas Irving¹, Ramon Collazo¹ and Zlatko Sitar¹; ¹Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; ²Fakultät für Festkörperphysik, Technische Universität Berlin, Berlin, Germany

F0.6: Novel Materials and Devices VI: Watersplitting and Sensors Thursday Morning, October 6, 2016 Room: Poinsettia/Quince

10:45 AM *F0.6.01

High Efficiency Solar Fuels Generation on III-Nitride Nanostructures <u>Zetian Mi</u>, Shizhao Fan and Faqrul Chowdhury; McGill University, Montreal, Canada

11:15 AM <u>F0.6.02</u>

Photocatalytic Properties of InGaN/GaN Nanowires Functionalized with Ultrathin Oxide Films Paula Neuderth¹, Pascal Hille¹, Joerg Teubert¹, Jorg Schormann¹, Christian Reitz², Sara Marti-Sanchez³, Maria de la Mata³, Mariona Coll⁴, Jordi Arbiol^{3, 5}, Roland Marschall⁶ and Martin Eickhoff¹; ¹I. Physical Institute, Justus Liebig University, Giessen, Germany; ²Institute of Nanotechnology, Karlsruhe Institute of Technology, Eggenstein-Leopoldshafen, Germany; ³Institute of Science and Technology, Autonomous University of Barcelona, Barcelona, Spain; ⁴Institute of Materials Science, Autonomous University of Barcelona, Spain; ⁵Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain; ⁶Institute of Physical Chemistry, Justus Liebig University, Giessen, Germany

11:30 AM <u>F0.6.03</u>

Visible Light Responding InGaN/AIN/GaN Polarization Engineered Water Splitting Photocathode Akihiro Nakamura¹, Katsushi Fujii², Yoshiaki Nakano¹ and Masakazu Sugiyama¹; ¹School of Engineering, University of Tokyo, Bunkyo, Japan; ²Institute of Environmental Science and Technology, University of Kitakyushu, Kitakyushu, Japan

11:45 AM F0.6.04

Realization of Robust Photoelectrochemical Water Splitting System with Enhanced Conversion Efficiency using 1.65 eV InGaN Nanowires on Bulk-Metal Substrates Mohamed Ebaid¹, Davide Priante¹, Guangyu Liu¹, Chao Zhao¹, Tayirjan T. Isimjan², Tien K. Ng¹ and Boon S. Ooi¹; ¹Computer, Electrical, and Mathematical Sciences and Engineering, King Abdullah University of Science and Technology, Jeddah, Saudi Arabia; ²SABIC, Thuwal, Saudi Arabia

12:00 PM <u>F0.6.05</u>

GaN Sub-MicronRod Ultrahigh Sensitivity Mechanical Sensor <u>Hua Zong</u> and Xiaodong Hu; Department of Physics, Peking University, Beijing, China

12:15 PM F0.6.06

Flexible Capacitive Piezoelectric Sensors Based on GaN Wires—Physics and Realization Amine El Kacimi^{2, 3}, Emmanuelle Pauliac-Vaujour^{2, 3} and <u>Joel Eymery</u>^{1, 3}; ¹INAC, CEA Grenoble, Grenoble, France; ²CEA, LETI, MINATEC Campus, Grenoble, France; ³University Grenoble Alpes, Grenoble, France

A2.9: Epitaxial Growth IX: Epitaxial Growth of N-Polar Nitrides and GaN-on-Si Thursday Afternoon, October 6, 2016 Room: International South

2:00 PM A2.9.01

Role of Low Temperature Buffers for Polarity Control of III-Nitrides on Sapphire Stefan Mohn¹, Natalia Stolyarchuk^{1, 3}, Toni Markurt¹, Ronny Kirste², Marc P. Hoffmann², Ramon Collazo², Aimeric Courville³, Zlatko Sitar², Philippe Vennegues³ and Martin Albrecht¹; ¹Electronmicroscopy, Leibniz Institute for Crystal Growth, Berlin, Germany; ²Material Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; ³Centre de Recherche sur l'HétéroEpitaxie et ses Applications, Valbonne, France

2:15 PM A2.9.02

Growth of High Quality N-Polar In_xGa_{1-x}N Films with x > 0.4 for Tunnel Junction Devices Cory Lund¹, Brian Romanczyk¹, Massimo Catalano², Qingxiao Wang³, Wenjun Li⁴, Steven P. DenBaars⁵, Shuji Nakamura⁵, Moon Kim³, Patrick Fay⁴, Umesh K. Mishra¹ and Stacia Keller¹; ¹Electrical and Computer Engineering, University of California, Santa Barbara, Santa Barbara, California, United States; ²Institute for Microelectronics and Microsystems CNR, Lecce, Italy; ³Material Science Engineering, University of Texas, Dallas, Texas, United States; ⁴Electrical Engineering, University of Notre Dame, Notre Dame, Indiana, United States; ⁵Materials, University of California, Santa Barbara, Santa Barbara, California, United States

2:30 PM A2.9.03

Control of Impurity Concentration of Undoped N-Polar (000-1) GaN Grown by Metalorganic Vapor Phase Epitaxy Tomoyuki Tanikawa, Shigeyuki Kuboya and Takashi Matsuoka; Institute for Materials Research, Tohoku University, Sendai, Japan

2:45 PM A2.9.04

Improvement of Homogeneity in N-Polar (000–1) InGaN Grown by Metalorganic Vapor Phase Epitaxy Ryohei Nonoda, Tanikawa Tomoyuki, Kanako Shojiki, Takeshi Kimura, Shinji Tanaka, Shigeyuki Kuboya, Ryuji Katayama and Takashi Matsuoka; Institute for Materials Research, Tohoku University, Sendai, Japan

3:00 PM A2.9.05

Selective Area Growth of High Crystalline Quality N-Polar GaN Pseudo-Substrates on Si (100) Gautier Laval¹, Nicolas Mante¹, Guy Feuillet¹, Pierre Ferret¹, Nevine Rochat¹, Sylvain David², Thierry Baron² and Amelie Dussaigne¹; ¹University of Grenoble Alpes, CEA LETI, Grenoble, France; ²University of Grenoble Alpes, CNRS-LTM, Grenoble, France

3:15 PM A2.9.06

Control of Stress, Bow, and Dislocation Density in (0001) AlN/GaN Superlattices Grown on Silicon Mikhail Rudinsky, Anna Lobanova, Eugene Yakovlev and Roman Talalaev; STR Group – Soft-Impact, Ltd., St.-Petersburg, Russian Federation

3:30 PM A2.9.07

Study of AlN Nucleation by Directional Sputtering for Growth of Orientation-Controlled GaN on Si(001) Substrates <u>Hojun Lee</u>¹, Si-Young Bae², Kaddour Lekhal², Akira Tamura¹, Yoshio Honda² and Hiroshi Amano^{2,3}; ¹Electrical Engineering and Computer Science, Nagoya University, Nagoya, Japan; ²Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan; ³Akasaki Research Center, Nagoya University, Nagoya, Japan

3:45 PM BREAK

B1.7: Visible Devices VII: Light Emitters and their Degradation Thursday Afternoon, October 6, 2016 Room: International Center

2:00 PM B1.7.01

Nitride Superluminescent Diodes with Broadband Emission Spectra Realized by Step-Like Indium Content Profile Anna Kafar¹, Szymon Stanczyk¹, Marcin Sarzynski^{1, 2}, Szymon Grzanka^{1, 2}, Jakub Goss¹, Tadeusz Suski¹ and Piotr Perlin^{1, 2}; ¹Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; ²TopGaN Ltd., Warsaw, Poland

2:15 PM B1.7.02

Fabrication and Characterization of GaN Based White Light-Emitting Diode without Phosphor Seung-Hyuk Lim, Young-Ho Ko, Christophe Rodriguez, Su-Hyun Gong and Yong-Hoon Cho; Physics, KAIST, Daejeon, Korea (the Republic of)

2:30 PM <u>B1.7.03</u>

Practical Method of Fabrication of High Quality Micrometer Size InGaN Light Emitting Diode Krzysztof J. Gibasiewicz¹, Jacek Kacperski², Irina Makarowa^{1, 2}, Szymon Grzanka^{1, 2}, Tadeusz Suski¹ and Piotr Perlin^{1, 2}; ¹Semiconductor, Institute of High Pressure Physics, "Unipress", Warsaw, Poland; ²TopGaN, Warsaw, Poland

2:45 PM B1.7.04

Defect Repair of GaN-Based LEDs by Ultraviolet Laser Processing Thorsten Passow¹, <u>Michael Kunzer</u>¹, Alexander Pfeuffer², Michael Binder² and Joachim Wagner¹; ¹Fraunhofer-Institut für Angewandte Festkörperphysik, Freiburg, Germany; ²Osram Opto Semiconductors GmbH, Regensburg, Germany

3:00 PM B1.7.05

Changes of Indium Distribution within the InGaN MQWs in LED and LD Structures just before Their Decomposition Ewa Grzanka, Szymon Grzanka^{1, 2}, Julita Smalc-Koziorowska^{1, 2}, Robert Czernecki^{1, 2}, Slawomir Kret³, Tadeusz Suski¹, Piotr Perlin^{1, 2} and Michal Leszczynski^{1, 2}; ¹Polish Academy of Sciences, Institute of High Pressure Physics, Warsaw, Poland; ²TopGaN LTD, Warsaw, Poland; ³Polish Academy of Sciences, Institute of Physics, Warsaw, Poland

3:15 PM B1.7.06

Time-Dependent Breakdown in GaN-Based LEDs—Description and Physical Origin Carlo De Santi, Matteo Meneghini, Matteo Buffolo, Gaudenzio Meneghesso and Enrico Zanoni; Department of Information Engineering, University of Padova, Padova, Italy

3:30 PM LATE NEWS

3:45 PM BREAK

B2.4: UV Devices IV: UV Emitters Thursday Afternoon, October 6, 2016 Room: Azalea/Begonia

2:00 PM B2.4.01

AlGaN DBR and Microcavities for Deep UV Vertical Emitting Laser Alexander Franke¹, Felix Kaess¹, Marc P. Hoffmann¹, James Tweedie^{1, 2}, Ronny Kirste^{1, 2}, Milena Bobea-Graziano¹, Edward Sachet¹, Jon-Paul Maria¹, Michael Gerhold³, Ramon Collazo¹ and Zlatko Sitar¹; ¹Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; ²Adroit Materials, Raleigh, North Carolina, United States; ³Engineering Sciences Directorate, Army Research Office, Research Triangle Park, North Carolina, United States

2:15 PM B2.4.02

Sub 250nm Deep-UV AlGaN/AlN Distributed Bragg Reflectors Grown by Metalorganic Chemical Vapor Deposition Theeradetch Detchprohm¹, Yuh-Shiuan Liu¹, Karan Mehta¹, Young Jae Park¹, Shuo Wang², Tsung-Ting Kao¹, Shyh-Chiang Shen¹, Paul D. Yoder¹, Fernando Ponce² and Russell D. Dupuis^{1, 3}; ¹Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States; ²Physics, Arizona State University, Tempe, Arizona, United States; ³Materials Science Engineering, Georgia Institute of Technology, Atlanta, Georgia, United States

2:30 PM <u>B2.4.03</u>

Design of p-AlGaN Layers for Efficient Carrier Injection in Deep Ultraviolet Light-Emitting Diodes Masafumi Jo and Hideki Hirayama; RIKEN, Wako, Japan

2:45 PM B2.4.04

Graphene-Based *p*-Electrodes for Deep UV Light Emitting Diodes <u>Luca Sulmoni</u>¹, Marc A. Gluba², Norbert H. Nickel², Frank Mehnke¹, Christian Kuhn¹, Johannes Enslin¹, Tim Wernicke¹ and Michael Kneissl¹; ¹Institute of Solid State Physics, Technische Universität Berlin, Berlin, Germany; ²Institut für Silizium-Photovoltaik, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, Berlin, Germany

3:00 PM B2.4.05

Hole Accumulations to Polarization Charges in Relaxed AlGaN Heterostructures with High AlN Mole Fractions Toshiki Yasuda¹, Tetsuya Takeuchi¹, Motoaki Iwaya¹, Satoshi Kamiyama¹, Isamu Akasaki^{1, 2} and Hiroshi Amano²; ¹Meijo University, Nagoya, Japan; ²Nagoya University, Nagoya, Japan

3:15 PM B2.4.06

Cluster Contact Behavior in p-GaN Grown on Sapphire and AlN Substrate Biplab Sarkar, Andrew Klump, Seiji Mita, Pramod Reddy, Erhard Kohn, Ronny Kirste, Ramon Collazo and Zlatko Sitar; North Carolina State University, Raleigh, North Carolina, United States

3:30 PM B2.4.07

Low Resistivity Ohmic Contact V-Based Electrode Contributed by Using Thin SiN_x Intermediate Layer for High AlN Molar Fraction n-Type AlGaN Noriaki Nagata¹, Takashi Senga¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹ and Isamu Akasaki^{1, 2}; ¹Faculty of Science and Technology, Meijo University, Nagoya, Japan; ²Akasaki Research and Technology, Nagoya University, Nagoya, Japan

3:45 PM BREAK

C2.3: Power Devices III: Devices for Power Electronics III
Thursday Afternoon, October 6, 2016
Room: Narcissus/Orange Blossom

2:00 PM *C2.3.01

Enhancement-Mode GaN-Based MIS-HEMTs for Dynamic Voltage Power Supply Applications <u>Sen Huang</u>, Xinhua Wang, Xuanwu Kang, Ke Wei and Xinyu Liu; Institute of Microelectronics of Chinese Academy of Sciences, Beijing, China

2:30 PM C2.3.02

Normally-off HEMTs with p-GaN Gate—Stability and Lifetime Extrapolation <u>Gaudenzio Meneghesso</u>¹, Matteo Meneghini¹, Isabella Rossetto¹, Vanessa Rizzato¹, Steve Stoffels², Marleen Van Hove², Tian-Li Wu², Shuzhen You², Niels Posthuma², Stefaan Decoutere² and Enrico Zanoni²; ¹University of Padova, Padova, Italy; ²IMEC, Heverlee, Belgium

2:45 PM C2.3.03

Normally-off AlGaN/GaN-on-Si Metal-Oxide-Semiconductor-Heterojunction Field-Effect Transistor with an Integrated Single Stage GaN Inverter as a Gate Driver Sang-Woo Han, Sung-Hoon Park, Hyun-Seop Kim, Min-Gi Jo and Ho-Young Cha; Hongik University, Seoul, Korea (the Republic of)

3:00 PM C2.3.04

An AlGaN/GaN Field Effect Diode with a High Turn-On Voltage Controllability Naoki Kato¹, Takaya Nagai¹, Akio Wakejima¹, Yamato Osada², Ryuichiro Kamimura², Kenji Itou³ and Takashi Egawa¹; ¹Nagoya Institute of Technology, Nagoya, Japan; ²ULVAC Corporation, Shizuoka, Japan; ³Kanazawa Institute of Technology, Kanazawa, Japan

3:15 PM C2.3.05

High-Performance Quasi- and Fully-Vertical GaN-on-Si pn Diodes Yuhao Zhang¹, Min Sun¹, Daniel Piedra¹, Lili Yu¹, Jonas Hennig², Armin Dadgar² and Tomas Palacios¹; ¹Massachusetts Institute of Technology, Cambridge, Massachusetts, United States; ²Otto-von-Guericke-University Magdeburg, Magdeburg, Germany

3:30 PM C2.3.06

Switching Performance of Quasi-Vertical GaN-Based p-i-n Diodes on Si Xu Zhang¹, Xinbo Zou^{1, 2}, Chak Wah Tang¹ and Kei May Lau^{1, 2}; ¹Department of Electronic and Computer Engineering, Hong Kong University of Science and Technology, Kowloon, Hong Kong; ²HKUST Jockey Club Institute for Advanced Study (IAS), Kowloon, Hong Kong

3:45 PM BREAK

D1.9: Materials Characterization IX: Characterization of Optical Processes in (In,Ga)N
Thursday Afternoon, October 6, 2016
Room: International North

2:00 PM *D1.9.01

Efficient Formation of Free Excitons in Nitride Quantum Wells at Room Temperature—Impact on Recombination Processes and LED Droop Andreas Hangleiter^{1, 2}; ¹Institute of Applied Physics, Technische Universität Braunschweig, Braunschweig, Germany; ²Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, Braunschweig, Germany

2:30 PM D1.9.02

Power Law Decay of the Photoluminescence Intensity of (In,Ga)N/GaN{0001} Quantum Wells—Impact of Nonradiative Recombination and Diffusion Felix Feix¹, Timur Flissikowski¹, Karl K. Sabelfeld², Vladimir M. Kaganer¹, Holger T. Grahn¹ and Oliver Brandt¹; ¹Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany; ²Institute of Computational Mathematics and Mathematical Geophysics, Russian Academy of Sciences, Novosibirsk, Russian Federation

2:45 PM D1.9.03

Enhancement of Auger Recombination Induced by Localization in InGaN/GaN Quantum Wells Raphael Butte¹, Mehran Shahmohammadi¹, Wei Liu¹, Georg Rossbach¹, Lise Lahourcade¹, Amelie Dussaigne², Benoit Deveaud¹, Nicolas Grandjean¹ and <u>Gwenole Jacopin</u>¹; ¹Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland; ²CEA, LETI, University of Grenoble Alpes, Grenoble, France

3:00 PM D1.9.04

Recombination Processes and Influence of Carrier Localization on their Optical Properties in (In,Ga)N/GaN Short Period Superlattices Mariia Anikeeva¹, Tobias Schulz¹, Pawel Strak ², Izabela Gorczyca ², Tadeusz Suski², Caroline Cheze³, Felix Feix³, Raffaella Calarco³ and Martin Albrecht¹; ¹Leibniz-Institut für Kristallzüchtung, Berlin, Germany; ²Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland; ³Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany

3:15 PM D1.9.05

Searching for Indirect Excitons in Coupled Double InGaN/GaN Quantum Wells <u>Tadeusz Suski</u>¹, Grzegorz Staszczak¹, Grzegorz Muziol¹, Czeslaw Skierbiszewski^{1, 2}, Michal Kulczykowski³, Michal Matuszewski³, Krzysztof Korona⁴, Piotr Drozdz⁴, Ewa Grzanka¹, Szymon Grzanka¹, Katarzyna Pieniak¹, Aleksandr Khachapuridze¹, Julita Smalc-Koziorowska¹ and Piotr Perlin^{1, 2}; ¹Institute of High Pressure Physics, UNIPRESS, Warszawa, Poland; ²TopGaN Ltd., Warsaw, Poland; ³Institute of Physics, Polish Academy of Sciences, Warsaw, Poland; ⁴Insitute of Experimental Physics, Warsaw University, Warsaw, Poland

3:30 PM D1.9.06

Exciton Dynamics and Stability of GaN in Non-Thermal Equilibrium State by the Analysis Taking into Account the Higher-Order Exciton States <u>Yoshihiro Ishitani</u>¹, Kazuma Takeuchi¹, Tomohiro Iwahori¹, Naoyuki Oizumi¹, Kensuke Oki¹, Kentaro Nomachi¹, Bei Ma¹, Ken Morita¹, Hideto Miyake² and Kazumasa Hiramatsu²; ¹Electrical and Electronic Engineering, Chiba University, Chiba, Japan; ²Electrical and Electronic Engineering, Mie University, Tsu, Japan

3:45 PM BREAK

E0.5: Nanostructures V: Nanostructures for Electronic Applications
Thursday Afternoon, October 6, 2016
Room: Camelia/Dogwood

2:00 PM <u>E0.5.01</u>

First Demonstration of Top-Down GaN Nanowire Gate-All-Around FET <u>Ki-Sik Im</u>¹, Chul-Ho Won¹, Sindhuri Vodapally¹, Yong Soo Lee¹, Raphael Caulmilone², Sorin Cristoloveanu³, Yong-Tae Kim⁴ and Jung-Hee Lee¹; ¹School of Electronics Engineering, Kyungpook National University, Daegu, Korea (the Republic of); ²SOITEC, Bernin, France; ³IMEP-LAHC, Grenoble Institute of Technology, Grenoble, France; ⁴Korea Institute of Science and Technology, Seoul, Korea (the Republic of)

2:15 PM E0.5.02

Transport Properties of Nano-Ribbon AlGaN/GaN Devices—Impact of Sidewall Roughness <u>Sameer Joglekar</u>¹, Mohamed Azize² and Tomas Palacios²; ¹Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States; ²Microsystems Technology Laboratories, Cambridge, Massachusetts, United States

2:30 PM E0.5.03

Suspended Nanowire GaN Junctionless FET Fabricated by Top-Down Approach <u>Dong-Hyeok Son</u>¹, Young-Woo Jo¹, Chan Heo¹, Jae Hwa Seo¹, Chul-Ho Won¹, Hwan Soo Jang², Yong Soo Lee¹, In Man Kang¹ and Jung-Hee Lee¹; ¹Electronics Engineering, Kyungpook National University, Daegu, Korea (the Republic of); ²Daegu Gyeongbuk Institute of Science and Technology, Daegu, Korea (the Republic of)

2:45 PM E0.5.04

Room Temperature Ballistic Devices for High Frequency Harmonic Generation <u>Giovanni Santoruvo</u> and Elison Matioli; STI, EPFL, Lausanne, Switzerland

3:00 PM E0.5.05

High Aspect Ratio 3D GaN Fins with Nonpolar A-Plane Sidewalls Grown by Metalorganic Vapor Phase Epitaxy Jana Hartmann^{1, 3}, Frederik Steib^{1, 3}, Hao Zhou¹, Johannes Ledig^{1, 3}, Sonke Fuendling^{1, 3}, Tilman Schimpke², Adrian Avramescu², Tansen Varghese², Hergo H. Wehmann^{1, 3}, Martin Strassburg², Hans-Juergen Lugauer² and Andreas Waag^{1, 3}; ¹Laboratory for Emerging Nanometrology, Braunschweig University of Technology, Braunschweig, Germany; ²Osram Opto Semiconductors GmbH, Regensburg, Germany; ³Epitaxy Competence Center, Braunschweig University of Technology, Braunschweig, Germany

3:15 PM <u>E0.5.06</u>

Energy Transfer Processes in GaN Quantum Wires Ludwig A. Greif³, Stefan Kalinowski³, Jan Mussener², Jordi Arbiol¹, Gerald Honig³, Markus Wagner³, Gordon Callsen³, Martin Eickhoff² and Axel Hoffmann³; ¹Institut Català de Nanociència i Nanotecnologia, ICN2, CSIC and The Barcelona Institute of Science and Technology, Barcelona, Spain; ²Justus Liebig-Universität Gießen I. Physikalisches Institut, Berlin, Germany; ³Institut für Festkörperphysik, Technische Universität Berlin, Berlin, Germany

3:30 PM E0.5.07

Transport of Indirect Excitons in GaN Quantum Wells <u>Thierry Guillet</u>¹, Benoit Jouault¹, Fedor Fedichkin¹, Pierre Lefebvre¹, Christelle Brimont¹, Pierre Valvin¹, Thierry Bretagnon¹, Lise Lahourcade², Nicolas Grandjean² and Masha Vladimirova¹; ¹Laboratoire Charles Coulomb (L2C), Université de Montpellier, Montpellier, France; ²Institute of Physics, EPFL, Lausanne, Switzerland

3:45 PM BREAK

F0.7: Novel Materials and Devices VII: Novel Sensing Devices and Magnetism Thursday Afternoon, October 6, 2016 Room: Poinsettia/Quince

2:00 PM *F0.7.01

Opto-Electrochemical Sensing Devices Based on Group III-Nitride Nanowires <u>Martin Eickhoff</u>; University of Giessen, Giessen, Germany

2:30 PM F0.7.02

Sensing the Iron-Load of Ferritin Biomolecules Using GalnN Quantum Wells as Optochemical Transducers <u>Dominik Heinz</u>¹, Vignesh Devaki Murugesan¹, Shaohua Bian¹, Linyuan Wu¹, Florian Huber², Sabyasachi Chakrabortty³, Yuzhou Wu³, Tanja Weil³, Klaus Thonke² and Ferdinand Scholz¹; ¹Institute of Optoelectronics, Ulm University, Ulm, Germany; ²Institute of Quantum Matter / Semiconductor Physics Group, Ulm University, Ulm, Germany; ³Institute of Organic Chemistry III, Ulm University, Ulm, Germany

2:45 PM F0.7.03

InGaN/GaN Nanowire Heterostructures as Multifunctional Optical Biosensors—Selective Detection of Biochemical Species and Local Sensing of pH Changes in Cells Sara Lippert¹, Marc Riedel², Ervice Pouokam³, Pascal Hille¹, Joerg Teubert¹, Fred Lisdat², Martin Diener³ and Martin Eickhoff¹; ¹I. Physical Institute, Justus Liebig University, Giessen, Germany; ²Biosystems Technology, Technical University of Applied Sciences, Wildau, Germany; ³Institute for Veterinary Physiology and Biochemistry, Justus Liebig University, Giessen, Germany

3:00 PM F0.7.04

Stretching Magnetism with an Electric Field in a Nitride Semiconductor Maciej Sawicki¹, Darek Sztenkiel¹, Marek Foltyn¹, Grzegorz P. Mazur¹, Rajdeep Adhikari², Kamil Kosiel³, Katarzyna Gas^{1, 4}, Maciej Zgirski¹, Renata Kruszka³, Rafal Jakiela¹, Tian Li¹, Anna Piotrowska³, Alberta Bonanni² and Tomasz Dietl^{1, 5}, ⁶; ¹Institute of Physics, Polish Academy of Sciences, Warszawa, Poland; ²Institut fuer Halbleiter- und Festkoerperphysik, Johannes Kepler University, Linz, Austria; ³Institute of Electron Technology, Warszawa, Poland; ⁴Institute of Experimental Physics, University of Wroclaw, Wroclaw, Poland; ⁵Institute of Theoretical Physics, University of Warszawa, Poland; ⁶WPI-Advanced Institute for Materials Research, Tohoku University, Sendai, Japan

3:15 PM F0.7.05

Enhanced Ferromagnetism in Nanoscale GaN:Mn Wires Grown on GaN Ridges Shengxiang Jiang¹, Cheng Ji¹, Yan Zhang², Zhijian Yang¹, Cunda Wang¹, Zhizhong Chen¹, Tongjun Yu¹ and Guoyi Zhang^{1, 3}; ¹State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing, China; ²Institute of Condensed Matter Physics, School of Physics, Peking University, Beijing, China; ³Dongguan Institute of Optoelectronics, Peking University, Dongguan, China

3:30 PM F0.7.06

Impact of Mg Doped Cladding Layers on Ferromagnetism of (Ga,Mn)N Thin Films Katarzyna Gas^{1, 2}, Gerd Kunert^{3, 4}, Stephan Figge⁴, Sylwia Stefanowicz², Tomasz Baraniecki³, Piotr Dluzewski², Boguslawa Kurowska², Rafal Jakiela², Grzegorz Mazur², Detlef Hommel^{3, 1, 4} and Maciej Sawicki²; ¹Institute of Experimental Physics, University of Wroclaw, Wroclaw, Poland; ²Institute of Physics Polish Academy of Sciences, Warsaw, Poland; ³Wroclaw Research Center EIT+ Sp. z o.o., Wroclaw, Poland; ⁴Institute of Solid State Physics, University of Bremen, Bremen, Germany

3:45 PM BREAK

A2.10: Epitaxial Growth IX: Growth of UV Devices and Thick AlN and GaN Films Thursday Afternoon, October 6, 2016 Room: Azalea/Begonia

4:15 PM A2.10.01

Progress in AlGaN-Based Ultraviolet Light-Emitting Diodes Made from Films Synthesized by the Liquid-Metal-Enabled Growth Mode of Molecular Beam Epitaxy <u>Yu-Han Liang</u>¹ and Elias Towe²; ¹Material Science and Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States; ²Electrical and Computer Engineering, Carnegie Mellon University, Pittsburgh, Pennsylvania, United States

4:30 PM A2.10.02

Significant Internal Quantum Efficiency Enhancement of GaN/AlGaN Multiple Quantum Wells Emitting at ~350 nm Feng Wu^{1, 2}, Jiangnan Dai¹, Zhe Chuan Feng³, Changqing Chen¹ and Xiaohang Li²; ¹Huazhong University of Science and Technology, Wuhan, China; ²King Abdullah University of Science and Technology, Thuwal, Saudi Arabia; ³Guangxi University, Nanning, China

4:45 PM A2.10.03

2 inch AlN/Sapphire Template Grown by HVPE <u>Jicai Zhang</u>^{1, 2}, Jun Huang¹, Maosong Sun¹, Xuewei Li¹, Guoqiang Ren^{1, 2}, Jianfeng Wang^{1, 2} and Ke Xu^{1, 2}; ¹Suzhou Institute of Nanotech and Nanobionics, Chinese Academy of Sciences, Suzhou, China; ²Suzhou Nanowin Science and Technology Co., Ltd, Suzhou, China

5:00 PM A2.10.04

Effect of AlN Buffer Layer Thickness on Crystallinity and Surface Morphology of 10-μm-Thick A-Plane AlN Films Grown on R-Plane Sapphire Substrates Chia-Hung Lin, Shinya Tamaki, Yasuhiro Yamashita, Hideto Miyake and Kazumasa Hiramatsu; Mie University, Tsu, Japan

5:15 PM A2.10.05

Fabrication of a-Plane AlN on r-Plane Sapphire Substrate by Sapphire Nitridation and Ga-Al Liquid Phase Epitaxy Masayoshi Adachi and Hiroyuki Fukuyama; Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Sendai, Japan

5:30 PM <u>A2.10.06</u>

Visualization of Dislocation Behavior in HVPE-Grown GaN Using Facet Controlling Technique Tohoru Matsubara^{1, 2}, Shin Goubara¹, Kota Yukizane¹, Ryo Inomoto¹, Narihito Okada¹ and Kazuyuki Tadatomo¹; ¹Graduate School of Science and Engineering, Yamaguchi University, Ube, Japan; ²UBE Scientific Analysis Laboratory, Inc., Ube, Japan

5:45 PM LATE NEWS

B3.4: Photodetectors, Photovoltaics, Intersubband Devices IV: Characterization of Intersubband Structures Thursday Afternoon, October 6, 2016 Room: Poinsettia/Quince

4:15 PM <u>B3.4.01</u>

Crystal Orientation Dependent Intersubband Transition in Semipolar AlGaN/GaN Quantum Well for Optoelectronic Applications Houqiang Fu, Hong Chen, Xuanqi Huang, Zhijian Lu and Yuji Zhao; Arizona State University, Tempe, Arizona, United States

4:30 PM B3.4.02

Doping of Nonpolar M-Plane GaN/AlGaN Multi-Quantum-Wells with Intersubband Transitions in the THz Range—Effect of Si and Ge Doping Caroline B. Lim¹, Akhil Ajay¹, Catherine Bougerol², Jorg Schormann³, David A. Browne¹ and Eva Monroy¹; ¹CEA Grenoble, Grenoble, France; ²CNRS Institut Néel, Grenoble, France; ³I. Physikalisches Institut - Justus-Liebig-Universität Gießen, Giessen, Germany

4:45 PM B3.4.03

Dramatic Enhancement of Near-Infrared Intersubband Absorption in c-Plane AllnN/GaN Superlattices K. Turkmeneli¹, S. Dai¹, Mohammad A. Shirazi^{2,3}, S. Liu², C. Edmunds¹, J. Shao^{1,3}, G. Gardner^{4,3}, D. Zakharov⁵, M. J. Manfra^{1,2,3} and <u>Oana Malis</u>¹; ¹Physics Dept., Purdue University, West Lafayette, Indiana, United States; ²School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, United States; ³Birck Nanotechnology Center, Purdue University, West Lafayette, Indiana, United States; ⁴School of Materials Engineering, Purdue University, West Lafayette, Indiana, United States; ⁵Center for Functional Nanomaterials, Brookhaven National Laboratory, Upton, New York, United States

5:00 PM B3.4.04

Evidence of Inter-Subband Transitions at the InN Surface Probed by Electrolyte-Gated Raman Spectroscopy Tommaso Brazzini^{1, 2}, Esther Alarcon-Llado^{2, 3} and Joel Ager²; ¹Electronic Engineering Department, ISOM - Universidad Politecnica de Madrid, Madrid, Spain; ²Materials Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, California, United States; ³Swiss Federal Institute of Technology, Lausanne, Switzerland

5:15 PM LATE NEWS

5:30 PM LATE NEWS

5:45 PM LATE NEWS

C0.5: Electronic Devices V: Doping, Implantation and Isolation Thursday Afternoon, October 6, 2016 Room: Narcissus/Orange Blossom

4:15 PM *C0.5.01

Advances and Challenges in p-Type Doping of GaN by Implantation and Novel Annealing Technique Boris N. Feigelson¹, Travis J. Anderson¹, Jordan D. Greenlee^{2, 1}, Jennifer K. Hite¹, Karl D. Hobart¹ and Fritz J. Kub¹; ¹US Naval Research Laboratory, Washington, District of Columbia, United States; ²National Research Council, Washington, District of Columbia, United States

4:45PM C0.5.02

P-Type Conduction by Mg-Ion Implantation for N-Face GaN <u>Tetsuo Narita</u>¹, Tetsu Kachi^{1, 2}, Keita Kataoka¹ and Tsutomu Uesugi¹; ¹Toyota Central R&D Labs, Inc., Nagakute, Japan; ²Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Japan

5:00 PM C0.5.03

Mg Doping Dependence of GaN MOSFETs Fabricated on Homoepitaxial p-GaN Layers Shinya Takashima¹, Katsunori Ueno¹, Hideaki Matsuyama¹, Masaharu Edo¹, Kiyokazu Nakagawa², Masahiro Horita³ and Jun Suda³; ¹Fuji Electric Co., Ltd., Hino, Japan; ²University of Yamanashi, Kofu, Japan; ³Kyoto University, Kyoto, Japan

5:15 PM C0.5.04

InGaN/GaN Heterostructure P-Channel Metal-Oxide-Semiconductor Field Effect Transistor by Using Polarization-Induced Two-Dimensional Hole Gas Kexiong Zhang; National Institute for Materials Science, Tsukuba, Japan

5:30 PM C0.5.05

Characterization of GaN-Based Trench-Gate MOSFET with Implanted Source Region Aki Sasakura¹, Norihumi Takashima¹, Hirokuni Tokuda¹, Masaharu Edo², Katsunori Ueno² and Masaaki Kuzuhara¹; ¹Electrical and Electronics, University of Fukui, Fukui, Japan; ²Fuji Electric Co., Ltd., Tokyo, Japan

5:45 PM <u>C0.5.06</u>

Growth and Characterization of Buffer Structures for AlGaN/GaN-Based Heterostructure Field Effect Transistors Martin Eickelkamp¹, Dirk Fahle¹, Christof Mauder¹, Yoga Saripalli², Ming Zhao², Hu Liang², Prem K. Kandaswamy² and Michael Heuken¹; ¹AIXTRON SE, Herzogenrath, Germany; ²Interuniversity Microelectronics Center, Leuven, Belgium

D1.10: Materials Characterization X: Characterization of Low Dimensional Nitrides and Defects Thursday Afternoon, October 6, 2016 Room: International Center

4:15 PM *D1.10.01

Light-Matter Coupling Phenomena in Low-Dimensional Nitride-Semiconductors <u>Alexey Kavokin;</u> University of Southampton, Southampton, United Kingdom

4:45 PM *D1.10.02

Three-Dimensional Reciprocal Space Mapping Analysis for Localized Structures and Defects in Nitride Semiconductor Materials Akira Sakai and Shotaro Takeuchi; Osaka University, Toyonaka, Japan

5:15 PM D1.10.03

Birefringence in GaN Epitaxial Layers and GaN Microrods Ines Trenkmann¹, Lukas Uhlig¹, Matthias Wachs¹, Christian Mounir² and Ulrich T. Schwarz¹; ¹Physics, Technische Universität Chemnitz, Chemnitz, Germany; ²IMTEK, University of Freiburg, Freiburg, Germany

5:30 PM D1.10.04

Vacancy-Type Defects in Metal Deposited GaN Probed Using a Monoenergetic Positron Beam Akira <u>Uedono</u>¹, Tatsuya Fujishima², Daniel Piedra², Oleg Laboutin³, Wayne Johnson³, Shoji Ishibashi⁴, Masatomo Sumiya⁵ and Tomas Palacios²; ¹University of Tsukuba, Tsukuba, Japan; ²Massachusetts Institute of Technology, Cambridge, Massachusetts, United States; ³IQE, Taunton, Massachusetts, United States; ⁴National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan; ⁵ National Institute for Materials Science, Tsukuba, Japan

5:45 PM <u>D1.10.05</u>

Fine Structure of the Yellow Luminescence Band in GaN Michael A. Reshchikov¹, Joy D. McNamara¹, Fan Zhang², Morteza Monavarian², Alexander Usikov^{3, 4}, Heikki Helava³, Yuri Makarov³ and Hadis Morkoc²; ¹Physics, Virginia Commonwealth University, Richmond, Virginia, United States; ²Electrical and Computer Engineering, Virginia Commonwealth University, Richmond, Virginia, United States; ³Nitride Crystals, Inc., Deer Park, New York, United States; ⁴St. Petersburg National Research University of Information Technologies, Mechanics and Optics, St. Petersburg, Russian Federation

6:00 PM D1.10.06

Experimental Analysis of Defect Quasi Fermi Level Control in MOCVD-Grown GaN and AlGaN Felix Kaess^{1, 2}, Pramod Reddy¹, Andrew Klump¹, Luis Hernandez-Balderrama¹, Dorian Alden^{1, 2}, Sebastian Metzner³, Alexander Franke¹, Ronny Kirste¹, Frank Bertram³, Juergen Christen³, Axel Hoffmann², Ramon Collazo¹ and Zlatko Sitar¹; ¹Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina, United States; ²Solid State Physics Institute, Technical University Berlin, Berlin, Germany; ³Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, Magdeburg, Germany

D1.11: Materials Characterization XI: Wear of Nitride Materials and Properties of GaN Based Structures Thursday Afternoon, October 6, 2016 Room: International North

4:15 PM <u>D1.11.01</u>

Investigation of Ultralow Wear of III-Nitride Materials <u>Guosong Zeng</u>¹, Chee-Keong Tan², Xiaofang Yang³, Bruce Koel³, Brandon Krick¹ and Nelson Tansu²; ¹Mechanical Engineering and Mechanics, Lehigh University, Bethlehem, Pennsylvania, United States; ²Center for Photonics and Nanoelectronics, Electrical and Computer Engineering, Lehigh University, Bethlehem, Pennsylvania, United States; ³Chemical and Biological Engineering, Princeton University, Princeton, New Jersey, United States

4:30 PM D1.11.02

ICP-Etching Induced Defects in GaN and its Recovery Revealed by Two-Wavelength Excited Photoluminescence Md Julkarnain^{1, 2}, <u>Norihiko Kamata</u>¹, Takeshi Fukuda¹, Keita Kataoka³, Masakazu Kanechika³, Tetsuo Narita³ and Yasushi Kimoto³; ¹Department of Functional Materials Science, Saitama University, Saitama-shi, Japan; ²Department of Applied Physics and Electronic Engineering, University of Rajshahi, Rajshahi, Bangladesh; ³Toyota Central Research and Development Labs. Inc., Nagakute, Japan

4:45 PM D1.11.03

Electrochemical Characterization of Surface States at the GaN/electrolyte Interface Andrea Winnerl¹, Jose A. Garrido² and Martin Stutzmann¹; ¹Walter Schottky Institut and Physik Department, Technische Universität München, Garching, Germany; ²Catalan Institute of Nanoscience and Nanotechnology, Barcelona, Spain

5:00 PM D1.11.04

Enhanced Forster Energy Transfer in Hybrid Organic/III-Nitride Grating Structures Modestos

Athanasiou, Richard Smith, Sunneal Ghataora and Tao Wang; Electrical and Electronic Engineering,
University of Sheffield, SHEFFIELD, United Kingdom

5:15 PM D1.11.05

Quantitative Analysis on Energy Transfer Process for Eu Luminescent Centers in Eu-Doped GaN <u>Tomohiro Inaba</u>, Takanori Kojima, Genki Yamashita, Masaaki Ashida and Yasufumi Fujiwara; Osaka University, Suita, Japan

5:30 PM LATE NEWS

5:45 PM LATE NEWS

E0.6: Nanostructures VI: III-N Quantum Dots Thursday Afternoon, October 6, 2016 Room: Camelia/Dogwood

4:15 PM E0.6.01

Linearly Polarized Single Photon Emission at 220 K from a Non-Polar (11-20) InGaN/GaN Quantum Dot Tong Wang¹, Tim J. Puchtler¹, Tongtong Zhu², John C. Jarman², Luke P. Nuttall¹, Rachel A. Oliver² and Robert A. Taylor¹; ¹Department of Physics, University of Oxford, Oxford, United Kingdom; ²Department of Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom

4:30 PM E0.6.02

Single Photon Emission from Site-Controlled In(Ga)N/GaN Monolayers Quantum Dot Ping Wang¹, Tao Wang¹, Jong-Hoi Cho², Chung H. Beak², Yong H. Cho², Tobias Schulz³, Martin Albrecht³, Xixiang Zhang⁴ and Xinqiang Wang¹; ¹School of physics, Peking University, Beijing, China, Beijing, China; ²KAIST, Daejon, Korea (the Republic of); ³IKZ, Berlin, Germany; ⁴KAUST, Thuwal, Saudi Arabia

4:45 PM E0.6.03

InGaN Pyramidal Quantum Dots as Source of Single Photons Device <u>Houssaine Machhadani</u>; Department of Physics, Chemistry and Biology, Linkoping University, Linkoping, Sweden

5:00 PM E0.6.04

Polarized Single-Photon Emission from m-Plane InGaN Quantum Dots Tim J. Puchtler¹, Tong Wang¹, Christopher Ren², Rachel A. Oliver², Robert Taylor¹ and Tongtong Zhu²; ¹Department of Physics, University of Oxford, Oxford, United Kingdom; ²Materials Science and Metallurgy, University of Cambridge, Cambridge, United Kingdom

5:15 PM E0.6.05

Stacked Self-Assembled Cubic GaN Quantum Dots Grown by Molecular Beam Epitaxy Sarah Blumenthal, Dirk Reuter and Donat J. As; Dept of Physics, University of Paderborn, Paderborn, Germany

5:30 PM E0.6.06

Molecular Beam Epitaxial Growth and Characterization of AlGaN Single Monolayer Dot-in-Nanowire Heterostructures Songrui Zhao¹, A. Aiello², S. Y. Woo³, X. Liu¹, D. Laleyan¹, G. A. Botton³, Pallab Bhattacharya² and Zetian Mi¹; ¹McGill University, Montreal, Canada; ²University of Michigan, Ann Arbor, Michigan, United States; ³McMaster University, Hamilton, Canada

5:45 PM <u>E0.6.07</u>

InGaN Quantum Dots by Quantum Size Controlled Photoelectrochemical Etching Benjamin Leung¹, Xiaoyin Xiao¹, Ping Lu¹, Arthur J. Fischer¹, Miao-Chan Tsai², Daniel D. Koleske¹, Michael E. Coltrin¹, Jeffrey Y. Tsao¹ and George T. Wang¹; ¹Sandia National Laboratories, Albuquerque, New Mexico, United States; ²Center for High Tech Materials, University of New Mexico, Albuquerque, New Mexico, United States

F0.8: Novel Materials and Devices VIII/ A2.10: Epitaxial Growth X: Growth of Novel Materials and Devices Thursday Afternoon, October 6, 2016 Room: International South

4:15 PM *F0.8.01/A2.10.01

Epitaxial Conductors—**Transition Metal Nitride Integration with III-N Materials** <u>David J. Meyer</u>¹, Douglas S. Katzer¹, Neeraj Nepal¹, Brian P. Downey¹, Virginia D. Wheeler¹, David F. Storm¹ and Matthew T. Hardy²; ¹Electronics Science and Technology Division, U.S. Naval Research Laboratory, Washington, District of Columbia, United States; ²U.S. Naval Research Laboratory, Washington, District of Columbia, United States

4:45 PM F0.8.02/A2.10.02

Electron-Photon and Electron-LO Phonon Intersubband Scattering Rates in Lattice-Matched GaN-ZnGeN₂ Coupled Quantum Wells Lu Han, Colin Lieberman and Hongping Zhao; Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, Ohio, United States

5:00 PM <u>F0.8.03/A2.10.03</u>

Group-IV Nitride Compounds and Alloys for Solar Energy Conversion Applications Andre Bikowski, Stephan Lany and <u>Andriy Zakutayev</u>; National Renewable Energy Laboratory, Golden, Colorado, United States

5:15 PM F0.8.04/A2.10.04

Epitaxial ScAlN Grown by Plasma-Assisted Molecular Beam Epitaxy on GaN and SiC Substrates<u>Matthew T. Hardy</u>, Neeraj Nepal, Brian Downey, David Storm, Douglas S. Katzer and David Meyer;
Electronic Science and Technology Division, Naval Research Laboratory, Washington, District of
Columbia, United States

5:30 PM F0.8.05/A2.10.05

Morphology Study of Diamond Grown on GaN Using Near-Ultraviolet Micro-Raman Technique Mohammad Nazari, Bobby L. Hancock, Jonathan Anderson, Alissa Savage, Edwin Piner and Mark Holtz; Texas State University, San marcos, Texas, United States

5:45 PM F0.8.06/A2.10.06

Structural and Raman Properties of Molecular Beam Epitaxy Grown β-Nb₂N Films and AlN/β-Nb₂N Heterojunctions on 6H-SiC Substrates Neeraj Nepal¹, Douglas S. Katzer¹, David J. Meyer¹, Brian P. Downey¹, Virginia D. Wheeler¹, David F. Storm¹ and Matthew T. Hardy^{2, 1}; ¹U.S. Naval Research Laboratory, Washington, District of Columbia, United States; ²ASEE, Washington, District of Columbia, United States

PL.2: Plenary II Friday Morning, October 7, 2016 Room: Grand Ballroom

9:00 AM *PL.2.01

Progress in LED Technology for Solid-State Lighting Jy Bhardwaj; Research and Development, Lumileds, San Jose, California, United States

9:45 AM *PL.2.02

Heteroepitaxial Growth of GaN-on-Si and Power Device Applications <u>Takashi Egawa</u>; Research Center for Nano Devices and advanced Materials, Nagoya Institute of Technology, Nagoya, Japan

10:30 AM BREAK

11:00 AM LATE NEWS

11:15 AM LATE NEWS

11:30 AM LATE NEWS

11:45 AM CLOSING REMARKS

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