



12th International Conference on Nitride Semiconductors (ICNS12)

24th-28th July 2017

Strasbourg, France

Welcome

to the 12th international conference
on nitride semiconductors
July 24-28, 2017 - Strasbourg, France

This biennial conference is the twelfth of a series. It follows the first conference held in Nagoya, Japan [TWN'95]; the second in Tokushima, Japan [ICNS-2]; the third in Montpellier, France [ICNS-3]; the fourth in Denver, USA [ICNS-4]; the fifth in Nara, Japan [ICNS-5]; the sixth in Bremen, Germany [ICNS-6]; the seventh in Las Vegas, USA [ICNS-7]; the eighth in Jeju, Korea [ICNS-8]; the ninth in Glasgow, UK [ICNS-9]; the tenth in Washington D.C. USA [ICNS-10] and the 11th in Beijing, China [ICNS-11].

The ICNS-12 conference will present high impact scientific and technological advances in materials and devices based on group-III nitride semiconductors. The conference is featured by plenary sessions, parallel topical sessions, poster sessions and an industrial exhibition.

We look forward to entertain you to the beautiful and mesmerizing city of Strasbourg and hope that this conference will be a memorable experience for all of you. We are sure that this conference will be a great platform for you to promote further cooperations, to develop closer friendship and to effectively support scientific collaborations.

The Organizing Committee



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Conference floor plan	back cover

Strasbourg Convention + Exhibition Centre

Palais de la Musique et des Congrès - Place de Bordeaux - 67082 Strasbourg
Tramway: lines B and E - Wacken tram stop



is pleased to offer a public transport pass (also called "Sympopass") to allow complimentary, unlimited use of both tramway and buses of Strasbourg's public transport network during the ICNS'12 conference. Available on site.



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4. You are connected

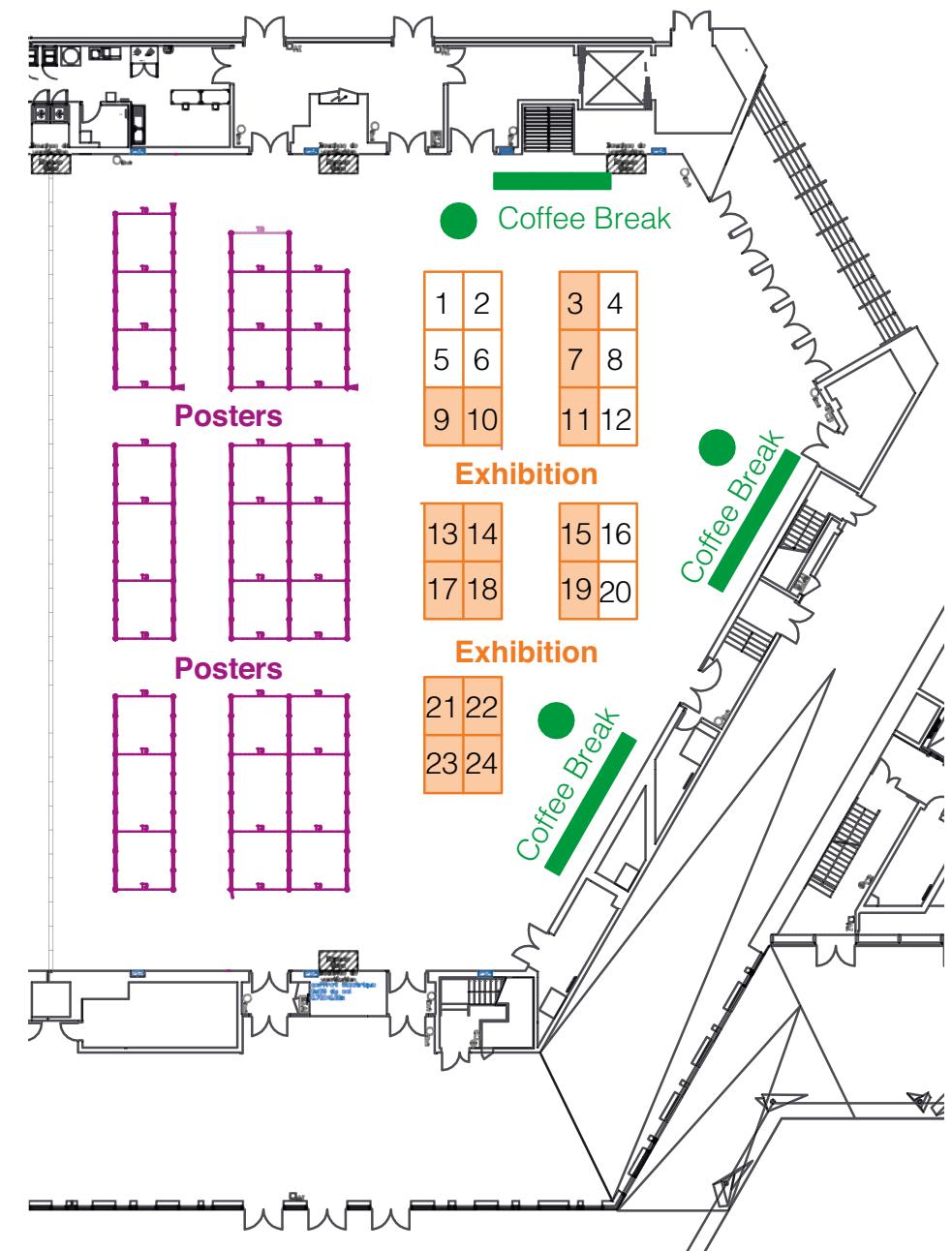
Exhibition

Around 20 international exhibitors will display a full spectrum of equipment, instrumentation, products, software, publications and services. To be held on July 24 – 27 at the Convention Centre of Strasbourg (Hall Rhin – Ground floor), the exhibit will be convenient to the technical session rooms and scheduled to coincide with the technical program. For exhibitors, it will mean an excellent opportunity to meet just the right customers and disseminate information effectively.

For meeting attendees, the ICNS'12 exhibition will offer the convenience of visiting with multiple vendors all under one roof. So, pick up some literature, enjoy a hands-on product demonstration or meet face-to-face with company representatives.

The following exhibitors are confirmed for the ICNS'12 meeting (21/06/2017):

AIXTRON	booth 09
AKZONOBEL	booth 22
ATTOLIGHT	booth 03
CROSSLIGHT SOFTWARE	booth 19
EAG Laboratories	booth 15
EULITHA	booth 11
HEXATECH	booth 10
KITECH	booth 23
NOVASIC	booth 21
NTT Advanced Technology	booth 07
OSRAM Opto Semiconductors	booth 17
SAES Pure Gas	booth 13
STR GROUP	booth 14
SUZHOU NANOWIN SCIENCE AND TECHNOLOGY	booth 18
TAIYA NIPPON SANSO	booth 24



Company profiles

AIXTRON

AIXTRON is a leading provider of deposition equipment to the semiconductor industry. The Company's technology solutions are used to build advanced components for electronic and opto-electronic applications based on compound, silicon, organic semiconductor materials, carbon nanotubes (CNT) and other nanomaterials. Such components are used in fiber optic communication systems, wireless and mobile telephony applications, optical and electronic storage devices, computing, signaling, lighting and other leading-edge technologies.



AkzoNobel

AkzoNobel High Purity Metalorganics (HPMO) services the semiconductor industry. We are specialized in the production of high purity metalorganics sources based on indium, gallium, aluminum, zinc and magnesium. Our products are used in a wide range of industrial and consumer applications, including lasers, solar cells, LEDs and smartphones. We have a strong base in industrial scale metalorganics production and are a fully vertical integrated high purity metalorganics supplier. As part of the global AkzoNobel organization, we leverage on its network for distribution, service, manufacturing expertise, global R&D, and expertise in safe handling of metalorganics. AkzoNobel HPMO strives continually to address our customers' future needs, looking ahead to find answers to questions they will face tomorrow. Our dedicated global technical marketing and sales team, comprised of scientists and engineers with experience in both the chemical and semiconductor industry, is available to meet your needs!



Attolight builds fully integrated cathodoluminescence systems with best-in-class collection efficiency and reproducibility. All products feature Attolight's proprietary quantitative cathodoluminescence technology. The company's products are used in FA laboratories, material research laboratories, and semiconductor industry. Major application fields include: R&D and reliability assessment for LEDs, lasers, power transistors, nano-electronic devices, and solar cells. The company also provides analytical services in its privately owned laboratory in Switzerland.

CROSSTLIGHT Software Inc.

Crosslight Software Inc. is an industry leader in TCAD simulation tools headquartered in the greater Vancouver area. For almost twenty years, Crosslight has been dedicated to providing state-of-the-art TCAD tools for the simulation of semiconductor devices and processes. Crosslight Software, was the first commercial company to provide TCAD software for electrical and optical modeling of quantum well laser diodes (LD) and has continued to maintain a leadership position ever since. Crosslight is among the world's top suppliers of semiconductor TCAD tools with a customer list extending to hundreds of semiconductor companies and research institutions.

EAG Laboratories



Eulitha provides nanolithography services and equipment for research and production. Its revolutionary PHABLE photolithography systems enable low-cost fabrication of periodic nanostructures over large areas. This proprietary technology has wide ranging uses in photonics, optoelectronics, displays, electronics, biotechnology, telecommunication, photovoltaics, lasers, sensors and other areas. Eulitha's custom and standard ranges of nano-patterned substrates are made with electron-beam or its own PHABLE lithography techniques and are widely used as nanoimprint templates.

Featured Products: PhableR 100 lithography system, nanoimprint stamps, lithography services



HexaTech is the world leader commercial manufacturer of high quality, single crystal Aluminum Nitride (AlN) substrates. This substrate material is enabling advanced technologies such as high performance, long life UV-LED light emitting diodes (LEDs) for disinfection applications, deep UV lasers for biological threat detection, as well as high voltage and high frequency power semiconductors.

HexaTech's current product portfolio includes 35 mm diameter substrates, with 2 inch diameter substrates to be commercially available in late 2017.

Founded in 2001, and being driven by a team of industry experts in III-nitride semiconductors, HexaTech has successfully solved the complex material science and engineering challenges to commercialize high quality bulk AlN for volume production.

For additional company and product information, please visit us at www.hexatechinc.com.



KITEC is supplier of advanced resistance measurement tools. M-RES is a series of non contact resistance and resistivity measurement systems with and without automatic sample thickness compensation. Manual and mapping systems including automatic wafer loading option. Applications such as wafer measurements and EPI, implant or metallization process monitoring. Bow and warp measurement compensation.

KITEC GmbH - Rennweg 59 - 85435 Erding - Germany
Phone : +49 (0) 8122 86676
Fax : +49 (0) 8122 86652
mfischer@kitec.de
www.kitec.de



NOVASIC provides SiC epitaxy and wide bandgap polishing services.

NOVASIC provides 4H-SiC on 4H-SiC and 3C-SiC epitaxy on silicon – useful templates for nitride growth.

We specialize in high-quality polishing of SiC, GaN, AlN, diamond, ZnO... Our polishing is widely recognized as the industry's benchmark. NOVASIC provides reclaim, planarization and thinning services – from removing as little as 1000Å to thinning substrates to 150 microns, or even less.

NOVASIC's headquarters are in the French Alps, near Grenoble.

Key Products:

3C-SiC and 4H-SiC epitaxy

Polishing, reclaim, thinning and planarization services



NTT Advanced Technology Corporation (NTT-AT) has developed GaN epitaxial wafers on a variety of substrates – Si, Sapphire, SiC, and GaN. These wafers come in several sizes, including a 6" GaN wafer on a silicon substrate. NTT-AT can manufacture customized wafers to meet both R&D specialized needs as well as mass production requirements.



OSRAM Opto Semiconductors is one of the world's leading opto component manufacturers and offers its customers a spectrum of infinite possibilities. Components and solutions based on semiconductor technology for lighting, sensor and visualization applications.

The expertise of OSRAM Opto Semiconductors extends from basic semiconductor technologies to individual customer applications.

The product portfolio comprises high-performance light-emitting diodes (LEDs) (e.g. for automotive and general lighting applications), high performance infrared diodes (IRLED) for consumer applications (e.g. gesture recognition), visible and IR-semiconductor lasers and detectors.



SAES Pure Gas

The Technology of Pure Gas

SAES Pure Gas, Inc., a member of the SAES Group, is the world leader in gas purification technology. SAES develops ultra-high purity gas-handling equipment, supplying gas purifiers for a wide range of bulk and specialty gas applications. SAES continues to set the standard for the market with its superior impurity capacities and longer purifier lifetimes. In order to meet individual customer requirements and the needs of an increasing technological market, SAES's extensive R&D has resulted in the largest portfolio of gas purifiers available for all gas purification needs. Factory regenerable in-line ambient temperature purifiers are available in a wide range of sizes for purifying gases such as H₂, N₂, NH₃, AsH₃, PH₃, Ar, Corrosive Gases, etc. For H₂ Purification SAES Pure Gas offers four different technologies depending on which impurities need to be removed: Heated Getter Purifiers, Factory Regenerable in-line purifiers Purifiers, Micro-Channel Palladium Purifiers and Cryogenic. Through our 25 year history we continue to be a flexible supplier offering customized solutions ensuring our customers receive cost effective and efficient gas purification equipment. For more information please contact SAES Pure Gas at spg@saes-group.com or online at www.saespuregas.com



STR provides consulting services and specialized software for development/optimization of industrial growth equipment and engineering of advanced semiconductor devices. STR offers a number of software products allowing comprehensive simulation of LEDs/LDs, HEMTs, solar cells, modeling of MOCVD and HVPE of Group-III nitrides, Oxides, III-V and II-VI materials, and simulation of wide bandgap crystal growth (AlN, AlGaN, AlN, SiC).



Suzhou Nanowin Science and Technology Co., Ltd

Company Profile

Suzhou Nanowin Science and Technology Co., Ltd (NANOWIN) founded in Suzhou Industry Park, China in May, 2007, is a high-tech company devoting to fabricate high-quality Gallium Nitride (GaN) substrates and develop the related technologies.

NANOWIN's key advantage is unrivaled materials expertise owning essential patents in GaN substrates and growth technologies. NANOWIN offers standard and customized free-standing GaN substrates and thick GaN/sapphire templates with extra low dislocation densities which are suitable for applications in high-power LED, blue LD and high-power electronic/electric devices. The main products of NANOWIN are 2-inch GaN/sapphire templates with GaN thickness of 15 to 30 microns, 2-inch free-standing GaN substrates with thickness around 350 microns and Ga face dislocation density within 105cm⁻², small square free-standing GaN substrates, non-polar GaN substrates (a/m face), high-crystallinity GaN powder and AlN substrates. All the GaN templates and substrates produced by NANOWIN include three categories: n-type doped, undoped and semi-insulating doped.

Our strategic goal is to become a leading nitride semiconductor material provider and a pioneer in the industry applications of nitride semiconductors.

Our website : www.nanowin.com.cn



TAIYO NIPPON SANSO
The Gas Professionals

TAIYO NIPPON SANSO Corporation is a world-class MOCVD system supplier as well as a manufacturer of industrial and specialty gases. It is providing a wide variety of MOCVD system from small R&D scale to mass production scale for GaN and GaAs/InP application. Its unique GaN MOCVD System SR4000HT for UVC application has been selected by world renowned research center such as SNL, UCSB and RIKEN.



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Monday

Monday Program

- Plenary Session
- A - Materials
- B - Optical devices
- C - Electronic devices
- E - Theory-basics

Plenary

Monday - July 24

08:45 - 09:15: **Opening ceremony** - J. Y. Duboz - B. Gil

Session chair: B. Gil

09:15 - 10:00: **Plenary talk 1**

Wide-band-gap semiconductors: present and future

Chris G. Van de Walle

Materials Department, University of California, Santa Barbara, California, USA

The adoption of nitride semiconductors has progressed startlingly fast, from initial discoveries to widespread applications. This is not because the materials are simple and trouble-free; to the contrary, throughout their history they have confronted us with physics problems that were known to be nuisances in other materials but could have been showstoppers for the nitrides. The issues include lattice-mismatched heteroepitaxy, dopant passivation, shallow-versus-deep character of acceptors, the role of polarization fields, and nonradiative recombination processes such as Auger and defect-assisted Shockley-Read-Hall. These problems have forced us to develop new understanding, resulting in insights into physical mechanisms that will now benefit other semiconductors and encourage us to explore other materials, such as the II-IV-V₂ analogues of nitrides. Now we are entering the era of ultrawide-band-gap semiconductors, with band gaps significantly wider than the 3.4 eV of GaN, which will enable deep-UV optoelectronics and have compelling advantages in high-power and RF electronics, quantum information science, and extreme-environment applications. Building on what we have learnt, I will highlight areas in which further progress could have high payoffs. Work performed in collaboration with A. Alkauskas, C. Dreyer, A. Janotti, E. Kioupakis, J. Lyons, L. Gordon, J. Shen, J. Varley, D. Wickramaratne, and Q. Yan, and supported by DOE and NSF.

10:00 - 10:30: **Coffee break**

Session chair: J. Christen

10:30 - 11:15: **Plenary talk 2**

Successes of Wide-Bandgap Electronics, and Future Directions

Debdeep Jena

Cornell University, USA

Riding on the success of GaN photonic devices, wide-bandgap nitride electronic devices have made significant inroads into new regimes of device operation. Exploiting the high breakdown fields, and the high mobility of 2-dimensional electron gases, GaN HEMTs are now capable of generating enormous amounts of microwave power at high frequencies, and have become very attractive for RF amplifiers that power communications. At the same time, both lateral GaN HEMTs, and vertical GaN FETs are making inroads into high-voltage power electronics. Surprisingly, GaN also has a significant role to play in low-power energy-efficient electronics. This talk will review these successes and discuss the physics underlying them. Then, the same physics and a slew of new nitride materials to augment the ‘conventional’ nitrides and to take Wide-bandgap electronics well into the future will be discussed.

11:15 - 11:30: **Break**

11:30 - 12:15: **Plenary talk 3**

Solid State Lighting

Martin Strassburg

*OSRAM Opto Semiconductors GmbH,
Leibnizstr. 4, 93055 Regensburg, Germany*

Optoelectronic devices based on group III nitrides (i.e., LEDs) provided a completely new technology in the lighting sector, the solid state lighting. There has been an incredible development in the recent more than 20 years: LEDs for illumination and projectors in mobile devices were just a vision for a far away future. Meanwhile, such devices are commodity based on the significant increase in their efficiency. This has been the driving force for about one decade. However this development has not fully accomplished yet. The recent improvements of the device design and in doping strategies yielded efficiencies close to the fundamental limit reaching internal quantum efficiencies of more than 90 % and corresponding wall-plug efficiencies well above 70%. Nowadays, it is recognized that LED offer a big variety of opportunities beyond efficient lighting. There are many applications that could only be addressed by the unique characteristics of semiconductor LED light sources. Thus, it is much more than cost cutting triggering further research on group III nitride optoelectronics. A brief history of group III nitride based SSL developments along with an introduction to OSRAM Opto Semiconductors' numerous activities in research and development of next generation LEDs / Lasers and future trends for lighting applications will be given. Examples of technology and products for various application fields will illustrate the claimed technology leadership that is based on the close interplay of material development, thorough understanding of scientific background and of technological solutions yielding.

parallel sessions

13:45 - 15:45

Bulk nitrides : Izabella Grzegory

- 13:45 **HVPE-grown GaN substrate with overall low dislocation density and relation between lattice bowing and defects** A 1.1

Narihito Okada¹, Keisuke Yamane², Tohoru Matsubara^{1,3}, Shin Goubara¹, Hiroshi Ihara¹, Kota Yukizane¹, Tatsuya Ezaki¹, Satoru Fujimoto¹, Ryo Inomoto¹, Kazuyuki Tadatomo¹

1 Yamaguchi University, 2 Toyohashi University of Technology 2 Toyohashi University of Technology 3 UBE Scientific Analysis Laboratory, Inc. Japan

- 14:15 **Low-dislocation Density and 6 Inch GaN Substrates Grown by Hydride Vapor Phase Epitaxy** A 1.2

Jianfeng Wang^{1,2}, Guoqiang Ren¹, Yu Xu¹, Demin Cai², Mingyue Wang¹, Yuming Zhang¹, Xiaojian Hu², and Ke Xu^{1,2*}

1 Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China 2 Suzhou Nanowin Science and Technology Co. Ltd., Suzhou Industry Park, China *Corresponding author's Tel: 86-512-6287-2501, E-mail: kxu2006@sinano.ac.cn

- 14:45 **Realization of thick GaN bulk crystals by hardness control in HVPE growth** A 1.3

Hajime Fujikura, Takayuki Suzuki, Toshio Kitamura and Tetsuji Fujimoto
SCIOCS Co. Ltd.

- 15:00 **Halogen-free vapor phase epitaxy to grow GaN bulk crystals at high rate** A 1.4

Daisuke Nakamura, Taishi Kimura, Kayo Horibuchi

Toyota Central R&D Labs., Inc. Nagakute, Aichi, 480-1192, Japan

- 15:15 **Interfacial structure control of AlN on sapphire fabricated from Al metal and N₂ gas** A 1.5

Katsuhiro Kishimoto Mitsuru Funato Yoichi Kawakami

Kyoto University

- 15:30 **Study on AlN growth by high-temperature HVPE** A 1.6

Jicai Zhang^(1,2), Jun Huang⁽¹⁾, Maosong Sun⁽¹⁾, Xuewei Li⁽¹⁾, Guoqiang Ren^(1,2), Jianfeng Wang^(1,2), Ke Xu^(1,2)

1. Platform for Characterization and Test, Suzhou Institute of Nano-tech and Nano-bionics, CAS, Suzhou 215123, China 2. Suzhou Nanowin Science and Technology Co., Ltd, Suzhou 215123, China

- 15:45 **Coffee break**

UV sources : Tetsuya Akasaki

- 13:45 **Deep UV Light Emitting Diodes – Development and Applications** B 1.1

Marc Patrick Hoffmann, Christian Brandl, Mohammad Tollabi-Mazraehno, Mariel Grace Jama, Nadine Tillner, Matthew John Davies, Georg Rossbach, Hans-Juergen Lugauer

OSRAM Opto Semiconductors GmbH, Leibnizstr. 4, 93055 Regensburg, Germany

- 14:15 **Optical characteristics of c-plane AlGaN multiple-quantum-well light-emitting diode structures with macro-size steps** B 1.2

Kazunobu Kojima¹, Yosuke Nagasawa², Akira Hirano², Masamichi Ipponmatsu², Yoshio Honda³, Hiroshi Amano^{3,4,5}, Isamu Akasaki^{4,6}, Shigefusa F. Chichibu^{1,3}

1. IMRAM-Tohoku Univ., 2. UV craftory Co., Ltd., 3. IMaSS-Nagoya Univ., 4. ARC-Nagoya Univ., 5. VBL-Nagoya Univ., 6. Meijo Univ.

14:30 High-efficiency top-emitting deep UV LEDs using AlN-based glass electrodes B 1.3

Tae Ho Lee¹, Byeong Ryong Lee¹, Kyung Rock Son¹, Tae Hoon Park¹, Hyek Jun Choi¹, Hee Woong Shin^{1,2}, Tae Geun Kim^{1,*}

¹School of Electrical Engineering, Korea University, Seoul 136-701, Republic of Korea ²LED R&D Center, LED Division, LG Innotek Co., Ltd., Paju 413-901, Republic of Korea

14:45 Enhanced efficiencies from UVB light emitting diodes with transparent p-AlGaN superlattices B 1.4

Johannes Enslin¹, Norman Susilo¹, Martin Guttmann¹, Martin Hermann¹, Sarina Graupeter¹, Luca Sulmoni¹, Christian Kuhn¹, Frank Mehnke¹, Tim Wernicke¹, Michael Kneissl^{1,2}

1) Technische Universität Berlin, Institute of Solid State Physics, Hardenbergstr. 36, EW 6-1, 10623 Berlin, Germany 2) Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany

15:00 Determination of current injection efficiency at low current density in AlGaN-based deep-ultraviolet light-emitting diodes B 1.5

Guo-Dong Hao, Manabu Taniguchi, Naoki Tamari, Shin-ichiro Inoue

Advanced ICT Research Institute, National Institute of Information and Communications Technology (NICT), Kobe 651-2492, Japan, Tsukuba Research Laboratories, Tokuyama Corporation, Tsukuba, Ibaraki 300-4247, Japan

15:15 New field effect Deep-UV LEDs developpement B 1.6

Jean Rottner, Christophe Largeron, David Vaufrey, Ivan-Christophe Robin

Univ. Grenoble Alpes, CEA-LETI, Minatec Campus, Grenoble, France , Univ. Grenoble Alpes, CEA-LETI, Minatec Campus, Grenoble, France , Univ. Grenoble Alpes, CEA-LETI, Minatec Campus, Grenoble, France , Univ. Grenoble Alpes, CEA-LETI, Minatec Campus, Grenoble, France

15:25 Degradation effects in AlGaN-based UVC light-emitting diodes B 1.7

Johannes Glaab, Joscha Haefke, Jan Ruschel, Moritz Brendel, Jens Rass, Tim Kolbe, Christian Kuhn, Johannes Enslin, Tim Wernicke, Sven Einfeldt, Markus Weyers, Michael Kneissl

Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany, Technische Universität Berlin, Institute of Solid State Physics, Hardenbergstr. 36, EW 6-1, 10623 Berlin, Germany

15:45 Coffee break

RF technologies : Rüdiger Quay

13:45 Comparing both GaAs and GaN technologies for RF C 1.1

J. Jimenez

QORVO, USA

14:15 Advanced HEMTs and MMICs Technologies for Next Generation Millimeter-wave Amplifiers C 1.3

Kozo Makiyama¹, Shirou Ozaki¹, Yoshitaka Niida², Toshihiro Ohki¹, Naoya Okamoto¹, Yuichi Minoura¹, Masaru Sato¹, Yoichi Kamada¹, Kazukiyo Joshi¹, Norikazu Nakamura¹, Yasuyuki Miyamoto³

¹Fujitsu Limited, Fujitsu Laboratories Ltd., ²Fujitsu Laboratories Ltd., ³Tokyo Institute of Technology

14:45 AlN-based HEMTs grown on silicon substrate by NH₃-MBE C 1.4

S. Rennesson^{*1}, F. Semond¹, M. Nemoz¹, J. Massies¹, S. Chenot¹, L. Largeau², E. Dogmus³, M. Zegaoui³ and F. Medjdoub³

¹Université Côte d'Azur, CRHEA-CNRS, 06560 Valbonne, France, ²C2N, CNRS, Univ. Paris-Sud, Univ. Paris-Saclay, 91460 Marcoussis, France, ³IEMN/CNRS, 59650 Villeneuve d'Ascq, France

15:00	Growth and electrical properties of Al-rich, AlGaN/AlGaN heterostructures for high-electron-mobility transistors	C 1.5
	A. A. Allerman, A.G. Baca, A. M. Armstrong, J. R. Dickerson, M. P. King, R. J. Kaplar, E. A. Douglas, B.A. Kline, C.A. Sanchez and M.E. Coltrin	
	Sandia National Laboratories, Albuquerque, NM 87185	
15:15	Impact of AlN/Si nucleation layers grown either by NH₃-MBE or MOCVD on the properties of AlGaN/GaN HFETs	C 1.6
	1) H. Yacoub, T. Zweipfennig, H. Kalisch, and A. Vescan 2) A. Dadgar, M. Wieneke, J. Bläsing and A. Strittmatter 3) S. Rennesson and F. Semond	
	1) GaN Device Technology, RWTH Aachen University, Sommerfeldstr. 25, 52074 Aachen, Germany 2) Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Universitätsplatz 2, 39106 Magdeburg, Germany 3) Université Côte d'Azur, CRHEA-CNRS, rue B. Grégory, F-06560 Valbonne, France	
15:30	High Temperature operation of n-Al_{0.65}Ga_{0.35}N Channel Metal Semiconductor Field Effect Transistors on low-defect AlN Templates w	C 1.7
	Sakib Muhtadi, Seong Mo. Hwang, Antwon. Coleman, Fatima Asif, Alexander Lunev, MVS Chandrashekhar, and Asif Khan	
	Electrical Engineering, University of South Carolina, Columbia, SC 29208	
15:45	Coffee break	

Localization, LED physics : Aurélien David

13:45	The Role of Random Alloy Fluctuations in the InGaN/GaN LED	E 1.1
	Aldo Di Carlo(a), Matthias Auf der Maur (a), Alessandro Pecchia (b)	
	(a) Dept. Electronics Engineering, University of Rome "Tor Vergata", Rome (Italy) (b) CNR-ISMN, Rome (Italy)	
14:15	3D Modeling of Green InGaN QW LEDs with Random Alloy fluctuation	E 1.2
	Shuan Wang (1), Chi-Kang Li(1), Marcel Filoche(2), Claude Weisbuch (2,3), James S. Speck(3), and Yuh-Renn Wu(1)	
	(1) Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taipei 10617, Taiwan (2) Laboratoire de Physique de la Matière Condensée, CNRS-Ecole Polytechnique, 91128 Palaiseau Cedex, France (3) Materials Departments, University of California, Santa Barbara, California 93106, USA	
14:30	Modeling of carrier dynamics in GaInN QWs with different In content.	E 1.3
	Piotr A. Dróżdż(1,2), Krzysztof P. Korona(1), Marcin Sarzyński(2), Tadeusz Suski(2), Czesław Skierbiszewski(2), Henryk Turski(2)	
	(1) Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland, (2) Institute of High Pressure Physics "Unipress", Polish Academy of Sciences, Sokołowska 29/37, 01-142 Warsaw, Poland,	
14:45	Re-hybridization and strain induced reconstructions on InGaN surfaces: Implications on alloy ordering and stoichiometric limits	E 1.4
	Liverios Lymparakis 1, Christoph Freysoldt 1, Tobias Schulz 2, Martin Albrecht 2, Jörg Neugebauer 1	
	1 Computational Materials Design department, Max-Planck-Institut für Eisenforschung GmbH, 40237 Düsseldorf, Germany, 2 Leibniz-Institut für Kristallzüchtung, Max-Born-Straße 2, 12489 Berlin, Germany	

- 15:00 **Effect of carrier localization on recombination processes and efficiency of polar LEDs operating in the “green gap”** E 1.5

S. Yu. Karpov

STR Group - Soft-Impact, Ltd., P.O.Box 83, 27 Engels ave., St.Petersburg, 194156 Russia

- 15:15 **A high internal quantum efficiency of the emission in GaN single crystals observed by omnidirectional photoluminescence (ODPL)** E 1.6

Kazunobu Kojima¹, Hirotaka Ikeda², Kenji Fujito², Shigefusa F. Chichibu¹

Tohoku University¹, Mitsubishi Chemical Corporation²

- 15:30 **Polarization-induced fixed surface charge** E 1.7

Dan Ritter (1), Chris G. Van de Walle (2)

(1) Department of Electrical Engineering, Technion- Israel Institute of Technology, Haifa, Israel (2) Materials Department, University of California, Santa Barbara, California 93106-5050, USA

parallel sessions

16:15 – 18:00

Bulk nitride : Narihito Okada

- 16:15 **GaN bulk crystallization by HVPE on ammonothermal seeds and some new approaches** A 2.1

Izabella Grzegory

Institute of High Pressure Physics PAS Unipress ul. Sokolowska 29/37, 01-142 Warsaw, Poland

- 16:45 **High Quality Bulk GaN Crystal Grown by Acidic Ammonothermal Method** A 2.2

Makoto Saito, Quanxi Bao, Kohei Kurimoto, Daisuke Tomida, Kazunobu Kojima, Yuji Kagamitani, Rinzo Kayano, Toru Ishiguro, Shigefusa F. Chichibu

IMRAM Tohoku University, Mitsubishi Chemicap Corporation, The Japan Steel Works

- 17:00 **Nano beam X-ray diffraction analysis of Na flux GaN bulk crystals grown with controlling seed crystal surfaces and growth mode** A 2.3

Shotaro Takeuchi¹, Yuki Mizuta¹, Masayuki Imanishi², Mamoru Imade², Yusuke Mori², Yasuhiko Imai³, Shigeru Kimura³, Akira Sakai¹

¹Graduate School of Engineering Science, Osaka University, ²Graduate School of Engineering, Osaka University, ³Research & Utilization Division, Japan Synchrotron Radiation Research Institute (JASRI)

- 17:15 **New spontaneous AlN single crystal growth method on the top surface of sintered AlN source by PVT method** A 2.4

Q.K. Wang, K. Cao, J. Wang, Z.H. Wang, L.X. Liu, J.W. Gong, L. Wu
State Key Laboratory of Advanced Special Steel & Shanghai Key Laboratory of Advanced Ferrometallurgy & School of Materials Science and Engineering, Shanghai University, Shanghai 200072, China, Suzhou Ultratrend Technologies Co. Ltd, Suzhou City 215699, Jiangsu Province, China

- 17:30 **Quality Improvement of AlN Crystals Grown on AlN Buffer Layer by Alumina Decomposition-Nitridation Method** A 2.5

Makoto OHTSUKA, Keigo FUJIWARA, Hideto MIYAKE, Hiroyuki FUKUYAMA

Tohoku University, Tohoku University, Mie University, Tohoku University

17:45 **a-plane AlN layer fabricated by Ga-Al liquid phase epitaxy on nitrided r-plane sapphire substrate with off-cut angle**

Masayoshi Adachi, Hiroyuki Fukuyama

Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University

A 2.6

UV sources : Michael Kneissl

16:15 **Electron-beam-pumped UV lasers**

B 2.1

Thomas Wunderer

PARC, Inc. 3333 Coyote Hill Road Palo Alto, CA 94304 USA

16:45 **AlGaN LEDs on AlN Substrates Emitting at 230 nm**

B 2.2

Craig G. Moe, Sho Sugiyama, Jumpei Kasai, James R. Grandusky, and Leo J. Schowalter

Crystal IS, Green Island, NY, USA, and Asahi Kasei, Fuji-shi, Shizuoka, Japan

17:00 **Ultraviolet AlGaN Nanowire Light Emitting Diodes Operating at 279 nm by Selective Area Epitaxial Growth**

B 2.3

X. Liu(1)(2), B. H. Le(1)(2), A. Pofelski(3), S. Zhao(1), G. A. Botton§, Ishiang Shih(1), and Z. Mi(1)(2)* * Author for correspondence: zetian.mi@mcgill.ca

(1) Department of Electrical and Computer Engineering, McGill University, Montreal, QC H3A0E9, Canada, (2) Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI 48109-2099, USA, (3) Department of Materials Science and Engineering, Canadian Centre for Electron Microscopy, McMaster University, 1280 Main Street West, Hamilton, ON L8S4M1, Canada.

17:15 **245 nm GaN/AlN deep UV LED grown by MBE on bulk AlN substrates**

B 2.4

Shyam Bharadwaj, SM Islam, Kevin Lee, Vladimir Protasenko, Huili (Grace) Xing, Debdeep Jena

Cornell University for everyone

17:30 **Deep UV Emission from Simple Tunnelling MIS Diodes**

B 2.5

C. S. Lin¹, K. Cavanagh², A. Mihai¹, B. Zou¹, D. Allsopp², M. A. Moram¹

¹ Department of Materials, Imperial College London, United Kingdom ² Department of Electronic and Electrical Engineering, University of Bath, United Kingdom

17:45 **Highly Ultraviolet-Transparent ITO/ZGO Contact Layers for AlGaN Deep-Ultraviolet Light-Emitting Diodes**

B 2.6

Ray-Hua Horng^{1,2*}, Yu-Yuan Zeng², Ching-Ho Tien³, Chia-Lung Tsai⁴, Yi-Keng Fu⁴, Wei-Hung Kuo⁴ and Dong-Sing Wu³

¹Institute of Electronics, National Chiao Tung University, Hsinchu 300, Taiwan ²Graduate Institute of Precision Engineering, National Chung Hsing University, Taiwan ³Department of Materials Science and Engineering, National Chung Hsing University, Taiwan ⁴ Electronic and Optoelectronic System Research Laboratories, ITRI, Hsinchu 310, Taiwan *E-mail: rhh@ nctu.edu.tw (MOST 104-2221-E-009-199-MY3, 104-2221-E-005-036-MY3, ITRI G101W3402W)

RF Technologies : Jose Jimenez

16:15 **High-power Microwave GaN/AlGaN HEMTs and MMICs on SiC and Si Substrates**

C 2.1

Rüdiger Quay, Dirk Schwantuschke, Erdin Ture, Friedbert van Raay, Christian Friesicke, Stefan Müller, Steffen Breuer, and Peter Brückner

Fraunhofer Institute of Applied Solid-State Physics (IAF) Tullastr. 72 D-79108 Freiburg, Germany, ph: ++49-761-5159-843, ruediger.quay@iaf.fraunhofer.de

16:45 **Improved MOS gate control in Al₂O₃/AlGaN/GaN HEMTs with reverse-bias annealing** C 2.3

Kenya Nishiguchi, Syota Kaneki, Tamotsu Hashizume

Research Center for Integrated Quantum Electronics, Hokkaido University, Sapporo, Japan

17:00 **Suppression of flat-band voltage shift for AlSiO/GaN MOS structure** C 2.4

Daigo Kikuta¹, Kenji Ito¹, Tetsuo Narita¹, and Tetsu Kachi²

¹ Toyota Central R&D Labs., Inc., ² Nagoya University

17:15 **DC-6GHz GaN Based SPDT Switch MMIC** C 2.5

WeijunLuo, Miao Geng, Pengpeng Sun, Ke Wei, Xiaojuan Chen, Tingting Yuan, YingkuiZheng and Xinyu Liu

Institute of Microelectronics, Chinese Academy of Sciences, Beijing, CHINA The School of Microelectronics, University of Chinese Academy of Sciences, Beijing, CHINA E-mail: luowei jun@ime.ac.cn

17:30 **Low reduction rate of ID, gm, fT and fmax with Drain Voltage in AlGaN/GaN HEMTs on CVD-Diamond** C 2.6

K. Ranjan¹, S. Arulkumaran¹, G.I. Ng², C M Manoj Kumar¹, S. Vicknesh¹, K.S. Ang¹, M. Bryan¹, S.C. Foo¹

¹Temasek Laboratories@NTU, Nanyang Technological University, Singapore 637553. ²School of EEE, Nanyang Technological University, 50 Nanyang Avenue, Singapore 639798. *E-mail: kranjan@ntu.edu.sg, Phone: +65-6592-7796, Fax: +65-6790-0215

17:45 **Two-dimensional electron gas in InGaN/InN heterostructure** C 2.7

Tao Wang¹, Zhaoying Cheng¹, Ping Wang¹, Xiantong Zheng¹, Jun Li², Xin He², Peng Li², Xixiang Zhang², Xuelin Yang¹, Bo Shen¹, Xinqiang Wang¹

¹State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing, 100871, China ²King Abdullah University of Science and Technology (KAUST), Division of Physical Science and Engineering and Core Labs, Thuwal 23955-6900, Kingdom of Saudi Arabia



12th International Conference
on Nitride Semiconductors (ICNS12)
24th-28th July 2017, Strasbourg, France

Tuesday

Tuesday Program

- A - Materials
- B - Optical devices
- C - Electronic devices
- D - Other devices
- E - Theory-basics
- F - Late news

parallel sessions

8:30 – 10:00

Growth and polarity : Ferdinand Scholz

- 08:30 **MOCVD of N-polar (Al,Ga,In)N heterostructures** A 3.1 and their application in electronic devices

S. Keller and U.K. Mishra

University of California Santa Barbara Electrical and Computer Engineering Department

- 09:00 **Polarity Control in III-Nitrides beyond Pragmatism** A 3.2

Stefan Mohn,¹ Natalia Stolyarchuk,^{1,2} Toni Markurt,¹ Ronny Kirste,³ Marc P. Hoffmann,³ Ramón Collazo,³ Aimeric Courville,² Rosa Di Felice,^{4,5} Zlatko Sitar,³ Philippe Vennéguès,² and Martin Albrecht¹

¹ Leibniz Institute for Crystal Growth, Max-Born-Strasse 2, 12489 Berlin, Germany, ² Centre de Recherche sur l'HétéroEpitaxie et ses Applications, CNRS-CRHEA, rue Bernard Grégory, 06560 Valbonne, France, ³ Material Science and Engineering, North Carolina State University, 1001 Capability Drive, Raleigh, North Carolina 27695-7919, USA, ⁴ Center S3, CNR Institute of Nanoscience, Via Campi 213/A, 41125 Modena, Italy, ⁵ Department of Physics, University of Southern California, Los Angeles, California 90033, USA,

- 09:30 **AlN seed layers from atomic layer deposition on sapphire for MOVPE growth of AlN** A 3.3

Sylvia Hagedorn¹, Hassan Gargouri², Franziska Naumann², Arne Knauer¹, Ute Zeimer¹, and Markus Weyers

¹ Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, D-12489 Berlin, Germany ² SENTECH Instruments GmbH, Schwarzschildstraße 2, D-12489 Berlin, Germany

- 09:45 **MOVPE growth of nitrogen-polar AlN on C-face 4H-SiC with miscut** A 3.4

Jori Lemettinen, Iurii Kim, Hironori Okumura, Sami Suihkonen

Aalto University Department of Electronics and Nanoengineering, Aalto University Department of Electronics and Nanoengineering, Faculty of pure and applied science, Tsukuba University and Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Aalto University Department of Electronics and Nanoengineering

- 10:00 **Coffee break**

Devices based on LEDs : Guy Feuillet

- 08:30 **GaN micro-LED arrays for multi-Gb/s visible light communications** B 3.1

Martin D. Dawson

University of Strathclyde

- 09:00 **Core-Shell P-N Junction Nanowire LEDs Fabricated by N-polar Selective Area Growth Process** B 3.2

Matt D. Brubaker, Joel C. Weber, Paul T. Blanchard, Bryan T. Spann, Alexana Roshko, Todd E. Harvey, Norman A. Sanford, and Kris A. Bertness

Physical Measurement Laboratory, National Institute of Standards and Technology, Boulder, CO 80305, United States

09:15 High Aspect Ratio 3D GaN Fin LEDs with Nonpolar a-Plane Sidewalls grown by MOVPE B 3.3

Jana Hartmann^{1,2}, Frederik Steib^{1,2}, Hao Zhou¹, Johannes Ledig^{1,2}, Felix Blumenröther¹, Lars Nicolai⁴, Sönke Fündling^{1,2}, Tilman Schimpke³, Adrian Avramescu³, Tansen Varghese³, Hergo-Heinrich Wehmehn^{1,2}, Achim Trampert⁴, Martin Straßburg³, Hans-Jürgen Lugauer³, Andreas Waag^{1,2}

¹Institut für Halbleitertechnik and Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, 38092 Braunschweig, Germany, ² epitaxy competence center ec2, Hans-Sommer-Straße 66, 38106 Braunschweig, Germany, ³Osram Opto Semiconductors GmbH, Leibnizstraße 4, 93055 Regensburg, Germany, ⁴Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5-7, 10117 Berlin, Germany

09:30 LED based microdisplays with integrated collimating lenses B 3.4

Kunook Chung, Brandon Demory, Jingyang Sui, P.C. Ku

University of Michigan, University of Michigan, University of Michigan, University of Michigan

09:45 3D GaN Photonic Integrated Circuits B 3.5

K.H. Li, Y.F. Cheung, H.W. Choi

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

10:00 Coffee break

Detectors : Martin Kuball

08:30 Polarization and energy-band engineering on AlGaN avalanche photodiodes D 1.1

D. J. Chen, Z. G. Shao, K. X. Dong, Z. L. Xie, H. Lu, R. Zhang, Y. D. Zheng

the Key Laboratory of Advanced Photonic and Electronic Materials, School of electronic Science and Engineering, Nanjing University, Nanjing, China

09:00 Semipolar (10-1-1) GaInN/GaN p-i-n light-emitting solar cells D 1.2

N. Muramatsu, T. Takanishi, S. Mitsufuji, M. Iwaya, T. Takeuchi, S. Kamiyama, and I. Akasaki

Department of Materials Science and Engineering, Akasaki Research Center, Nagoya University,

09:15 Solar blind UV detection using high-Al content Al_xGa_{1-x}N devices with responsivity >106A/W D 1.3

Sakib Muhtadi, Seong Mo Hwang, Antwon L. Coleman, Alexander Lunev, Fatima Asif, V.S.N. Chava, MVS Chandrashekhar, Asif Khan

Electrical Engineering, University of South Carolina, Columbia, SC 29208

09:30 Growth, Fabrication, and Characterization of GaN p-i-p-i-n Ultraviolet Avalanche Photodiodes D 1.4

Mi-Hee Ji, Jeomoh Kim*, Theeradetch Detchprohm, Yuanzheng Zhu, Shyh-Chiang Shen, and Russell D. Dupuis

Georgia Institute of Technology, Atlanta, Georgia, USA, Georgia Institute of Technology, Atlanta, Georgia, USA *Currently LG Electronics, Seoul, South Korea

09:45 Fabrication of GaInN/GaInP/GaAs/Ge 4-junction solar cell using wafer bonding technology D 1.5

[1] Kazuya Takahashi, Ryoji Shinoda, Syun Mitsufuji, Motoaki Iwaya, Tetsuya Takeuchi, Satoshi Kamiyama, Tomokazu Hattori, Isamu Akasaki [2] Isamu Akasaki, Hiroshi Amano [3] Hiroshi Amano

[1] Department of Materials Science and Engineering, Meijo University [2] Akasaki Research Center, Nagoya University [3] Center for Integrated Research of Future Electronics, Nagoya University

10:00 Coffee break

parallel sessions

10:30 - 12:15

Exploratory growth : Stacia Keller

- 10:30 **Impact of InGaN epitaxy lattice matched to ScAlMgO₄ substrates on future photonic devices** A 4.1

Yoichi Kawakami, Takuya Ozaki and Mitsuru Funato

Department of Electronic Science and Engineering, Kyoto University, Kyoto 606-8501, Japan

- 11:00 **Evaluation of stacking faults free semipolar {11-22} GaN substrate grown by Na-flux point seed technique** A 4.2

Narihito Okada¹, Hiroki Ikeuchi¹, Naoki Morishita¹, Tohoru Matsubara^{1,2}, Tomoyuki Tanikawa³, Kim DoHun⁴, Masayuki Imanishi⁴, Mamoru Imade⁴, Yusuke Mori⁴, Kazuyuki Tadatomo¹

¹ Yamaguchi University, ² UBE Scientific Analysis Laboratory, Inc., ³Institute for Materials Research, Tohoku University, ⁴ Osaka University

- 11:15 **Pulsed DC Sputtering Deposition of GaN and ternary nitrides for LED applications** A 4.3

Frederik Steib^{1,2}, Jan Gülink¹, Johannes Ledig^{1,2}, Thilo Remmeli⁴, Alexander Behres³, Sönke Fündling^{1,2}, Martin Albrecht⁴ , Martin Straßburg³, Hans-Jürgen Lugauer³, Hergo-Heinrich Wehmann^{1,2}, Andreas Waag^{1,2}

¹ Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, Braunschweig University of Technology, 38092 Braunschweig, Germany ² epitaxy competence center ec2, Hans-Sommer-Straße 66, 38106 Braunschweig, Germany ³ Osram Opto Semiconductors GmbH, Leibnizstraße 4, 93055 Regensburg, Germany ⁴ Leibniz Institute for Crystal Growth, Max-Born-Straße 2, 12489 Berlin, Germany

- 11:30 **GaN-on-Si epitaxial defects – Impact on device yield and their corresponding control through Epitaxy process.** A 4.4

a) Srinivasan Kannan, Brian Gruver, Chankyun Choi, Jianwei Wan, Mihir Tungare, Seong-Eun Park, Troy Larsen, Peter W. Kim b) Lauri Knuutila, Ingo Daumiller, Uttiya Chowdhury, Werner Sebastian, Markus Harfmann

a) Infineon Technologies Americas Corporation, Mesa, Arizona, USA
b) Infineon Technologies Austria, Villach, Austria

- 11:45 **Structural and optical characterization of Si-doped polar and (11-22) semipolar wide bandgap AlGaN** A 4.5

G. Kusch¹, M. Nouf-Allehiani¹, L. Spasevski¹, F. Mehnke², P. Pampili³, J. Enslin², P. R. Edwards¹, G. Naresh-Kumar¹, T. Wernicke², D. V. Dinh³, V. Z. Zubalevich³, A. Knauer⁴, M. Weyers⁴, M. Kneissl^{2,4}, P. J. Parbrook³, C. Trager-Cowan¹, R. W. Martin¹

¹Department of Physics, SUPA, University of Strathclyde, 107 Rottenrow East, Glasgow G4 0NG, United Kingdom ,
²Institute of Solid State Physics, Technische Universität Berlin, Hardenbergstr. 36, 10623 Berlin, Germany, ³Tyndall National Institute, University College Cork, Lee Maltings, Dyke Parade, Cork, Ireland, ⁴Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik,Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany

- 12:00 **HVPE of Thick GaN Layers on ScAlMgO₄ Substrates and their Self-Separation for Fabricating Free-Standing wafers** A 4.6

Kazuki Ohnishi¹,Masaya Kanoh²,Tomoyuki Tanikawa¹,Shigeyuki Kuboya¹,Takashi Mukai²,Takashi Matsuoka¹

¹Institute for Materials Research, Tohoku University,²Nichia Corporation

- 12:15 **lunch**

Tuesday

Optics and physics : Andreas Hangleiter

- 10:30 **Challenge to highly efficient wavelength-stable red light-emitting diodes using Eu-doped GaN** B 4.1

Yasufumi Fujiwara¹, Tomohiro Inaba¹, Wanxin Zhu¹, Brandon Mitchell^{1,2}, Takanori Kojima¹, and Tom Gregorkiewicz^{1,3}

¹ Graduate School of Engineering, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan ² Department of Physics, West Chester University, West Chester, PA 19383, USA ³ Van der Waals-Zeeman Institute, University of Amsterdam, Science Park 904, 1098 XH Amsterdam, The Netherlands

- 11:00 **Towards Lowest-Threshold Lasing for InGaN/GaN Quantum Dots in High Quality Nanocavities** B 4.2

Danqing Wang¹, Tongtong Zhu², Rachel A. Oliver² and Evelyn L. Hu¹

¹John A. Paulson School of Engineering and Applied Sciences, Harvard University, USA ²Department of Materials Science and Metallurgy, University of Cambridge, UK

- 11:30 **Feasibility study on limited area formation of GaN nanowires for multi-quantum shell LDs** B 4.3

[1] Minoru Takebayashi, Yuki Kurisaki, Hiroki Shibuya, Myunghee Kim, Satoshi Kamiyama, Tetsuya Takeuchi, Motoaki Iwaya, Isamu Akasaki [2] Isamu Akasaki

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

- 11:45 **Crystal-phase quantum wires in GaN nanowires: One-dimensional heterostructures with atomically flat interfaces** B 4.4

Pierre Corfdir, David van Treeck, Timur Flissikowski, Johannes K. Zettler, Sergio Fernández-Garrido, Holger T. Grahn, Oliver Brandt

Paul-Drude-Institut für Festkörperelektronik, Leibniz Institut im Forschungsverbund Berlin e. V., Hausvogteiplatz 5??, 10117 Berlin, Germany

- 12:00 **Quantitative electroluminescence characteristics of packaged LED devices from ensembles of AlInGaN based core-shell microrods** B 4.5

Johannes Ledig¹, Adrian Avramescu², Tilman Schimpke³, Tansen Varghese³, Georg Roßbach³, Bastian Galler³, Helena Doblinger³, Thorsten Gerloff³, Frederik Steib¹, Sönke Fündling², Martin Strassburg³, Hans-Jürgen Lugauer², Andreas Waag³, Armin Sperling¹

¹Physikalisch-Technische Bundesanstalt (PTB), Bundesallee 100, 38116 Braunschweig, Germany, ²Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, TU Braunschweig, 38092 Braunschweig, Germany, ³Osram Opto Semiconductors GmbH, Leibnizstraße 4, 93055 Regensburg, Germany

Chemistry, Biology, Sensors : Patrick Ruther

- 10:30 **Photocatalytic water splitting on (oxy)nitride semiconductors** D 2.1

Tsuyoshi Takata, Kazunari Domen

Department of Chemical System Engineering, School of Engineering, The University of Tokyo

- 11:00 **Efficient Direct Hydrogen Generation using InGaN Nanowires treated by Nanoscale Surface Passivation and Metal Co-catalyst** D 2.2

Mohamed Ebaid¹, Davide Priante¹, Guangyu Liu¹, Chao Zhao¹, Tayirjan T. Isimjan², Tien Khee Ng¹, Hicham Idriss^{1,2}, Boon S. Ooi¹

¹King Abdullah University of Science and Technology (KAUST), Photonics Laboratory, Thuwal 23955-6900, Kingdom of Saudi Arabia, ²SABIC-Corporate Research and Development Center (CRD) at KAUST, Thuwal 23955, Kingdom of Saudi Arabia

11:15 Conductometric gas nanosensors based on sub-100 nm vertical 3D GaN nanopillars D 2.3

Tony Granz 1/2, Shinta Mariana 1, Gerry Hamdana 1/2, Feng Yu 1/2, Alaaeldin Gad 1/2, Muhammad Fahlesa Fatahilah 1/2, Jana Hartmann 1/2, Nurhalis Majid 3/4, Olga Casals 5, Gerhard Lilienkamp 3, Sönke Fündling 1/2, Erwin Peiner 1/2, Winfried Daum 3, Joan Daniel Prades 5, Andreas Waag 1/2, Hutomo Suryo Wasisto 1/2

1 Institut für Halbleitertechnik (IHT), Technische Universität Braunschweig, Hans-Sommer-Str. 66, D-38106 Braunschweig, Germany 2 Laboratory for Emerging Nanometrology (LENA), Technische Universität Braunschweig, Langer Kamp 6a, D-38106 Braunschweig, Germany 3 Institut für Energieforschung und Physikalische Technologien (IEPT), Technische Universität Clausthal, Leibnizstr. 4, D-38678 Clausthal, Germany 4 Research Center for Physics, Indonesian Institute of Sciences (LIPI), Gd. 442 Kawasan Puspitek Serpong, 15314 Tangerang Selatan, Indonesia 5 MIND-IN2UB, Department of Engineering: Electronics, University of Barcelona, C/Martí i Franquès 1, E-08028 Barcelona, Spain

11:30 Detection of anticancer drugs action on cells by AlGaN/GaN field effect transistors D 2.4

Can Li¹, Paul Bertani², Yuji Wang², Peng Zhao¹, Hao Wu¹, Jianfei Sun¹, Ning GU^{*1}, and Wu Lu

¹School of Biological Science and Medical Engineering, Southeast University, Nanjing, 210009, China, ²Department of Electrical and Computer Engineering, the Ohio State University, Columbus, OH 43210, USA

11:45 Functionalization of (In)GaN quantum well structures for selective optical (bio)chemical sensing D 2.5

M. Schneidereit 1), D. Heinz 1), F. Scholz 1), S. Chakrabortty 2), N. Naskar 2), T. Weil 2), F. Huber 3), B. Hörbrand 3), and K. Thonke 3)

1) Institute of Optoelectronics, Ulm University, Ulm, Germany, 2) Institute of Organic Chemistry III, Ulm University, Ulm, Germany, 3) Institute of Quantum Matter / Semiconductor Physics Group, Ulm University, Ulm, Germany

12:00 Deep UV photodetector prototype on flexible wafer-scale thick boron nitride layers grown by MOVPE D 2.6

Xin Li¹, Matthew B. Jordan^{1,2}, Taha Ayari^{1,2}, Suresh Sundaram¹, Youssef El Gmili¹, Saiful Alam^{1,2,3}, Muhibub Alam^{1,2}, Gilles Patriarche⁴, Paul L. Voss^{1,2}, Jean Paul Salvestrini^{1,5}, and Abdallah Ougazzaden 1,2,

¹ UMI 2958, Georgia Tech - CNRS, 57070 Metz, France ² Georgia Institute of Technology, School of Electrical and Computer Engineering, GT-Lorraine, 57070 Metz, France ³ CEA-LETI, Minatoc Campus, F-38054 Grenoble, France ⁴ Centre de Nanosciences et de Nanotechnologies, Université Paris-Saclay, C2N – Site de Marcoussis, route de Nozay, F-91460 Marcoussis, France ⁵ Université de Lorraine, LMOPS, EA 4423, 57070 Metz, France

12:15 Lunch

parallel sessions
13:45 - 15:45

**B containing nitrides :
Sergei Novikov**

13:45 MOVPE growth of wurtzite BN-related alloys A 5.1

Tetsuya Akasaka

NTT Basic Research Laboratories, NTT Corp. 3-1 Morinosato-Wakamiya, Atsugi, Japan

14:15 The surface evolution of hexagonal boron nitride on sapphire by pulsed-mode MOVPE A 5.2

X. Yang*, S. Nitta, K. Nagamatsu, M. Pristovsek, Y. H. Liu, Y. Honda, and H. Amano

Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya 464-8603, Japan, Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya 464-8603, Japan, School of Information Engineering, Zhengzhou University, Zhengzhou, 450001, China, Akasaki Research Center, Nagoya University, Nagoya 464-8603, Japan, Venture Business Laboratory, Nagoya University, Nagoya 464-8603, Japan.

14:30 Fine structure of phonon replicas and exciton-phonon interaction in the strong coupling regime in hexagonal boron nitride A 5.3

T. Q. P. Vuong, G. Cassabois, P. Valvin, B. Gil, V. Jacques, R. Cusco, L. Artus, S. Liu, J. H. Edgar.

Laboratoire Charles Coulomb, UMR 5221 CNRS-Université de Montpellier, 34095 Montpellier, France, Institut Jaume Almera, Consejo Superior de Investigaciones Científicas (ICTJA-CSIC), 08028 Barcelona, Spain, Department of Chemical Engineering, Kansas State University, Manhattan, Kansas 66506, USA.

14:45 Wafer scale MOVPE growth of AlGaN/GaN HEMTs structure on 2D h-BN buffered sapphire templates. A 5.4

Suresh Sundaram 1, Xin Li 1,2, Taha Ayari 1,2, Saiful Alam 1,2, Youssef El Gmili 1, Gilles Patriarche 4, Paul L. Voss 1,2, Jean Paul Salvestrini 1,3, Abdallah Ougazzaden 1,2.

1 Georgia Tech Lorraine, UMI 2958, Georgia Tech - CNRS, 57070 Metz, France, 2 School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia, 30332, USA, 3 Université de Lorraine and CentraleSupélec, LMOPS, EA 4423, 57070 Metz, France, 4 Laboratoire de Photonique et de Nanostructures (LPN), CNRS, Université Paris-Saclay, route de Nozay, F-91460 Marcoussis, France,

15:00 Crystal structure of BAIN thin films: effect of boron concentration in the gas flow A 5.5

Shuo Wang, Xiaohang Li, Alec M. Fischer, Theeradetch Detchprohm, Russell D. Dupuis, Fernando A. Ponce

Department of Physics, Arizona State University, Tempe, Arizona 85287-1504, USA, Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA, Computer, Electrical and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology, Thuwal 23955, KSA,

15:15 Extremely high-temperature molecular beam epitaxy of boron-nitride. A 5.6

T.S. Cheng¹, A. Summerfield¹, J. D. Albar¹, A. Davies^{1,2}, C.J. Mellor¹, L. Eaves¹, C.T. Foxon¹, A.N. Khlobystov², T.Q.P. Vuong³, G. Cassabois³, P. Valvin³, B. Gil³, P.H. Beton¹, S.V. Novikov¹

¹School of Physics and Astronomy, University of Nottingham, Nottingham NG7 2RD, UK, ²School of Chemistry, University of Nottingham, Nottingham NG7 2RD, UK, ³Laboratoire Charles Coulomb, UMR5221 CNRS-Université de Montpellier, 34095 Montpellier, France.

15:30 Coffee break

Visible LEDs : Benjamin Damilano

13:45 The physics of SRH recombinations in III-Nitride quantum-well LEDs B 5.1

A. David

Soraa, USA

14:15 Localization in InGaN/GaN light-emitting diodes B 5.2

Felix Nippert¹, Sergey Yu. Karpov², Gordon Callsen¹, Bastian Galler³, Thomas Kure¹, Markus R. Wagner¹, Hans-Jürgen Lugauer³, Martin Straßburg³, Axel Hoffmann¹

¹Institut für Festkörperphysik, Technische Universität Berlin, Germany, ²STR Group - Soft-Impact Ltd., St. Petersburg, Russian Federation, ³OSRAM Opto Semiconductors GmbH, Regensburg, Germany

14:30 Internal Quantum Efficiency (IQE) Characterization of LEDs by Bias Dependent Resonant Photoluminescence B 5.3

Matthias Wachs, Christian Mounir, Ulrich T. Schwarz

Experimental Sensor Science, Chemnitz University of Technology, Germany, Department of Microsystems Engineering, IMTEK, University of Freiburg, Germany, Experimental Sensor Science, Chemnitz University of Technology, Germany

14:45 Internal Quantum Efficiency in InGaN-GaN heterostructures emitting from blue to red B 5.4

Thi Huong Ngo¹, Nicolas Chery², Pierre Valvin¹, Aimeric Courville³, Philippe de Mierry³, Benjamin Damilano³, Pierre Ruterana² and Bernard Gil¹

1-Laboratoire Charles Coulomb, CNRS and Univ.Montpellier, case courrier 074, 34095 Montpellier CEDEX 5, France 2-Centre de Recherche sur les Ions, les Matériaux et la Photonique, Boulevard du Maréchal Juin 14050 Caen CEDEX 4, France 3-Université Côte d'Azur, CRHEA-CNRS, Centre de Recherche sur l'HétéroÉpitaxie et ses Applications, Rue Bernard Gregory, Sophia Antipolis, 06560 Valbonne, France

15:00 Investigations into high energy emission band from InGaN/GaN quantum well structures under high excitation power densities B 5.5

George M. Christian [1], Simon Hammersley [1], Menno J. Kappers [2], Colin J. Humphreys [2], Rachel A. Oliver [2], David J. Binks [1], Phil Dawson [1]

[1] School of Physics and Astronomy, Photon Science Institute, University of Manchester, Manchester, M13 9PL, United Kingdom, [2] Department of Materials Science and Metallurgy, 27 Charles Babbage Road, University of Cambridge, Cambridge, CB3 0FS, United Kingdom

15:15 New insights into III-Nitride LED designs through quantitative modeling B 5.6

Junzhe Geng, Kuang-Chung Wang, Prasad Sarangapani, Ben Browne, Carl Wordelman, Erik Nelson, Tillmann Kubis and Gerhard Klimeck

Purdue University, Lumileds

15:30 InGaN quantum wells with reduced quantum-confined Stark effect and their application to laser diodes B 5.7

G. Muziol,¹ H. Turski,¹ M. Siekacz,¹ S. Grzanka,^{1,2} P. Perlin,^{1,2} M. Baranowski,³ L. Janicki,³ S. Zolud,³ M. Gladysiewicz,³ R. Kudrawiec,³ and C. Skierbiszewski,^{1,2}

¹ Institute of High Pressure Physics Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland ² TopGaN Ltd, Sokolowska 29/37, 01-142 Warsaw, Poland ³ Faculty of Fundamental Problems of Technology, Wroclaw University of Science and Technology, Wybrzeze Wyspianskiego 27, 50-370 Wroclaw, Poland

Power : Farid Medjdoub

13:45 To be announced C 3.1

A. Hanson

Macom, USA

14:15 Large-Diameter, Thermal-Expansion Matched Substrates for GaN C 3.2

Vladimir Odnoblyudov, Cem Basceri, Shari Farrens, Ozgur Aktas, Steve Lester, Jeff Honeycutt

Quora Technology, Inc.

14:30 Characterization and Analysis of Dynamic RON of GaN-on-Si Lateral Power Devices with Grounded and Floating Si Substrate C 3.3

Gaofei Tang, Jin Wei, Zhaofu Zhang, Mengyuan Hua, Xi Tang, Hanxing Wang, Kevin J. Chen

Dept. of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong

14:45 Novel Mechanism Responsible for RDSON Shift C 3.4 in GaN-on-Si Power Devices

Hyeongnam Kim (a), Mihir Tungare (a), J. Sun (a), H. Kannan (a), Y. Pan (a), D. Veerreddy (a), B. Pandya (a), R. Garg (a), S. Khalil (a), C. Choi (a), J. Wan (a), S. Park (a), S. Kannan (a), S. Sicre (b), S. Hardikar (c), D. Macfarlane (b), M. Vorwerk (b), M. Imam (a), P. Kim (a), & A. Charles (a)

(a) Infineon Technologies Americas Corp. (IFAM), (b) Infineon Technologies Austria (IFAT), (c) Infineon Technologies AG (IFAG)

15:00 AlGaN/GaN HFETs on intentionally C-doped 200 mm GaN-on-Si (111) C 3.5

H. Yacoub, C. Mauder, S. Leone, M. Eickelkamp, D. Fahle, M. Heuken, H. Kalisch, A. Vescan

GaN Device Technology, RWTH Aachen University, Sommerfeldstr. 24, 52074 Aachen, Germany AIXTRON SE, Dornkaustr. 2, 52134 Herzogenrath, Germany

15:15 Thermal resistance of AlGaN/GaN HEMTs transferred to various foreign substrates C 3.6

Masanobu Hiroki, Kazuhide Kumakura

NTT Basic Research Labs.

15:30 Growth and Characterization of Buffer Structures for High Power Enhancement-Mode AlGaN/GaN HEMT C 3.7

M. Eickelkamp(1), D. Fahle(1), C. Mauder(1), M. Zhao(2), H. Liang(2), N. Posthuma(2), M. Van Hove(2), and M. Heuken(1)

(1) AIXTRON SE, Dornkaustr.2 , D-52134 Herzogenrath (Germany)
 (2) Interuniversity Microelectronics Center (IMEC), Kapeldreef 75, B-3000, Leuven (Belgium)

15:45 Coffee break

MEMS and piezo : Julien Pernot

13:45 Implantable MEMS-based tools for optogenetics D 3.1

Patrick Ruther, Eric Klein, Suleman Ayub, Christian Gossler, Michael Schwaerzle, Oliver Paul

Department of Microsystems Engineering (IMTEK) and BrainLinks-BrainTools Cluster of Excellence, University of Freiburg, Freiburg, Germany

14:15 Design and Growth of III-Nitride Dipole Induced Diodes by Molecular Beam Epitaxy D 3.2

Micha N. Fireman, David A. Browne, Haoran Li, Stacia Keller, Umesh K. Mishra, James S. Speck

Micha N. Fireman - Materials Department, UC Santa Barbara, David A. Browne - CEA Grenoble, Haoran Li - ECE Department, UC Santa Barbara, Stacia Keller - ECE Department, UC Santa Barbara, Umesh K. Mishra-ECE Department, UC Santa Barbara, James S. Speck-Materials Department, UC Santa Barbara,

14:30 Piezoelectric conversion with InGaN/GaN nanowire heterostructures D 3.3

N. Jegenyes(1), M. Morassi(1), P. Chrétien(2), L. Travers(1), L. Lu(3), J.-C. Harmand(1), F. Houzé(2), M. Thernycheva(3), N. Gogneau(1)

1) Centre de Nanosciences et de Nanotechnologies - Site Marcoussis, CNRS-UMR9001, Université Paris-Saclay, Route de Nozay, 91460 Marcoussis, France 2) Laboratoire de Génie Électrique et Électronique de Paris, UMR 8507 CNRS-CentraleSupélec, Université Paris-Sud et UPMC, 11 rue Joliot-Curie, 91192 Gif-sur-Yvette, France 3) Centre de Nanosciences et de Nanotechnologies – Site Orsay, CNRS-UMR9001, Université Paris-Saclay, 91405 Orsay, France

14:45 **Gallium nitride nanowire based flexible piezoelectric sensor: design, fabrication and electrical performances.** D 3.4

Amine El Kacimi (1), Emmanuelle Pauliac-Vaujour (1), Joël Eymery(2)

1 University Grenoble Alpes, CEA, LETI, MINATEC Campus, F-38054, Grenoble, France 2 University Grenoble Alpes, CEA, INAC-MEM, Nanostructures and Synchrotron Radiation Laboratory, F-38000 Grenoble, France

15:00 **Optimization of process fabrication of GaN-based heterostructure on h-BN for flexible gas sensors** D 3.5

Taha Ayari^{1,2}, Chris Bishop³, Matthew B. Jordon^{1,2}, Suresh Sundaram⁴, Xin Li¹, Youssef ElGmili¹, Jean Paul Salvestrini⁴, Paul L. Voss^{1,2}, Abdallah Ouagazzaden^{1,2}

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

15:15 **GaN HEMTs and LEDs transferred from Silicon substrate to flexible tapes (FLEXIGaN)** D 3.6

Di Zhou¹, S. Mhedhbi¹, G. Tabares-Jiménez², M. Lesecq¹, N. Defrance¹, B. Damilano², E. Okada¹, E. Frayssinet², J. Brault², S. Chenot², A. Ebongué³, Y. Cordier², and V. Hoel¹

¹) IEMN-CNRS UMR8520, Av. Poincaré, Cité Scientifique, 59650 Villeneuve d'Ascq, France ²) Université Côte d'Azur, CNRS, CRHEA, rue Bernard Grégory, 06560 Valbonne, France ³) 3M France, CTC, Avenue Boulé, 95250 Beauchamp, France

15:30 **GaN Nanowire-based piezo-generators for Powering Nomad Electronics** D 3.7

N. Gogneau¹, N. Jamond¹, P. Chrétien², N. Jegenyes¹, M. Morassi^{1,3}, L. Lu³, L. Travers¹, J. C. Harmand¹, F. H. Julien³, F. Houzé², M. Tchernycheva³

¹ Centre des Nanosciences et des Nanotechnologies, site-Marcoussis, CNRS-UMR 9001, Université Paris-Saclay, Route de Nozay, 91460 Marcoussis, France, ² Laboratoire de Génie Électrique et Électronique de Paris, UMR 8507 CNRS-CentraleSupélec, Université Paris-Sud et UPMC, 11 rue Joliot-Curie, 91192 Gif-sur-Yvette, France, ³ Centre des Nanosciences et des Nanotechnologies, site-Orsay, CNRS-UMR 9001, Université Paris-Saclay, 91405 Orsay, France

15:45 **Coffee break**

parallel sessions

16:15 - 18:00

GaN on graphene : Russel Dupuis

16:15 **Graphene Encapsulated Growth of 2D Gallium Nitride** A 6.1

Joan M. Redwing, Zakaria Y. Al Balushi, Joshua A. Robinson

Department of Materials Science and Engineering, Materials Research Institute, The Pennsylvania State University, University Park, USA

16:45 **Epitaxial Growth of Vertical n-type GaN/AlGaN Nanocolumns on Graphene/Silica Glass** A 6.2

A. Liudi Mulyo (1,2), B.O. Fimland (1), H. Weman (1) and K. Kishino (2)

¹ Department of Electronic Systems, Norwegian University of Science and Technology (NTNU), NO-7491 Trondheim, Norway ² Department of Engineering and Applied Sciences, Sophia University, 7-1 Kioi-cho, Chiyoda-Ku, 102-8554 Tokyo, Japan

17:00 **Van der Waals molecular beam epitaxy of GaN on graphene** A 6.3

M. Gruart [1,2], T. Journot [1,3], B. Hyot [1,3], B. Gayral [1,2], B. Daudin [1,2]

[1] Univ. Grenoble Alpes, 38000 Grenoble, France, [2] CEA, INAC-PHELIQS «Nanophysics and semiconductors» group, 38000 Grenoble, France, [3] CEA, LETI, MINATEC campus, 38000 Grenoble, France.

17:15 **Combined experimental and theoretical study of the structural and electronic properties of alloyed AlN and MgSiN₂ semiconductors** A 6.4

Mikael Råsander, James B. Quirk, Michelle A. Moram

Department of Materials, Imperial College London

17:30 **Selective area growth and optical properties of nitride nanowires on prepatterned graphene substrates** A 6.5

Maria Tchernycheva, Vishnuvarthan Kumaresan, Ludovic Largeau, Nan Guan, Lorenzo Mancini, Ali Madouri, Frank Glas, Hezhi Zhang, Fabrice Oehler, Antonella Cavanna, Martina Morassi, Andrea Cattoni, François H. Julien, Andrey Babichev, Noelle Gogneau and Jean-Christophe Harmand

Center of Nanoscience and Nanotechnologies (C2N), UMR9001 CNRS site Orsay & Marcoussis, Université Paris-Sud, Université Paris-Saclay, France

17:45 **Analyses on the separation processes for GaN epilayer from sapphire substrate** A 6.6

Yutian Cheng¹, Duanjun Cai², Jiejun Wu^{1*}, Xiangshun Liu¹, Xiaohui Feng¹, Guoyi Zhang¹, Tongjun Yu^{1*}

¹ Research Center for Wide-gap Semiconductors, State Key Laboratory for Artificial Microstructures and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, P. R. China ² Fujian Key Laboratory of Semiconductor Materials and Applications and Department of Physics, Xiamen University, Xiamen 361005, China

Visible LEDs : James Speck

16:15 **GaN on Silicon - Has it's light gone out or will it shine brightly** B 6.1

K. Strickland

Plessey, UK

16:45 **InGaN LEDs fabricated directly on flexible metal foils** B 6.2

Vladimir Matias, Christopher Yung, Christopher Sheehan, Mary Crawford and Daniel Koleske

iBeam Materials, Inc., Santa Fe, NM, USA, Sandia National Laboratories, Albuquerque, NM, USA

17:00 **Flexible light emitting diodes based on InGaN/GaN nanowires** B 6.3

Nan Guan 1, Xing Dai 1, Hezhi Zhang 1, Valerio Piazza 1, Lorenzo Mancini 1, François H. Julien 1, Martin Foldyna 2, Akanksha Kapoor 3, Catherine Bougerol 4&5, Eric Gautier 4, Joël Eymery 3, Christophe Durand 3, Maria Tchernycheva 1

1. C2N-Orsay, UMR 9001 CNRS, Université Paris Sud, Université Paris-Saclay, 91405 Orsay, France, 2. LPICM-CNRS, Ecole Polytechnique, Université Paris-Saclay, 91128 Palaiseau, France, 3. CEA/CNRS/Université Joseph Fourier, CEA, INAC, SP2M, 17 rue des Martyrs, 38054 Grenoble, France 4. Univ. Grenoble Alpes, F-38000 Grenoble, France 5. CNRS, Inst. NEEL, F-38042 Grenoble, France

17:15 **Colour-crafted phosphor-free white light emitters via in-situ nanostructure engineering** B 6.4

Daehong Min, Donghye Park, Kyuseung Lee, and Okhyun Nam*

Convergence Center for Advanced Nano Semiconductors (CANS), Department of Nano- Optical Engineering, Korea Polytechnic University, 237, Sangidaehak-ro, Siheung-si, Gyeonggi-do 15073, Republic of Korea

17:30 **Fabrication of a vertically-stacked passive-matrix LED array structure for vertical light emission** B 6.5

Chang-Mo Kang, Seung-Hyun Mun, Soo-Young Choi, Woo-Lim Jeong, Hae-Sun Kim and Dong-Seon Lee

School of Electrical Engineering and Computer Science, Gwangju Institute of Science and Technology, 123 Cheomdangwagi-ro, Buk-gu, Gwangju 61005, Republic of Korea

17:45 **Wavelength tuning of InGaN/GaN light-emitting diode on flexible metal substrate by bending process** B 6.6

Sang-Jo Kim, Kwang Jae Lee, Semi Oh, Jang Hwan Han, and Seong-Ju Park*

School of Materials Science and Engineering, Gwangju Institute of Science and Technology, Gwangju 61005, Republic of Korea

Vertical Devices : Elison Matioli

16:15 **Review of vertical GaN based FETs** C 4.1

E. Bahat Treidel, O. Hilt, F. Brunner, A. Thies, M. Weyers and J. Würfl

Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Straße 4, 12489 Berlin, Germany

16:45 **Current Status of Vertical GaN Power Devices on GaN Substrates** C 4.4

Tohru Oka

Toyoda Gosei Co., Ltd.

17:15 **Low vertical leakage current of 0.07 µA/mm² at 600 V without intentional doping for 7 µm thick GaN-on-Si** C 4.5

Atsushi Nishikawa

ALLOS Semiconductors GmbH

17:30 **Crystal Plane Dependence of Interface States Density in c- and m-plane GaN MOS Capacitors** C 4.6

Manato Deki (1), Kazushi Sone (2), Junya Matsushita (2), Kentarou Nagamatsu (1), Atsushi Tanaka (1), Maki Kushimoto (2), Shugo Nitta (1), Yoshio Honda (1), Hiroshi Amano (1)(3)(4)

(1) Institute of Materials and Systems for Sustainability , (2) Nagoya University , (3) Akasaki Research Center , (4) Venture Business Laboratory

17:45 **Correlation between dislocations and leakage current of p-n diodes on free-standing GaN substrate** C 4.7

Shigeyoshi Usami 1, Yuto Ando 1, Atsushi Tanaka 2, Kentaro Nagamatsu 2, Maki Kushimoto 1, Manato Deki 2, Shugo Nitta 2, Yoshio Honda 2, Hiroshi Amano 2 3 4

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

**poster sessions:
18:00 - 20:00**

A poster : Bruno Daudin

18:00 **Defect controlling in epitaxial GaN nanowire arrays** A 1.1

Baodan Liu, Qingyun Liu, Xin Jiang

Shenyang National Laboratory for Materials Science (SYNL), Institute of Metal Research (IMR) Chinese Academy of Sciences (CAS)

18:00 **Defect related PL bands between 1.68 eV and 2.4 eV in AlN bulk crystals and epilayers** A 1.2

M. Lamprecht 1, V.N. Jmerik 2, R. Collazo 3, Z. Sitar 3, S.V. Ivanov 2, K. Thonke 1

1 Institute of Quantum Matter / Semiconductor Physics Group, University of Ulm, Albert-Einstein-Allee 45, 89069 Ulm, Germany, 2 Ioffe Institute, Politekhnicheskaya 26, 194021 St. Petersburg, Russia, 3 Department of Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina 27606, USA

18:00 **Characterizations of MOVPE- grown GaN layers on GaAs (110) substrate** A 1.3

I. Daldoul(a), N. Chaaben(a), Y. El Gmili(b), A. Bchetnia(a), J. P. Salvestrini(b,c) and A. Rebey(a).

(a)Unité de Recherche sur les Hétéro-Epitaxies et Applications, Faculté des Sciences de Monastir 5019, Université de Monastir, Tunisia. (b)CNRS, UMI 2958 Georgia Tech - CNRS, 57070 Metz, France. (c)Université de Lorraine, Centrale Supelec, LMOPS, EA4423, 57070 Metz, France Corresponding authors. Tel: +216 73 500 274, fax: +216 73 500 578. E-mail: imendaldoul9@gmail.com

18:00 **Suppression of surface instability of highly-compressive Al_{0.6}Ga_{0.4}N epitaxial layer on AlN template with transition layers** A 1.4

Chia-Yen Huang, Kai-Shiang Chang, Yun-Hsiang Lin, Wei-Chih Peng, Hao-Chung Kuo, Ray-Lin Min,

Department of Photonics and Institute of Electro-Optical Engineering, National Chiao Tung University, 1001 Ta Hsueh Rd., Hsinchu 300, Taiwan, Research & Development Center, Epistar Corp., 21, Li-hsin Rd., Hsinchu Science Park, Hsinchu 300, Taiwan R.O.C., Department of Electronic Engineering and Green Technology Research Center, Chang Gung University, Taoyuan 333, Taiwan

18:00 **Free-standing 4" GaN by Hydride Vapor Phase Epitaxy** A 1.5

Abby Luo, Troy Baker, Shell, Judy

Abby Luo, Troy Baker, Shell, Judy

18:00 **High quality and highly-transparent AlN template on annealed sputter-deposited AlN buffer layer for DUV-LEDs**

Chia-Yen Huang¹, Kai-Shiang Chang¹, Pei-Yu Wu², Yun-Hsiang Lin³, Wei-Chih Peng³, Yan-Yu Chang⁴, Jui-Ping Li⁴, Hung-Wei Yen⁵, Yew-Chung Sermon Wu², and Hao-Chung Kuo¹,

1. Department of Photonics and Institute of Electro-Optical Engineering, National Chiao Tung University, 1001 Ta Hsueh Rd., Hsinchu 300, Taiwan R.O.C., 2. Department of Materials Science and Engineering, National Chiao-Tung University, 1001 Ta Hsueh Rd., Hsinchu 300, Taiwan R.O.C., 3. Research & Development Center, Epistar Corp., 21, Li-hsin Rd., Hsinchu Science Park, Hsinchu 300, Taiwan R.O.C., 4. Advanced Technology Development Div., Crystalwise Technology Inc., No.8, Ke bei 5th Rd., Jhunan Science Park, Miaoli County 35053, Taiwan R.O.C., 5. Department of Materials Science and Engineering, National Chiao-Tung University, No. 1, Sec. 4, Roosevelt Road, 10617, Taipei, Taiwan R.O.C.

18:00 **Substrate Effect on the Growth of Indium Nitride Micro-columns by Chemical Vapor Deposition**

R. Garcia-Gutierrez¹, A. Ramos-Carrasco¹, D. Bermant-Mendoza¹, M. Barboza-Flores¹, G. A. Hirata², O. E. Contreras²

1 Department of Research in Physics, University of Sonora, Hermosillo, Sonora, 83000, México, 2 Center of Nanosciences and Nanotechnology, National University of Mexico, Baja California, 22800, México.

18:00 **High-quality AlN grown with a single substrate temperature below 1200 °C** A 1.8

Chun-Pin Huang¹, Chao-Hung Wang², Chuan-Pu Liu², and Kun-Yu Lai^{1*}

¹Department of Optics and Photonics, National Central University, Chung-Li 320, Taiwan, ²Department of Materials Science and Engineering, National Cheng Kung University, Tainan 701, Taiwan *(kylai@ncu.edu.tw)

18:00 **Room temperature bandedge luminescence from h-BN thin film grown on sapphire substrate by LP-CVD** A 1.9

Naoki Umehara, Takuou Adachi, Tetsuya Kouno, Hiroko Kominami, Kazuhiko Hara
Shizuoka University

18:00 **High-temperature growth of AlN in a production scale 19x2» HT-MOCVD** A 1.10

Xiaoliang Gong, Yiming Yang, Fengwu Chen, Wei Wei, Yongdong Shu, Jingying Jia
48th Research Institute of China Electronics Technology Group Corporation, Changsha, Hunan, P.R. China

18:00 **Study of TMAl-induced carbon impurity on AlN film polarity and growth mode on sapphire** A 1.11

Haiding Sun,¹ Feng Wu,¹ Talal M. Altahtamouni,² Nasir Alfaraj,¹ Theeradetch Detchprohm,³ Russell D. Dupuis,³ Xiaohang Li¹
¹Computer, Electrical and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia ²Materials Science and Technology Program, College of Arts and Sciences, Qatar University, Doha 2713, Qatar ³Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA

18:00 **Low energy electron beam irradiation effect on optical properties of MQW InGaN/GaN structures** A 1.12

E.B. Yakimov, A.Y. Polyakov, P.S. Vergelis
Institute of Microelectronics Technology RAS, 142432, Chernogolovka, Russia & National University of Science and Technology MISiS, Moscow, Russia, National University of Science and Technology MISiS, Moscow, Russia, Institute of Microelectronics Technology RAS, 142432, Chernogolovka, Russia

18:00 **Dislocation densities reduction in MBE-grown AlN thin films by high-temperature annealing** A 1.13

Maud Nemoz¹, Roy Dagher¹, Samuel Matta^{1,2}, Adrien Michon¹, Philippe Vennégues¹, and Julien Brault¹
¹ Université Côte d'Azur, CNRS, CRHEA, France ² L2C, UMR 5221, Case courrier 074-34095 Montpellier Cedex 5, France

18:00 **Insights into the growth of GaN and Fe based nitrides using Electron Beam Physical Vapour Deposition.** A 1.14

R.J. Davies, S. Pace, N.I.M. Nadzri, M.A. Moram.
Department of Materials, Imperial College London, Exhibition Rd., London SW7 2AZ.

18:00 **Optical bandgap shrinkage in GaN nanotubes grown by molecular beam epitaxy** A 1.15

Youngsin Park, Yongcheol Jo, Woochul Yang, Hyunsik Im, Seung W. Lee, Mark J. Holmes, Christopher C. S. Chan, Benjamin P. L. Reid, Robert A. Taylor
School of Natural Science, Ulsan National Institute of Science and Technology (UNIST), Ulsan 44919, Korea, Division of Physics and Semiconductor Science, Dongguk University, Seoul 04620, Korea, Institute for Nano Quantum Information Electronics, The University of Tokyo, Tokyo 153-8505, Japan, Clarendon Laboratory, Department of Physics, University of Oxford, Parks Road, Oxford OX1 3PU, UK

18:00 **Highly conductive n-type GaN with high electron mobility prepared by pulsed sputtering** A 1.16

Kohei Ueno, Yasuaki Arakawa, Atsushi Kobayashi, Jitsuo Ohta, Hiroshi Fujioka
Institute of Industrial Science, The University of Tokyo, JST-PRESTO, JST-ACCEL

18:00 **Characteristics of AlN Layer on 4 inch Sapphire Substrate by High Temperature Annealing in Nitrogen Atmosphere** A 1.17

Akira Mishima¹, Yuji Tomita¹, Yoshiki Yano¹, Toshiya Tabuchi¹, Koh Matsumoto¹, and Hideto Miyake²

¹ Taiyo Nippon Sanso Corporation Tsukuba-city, Ibaraki 300-2611, Japan, ² Graduate School of Regional Innovation Studies, Mie University, Tsu-city, Mie 514-8507, Japan

18:00 **High Temperature Electrical Transport Study of MBE grown Mg-doped AlGaN** A 1.18

(1) S.Contreras, L. Konczewicz, S. Juillaguet, H. Peyre, (2) M. Al Khalfioui, S. Matta, M. Leroux, B. Damilano and J. Brault

(1) Laboratoire Charles Coulomb (L2C), UMR 5221 CNRS-Université de Montpellier, Montpellier, FR-34095, France (2) CRHEA-CNRS, Centre de Recherche sur l'Hétéro-Epitaxie et ses Applications, CNRS, Rue B. Grégory, Valbonne 06560, France

18:00 **Eu-implanted AlGaN/GaN diode structures towards efficient solid-state lighting** A 1.19

N. Ben Sedrine^{1,*}, J. Rodrigues¹, A. F. Martins¹, D. Nd. Faye², M. Fialho², S. Magalhães², M. R. Correia¹, A. J. Neves¹, E. Alves², M. Bockowski³, V. Hoffmann⁴, M. Weyers⁴, K. Lorenz², and T. Monteiro¹

¹Departamento de Física e I3N, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal ²IPFN, Instituto Superior Técnico, Campus Tecnológico e Nuclear, Estrada Nacional 10, P-2695-066 Bobadela LRS, Portugal ³Institute of High Pressure Physics, Polish Academy of Sciences, 01-142 Warsaw, Poland ⁴Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Straße 4, 12489 Berlin, Germany

18:00 **Study of Al_xGa_{1-x}N nanowires implanted with Eu for solid-state nano-devices** A 1.20

N. Ben Sedrine^{1,*}, J. Cardoso¹, A. Alves¹, A. F. Martins¹, A. J. Neves¹, D. Nd. Faye², M. Belloeil³, B. Daudin³, M. Peres², E. Alves², K. Lorenz², M. R. Correia¹ and T. Monteiro¹

¹Departamento de Física e I3N, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal ²IPFN, Instituto Superior Técnico, Campus Tecnológico e Nuclear, Estrada Nacional 10, P-2695-066 Bobadela LRS, Portugal ³Univ. Grenoble Alpes, CEA/CNRS Group, “Nanophysique et Semiconducteurs”, F-38000 Grenoble, France

18:00 **Modification of internal mechanical stresses of epitaxial GaN by weak magnetic field treatment** A 1.21

Red'ko R.A., Milenin G.V., Red'ko S.M.

V. Lashkaryov Institute of Semiconductor Physics, NAS of Ukraine

18:00 **Radiative Atomic Transition from Rare Earth Doped GaN** A 1.22

Pratim Kumar Saha, Swaroop Ganguly and Dipankar Saha
Indian Institute of Technology Bombay

18:00 **Role of point defects on the luminescent properties of epitaxial and ion-implanted Mg-doped GaN fabricated on a GaN substrate** A 1.23

S. F. Chichibu^[1,2], K. Kojima^[1], S. Takashima^[3], M. Edo^[3], K. Ueno^[3], M. Shimizu^[4], T. Takahashi^[4], S. Ishibashi^[4], and A. Uedono^[5]

¹ IMRAM, Tohoku University, ² IMaSS, Nagoya University, ³ Fuji Electric Co. Ltd., ⁴ AIST, ⁵ Univ. of Tsukuba

18:00 **Spatio-Time-Resolved Cathodoluminescence studies of h-BN microcrystals** A 1.24

S. F. Chichibu^[1], Y. Ishikawa^[1], Y. Kominami^[2], and K. Hara^[2]
¹ IMRAM, Tohoku University, ² RIE, Shizuoka University

18:00 **Alleviating parasitic reactions of III-nitride epitaxy in MOCVD systems with a spatial separated source delivery method** A 1.25

Ziguang Ma, Haojun Yang, Haiyan Wu, Wei Hu, Yang Jiang, Wenxin Wang, Haiqiang Jia, Junming Zhou and Hong Chen

Key Laboratory for Renewable Energy, Beijing Key Laboratory for New Energy Materials and Devices, Beijing National Laboratory for Condense Matter Physics, Institute of Physics, Chinese Academy of Sciences

18:00 **Potential Barrier formed around Dislocations in InGaN Quantum Well Structures by Spot Cathodoluminescence Measurements** A 1.26

Satoshi Kurai, Shota Higaki, Narihito Okada, Kazuyuki Tadatomo, Yoichi Yamada

Yamaguchi University

18:00 **Spatial Resolved Spectroscopy of Blue and Green InGaN Quantum Wells by Scanning Near-Field Optcal Microscopy** A 1.27

Satoshi Kurai, Renma Mihara, Genki Nobata, Kohei Okawa, Narihito Okada, Kazuyuki Tadatomo, Yoshiaki Yano, Toshiya Tabuchi, Koh Matsumoto, Yoichi Yamada

Yamaguchi University, TAIYO NIPPON SANSO Corporation

18:00 **Surface morphology and microstructure of pulsed DC magnetron sputtered piezoelectric AlN and AlScN thin films** A 1.28

Yuan Lu¹, Markus Reusch^{1, 2}, Nicolas Kurz^{1, 2}, Tim Christoph¹, Lutz Kirste¹, Vadim Lebedev¹ and Agnė Žukauskaitė¹

¹Fraunhofer Institute for Applied Solid State Physics IAF, Tullastraße 72, 79108 Freiburg, Germany, ²Laboratory for Compound Semiconductor Microsystems, IMTEK-Department of Microsystems Engineering, University of Freiburg, Georges-Koehler-Allee 103, 79110 Freiburg, Germany

18:00 **ITO nanowire networks applied on GaN-based LEDs as current spreading layer to enhance light extraction** A 1.29

Qiang Li, Feng Yun , Yufeng Li, XilinSu, Wen Ding, Ye Zhang

Key Laboratory of Physical Electronics and Devices for Ministry of Education and Shaanxi Provincial Key Laboratory of Photonics & Information Technology, Xi'an Jiaotong University, Xi'an, China, Solid-State Lighting Engineering Research Center, Xi'an Jiaotong University, Xi'an, China,

18:00 **Optimization of timing in growing InN epilayers by pulsed MOCVD** A 1.30

D.Dobrovolskas, J.Mickevičius, T.Steponavičius, S.Nargelias, R.Aleksiejunas, K.Nameika, T.Malinauskas, M.Kolenda, A.Kadys, and G.Tamulaitis

Institute of Applied Research and Semiconductor Physics Department, Vilnius University, Saulėtekio al. 3, Vilnius, LT-10257, Lithuania

18:00 **Spatial inhomogeneities in different thickness InN layers grown by pulsed MOCVD** A 1.31

D.Dobrovolskas, J.Mickevičius, T.Steponavičius, S.Nargelias, R.Aleksiejunas, K.Nameika, M.Kolenda, A.Kadys, and G.Tamulaitis

Semiconductor Physics Department and Institute of Applied Research, Vilnius University, Saulėtekio 3-III, LT-10257 Vilnius, Lithuania

18:00 **Spectroscopy of InGaN quantum wells by far field and near field techniques** A 1.32

Maximilian Ries, Norbert Esser, Volker Deckert

School of Analytical Sciences Adlershof (SALSA), Albert-Einstein-Strasse 5-9, 12489 Berlin, Germany, Leibniz Institut für Analytische Wissenschaften-ISAS e.V., Schwarzschildstrasse 8, 12489 Berlin, Germany, School of Analytical Sciences Adlershof (SALSA), Albert-Einstein-Strasse 5-9, 12489 Berlin, Germany, Leibniz Institut für Analytische Wissenschaften-ISAS e.V., Schwarzschildstrasse 8, 12489 Berlin, Germany, Leibniz Institute of Photonic Technology (IPHT), Albert-Einstein-Strasse 9, 07745 Jena, Germany

18:00 **Estimation of maximum excess carrier concentration in GaN under the electron beam irradiation** A 1.33

E.B. Yakimov

Institute of Microelectronics Technology RAS, Chernogolovka, Russia National University of Science and Technology MISiS, Moscow, Russia

18:00 **Structural, optical, and electrical properties of highly conductive HVPE-GaN doped with Si or Ge and grown on native seeds** A 1.34

Małgorzata Iwinska, Tomasz Sochacki, Bolesław Lucznik, Michał Fijałkowski, Mikołaj Amilusik, Michał Bockowski

Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland

18:00 **Optical properties of GaN nanowires with wide-bandgap-oxide shells** A 1.35

K. P. Korona¹, M. Sobanska², F. Sosada¹, A. Kamińska², K. Klosek², P. Dróżdż¹, G. Tchutchulashvili², and Z. R. Zytkiewicz²

¹ Institute of Experimental Physics, Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland, ² Institute of Physics, Polish Academy of Sciences, al. Lotników 32/46, 02-668 Warsaw, Poland,

18:00 **Highly resistive HVPE-GaN grown on native seeds with solid iron or methane as a source of dopants** A 1.36

Tomasz Sochacki, Małgorzata Iwinska, Bolesław Lucznik, Michał Fijałkowski, Mikołaj Amilusik, Michał Bockowski

Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland

18:00 **Investigation of Boron containing AIBN and AlBGaN Layers grown by MOVPE** A 1.37

O. Rettig¹, J.-P. Scholz², N. Steiger², S. Bauer², T. Hubáček^{1,4}, Y. Li³, H. Qi³, J. Biskupek³, U. Kaiser³, K. Thonke², F. Scholz¹

¹⁾ Institute of Optoelectronics, Ulm University, Albert-Einstein-Allee 45, 89081 Ulm, Germany, ²⁾ Institute of Quantum Matter / Semiconductor Physics Group, Ulm University, Albert-Einstein-Allee 45, 89081 Ulm, Germany, ³⁾ Central Facility of Electron Microscopy, Ulm University, 89081 Ulm, Germany, ⁴⁾ Permanent address: Institute of Physics CAS, v. v. i., Cukrovarnická 10, 162 00 Prague 6, Czech Republic

18:00 **Correlated Transmission Electron Microscopy and Atom Probe Tomography study of Boron distribution in BGaN** A 1.38

Bastien Bonef¹, Richard Cramer¹, James S. Speck¹

¹ Materials Department, University of California, Santa Barbara, CA 93106, USA

18:00 **Ultra-Smooth/ Planar Diamond and GaN Substrates for GaN on Diamond Applications** A 1.39

Rajiv K.Singh, Arul Chakkaravarthi, Arjunan

Sinmat Inc Gainesville FL 32653 -USA

18:00 **Monolayer-thick compositional inhomogeneities in AlGaN layers grown by plasma-assisted MBE with asymmetric nitrogen flux diagram** A 1.40

D.V. Nechaev¹, M.V. Rzheutski², E.V. Lutsenko², S. Rouvimov³, S.V. Ivanov¹, and V.N. Jmerik¹

¹Ioffe Institute, Polytekhnicheskaya 26, St. Petersburg 194021, Russia, ² Stepanov Institute of Physics, Nezalezhnosti Ave. 68, Minsk 220072, Belarus, ³ University of Notre Dame, Notre Dame, Indiana 46556, USA

18:00 **XRD analysis of volatiles deposited on furnace walls during ALN sintering and crystal growth process by PVT method** A 1.41

Q.K. Wang, J.Wang, J.W. Gong, L.X. Liu, K. Cao, Z.H. Wang, L. Wu

State Key Laboratory of Advanced Special Steel & Shanghai Key Laboratory of Advanced Ferrometallurgy & School of Materials Science and Engineering, Shanghai University, Shanghai 200072, China, Suzhou Ultratrend Technologies Co. Ltd, Suzhou City 215699, Jiangsu Province, China

18:00 **Narrow pitch pattern process at GaN double polarity selective area growth using MOVPE** A 1.42

H. Yagi, N. Osumi, Y. Inoue, T. Nakano

Dept. of Electronics and Materials Science, Shizuoka Univ., 3-5-1 Johoku, Hamamatsu, Japan

18:00 **Electrical property and band-structure in carbon nanotube/GaN hetero-interface and its application for device** A 1.43

Toshiya Yokogawa and Syota Miyake

Yamaguchi University

18:00 **High quality GaN epilayers grown on Si(110) substrates by MOCVD- Designing the buffer layers using ultra-thin AlN/GaN SL-** A 1.44

X.Q. Shen, T. Takahashi, T. Ide, and M. Shimizu

National Institute of Advanced Industrial Science and Technology (AIST), Japan

18:00 **A Study on the relation between impurity incorporation and bowing of the Freestanding GaN** A 1.45

Hae-Gon Oh, Young Jun, Choi, Seoug-Kuk Lee, Hae-Yong Lee, Ju-Hyung Ha, Jung-Young Jung, Jonghee Hwang

LumiGNtech Co., Ltd, Room 902, E-Dong, 60, Haan-ro Gwangmyeong-si, Gyeonggi-do, 14322 Korea, Korea Institute of Ceramic Engineering & Technology (KICET), Jinju-si, Gyeongsangnam-do, 52851 Korea

18:00 **Morphological study of InGaN layer growth on GaN substrate by metalorganic vapor phase epitaxy** A 1.46

Zhibin Liu, Ryosuke Miyagoshi, Shugo Nitta, Yoshio Honda, Hiroshi Amano,

Department of Electrical Engineering and Computer Science, Nagoya University, Institute of Materials and Systems for Sustainability, Nagoya Univ., Akasaki Research Center, Nagoya Univ., Venture Business Laboratory, Nagoya Univ.,

18:00 **Localization-enhanced biexciton binding in Ga-rich InGaN and AlGaN epitaxial layers** A 1.47

Kyohei Umezawa, Eiji Kobayashi, Hideaki Murotani, Satoshi Kurai, and Yoichi Yamada

Department of Electrical and Electronic Engineering, Yamaguchi University, Japan

18:00 **Effect of High Pressure on Optical Vibrations in Wurtzite InN** A 1.48

J. S. Reparaz[a], K. Pereira da Silva[a,b], M. R. Wagner[c], G. Callsen[c], J. Serrano[d], A. H. Romero[e], A. Hoffmann[c], A. R. Goñi[a,f]

[a] Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Campus UAB, 08193 Bellaterra, Spain [b] Faculdade de Física, Universidade Federal do Pará, CEP 66075-110, Belém, PA, Brazil

[c] Institut für Festkörperphysik, Technische Universität Berlin, Hardenbergstr. 36, 10623 Berlin, Germany [d] School of Physics Yachay Tech, Yachay City of Knowledge 100119-Urcuqui, Ecuador

[e] Physics & Astronomy Department, West Virginia University, USA [f] ICREA, Passeig Lluís Companys 23, 08010 Barcelona, Spain

18:00 **Polarity Inversion of AlN Layer Grown on a Nitrided a-Plane Sapphire Substrate using Pulsed DC Reactive Sputtering** A 1.49

Marsetio Noorprajuda, Makoto Ohtsuka, Hiroyuki Fukuyama

Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku Univ.

18:00 Atomic structure of inclined dislocation observed in GaN grown Si(111) A 1.50

Yewon Jo¹, Wontaek Ryu², Hionsuck Baik¹, Mino Yang^{1*}

¹ Seoul Center, Korean Basic Science Institute, Seoul 02841, Korea,
² Center for Inter-University Research Facility, Kookmin university, Seoul 02707, Korea

18:00 Polarized ultraviolet light emission from nonpolar a-plane n-ZnO/i-ZnO/p-AlGaN heterojunction light emitting diode A 1.51

Jun Zhang, Jingwen Chen, Feng Wu, Shuai Wang, Renli Liang, Jiangnan Dai, Changqing Chen

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

18:00 Structural impact on the nanoscale optical properties of InGaN core-shell nanorods A 1.52

J.T. Griffiths¹, C. X. Ren¹, P.-M Coulon², E D. Le Boulbar², C.G. Bryce³, I. Girgel², A. Howkins⁴, I. Boyd⁴, R. W. Martin³, D. W. E. Allsopp², P. A. Shields², C.J. Humphreys¹, and R.A. Oliver¹

1. Department of Materials Science and Metallurgy, Charles Babbage Road, Cambridge, CB3 0FS, United Kingdom, 2. Department of Electronic and Electrical Engineering, University of Bath, Bath, BA2 7AY, United Kingdom, 3. Department of Physics, SUPA, University of Strathclyde, Glasgow, G4 0NG, United Kingdom, 4. Experimental Techniques Centre, Brunel University, Uxbridge, UB8 7BQ, United Kingdom

18:00 Raman study of GaN and AlGaN single nanowire pn junctions for ultraviolet emitters A 1.53

A. Cros, N. Garro, S. Murcia-Mascaro, M. Belloeil, A.M. Siladie, B. Gayral, B. Daudin

Materials Science Institute (ICMUV), University of Valencia, P. O. Box 22085, E46071, Valencia, Spain, Univ. Grenoble Alpes, France and CEA, INAC-PHELIQS, "Nanophysics and semiconductors" group, F38000 Grenoble

18:00 Correlation between photoluminescence and structural properties in InGaN/GaN heterostructures A 1.54

A. Minj, Q-T. Li, M. F. Romero, Y. Wang, O. Tuna, M. Feneberg, R. Goldhahn, G. Schmerber, C. Giesen, M. Heuken, P. Ruterana,

CIMAP, CNRS UMR 6252, 6 Boulevard du Maréchal Juin, 14050 Caen Cedex, France, Instituto de Sistemas Optoelectricos y Microtecnologia and Dpto. de Ingenieria Electronica, E.T.S.I.Telcomunicacion, Universidad Politecnica de Madrid, Avda. Complutense 30, Ciudad Universitaria,28040 Madrid, Spain,AIXTRON SE, Kaiserstr. 98, 52134 Herzogenrath, Germany,Institut fur Experimentelle Physik, Otto-von-Guericke-Universitat Magdeburg, Universitätsplatz 2,39106 Magdeburg, Germany,Institut de Physique et Chimie des Materiaux de Strasbourg (IPCMS), UMR 7504 CNRS-UdS, 23 rue du Loess, BP 43, 67034-Strasbourg Cedex 2, France

18:00 Probing the electrical properties of thin nitride heterostructures below surface by electric force microscopy A 1.55

A. Minj, A. Cros, N. Garro, P. Ruterana

CIMAP, UMR 6252, ENSICAEN, 6 Bd Maréchal Juin, 14050 Caen Cedex 4, France, Institute of Materials Science (ICMUV), Universidad de Valencia, P.O. Box 22085, E-46071, Valencia, Spain

18:00 Controlled-Growth GaN Nanowires Using HVPE by Catalyst Engineering A 1.56

Zhiqiang Liu, Xiaoyan Yi, Shaoteng Wu, Junxi Wang, Jinmi Li

R&D Center for Semiconductor Lighting, Chinese Academy of Sciences, Beijing 100083, P. R. China

18:00 **Nanoscopic Optical Properties of InGaN/GaN Quantum Wells with V-Pit Using Near-Field Scanning Optical Microscopy and Correlation** A 1.57

MinKwan Kim¹, Sunghan Choi², Joo-Hyung Lee², ChungHyun Park^{2, 3}, Tae-Hoon Chung⁴, Jong Hyeob Baek⁴, Yong-Hoon Cho^{2,3}

¹Department of Nanoscience and Technology, Korea Advanced Institute of Science and Technology 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea , ²Department of Physics, Korea Advanced Institute of Science and Technology 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea , ³KI for the NanoCentury, Korea Advanced Institute of Science and Technology, Daejeon 305-701, Republic of Korea , ⁴LED Research and Business Division, Korea Photonics Technology Institute, Gwangju 61007, Korea

18:00 **Maskless and Polarity-Controlled Selective Area Epitaxy of 3D-GaN on Si(111)** A 1.58

C. Blumberg⁽¹⁾, S. Grosse⁽¹⁾, W.-A. Quitsch⁽²⁾, G. Bacher⁽²⁾, W. Prost⁽¹⁾

1) University of Duisburg-Essen, Solid-State Electronics Department, Faculty of Engineering, and CENIDE, Duisburg 2) University of Duisburg-Essen, Werkstoffe der Elektrotechnik, Faculty of Engineering, and CENIDE, Duisburg

18:00 **Effect of Boron Incorporation into Thin AlGaN Quantum Wells Grown by MOVPE** A 1.59

Tomas Hubacek^{1,2}, Oliver Rettig¹, Marketa Zikova^{1,2}, Jan-Patrick Scholz³, Matthias Hocker³, Natja Steiger³, Klaus Thonke³, Yueliang Li⁴, Ute Kaiser⁴, and Ferdinand Scholz¹

1 Institute of Optoelectronics, Ulm University, Albert-Einstein-Allee 45, 89081 Ulm, Germany, 2 Permanent address: Institute of Physics CAS, v. v. i., Cukrovarnická 10, 162 00 Prague 6, Czech Republic, 3 Institute of Quantum Matter/ Semiconductor Physics Group, Ulm University, Albert-Einstein-Allee 45, 89081 Ulm, Germany, 4 Central Facility of Electron Microscopy, Ulm University, 89081 Ulm, Germany,

18:00 **Reflectivity of plasmon–phonon modes in grating-coupled AlGaN/GaN heterostructures grown on SiC and GaN substrates** A 1.60

V. Janonis*, V. Jakstas*, I. Grigelionis*, I. Kasalynas*, P. Prystawko**, P. Kruszewski**, M. Leszczynski**

* Center for Physical Sciences and Technology, Saulėtekio al. 3, LT-10222 Vilnius, Lithuania, ** Institute of High Pressure Physics, Polish Academy of Sciences, Sokółowska 29/37, 01-142 Warsaw, Poland

18:00 **Carbon nanotube assisted Lift off of GaN layers on sapphire** A 1.61

HaoLong (a), Xiaohui.Feng (b), Yang Wei (c), Tongjun Yu (*b), Shoushan Fan (c), Leiying, Ying (a) and Baoping Zhang (*a)

(a) Department of Electronic Engineering, Optoelectronics Engineering Research Center, Xiamen University, Xiamen, 361005, China (b) State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China (c) Department of Physics and Tsinghua-Foxconn Nanotechnology Research Center, Tsinghua University, Beijing, 100084,China

18:00 **One-step fabrication of porous GaN crystal membrane and its application in energy storage** A 1.62

Lei Zhang, Shouzhi Wang, Yongzhong Wu, Xiaopeng Hao

State Key Lab of Crystal Materials, Shandong University, Jinan, 250100, P.R. China

18:00 **Terahertz electroluminescence of shallow impurities in AlGaN/GaN heterostructures at temperatures above 80 K** A 1.63

I. Grigelionis¹, V. Jakštas¹, V. Janonis¹, I. Kašalynas¹, P. Prystawko², P. Kruszewski², M. Leszczynski²

¹Center for Physical Sciences and Technology, Saulėtekio al. 3, LT-10222 Vilnius, Lithuania, ²Institute of High Pressure Physics, Polish Academy of Sciences, Sokółowska 29/37, 01-142 Warsaw, Poland

18:00 Electrical and optical properties of oxygen-doped ammonothermal GaN A 1.64

W. Jiang, D. Ehrentraut, and M. P. D'Evelyn

Soraa, Inc., Goleta, California 93117, USA

18:00 Solution process of graphene induced ohmic contact between metal and AlGaN/GaN for HEMTs A 1.65

Kang Bok Ko, Do Trong Thanh , Min Han , Beo Deul Ryu , Jo Chang Hee, Joo Kwan Seon, Tran Viet Cuong , Chang-Hee Hong

Semiconductor Physics Research Center, School of Semiconductor and Chemical Engineering, Chonbuk National University, Deokjin-gu, Jeonju, 561-756, South Korea

18:00 Characteristics comparison between GaN layer grown on patterned sapphire substrate and planar sapphire substrate by HVPE method A 1.66

Won-Jun Lee,Mi-Seon Park,Won-Jae Lee , Young-Jun Choi,Hae-Yong Lee

Department of Advanced Materials Engineering, Electronic Ceramics Center, Dong-Eui University, Busan 47340, Republic of Korea , LumiGNtech Co., Ltd., Room 902, E-dong, Gwangmyeong Techno-Park, 1345 Soha-dong, Gwangmyeong-si, Gyeonggi-do 14322, Republic of Kore

18:00 Crack statistics and stress analysis of thick crack free GaN on patterned silicon substrate A 1.67

T. Hossain^{1,2} , M. J. Rashid^{1,2}, E. Frayssinet¹, N. Baron¹, B. Damilano¹, F. Semond¹, J. Wang³, L. Durand^{3,4}, A. Ponchet³, F. Demangeot^{3,4} and Y. Cordier¹

¹CRHEA-CNRS, Rue Bernard Grégory, Sophia Antipolis, 06560 Valbonne, France. ²Université de Nice Sophia Antipolis, Parc Valrose, F-06102 Nice Cedex 2, France. ³CEMES-CNRS UPR-8011, 29 rue Jeanne Marvig, 31055 Toulouse Cedex 4, France ⁴Université de Toulouse, UPS, 118 Route de Narbonne, 31062 Toulouse, France

18:00 GaN/AlGaN Heterostructure Integration on Si Substrates: Hillock Growth Phenomena and Control A 1.68

P. Sana¹, H. Tetzner¹, R. Delgado¹, L. Lupina¹, A. Schubert¹, W. Seifert¹, S. Thapa², P. Storck², M. Zöllner¹ and T. Schroeder¹

¹IHP, Im Technologiepark 25, 15236 Frankfurt (Oder), Germany
²Siltronic AG, Hans Seidel Platz 4, 81737 Munich, Germany

18:00 Reduction of Defect States in n-GaN Due to AlN Underlayer Revealed by Below-Gap Excitation A 1.69

M. D. Haque, M. Julkarnain,N. Kamata, and T. Fukuda

M. D. Haque, N. Kamata, and T. Fukuda, Department of Functional Materials Science, Saitama University, Saitama 338-8570, Japan M. Julkarnain, Faculty of Engineering, University of Rajshahi, Rajshahi 6205, Bangladesh

18:00 Effective Cross-Plane Thermal Conductivity of GaN-on-Si (111) Epi-layers Evaluated by 3-Omega Technique A 1.70

Qilong Bao, Yang Li, Zhaofu Zhang, Qingkai Qian, Jiacheng Lei, Gaofei Tang, Baoling Huang and Kevin J. Chen

Dept. of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong, China, Dept. of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology, Hong Kong, China

18:00 Optical properties of cubic GaN quantum dot pairs grown by molecular beam epitaxy A 1.71

S. Blumenthal, D. Reuter, D. J. As

University of Paderborn, Faculty of Physics, Department of Optoelectronic Semiconductors

18:00 Photoluminescence characterization of germanium doped cubic Al_xGa_{1-x}N grown by molecular beam epitaxy A 1.72

Michael Deppe, Fabian Tacken, Dirk Reuter, Donat J. As

University of Paderborn, Department of Physics, Warburger Str. 100, 33098 Paderborn, Germany

18:00 **Highly Mg-doped GaN dots and films grown at low temperature by VLS transport** A 1.73

A. Jaud, T. Abi Tannous, A. Kahouli, S. Linas, G. Ferro, C. Brylinski, L. Auvray

Université de Lyon, Université Lyon 1, CNRS, UMR 5615, Laboratoire des Multimatériaux et Interfaces, 43 bd du 11 Novembre 1918, 69622 Villeurbanne Cedex, France

18:00 **In depth investigations of the threading dislocations in GaN epitaxial films using X-ray diffraction methods** A 1.75

C.Romanian[1,2]

1 National Institute for R&D in Microtechnologies, 72996, Bucharest, Romania 2 Faculty of Physics, 405 Atomistilor Street, Magurele RO-077125, Romania

18:00 **Correlation of decay time and barrier thickness for Asymmetric Cubic GaN/ Al_{0.64}Ga_{0.36}N DQWs** A 1.76

Tobias Wecker¹, Gordon Callsen², Axel Hoffmann², Dirk Reuter¹, and Donat J. As¹

¹Department of Physics, University of Paderborn, Warburger Strasse 100, 33098 Paderborn, Germany ²Institut für Festkörperphysik, Technische Universität Berlin, Straße des 17. Juni 135, 10623 Berlin, Germany

18:00 **Dislocation Formation in Nano-Indented GaN with Different Dislocation Densities** A 1.77

K Jones, R Tompkins, E Krimsky, M Derenge, D Magagnosc, B Schuster

US Army Research Lab

18:00 **Investigation of the growth of GaN films on 3C-SiC/Si(111) epilayers by Vapor-Liquid-Solid transport** A 1.78

T. Abi-Tannous, A. Jaud, A. Kahouli, L. Auvray, G. Ferro, C. Brylinski

Laboratoire des Multimatériaux et Interfaces, Centre National de la Recherche Scientifique, University of Lyon, Lyon 69621, France

18:00 **Charge trapping in Au mono-atomic layer islands grown on AlN(0001)** A 1.79

Bulent Baris, Hassan Khoussa, Benoit Eydoux, Thibault Arduin, David Martrou, Olivier Guillermet and Sébastien Gauthier

CEMES-CNRS, 29 rue J. Marvig, 31055 Toulouse Cedex, France

18:00 **Effect of the interface properties on the electrical characteristics in InGaN-based multijunction solar cell** A 1.80

Abdoulwahab Adaine, Sidi Ould Saad Hamady and Nicolas Fressengeas

Université de Lorraine, Laboratoire Matériaux Optiques, Photonique et Systèmes, Metz, F-57070, France. Laboratoire Matériaux Optiques, Photonique et Systèmes, CentraleSupélec, Université Paris-Saclay, Metz, F-57070, France.

18:00 **Examination of the Plasma Parameters of Aluminum Nitride Atomic Layer Epitaxy with Grazing Incidence Small Angle X-ray Scatterin** A 1.81

V. R. Anderson¹, N. Nepal¹, S. D. Johnson¹, D. R. Boris¹, S. G. Walton¹, Z. R. Robinson², A. C. Kozen¹, A. Nath³, S. G. Rosenberg¹, C. Wagenbach⁴, J. K. Hite¹, K. F. Ludwig, Jr.⁴, C. R. Eddy, Jr.¹

¹U.S. Naval Research Laboratory, ²The College at Brockport SUNY, ³George Mason University, ⁴Boston University

18:00 **Compositional modulation and plastic relaxation in semipolar (11-22) AlGaN grown by MOVPE** A 1.82

P. de Mierry, R. Mantach, F. Tendille, O. Tottreau, P. Vennégùès, M. Nemoz, G. Feuillet, Y. Cordier.

Université Côte d'Azur, CRHEA-CNRS, rue B. Grégory, F-06560 Valbonne

18:00 **N2 carrier gas as an alternative to H2 for improved surface morphology and structural quality of MOVPE-grown m-plane (10-10) GaN** A 1.83

Ousmane I Barry¹, Si-Young Bae², Kaddour Lekhal², Yoshio Honda², and Hiroshi Amano^{2,3}

¹Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya, Aichi 464-8603, Japan, ²Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Aichi 464-8603, Japan, ³Akasaka Research Center, Nagoya University, Nagoya, Aichi 464-8603, Japan

18:00 **Incorporation of Europium into GaN nanowires by ion implantation** A 1.84

M. Peres¹, D.Nd. Faye¹, X. Biquard^{2,4}, E. Nogales³, M. Felizardo¹, A. Redondo-Cubero¹, T. Auzelle^{4,5}, B. Daudin^{4,5}, L.H.G. Tizei⁶, M. Kociak⁶, P. Ruterana⁷, B. Méndez³, E. Alves¹, K. Lorenz¹

¹IPFN, Instituto Superior Técnico, Universidade de Lisboa, Campus Tecnológico e Nuclear, Estrada Nacional 10, 2695-066 Bobadela LRS, Portugal ² CEA, INAC-MEM, CEA-Grenoble, 17 av des Martyrs, 38054 Grenoble cedex 9, France ³ Departamento de Física de Materiales, Universidad Complutense, 28040 Madrid, Spain ⁴ Univ. Grenoble Alpes, 38000 Grenoble, France ⁵ CEA, INAC-PHELIQSCEA-Grenoble, 17 av des Martyrs, 38054 Grenoble cedex 9, France ⁶ Laboratoire de Physique des Solides, Université Paris-Sud, CNRS-UMR 8502, Orsay 91405, France ⁷Centre de recherche sur les Ions les Matériaux et la Photonique (CIMAP) ENSICAEN, Boulevard Maréchal Juin 14050 Caen France

18:00 **A study and development of ZrTiN thin films (1 nm ~ 50 nm) are deposited by HiPIMS at room temperature** A 1.85

Yu-Wei Lin, Jia-Hong Huang, Ge-Ping Yu, Chien-Nan Hsiao, Fong-Zhi Chen

1. Instrument Technology Research Center, National Applied Research Laboratories, 2. Department of Engineering and System Science National Tsing Hua University, 3. Institute of Nuclear Engineering and Science National Tsing Hua University.

18:00 **Structural and electronic characterization of III-nitride material ScGaN** A 1.86

Simona Pace, Robert J Davies, Michelle A Moram

Department of Materials, Imperial College London, Exhibition Road, London SW7 2AZ, UK

18:00 **Stabilization of Au mono-atomic layer islands on the AlN(0001) (2x2) reconstructed surface** A 1.87

Hassan Khoussa, Bulent Baris, Olivier Guillermet, Benoit Eydoux, Sébastien Gauthier, Xavier Bouju, David Martrou

Centre d'élaboration de matériaux et d'études structurales, CEMES-CNRS, UPR 8011, Nanosciences Group, 29 rue Jeanne Marvig, F-31055 Toulouse, France, Université Toulouse III, UPS, 118 route de Narbonne, F-31062 Toulouse, France, Laboratoire LSMC, Université d'Oran 1 Ahmed Ben Bella, 31100 Oran, Algérie

18:00 **Heteroepitaxy of GaN on sapphire by high temperature vapor phase epitaxy** A 1.88

G. Lukin¹, T. Schneider¹, C. Schimpf², M. Barchuk², F. Zimmermann³, C. Röder⁴, E. Niederschlag¹, O. Pätzold¹, M. Stelter¹

¹Institute of Nonferrous Metallurgy and Purest Materials, TU Bergakademie Freiberg, Leipziger Str. 32, 09599 Freiberg ²Institute of Material Science, TU Bergakademie Freiberg, Gustav-Zeuner-Str. 5, 09599 Freiberg ³Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, 09599 Freiberg ⁴Institute of Theoretical Physics, TU Bergakademie Freiberg, Leipziger Str. 23, 09599 Freiberg

18:00 **Connection Between Carrier Diffusivity, Lifetime, and Localization in AlGaN** A 1.89

Žydrūnas Podlipskas, Ramūnas Aleksiejūnas, Jūras Mickevičius, Martynas Riauka

Institute of Applied Research, Vilnius University, Vilnius, Lithuania

18:00 **Developments in Periodically Oriented Gallium Nitride** A 1.90

Jennifer K. Hite¹, Steven R. Bowman¹, Christopher G. Brown¹, Jacob H. Leach², Kevin Udvary², Michael A. Mastro¹, Jaime A. Freitas, Jr.¹, Francis J. Kub¹, and Charles R. Eddy, Jr.¹

¹U.S. Naval Research Laboratory, 4555 Overlook Ave, SW, Washington, DC 20375 ²Kyma Technologies, Inc., 8829 Midway West Rd. Raleigh NC 27617 USA

18:00 **In-situ observation of AlN formation from Ni-Al melts** A 1.91

Sonoko Hamaya, Akari Sato, Masayoshi Adachi, and Hiroyuki Fukuyama

Institute of Multidisciplinary Research for Advanced Materials (IMRAM), Tohoku University.

18:00 **The structure of InGaN/GaN QWs for long wavelength emission** A 1.92

N. Chery¹, T. H. Ngo³, M.P. Chauvat¹, A. Minj¹, B. Damilano², B. Gil³, T. Grieb⁴, M. Schowalter⁴, K. Müller-Caspary⁴, A. Rosenauer⁴, and P.Ruterana¹

[1] CIMAP, 6 Boulevard du Maréchal Juin 14000 Caen, France
[2] CRHEA, Rue Bernard Gregory 06560 Valbonne, France [3] Laboratoire Charles Coulomb, Batiment 13. Campus Triolet. Université de Montpellier. CC069, 34095 Montpellier [4] Institut für Festkörperphysik, Universität Bremen, Otto-Hahn-Allee 1, D-28359 Bremen, Germany

18:00 **Optical properties of InGaN alloys in the entire composition range** A 1.93

S.A. Kazazis¹, E. Papadomanolaki¹, M. Androulidaki², P. Tsotsis², S.I. Tsintzos², P.G. Savvidis², E. Iliopoulos^{1,2}

¹Department of Physics, University of Crete, Heraklion, Greece
²Microelectronics Research Group, IESL-FORTH, Heraklion, Greece ³Department of Materials Science and Technology, University of Crete, Heraklion, Greece

18:00 **Mechanical properties of cubic-BN bulk single crystal evaluated by nanoindentation** A 1.94

Momoko Deura, Kentaro Kutsukake, Yutaka Ohno, Ichiro Yonenaga, and Takashi Taniguchi

Tohoku University, National Institute for Materials Science

18:00 **The compressive strain release in $\text{In}_{x}\text{Ga}_{1-x}\text{N}/\text{GaN}$ heterostructures** A 1.95

Q.T. Li, A. Minj, M.P. Chauvat, P. Ruterana, N. Grandjean, C. Giesen and M. Heuken

CIMAP, UMR 6252, CNRS ENSICAEN UCBN CEA, 6 Boulevard du Maréchal Juin, 14050 Caen , France, Ecole Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland, AIXTRON SE, Kaiserstr. 98, 52134 Herzogenrath, Germany

18:00 **Growth of InN nanorods by MOVPE** A 1.96

C. Tessarek^{1,2,3}, S. Rechberger⁴, C. Dieker⁴, S. Figge¹, B. Hoffmann², G. Sarau², M. Bashouti², E. Specker⁴, M. Eickhoff¹, and S. Christiansen^{2,3}

¹Institute of Solid State Physics, University of Bremen, Otto-Hahn-Allee 1, 28359 Bremen, Germany, ²Max Planck Institute for the Science of Light, Günther-Scharowsky-Str. 1, 91058 Erlangen, Germany, ³Helmholtz Zentrum Berlin für Materialien und Energie GmbH, Hahn-Meitner Platz 1, 14109 Berlin, Germany, ⁴Institut für Mikro- und Nanostrukturforschung & Center for Nanoanalysis and Electron Microscopy (CENEM), Friedrich-Alexander-University Erlangen-Nürnberg, Cauerstr. 6, 91058 Erlangen, Germany

18:00 **Epitaxial Growth Evolution of N-polar GaN Films Grown on In Situ Deposited Porous SiNx Interlayer** A 1.97

Gaoqiang Deng, Yuantao Zhang, Zhen Huang, Baozhu Li, Baolin Zhang, and Guotong Du

State Key Laboratory on Integrated Optoelectronics, College of Electronic Science and Engineering, Jilin University, Qianjin Street 2699, Changchun 130012, China

18:00 **Ab initio investigations of In segregation in InGaN Grain boundary** A 1.98

Assa Aravindh S and Iman S Roqan

Spectroscopy and semiconductor group, Division of Physical Sciences and Engineering, King Abdullah University of Science and Technology, Saudi Arabia

18:00 **RF-MBE Growth of Indium Nitride on Graphene Substrate** A 1.99

Shingo Arakawa, Yuto Kubonaka, Shinichiro Mouri, Tsutomu Araki, Yasushi Nanishi

Department of Electrical and Electronic Engineering, Ritsumeikan University, Kusatsu, Shiga, 525-8577, Japan

18:00 **First-Principles Study of Non-Polar GaN Surfaces under the OVPE Growth Conditions** A 1.100

Takahiro Kawamura 1,2, Akira Kitamoto 2, Mamoru Imade 2, Masashi Yoshimura 2, Yusuke Mori 2, Yoshitada Morikawa 2, Yoshihiro Kangawa 3, Koichi Kakimoto 3

1 Graduate School of Engineering, Mie University, 2 Graduate School of Engineering, Osaka University, 3 Research Institute for Applied Mechanics, Kyushu University

B poster : Bruno Daudin

18:00 **A comparative study of GaN/AlGaN/sputtered AlN nucleation layers for application in GaN-based 375 nm ultraviolet LEDs** B 1.1

Shengjun Zhou, Hongpo Hu, Xingtong Liu, Chengqun Gui

1. School of Power and Mechanical Engineering, Wuhan University, Wuhan 430072, China, 2. School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai 200240, China, 3. Quantum Wafer Inc., Foshan 528251, China

18:00 **Enhanced optical output and reduction of the QCSE in surface plasmon-enhanced green light-emitting diodes with gold nanoparticle** B 1.2

Chuyoung Cho, Seong-Ju Park

Korea Advanced Nano fab Center, Suwon 443-270, Republic of Korea, Gwangju Institute of Science and Technology, Gwangju 500-712, Republic of Korea

18:00 **Photochromic switching of Eu-Mg defects in GaN(Mg):Eu** B 1.3

A.K. Singh¹, K.P. O'Donnell¹, P.R. Edwards¹, M. Yamaga², K. Lorenz³, M.J. Kappers⁴ and M. Boćkowski⁵

¹SUPA Physics, Strathclyde University, 107 Rottenrow, Glasgow G4 0NG, Scotland, UK, ²Department of Mathematical and Design Engineering, Gifu University,Gifu 501-1193, Japan, ³Instituto Superior Técnico, Universidade de Lisboa Campus Tecnológico e Nuclear, Estrada Nacional 102695-066 Bobadela LRS Portugal, ⁴Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge CB3 0FS, England, UK, ⁵Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland

18:00 **Room-temperature Lasing of Coupled GaN/InGaN Core-shell Nanorod Array** B 1.4

Chia-Yen Huang , Tsu-Ying Dai, Jing-Jie Lin , Tsu-Chi Chang , Che-Yu Liu , Kuo-Bin Hong, Tien-Chang Lu and Hao-Chung Kuo

Department of Photonics & Institute of Electro-Optical Engineering, National Chiao Tung University, Hsinchu 30010, Taiwan

18:00 **Ultrathin Al-doped Ag film as transparent conductive electrode in GaN-based ultraviolet light-emitting diodes** B 1.5

Mengling Liu¹, Cheng Zhang², Qinyu Cui², Shengjun Zhou¹, L. Jay Guo²

¹Mechanical Engineering, School of Power and Mechanical Engineering, Wuhan University

²Electrical Engineering and Computer Science, Michigan University

18:00 **Investigation of AlGaN-Based High-Voltage Ultraviolet Light-Emitting Diodes** B 1.6

Ray-Hua Horng, Chen-Hao Kuo, Ching-Ho Tien, and Dong-Sing Wuu

1. Departement of Electronics Engineering, National Chiao Tung University, Hsinchu 300, Taiwan 2. Graduate Institute of Precision Engineering, National Chung Hsing University, Taiwan 3. Department of Materials Science and Engineering, National Chung Hsing University, Taiwan

18:00 **Enhanced performance of nano-structured light-emitting diodes using localized surface plasmons** B 1.8

Jin Hyeon Yun, Kyu Cheol Kim, Won Wook Lee, A. Y. Polyakov, In Hwan Lee

School of Materials Science and Engineering, Korea University, Seoul 02841, Korea, School of Materials Science and Engineering, Korea University, Seoul 02841, Korea, School of Materials Science and Engineering, Korea University, Seoul 02841, Korea, Department of Semiconductor Electronics and Semiconductor Physics, National University of Science and Technology MISiS, Moscow, Russia, School of Materials Science and Engineering, Korea University, Seoul 02841, Korea

18:00 **Characteristics of HVPE vertical-type light emitting diode** B 1.9

(1) Injun Jeon, (1,2) Hunsoo Jeon, (1) Sung Geun Bae, (1) Min Yang, (1,2) Sam Nyung Yi, (1) Hyung Soo Ahn, (3) Young Moon Yu, (4) Yoshio Honda, (5) Nobuhiko Sawaki, and (6) Suck-Whan Kim

(1) Department of Electronic Material Engineering, Korea Maritime and Ocean University, Busan 49112, Korea (2) Compound Semiconductor Fabrication Technology Center, Korea Maritime and Ocean University, Busan 49112, Korea (3) LED-Marine Convergence Technology R&BD Center, Pukyong National University, Busan 48513, Korea (4) Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya 464-8603, Japan (5) Department of Electrical and Electronics Engineering, AIT, AICHI, 470-0392, Japan (6) Department of Physics, Andong National University, Andong 36729, Korea

18:00 **AlN microspheres grown by using hydride vapor phase epitaxy** B 1.10

(1,2) Hunsoo Jeon, (1) Injun Jeon, (1) Sung Geun Bae, (1) Min Yang, (1,2) Sam Nyung Yi, (1) Hyung Soo Ahn, (3) Young Moon Yu, (4) Yoshio Honda, (5) Nobuhiko Sawaki, and (6) Suck-Whan Kim

(1) Department of Electronic Material Engineering, Korea Maritime and Ocean University, Busan 49112, Korea (2) Compound Semiconductor Fabrication Technology Center, Korea Maritime and Ocean University, Busan 49112, Korea (3) LED-Marine Convergence Technology R&BD Center, Pukyong National University, Busan 48513, Korea (4) Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya 464-8603, Japan (5) Department of Electrical and Electronics Engineering, AIT, AICHI, 470-0392, Japan (6) Department of Physics, Andong National University, Andong 36729, Korea

18:00 **Mg doped-AlN epilayer grown by hydride vapor phase epitaxy method** B 1.11

(1) Sung Geun Bae, (1) Injun Jeon, (1,2) Hunsoo Jeon, (1) Min Yang, (1,2) Sam Nyung Yi, (1) Hyung Soo Ahn, (3) Young Moon Yu, (4) Suck-Whan Kim, (5) Yoshio Honda, and (6) Nobuhiko Sawaki

(1) Department of Electronic Material Engineering, Korea Maritime and Ocean University, Busan 49112, Korea (2) Compound Semiconductor Fabrication Technology Center, Korea Maritime and Ocean University, Busan 49112, Korea (3) LED-Marine Convergence Technology R&BD Center, Pukyong National University, Busan 48513, Korea (4) Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya 464-8603, Japan (5) Department of Electrical and Electronics Engineering, AIT, AICHI, 470-0392, Japan (6) Department of Physics, Andong National University, Andong 36729, Korea

18:00 Properties of AlGaN-based vertical-type white LED grown by HVPE B 1.12

(1)Injun Jeon, (1,2)Hunsoo Jeon, (1)Sung Geun Bae, (1)Min Yang, (1,2)Sam Nyung Yi, (1)Hyung Soo Ahn, (3)Young Moon Yu, (4)Yoshio Honda, (5)Nobuhiko Sawaki, and (6)Suck-Whan Kim

(1)Department of Electronic Material Engineering, Korea Maritime and Ocean University, Busan 49112, Korea (2)Compound Semiconductor Fabrication Technology Center, Korea Maritime and Ocean University, Busan 49112, Korea (3)LED-Marine Convergence Technology R&BD Center, Pukyong National University, Busan 48513, Korea (4)Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya 464-8603, Japan (5)Department of Electrical and Electronics Engineering, AIT, AICHI, 470-0392, Japan (6)Department of Physics, Andong National University, Andong 36729, Korea

18:00 Deep traps and low frequency noise in MQW GaN/InGaN UV LEDs B 1.13

A.Y. Polyakov 1, N.B. Smirnov 1, N.M. Shmidt 2, E.I. Shabunina 2, Han-Su Cho 3, Sung-Min Hwang 4, In- Hwan Lee 3, I.V. Shchemberov 1, S.J. Pearton 5

1 National University of Science and Technology MISiS, Moscow, Russia, 2 Ioffe Physico-Technical Institute, 26 Polytekhnicheskaya Str., St. Petersburg 194021, Russia, 3 School of Materials Science and Engineering, Korea University, Seoul 02841, Korea, 4 Soft-Epi Inc., Opo-ro 240, Gwangju-si, Gyeonggi-do 464-892, South Korea, 5 University of Florida, Gainesville, FL 32611, USA

18:00 The evolution of deep traps spectra in GaN-based LEDs when moving from NUV to green spectral regions B 1.14

A.Y. Polyakov1, N.B. Smirnov1, In-Hwan Lee2, Han-Su Cho2, Tae-Hoon Chung3, Sung-Min Hwang4, J.H. Baek3, S.J. Pearton5

1National University of Science and Technology MISiS, Moscow, Leninskiy pr. 4, Moscow 119049, Russia, 2School of Materials Science and Engineering, Korea University, Seoul 02841, Korea, 3Korea Photonics Technology Institute, Gwangju 500-779, South Korea, 4Soft-Epi Inc., Opo-ro 240, Gwangju-si, Gyeonggi-do 464-892, South Korea, 5Department of Materials Science and Engineering, University of Florida, Gainesville, FL

18:00 High power 3D flip-chip LEDs B 1.15

Chenju Zheng, Jiajiang Lv, Shengjun Zhou, Sheng Liu

School of Power and Mechanical Engineering, Wuhan University

18:00 Study on Thermal Dynamics of Flip-Chip GaN Light-Emitting Diodes B 1.16

Byungjin Ma, Taehee Jung, and Kwanhun Lee

Korea Electronics Technology Institute

18:00 Asymmetric ITO/Ag/AlN/Al₂O₃ multilayer electrodes for UV LEDs B 1.17

Byeong Ryong Lee, Kyung Rock Son, Tae Ho Lee, Hyun Tae Kim, Young Woon Kim, Tae Geun Kim*

School of Electrical Engineering, Korea University, Seoul 136-701, Republic of Korea

18:00 Growth of high quality GaN layer on partially crystallized cavity engineered sapphire substrate B 1.18

Jeonghwan Jang1, Seungmin Lee1, Daeyoung Moon1, Yongjo Park1,2, and Euijoon Yoon1,*

1Department of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea 2Energy Semiconductor Research Center, Advanced Institutes of Convergence Technology, Seoul National University, Suwon 443-270, Korea *Corresponding author: Tel: 82-2- 880-7169, E-mail address: eyoon@snu.ac.kr

18:00 Flexibly and Repeatedly Tuning Lasing Wavelengths in Single GaN/InGaN Core-Shell Microrod B 1.19

Hua Zong,Yue Yang,Chuang Ma,Tiantian Wei,Caofeng Pan,Xiaodong Hu

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, P. R. China, Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, Beijing 100083, P. R. China

18:00 Monolithic wideband InGaN/GaN LED: from green to blue light emission in one device. B 1.20

Piotr A. Dróżdż(1,2), Marcin Sarzyński(1), Krzysztof P. Korona(2), Robert Czernecki(1) and Tadeusz Suski(1)

(1) Institute of High Pressure Physics “Unipress”, Polish Academy of Sciences, Sokołowska 29/37, 01-142 Warsaw, Poland, (2) Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland,

18:00 Lateral Energy Transport in InGaN LED Structure on Patterned GaN Substrate. B 1.21

Piotr A. Dróżdż(1,2), Marcin Sarzyński(2), Krzysztof P. Korona(1), Robert Czernecki(2), Szymon Grzanka(2), Tadeusz Suski(2)

(1) Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland, (2) Institute of High Pressure Physics “Unipress”, Polish Academy of Sciences, Sokołowska 29/37, 01-142 Warsaw, Poland,

18:00 Pressure-dependence of the built-in electric field in GaN/AIGaN multi-quantum-wells: experimental and ab-initio studies B 1.22

A. Kaminska^{1,2}, K. Koronski¹, P. Strak³, A. Wierzbicka¹, E. Grzanka³, K. Sobczak¹, M. Sobanska¹, K. Klosek¹, E. Monroy^{4,5}, Z. R. Zytkiewicz¹, S. Kukowski³

1 Institute of Physics, Polish Academy of Sciences, Aleja Lotników 32/46, PL-02668 Warsaw, Poland, 2 Cardinal Stefan Wyszyński University, College of Science, Department of Mathematics and Natural Sciences, Dewajtis 5, 01-815 Warsaw, Poland, 3 Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland, 4 Université Grenoble-Alpes, 38000 Grenoble, France, 5 CEA Grenoble, INAC-PHELIQS, 17 av. des Martyrs, 38054 Grenoble, France,

18:00 Strain and compositional analysis of BAIN/Al(Ga)N structures for distributed Bragg reflector application B 1.23

Haiding Sun¹, Feng Wu¹, T. M. Altahtamouni², Dalaver H. Anjum³, Theeradetch Detchprohm⁴, Russell D. Dupuis⁴, Xiaohang Li¹

¹Computer, Electrical and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia ²Materials Science and Technology Program, College of Arts and Sciences, Qatar University, Doha 2713, Qatar ³King Abdullah University of Science and Technology (KAUST), Imaging and Characterization Core Lab, Thuwal 23955, Saudi Arabia ⁴Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332, USA

18:00 Highly efficient GaN micro-light-emitting diodes using AlN rod-shaped glass electrodes B 1.24

Kyung Rock Son, Hyun Tae Kim, Tae Ho Lee, Byeong Ryong Lee, Tae Geun Kim

School of Electrical Engineering, Korea University

18:00 Polariton Luminescence in InGaN Quantum Wells Microcavity at Room Temperature B 1.25

JinZhao Wu¹, Hao Long¹, BaoPing Zhang^{1*}

¹Department of Electronic Engineering, Optoelectronics Engineering Research Center, Xiamen University Xiamen 361005, China

18:00 Enhanced optical output power of blue light-emitting diode grown on sapphire substrate with distributed Bragg reflector mask B 1.26

Chu-Young Cho, Yumin Koh, Kyung-Ho Park, Won-Kyu Park, Seong-Ju Park

Korea Advanced Nano fab Center, Suwon 443-270, Republic of Korea, Gwangju Institute of Science and Technology, Gwangju 500-712, Republic of Korea

18:00 **Investigation of electron blocking layers in AlGaN-based 280 nm ultraviolet light emitting diodes** B 1.27

Yi-Keng Fu, Chia-Lung Tsai, Chien-Pin Lu

Electronic and Optoelectronic System Research Laboratories, Industrial Technology Research Institute, Hsinchu 31040, Taiwan, R.O.C.

18:00 **From large-size to micro-LEDs: scaling trends revealed by modeling** B 1.28

S. S. Konoplev, K. A. Bulashevich, S. Yu. Karpov

STR Group - Soft-Impact, Ltd., P.O.Box 83, 27 Engels ave., St.Petersburg, 194156 Russia

18:00 **Large area polymer films embedded with colloidal semiconductor quantum dots for efficient white light generation** B 1.29

Kang-Bin Bae, Won-Wok Lee, Hyeon-Yong Song, In-Hwan Lee

Korea University Department of Materials Science and Engineering

18:00 **Performance improvement of InGaN/GaN MQW Visible-light Photodiodes by optimizing TEGa flow** B 1.30

Bin Li¹, Shan-jin Huang¹, Hai-long Wang¹, Hua-long Wu¹, Zhi-sheng Wu², Gang Wang² and Hao Jiang²

¹School of physics and engineering, Sun Yat-Sen University, Guangzhou 510275, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, School of Electronics and Information Technology, Sun Yat-Sen University, Guangzhou 510275, China

18:00 **Effects of pattern size on performance of nitride-based ultraviolet light-emitting diodes grown on patterned sapphire substrate** B 1.31

Hongpo Hu, Shengjun Zhou, Chengqun Gui, Sheng Liu

School of Power and Mechanical Engineering, Wuhan University, Wuhan 430072, China

18:00 **Resin encapsulation using amorphous fluorine polymer with robustness against deep-ultraviolet-induced photolysis** B 1.32

Yosuke Nagasawa¹, Kiho Yamada¹, Shouko Nagai¹, Akira Hirano¹, Masamichi Ipponmatsu¹, Ko Aosaki², Yoshio Honda³, Hiroshi Amano³, 4, Isamu Akasaki⁴, 5

UV Craftory Co., Ltd. 1, Asahi Glass Co. Ltd. 2, IMaSS-Nagoya University 3, ARC-Nagoya University 4, Meijo University 5

18:00 **Temperature dependence of Stokes shifts of excitons and biexcitons in Al_{0.61}Ga_{0.39}N epitaxial layers** B 1.33

Hideaki Murotani¹, Kazuki Ikeda², Takuto Tsurumaru², Ryota Fujiwara², Satoshi Kurai², Hideto Miyake³, Kazumasa Hiramatsu³, Yoichi Yamada²

¹Department of Computer Science and Engineering, National Institute of Technology, Tokuyama College, Gakuen-dai, Shunan, Yamaguchi 745-8585, Japan, ²Department of Electrical and Electronic Engineering, Yamaguchi University, 2-16-1 Tokiwadai, Ube, Yamaguchi 755-8611, Japan, ³Department of Electrical and Electronic Engineering, Mie University, 1577 Kurimamachiya, Tsu, Mie 514-8507, Japan

18:00 **Effects of saturation of nonradiative recombination centers on internal quantum efficiency in InGaN-based light emitting diodes** B 1.34

Hideaki Murotani¹, Yoichi Yamada²

¹Department of Computer Science and Engineering, National Institute of Technology, Tokuyama College, Gakuen-dai, Shunan, Yamaguchi 745-8585, Japan, ²Department of Electrical and Electronic Engineering, Yamaguchi University, 2-16-1 Tokiwadai, Ube, Yamaguchi 755-8611, Japan

18:00 **Distance-Engineered Surface Plasmon-Coupled Photoluminescence of GaN-based Quantum Well LEDs** B 1.35

Yufeng Li, Shuai Wang, Weihan Tang, Xilin Su, Feng Yun*, Xun Hou

1Key Laboratory of Physical Electronics and Devices of Ministry of Education and Shaanxi Provincial Key Laboratory of Photonics & Information Technology, Xi'an Jiaotong University, Xi'an, China, 2 Solid-State Lighting Engineering Research Center, Xi'an Jiaotong University, Xi'an, China,

18:00 **Direct Growth of InGaN-based Blue Quantum Wells on Y₃Al₅O₁₂:Ce³⁺ Single Crystal Substrate for White Light Emitting Diode** B 1.36

Yufeng Li, Weihan Zhang, Xilin Su, Geng Shang, Feng Yun*, Xun Hou

1Key Laboratory of Physical Electronics and Devices of Ministry of Education and Shaanxi Provincial Key Laboratory of Photonics & Information Technology, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, P.R. China, 2Solid-State Lighting Engineering Research Center, Xi'an Jiaotong University, Xi'an Shaanxi, 710049, P.R. China,

18:00 **Phosphor-free InGaN white light emitting diodes overgrown on semi-polar GaN templates** B 1.37

N. Poyiatzis, J. Bai, M. Athanasiou, L. Jiu, L. C Wang, Y. Gong, T. Wang

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

18:00 **Transformation of localizing potential in InGaN MQWs as the emission shifts from blue to amber spectral region** B 1.38

J.Mickevičius, D.Dobrovolskas, J.Aleknavičius, T.Griniš, A.Kadys, and G.Tamulaitis

Institute of Applied Research and Semiconductor Physics Department, Vilnius University, Saulėtekio al. 3, Vilnius, LT-10257, Lithuania

18:00 **Influence of metalorganic precursor flow interruption timing on carrier localization in cyan InGaN/GaN MQWs** B 1.39

J.Mickevičius, D.Dobrovolskas, M.Kolenda, M.Dmukauskas, and G.Tamulaitis

Institute of Applied Research and Semiconductor Physics Department, Vilnius University, Saulėtekio al. 3, Vilnius, LT-10257, Lithuania

18:00 **Origin of strong blue light emission from Ce-doped aluminum nitride thin films** B 1.40

Alaa Eldin Giba^{1,2,*}, Philippe Pigeat¹, Stéphanie Bruyere¹, Hervé Rinnert¹, Flavio Soldera², Frank Mücklich², Raul Gago-Fernandez³, David Horwat¹

¹Institut Jean Lamour - UMR CNRS 7198? Université de Lorraine, Nancy, France. ²Department Materials Science and Engineering, Saarland University, D-66123 Saarbrücken, Germany. ³Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Científicas, E-28049 Madrid, Spain. *Corresponding author: alaa-eldin-abdel-azi.giba@univ-lorraine.fr

18:00 **Practical methods of fabrication of sub-micrometer size, columnar InGaN light emitting diodes** B 1.41

Krzysztof Gibasiewicz¹, Jacek Kacperski², Irina Makarowa², Szymon Grzanka¹², Tadeusz Suski¹, Piotr Perlin¹²

¹Institute of High Pressure Physics, „Unipress” Sokolowska 29/37 01-142 Warsaw, Poland ²TopGaN Limited, Sokolowska 29/37 01-142 Warsaw, Poland

18:00 **Growth,characterization and application of high quality separated GaN-based pyramid array on laser drilling micro-patterned sapp** B 1.42

Zhenhuan Tian, Feng Yun*, Ricky Lee, Yufeng Li, Xilin Su, Lungang Feng, Shuai Wang, Wen Ding, Qiang Li, Ye Zhang, and Maofeng Guo

1 Key Laboratory for Physical Electronics and Devices of the Ministry of Education and Shaanxi Provincial Key Laboratory of Photonics & Information Technology, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, P. R. China, 2 Solid-State Lighting Engineering Research Center, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, P. R. China, 3 Department of Mechanical and Aerospace Engineering, Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong,

18:00 **A new way to achieve fluorescence enhancement of YAG:Ce³⁺ based on Au nanoparticles LSPR** B 1.43

Yanxin Xing, Wen Ding, Zhenhuan Tian, Lungang Feng, Shuai Wang, Yufeng Li, Qiang Li, Xilin Su, Ye Zhang, Maofeng Guo, and Feng Yun*

1 Key Laboratory for Physical Electronics and Devices of the Ministry of Education and Shaanxi Provincial Key Laboratory of Photonics & Information Technology, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, P. R. China, 2 Solid-State Lighting Engineering Research Center, Xi'an Jiaotong University, Xi'an, Shaanxi 710049, P. R. China,

18:00 **Frequency measurement using noise setup for iii-nitrides based photodiode** B 1.44

Bandar Alshehri¹, Karim Dogheche¹, Abderrahim Ramdane², Didier Decoster¹, Elhadj Dogheche¹

¹ IEMN, Institute of Electronics, Microelectronics and Nanotechnology, CNRS & University of Lille 1, Avenue Poincaré, 59652 Villeneuve d'Ascq, Cedex, France ² C2N, Centre for Nanoscience and Nanotechnology, CNRS, Route de Nozay, 91460 Marcoussis, France

18:00 **Impact of strain on radiative and non-radiative recombination in m-plane GaInN/GaN quantum wells** B 1.45

Philipp Henning, Torsten Langer, Manuela Klisch, Fedor Alexej Ketzer, Philipp Horenburg, Heiko Bremers, Uwe Rossow, Andreas Hangleiter

Institute of Applied Physics, Braunschweig University of Technology, Mendelssohnstrasse 2, 38106 Braunschweig

18:00 **Femtosecond-laser irradiation onto sapphire substrates in N₂ ambient** B 1.46

Reina Miyagawa, Kenzo Goto, Osamu Eryu

Nagoya Institute of Technology

18:00 **Improved light output power of micro-LEDs for headlamp with enhanced reflectivity and coverage of p-type electrode** B 1.47

Tae Kyung Kim, Moon Uk Cho, Seung Kyu Oh, Yu Lim Lee, Bikramjit Chatterjee, Sukwon Choi, Joon Seop Kwak

Dept. of printed Electronics Engineering (BK21 plus), Sunchon National University, Jeonnam, 540-742, Korea, Dept. of Mechanical Engineering, University of Houston, Houston, TX 77204-4006, USA, Dept. of Mechanical and Nuclear Engineering, Pennsylvania State University, University Park, PA 16802, USA

18:00 **Resonant Tunneling in InGaN/GaN Superlattices and Multiple Quantum Wells** B 1.48

Prudaev, V. Kopyev, I. Romanov, V. Oleynik, A. Lozinskaya, A. Shemeryankina, D. Zasukhin, A. Marmalyuk, A. Padalitsa, A. Mazalov, V. Kureshov, and D. Sabitov

Functional Electronics Laboratory, Tomsk State University, Tomsk, Russia, JSC Research Institute of Semiconductor Devices, Tomsk, Russia, M. F. Stelmakh Research Institute "Polyus", Moscow, Russia

18:00 Optimization of active region embedded in compositionally graded AlGaN films for deep ultraviolet laser application B 1.49

Haiding Sun,¹ Jian Yin,² Emanuele Francesco Pecora,² Luca Dal Negro,² Roberto Paiella,² and Theodore D. Moustakas,²

1. Computer, Electrical and Mathematical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia, 2. Electrical and Computer Engineering Department, Boston University, Boston, MA, 02215, USA

18:00 Tailored CVD graphene on silver nanowire as a transparent conductive electrode in GaN-based UV-LEDs B 1.50

Tae Hoon Seo¹, Gun Hee Lee², Dong Kyu Yeo^{1,2}, Hee Su Kim^{1,2}, Myung Jong Kim¹, and Eun-Kyung Suh^{2*},

1. Applied Quantum Composites Research Center, Korea Institute of Science and Technology, Jeonbuk 565-905, South Korea , 2.School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Jeonju 561-756, South Korea

18:00 Electrically Injected III-Nitride Microdisk lasers for a Nanophotonic Platform on Silicon B 1.51

Farsane Tabataba-Vakili ^{1,2}, Iannis Roland ¹, Stéphanie Rennesson ³, Eric Frayssinet ³, Julien Brault ³, Moustafa El Kurdi ¹, Xavier Checoury ¹, Bruno Paulillo ¹, Raffaele Colombelli ¹, Thierry Guillet ⁴, Christelle Brimont ⁴, Benjamin Damilano ³, Fabrice Semond ³, Bruno Gayral ^{2,5}, Philippe Boucaud ¹

1 Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, F-91405 Orsay, France, 2 CEA, INAC-PHELIQS, Nanophysique et semiconducteurs group, F-38000 Grenoble, France, 3 Université Côte d'Azur, CRHEA-CNRS, F-06560 Valbonne, France, 4 Laboratoire Charles Coulomb (L2C), UMR 5221 CNRS-Université de Montpellier, F-34095 Montpellier, France, 5 Univ. Grenoble Alpes, F-38000 Grenoble, France

18:00 Optical characterization of (11-22) semi-polar InGaN/GaN single quantum well by using a novel nano-patterning approach B 1.52

Y. Zhang, M. Athanasiou, R. M. Smith, Y. Hou, Y. Gong, J. Bai, and T. Wang

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

18:00 Electroreflectance and photocurrent study of built-in electric field distribution in GaN/InGaN multiple quantum wells. B 1.53

Avakyants L.P., Aslanyan A.E., Bokov P. Yu., Chervyakov A.V.

Physics Department, M.V. Lomonosov Moscow State University, Leninskie Gory 1 b. 2, 119991, Moscow, Russia

18:00 Influence of the Electron Blocking Layer design on parameters of nitride laser diodes B 1.54

Agata Bojarska¹, Jakub Goss¹, Szymon Stanczyk¹, Julita Smalc-Koziorowska^{1,2}, Ewa Grzanka^{1,2}, Irina Makarowa², Robert Czernecki^{1,2}, Tadeusz Suski¹ and Piotr Perlin^{1,2}

1Institute of High Pressure Physics, "Unipress" Sokolowska 29/37 01-142 Warsaw, Poland, 2TopGaN Limited, Sokolowska 29/37 01-142 Warsaw, Poland

18:00 Polychromatic emission from semi/nonpolar faceted 3D-InGaN quantum wells with high radiative recombination probabilities B 1.55

Yoshinobu Matsuda, Mitsuru Funato, Yoichi Kawakami

Kyoto university

18:00 Investigation of InGaN/GaN multiple quantum well solar cells with different barrier thickness B 1.56

X.M. Cai^{1,*}, X.Q. Lv², X.L. Wang¹, H.L. Zhu¹, M.S. Wang¹, L. Yang¹ and B.P. Zhang^{3,*}

1 Department of Physics, Jimei University, Fujian, People's Republic of China 2 MEMS Research Center, Xiamen University, Fujian, People's Republic of China 3 Laboratory of Micro/Nano Optoelectronics, Department of Electronic Engineering, Xiamen University, Fujian, People's Republic of China

18:00 Improved Performance of AlGaN based UV LEDs with sidewall roughed sapphire and nanoparticles doped silicone packaging B 1.57

Jiangnan Dai*, Renli Liang, Shuai Wang, Jun Zhang, Feng Wu, J. W. Chen, Wei Zhang, Changqing Chen

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

18:00 Impact of carrier diffusion on photoluminescence dynamics in cyan and green InGaN led structures B 1.58

Kazimieras Nomeika (1), Ramunas Aleksiejunas (1), Saulius Miasojedovas (1), Rolandas Tomasiunas (1), K?stutis Jarasiunas (1), Ines Pietzonka (2), Martin Strassburg, (2) and Hans-Jurgen Lugauer (2)

(1) - Vilnius University, Institute of Applied Research, Saul?tekis av. 3, Vilnius, Lithuania, (2) - OSRAM Opto Semiconductors GmbH, Leibnizstr. 4, 93055 Regensburg, Germany

18:00 Enhancement of hole injection by electrostatically-doped carbon nanotube electrode in AlGaN-based DUV LEDs B 1.59

Mitsutoshi Soda, Shigeru Kishimoto, Hiroshi Amano, Yutaka Ohno

Institute of Materials and Systems for Sustainability, Nagoya University, Japan

18:00 Structural analysis of GaInN/GaN multi-quantum wells grown on a GaN {1-100} side-wall of nanowire by using an x-ray micro beam B 1.60

Ryoma Seiki¹), Hiroki Shibuya¹), Yasuhiko Imai¹), Kazushi Sumitani²), Shigeru Kimura²), Kohei Iwase¹), Takao Miyajima¹), Satoshi Kamiyama¹), Daichi Imai¹), Tetsuya Takeuchi¹), Motoaki Iwaya¹) and Isamu Akasaki¹)

1) Department of Materials Science and Engineering, Faculty of Science and Technology, Meijo University, 1-501 Shiogamaguchi, Tempaku-ku, Nagoya 468-8502, Japan , 2) Japan Synchrotron Radiation Research Institute, Mikazuki-cho, Hyogo 679-5198, Japan

18:00 Microstructured Hollow Cavities as Strong-Diffraction Growth Substrates B 1.61

Ji-Hyun Kim, Yoon-Jong Moon, Da-Som Kim, DukKyu Bae, Euijoon Yoon, Sun-Kyung Kim

Department of Applied Physics, Kyung-hee University, Department of Applied Physics, Kyung-hee University, Department of Applied Physics, Kyung-hee University, Hexa Solution Co., Ltd, Department of Materials Science and Engineering, Seoul National University, Department of Applied Physics, Kyung-hee University

18:00 Full-Color Nanowire Light-Emitters on Bulk-Metal Substrates B 1.62

Chao Zhao, Tien Khee Ng, and Boon S. Ooi

King Abdullah University of Science and Technology, Photonics Laboratory

18:00 Quantum Dot based UV Light Emitting Diodes B 1.63

J. Brault^{1,*}, S. Matta^{1,2}, M. Al Khalifioui¹, M. Leroux¹, B. Damilano¹, S. Chenot¹, M. Korytov¹, H. Peyre², L. Konczewicz², S. Contreras², C. Chaix³, J. Massies¹, and B. Gil²

1: CNRS-CRHEA, Rue B. Gregory, 06560 Valbonne, France 2: L2C, UMR 5221, Case courrier 074-34095 Montpellier Cedex 5, France 3: RIBER SA, 31 Rue Casimir P?rier, 95870 Bezons

18:00 **Polarized light emission from AlGaN-based UV emitters with subwavelength aluminum wire-grid polarizers** B 1.64

Semi Oh¹, Jung Hye Lee², Hyo-Ju Lee¹, Yoon Seok Kim³, Kyoung-Kook Kim³, Jaehee Cho⁴, Yeon Sik Jung², Seong-Ju Park^{1,*}

¹School of Materials Science and Engineering, Gwangju Institute of Science and Technology, Gwangju 61005, Republic of Korea,
²Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology, Daejeon 34141, Republic of Korea, ³Department of Advanced Convergence Technology, Research Institute for Advanced Convergence Technology, Korea Polytechnic University, Siheung 15073, Republic of Korea, ⁴School of Semiconductor and Chemical Engineering, Semiconductor Research Center, Chonbuk National University, Jeonju 54896, Republic of Korea

18:00 **P-type activation in MOVPE grown GaN tunnel junctions** B 1.65

Silvio Neugebauer, Andreas Lesnik, Florian Hörich, Hartmut Witte, Jürgen Bläsing, Armin Dadgar, and André Strittmatter

Otto-von-Guericke-Universität Magdeburg, Institut für Experimentelle Physik, Universitätsplatz 2, 39106 Magdeburg, Germany

18:00 **Ohmic V-based contacts on n-Al_{0.8}Ga_{0.2}N for deep UV LEDs** B 1.66

Luca Sulmoni¹, Martin Guttmann¹, Johannes Enslin¹, Christian Kuhn¹, Frank Mehnke¹, Tim Wernicke¹, and Michael Kneissl^{1,2}

¹Technische Universität Berlin, Institute of Solid State Physics, Hardenbergstr. 36, EW 6-1, 10623 Berlin, Germany, ²Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, 12489 Berlin, Germany

18:00 **Electron beam induced current and cathodoluminescence investigation of GaN nanowires containing AlN/GaN quantum discs** B 1.67

V. Piazza ¹, A. Babichev ², N. Guan ¹, M. Morassi ¹, L. Mancini ¹, P. Quach ¹, P. Rale ³ F. Bayle ¹, L. Largeau ³, F. H. Julien ¹, J.-C. Harmand ³, S. Collin ³, N. Gogneau ³, M. Tchernycheva ¹

¹ Centre de Nanosciences et de Nanotechnologies, UMR9001 CNRS, University Paris Sud, Université Paris-Saclay, Orsay 91405, France, ² ITMO University, St. Petersburg, 197101, Russia, ³ Centre de Nanosciences et de Nanotechnologies, CNRS, University Paris-Sud, Université Paris-Saclay, Marcoussis 91460, France.

18:00 **The effect of the three-dimensional strain variation on the emission properties of LEDs based on (In,Ga)N/GaN nanowires** B 1.68

M. Musolino ⁽¹⁾, F. Sacconi ⁽²⁾, C. De Santi ⁽³⁾, F. Panetta ⁽²⁾, A. Tahraoui ⁽¹⁾, M. Meneghini ⁽³⁾, E. Zanoni ⁽³⁾, and L. Geelhaar ⁽¹⁾

⁽¹⁾ Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5–7, 10117 Berlin, Germany ⁽²⁾ TiberLAB s.r.l., Via del Politecnico 1, 00133 Rome, Italy ⁽³⁾ Department of Information Engineering, University of Padova, Via Gradenigo 6/B, 35131 Padova, Italy

18:00 **Luminescence enhancement with increased QW number in multiple InGaN/GaN QW structure** B 1.69

A. Hospodková, J. Oswald, M. Zíková, J. Pangrác, K. Kuldová, V. Jarý

Institute of Physics, Czech Academy of Science, v.v.i., Cukrovarnická 10, Praha 6, 162 00, Czech Republic

C poster : Bruno Daudin

- 18:00 **Breakdown Voltage Enhancement in AlGaN/GaN HEMTs with Double Passivation Layers** C 01.1

K. Horio, H. Hanawa

Shibaura Institute of Technology

- 18:00 **Effects of Acceptors in a Buffer Layer on Breakdown Characteristics of AlGaN/GaN HEMTs with a High-k Passivation Layer** C 01.2

Y. Kawada, H. Hanawa and K. Horio

Shibaura Institute of Technology

- 18:00 **Drain Current DLTS and MCTS Studies of Traps in AlGaN/Gan HEMTs** C 01.3

Yutaka Tokuda, Kouta Takabayashi

Aichi Institute of Technology, Toyota 470-0392, Japan

- 18:00 **Vertical GaN p-n junction diodes with a highly Mg-doped thin layer as hole injector** C 01.4

1Hiroshi Ohta, 1Hiroyumi Tsuge, 1Kentaro Hayashi, 2Fumimasa Horikiri, 2Yoshinobu Narita, 2Takehiro Yoshida, 1Tohru Nakamura, and 1Tomoyoshi Mishima

1Hosei University, Japan, 2SCIOCS , Japan

- 18:00 **The influence of passivation layer on AlGaN/GaN HEMTs** C 01.5

H. Mosbahi, M. Gassoumi, C. Gaquiere, M.A. Zaidi, R. M'Ghaieth

Laboratoire de Micro-Optoélectronique et Nanostructures, Faculté des Sciences de Monastir, Avenue de l'environnement5000 Monastir, Tunisia

- 18:00 **Study of Nanoscale AlGaN/GaN HEMT devices using a Metal Gate Field-Plated Structure** C 01.6

Mourad Kaddeche, Azzedine Telia, Lemia Semra and Ali Soltani

Département de Technologie, Faculté des Sciences et de la Technologie Université de Djilali Bounââma Khemis Miliana, Algérie Laboratoire de Microsystème et Instrumentation (LMI), Département d'électronique, Université Mentouri de Constantine, 25000 Constantine, Algérie IEMN-CNRS 8520, Université des Sciences et Technologie de Lille, Cité Scientifique avenue Poincaré 59655 Villeneuve d'ascq- France

- 18:00 **Ti0.5Al0.5O-Dielectric AlGaN/GaN MOS-HEMTs by Using Non-Vacuum Ultrasonic Spray Pyrolysis Deposition** C 01.7

C. S Lee*,1, W. C. Hsu2, H. Y. Liu1, B. J. Chiang1, Y. C. Chen1, S. T. Yang1, C. G. Lin1, X. C. Yao1, J. Y. Lin1, Y. T. Shen1, and Y. C. Lin1

1 Department of Electronic Engineering, Feng Chia University, 100, Wenhwa Road, Taichung, Taiwan 40724, R.O.C. 2 Institute of Microelectronics, Department of Electrical Engineering, National Cheng-Kung University, 1, University Road, Tainan, Taiwan 70101, R.O.C.

- 18:00 **Development of AlGaN/GaN HEMT based sensor platform and its hydrogen sensor application** C 01.8

Yumin Koh, Chu-Young Cho, Hyeong-Ho Park, Do-Kywn Kim, Sunwoo Jung, Soohwan Jang, Won-Kyu Park, Kyung-Ho Park

Korea Advanced Nano Fab Center, Suwon 16229, Republic of Korea, Department of Chemical Engineering, Dankook University, Yongin 16890, Republic of Korea

- 18:00 **Field Emission in double barrier reverse-biased Graphene/Oxide/n-semiconductor Schottky junctions, via a Landauer formalism** C 01.9

AC Varonides

Physics & ECE Dept, University of Scranton, Scranton, PA 18510, USA

18:00 **Thermal oxidation fabrication of p-type NiO gate for normally-off AlGaN/GaN HFETs application** C 01.10

Liuan Li¹, Wenjing Wang¹, Liang He¹, Jialin Zhang¹, Baijun Zhang¹, Yang Liu^{1,2}

¹School of Electronics and Information Technology, Sun Yat-Sen University, Guangzhou 510275, P.R. China, ²Institute of Power Electronics and Control Technology, Sun Yat-Sen University, Guangzhou 510275, P.R. China

18:00 **Direct observation of high current density area by microscopic electroluminescence mappings in vertical GaN p-n junction diodes** C 01.11

Kentaro Hayashi , Hiroshi Ohta , Fumimasa Horikiri , Yoshinobu Narita , Takehiro Yoshida , Tohru Nakamura, Tomoyoshi Mishima

Hosei University, SCIOCS

18:00 **1370 V Tri-gate GaN MOSHEMTs on Silicon Substrate** C 01.12

Jun Ma and Elison Matioli

Power and Wide-band-gap Electronics Research Laboratory (POWERlab), École polytechnique fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

18:00 **The recessed trapezoidal groove dual-gate AlGaN/GaN E-mode transistor by using depletion enhancement effect** C 01.13

Ling Yang, Minhan Mi, Bin Hou, Jiejie Zhu, Meng Zhang, Yang Lu, Yunlong He, Qi Zhu, Lixiang Chen, Xiaowei Zhou, Xiaohua Ma, and Yue Hao

State Key Discipline Laboratory of Wide Band-gap Semiconductor Technology, Xidian University, Xi'an 710071, China

18:00 **Mg-related CL emissions from ion-implanted GaN(000-1) substrate** C 01.14

Keita Kataoka, Tetsuo Narita, Tetsu Kachi, Tsutomu Uesugi

Toyota Central Research and Development Laboratories, Inc., Nagakute, Aichi 480-1192, Japan, Toyota Central Research and Development Laboratories, Inc., Nagakute, Aichi 480-1192, Japan, Nagoya University, Nagoya, Aichi 464-8603, Japan, Toyota Central Research and Development Laboratories, Inc., Nagakute, Aichi 480-1192, Japan

18:00 **Molecular control over Ni/AlGaN/GaN Schottky barrier diode using Thiol Porphyrin** C 01.15

Manjari Garg, Tejas R. Naik, S. Nagarajan, V. Ramgopal Rao, Rajendra Singh

Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016, India, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai-400 076, Maharashtra, India, Department of Micro and Nanosciences, Aalto University, P.O. Box 13500, FI-00076, Aalto, Finland

18:00 **AlGaN/GaN heterojunction bipolar transistors with selective-area regrown n-AlGaN emitter** C 01.16

Lian Zhang¹, Jianping Zeng³, Yun Zhang^{1,2*}, Zhe Cheng¹, Hongxi Lu¹, Hongrui Lv^{1,2}, Junxi Wang^{1,2}, Wei Tan³, Jinmin Li^{1,2}

1. Institute of Semiconductor, Chinese Academy of Sciences, Beijing 100083, People's Republic of China 2. University of Chinese Academy of Science Beijing 100049 People's Republic of China 3. Terahertz Physics Laboratory, Microsystem and Terahertz Research center, Chinese Academy of engineering Physics, Chengdu, 610299, People's Republic of China * corresponding author

18:00 **Temperature Dependence of Equivalent Circuit Model for GaN Gate Injection Transistor Bi-directional Switch** C 01.17

Toshihide Ide¹, Mitsuaki Shimizu¹, Xu-Qiang Shen¹, Hidetoshi Ishida², Tsuguyasu Hatsuda², Tetsuzo Ueda²

¹Advanced Industrial Science and Technology (AIST), ²Panasonic Corporation

18:00 **Determination of Primary Indicators of AlGaN/GaN HEMT Wafers Based on Nondestructive Wafer Test and Device Characteristics** C 01.18

Yi-Nan Zhong, Shun-Wei Tang, Yue-ming Hsin
Department of Electrical Engineering, National Central University

18:00 **Off-State Negative Differential Capacitance in Low-Temperature AlGaN/GaN Heterostructures** C 01.19

Jie-Jie Zhu, Bin Hou, Hua-Mao Chen, Ting-Chang Chang, Xiao-Hua Ma, Yue Hao
Xidian University, Xidian University, National Sun Yat-Sen University, National Sun Yat-Sen University, Xidian University, Xidian University,

18:00 **A Novel Interface Treatment Process Used in GaN-based MOS-HEMTs: Diffusion-Control Surface Plasma Oxidation** C 01.20

Jiejie Zhu, Qing Zhu, Lixiang Chen, Yi Zhang, Bin Hou, Ling Yang, Xiaohua Ma, and Yue Hao
Xidian University, Xi'an, China

18:00 **Influence of Fin Architectures on Linearity Characteristics of AlGaN/GaN FinFETs** C 01.21

Kai Zhang, Guangrun Zhu, Jianjun Zhou, Yuechan Kong, and Tangsheng Chen
Science and Technology on Monolithic Integrated Circuits and Modules Laboratory, Nanjing Electronic Devices Institute, Nanjing, P. R. China

18:00 **The Role of Buffer Traps on the Time Dependent Off-State Leakage in AlGaN/GaN MIS-HEMT on Silicon** C 01.22

Ming Tao¹, Maojun Wang¹, Shaofei Liu¹, Cheng P. Wen¹, Jinyan Wang¹, Yilong Hao¹, Wengang Wu¹, Bo Shen²
¹Institute of Microelectronics, Peking University, Beijing, China,
²School of Physics, Peking University, Beijing, China

18:00 **Analysis of Peak Field Reduction in AlGaN/GaN HFETs with a Curved Field Plate.** C 01.23

Chih-Wei Hsu and Yuh-Renn Wu
Graduate Institute of Photonics and Optoelectronics, National Taiwan University

18:00 **Microwave Leakage through Buffer Layer of AlGaN/GaN HEMT on Si** C 01.24

Y. Ikeda¹, Y. Ito¹, T. Egawa¹, M. Kuzuhara², K. Hosoya³, and A. Wakejima¹, ¹Nagoya Institute of Technology, Aichi 466-8555, Japan, ²University of Fukui, Fukui 910-8507, Japan ³Hiroshima Institute of Technology, Hiroshima 731-5193, Japan
Nagoya Institute of Technology

18:00 **Quaternary barrier GaN High Electron Mobility Transistors with fT/fmax of 200/310 GHz** C 01.25

Guangrun Zhu, Kai Zhang, Yuechan Kong, Xinxin Yu, Tangsheng Chen
Science and Technology on Monolithic Integrated Circuits and Modules Laboratory, Nanjing Electronic Devices Institute, Nanjing, 210016, China

18:00 **Threshold voltage shifts induced by acceptor-like interface states in Al₂O₃/AlGaN/GaN HEMTs** C 01.26

Shota Kaneki*, Zenji Yatabe**, Kenya Nishiguchi*, Tamotsu Hashizume*
*RCIQE, Hokkaido University, **Kumamoto University

18:00 **Development of mask-less p-GaN regrowth on partially etched n-GaN template** C 01.27

Ryo Tanaka, Stacia Keller, Umesh Mishra
Fuji Electric Co., Ltd. , Department of Electrical and Computer Engineering, University of California, Santa Barbara, Department of Electrical and Computer Engineering, University of California, Santa Barbara

18:00 **A high electron mobility ($\square 1300 \text{ cm}^2/\text{Vs}$) in AlGaN/GaN heterostructures prepared by direct AlGaN regrowth on RIE-GaN** C 01.28

Akio Yamamoto, Satoshi Yoshida, Kento Kanatani, Masaaki Kuzuhara

Graduate School of Engineering, University of Fukui, Japan

18:00 **Threshold Voltage Instabilities in Integrated E/D-mode InAlN/GaN MOS HEMTs.** C 01.29

M. Blaho, D. Gregušová, Š. Haščík, M. Čapajna, K. Fröhlich, A. Šatka, and J. Kuzmík

Institute of Electrical Engineering, Slovak Academy of Sciences, Bratislava, Slovakia

18:00 **Direct observation of leakage paths in AlGaN/GaN high electron mobility transistors by electron-beam induced current** C 01.30

Li-Xiang Chen, Xiao-Hua Ma, Jie-Jie Zhu, Bin Hou, Qing Zhu, Meng Zhang, Ling Yang, Yue Hao

School of Advanced Materials and Nanotechnology, Xidian University, Xi'an 710071, People's Republic of China, Key Lab of Wide Band-Gap Semiconductor Materials and Devices, School of Microelectronics, Xidian University, Xi'an 710071, People's Republic of China

18:00 **Improving Thermal and Electrical Performance in InAlN/GaN HEMTs with Nanocrystalline Diamond Gate** C 01.31

Chenjie Tang, Koon Hoo Teo, Junxia Shi

Department of Electrical and Computer Engineering, University of Illinois at Chicago, Chicago, IL Mitsubishi Electric Research Laboratories, Cambridge, MA, USA

18:00 **Ohmic contact-free measurement of mobility in ultra-wide band gap AlGaN/AlGaN structures** C 01.32

Peter Butler (1,2), William Waller (1), Michael J Uren (1), Andrew Allerman (3), Andrew Armstrong (3), Robert Kaplar (3), Martin Kuball (1)

(1) H.H. Wills Physics Laboratory, University of Bristol, Tyndall Avenue, Bristol, United Kingdom, (2) AWE Plc., Aldermaston, Reading, United Kingdom, (3) Sandia National Laboratories, Albuquerque, New Mexico, USA.

18:00 **Dielectric Engineering of HfO₂ Gate Stacks for Normally-ON and Normally-OFF AlGaN/GaN Transistors** C 01.33

Hareesh Chandrasekar, Sandeep Kumar, K L Ganapathi, Shreesha Prabhu, Srinivasan Raghavan, R Muralidharan, Sangeneni Mohan, Navakanta Bhat, Digbijoy N Nath

Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore 560012, India

18:00 **Fabrication and characterization of aluminum nitride surface acoustic wave devices** C 01.34

Shuai Yang, Yujie Ai*, Yun Zhang, Lifang Jia, Lili Sun, Lian Zhang, Zhe Cheng, Junxi Wang, Jinmin Li

Institute of Semiconductors, Chinese Academy of Sciences, A 35, Qinghua East Road, Haidian District Beijing, Beijing 100083, China

18:00 **Precise thickness control in recess-etching for normally-off AlGaN/GaN HEMTs using a low damage photo-electrochemical reaction** C 01.35

Taketomo Sato, Keisuke Uemura, Yusuke Kumazaki, Tamotsu Hashizume

Research Center for Integrated Quantum Electronics, Hokkaido University

18:00 **Effect of Boron Nitride passivation on AlGaN/GaN High Electron Mobility Transistors** C 01.36

Gun Hee Lee,¹ Tae Hoon Seo,² Hee Su Kim,¹ Dong Kyu Yeo,¹ and Eun-Kyung Suh^{1*}

¹School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Jeonju 561-756, South Korea , ²Applied Quantum Composites Research Center, Korea Institute of Science and Technology, Jeonbuk 565-905, South Korea

18:00 **On the control of interface charges at MOCVD grown Al₂O₃/III-N heterojunctions: Impact of pre- and post-deposition treatments** C 01.37

M. Čapajna ^{1,a)}, F. Gucmann ¹, K. Hušeková ¹, D. Gregušová ¹, R. Stoklas ¹, M. Mičušík ², L. Tóth ³, B. Pécz ³, K. Fröhlich ¹, and J. Kuzmík ¹

¹ Institute of Electrical Engineering, Slovak Academy of Sciences, Dúbravská cesta 9, 841 04 Bratislava, Slovakia ² Institute of Polymers, Slovak Academy of Sciences, Dúbravská cesta 9, 841 04 Bratislava, Slovakia ³ Institute of Technical Physics and Materials Sciences, MTA EK, Konkoly T. M. út 29-33, H-1121 Budapest, Hungary a) milan.tapajna@savba.sk

18:00 **Development of the ammonia-MBE growth technique in view of monolithic integration of GaN transistors with Si-based technologies** C 01.38

Rémi Comyn, Yvon Cordier, Benjamin Damilano, Abdelatif Jaouad, Vincent Aimez, Hassan Maher

UCA, CRHEA-CNRS, Rue Bernard Gregory, Valbonne, 06560, France, Laboratoire Nanotechnologies Nanosystèmes (LN2)- CNRS UMI-3463, Université de Sherbrooke, 3000 Boulevard Université, Sherbrooke, J1K OA5, Québec, Canada

18:00 **Short gate-length technology for European high frequency GaN HEMTs and MMICs** C 01.39

P. Brückner, M. Dammann, R. Quay, M. Mikulla

Fraunhofer Institute for Applied Solid State Physics, Tullastrasse 72, 79108 Freiburg, Germany

18:00 **Investigation of deep level transient spectroscopy in AlGaN/GaN heterostructure** C 01.40

Qing Zhu, Xiao-Hua Ma, Bin Hou, Jie-Jie Zhu, Ling Yang, Li-Xiang Chen, Meng Zhang

School of Advanced Materials and Nanotechnology, Xidian University

18:00 **Electrically driven terahertz emission from plasma oscillations in grating gate of AlGaN/GaN heterostructures** C 01.41

I. Grigelionis¹, V. Jakštės¹, V. Janonis¹, I. Kašalynas¹, G. Seniutinas², S. Juodkazis², P. Prystawko³, M. Leszczynski³, W. Knap⁴

¹Center for Physical Sciences and Technology, Saulėtekio al. 3, LT-10222 Vilnius, Lithuania, ²Swinburne University of Technology, John St. Mail H34, Hawthorn, VIC 3122, Australia, ³Institute of High Pressure Physics, Polish Academy of Sciences, Sokołowska 29/37, 01-142 Warsaw, Poland, ⁴Laboratoire Charles Coulomb, University of Montpellier and CNRS, Place Eugène Bataillon, Montpellier F-34905, France

18:00 **Optimisation of barrier doping profile in AlGaN/AlN/GaN high electron mobility transistors** C 01.42

Filip Dominec

Institute of Physics, CAS

18:00 **“Kink” in AlGaN/GaN-HEMTs: Impact on Devices and Demonstration of Suppression** C 01.43

Manikant¹, Trevor Martin², M J Uren¹, Serge Karboyan¹, Hareesh Chandrasekar¹, Martin Kuball¹

¹H H Wills Physics Laboratory, University of Bristol, Bristol BS8 1TL, U.K. ²IQE Europe, St Mellons, Cardiff, U.K.

18:00 Formation of contacts with high thermal tolerance by using Si/GaN junctions C 01.44

Jianbo Liang¹, Takuya Nishimura¹, Moeko Matsubara², Marwan Dhamrin², Yoshitaka Nishio², and Naoteru Shigekawa¹

¹Electronic Information System, Osaka City University, Sumiyoshi-ku, Osaka 5588585, Japan ²Core Technology Center, Toyo Aluminium K. K., Chuo-ku, Osaka 5410056, Japan

18:00 Theoretical study on the formation of gallium oxide at the n-type GaN/SiO₂ interface C 01.45

K. Chokawa, E. Kojima, M. Arai, K. Shiraishi

Graduate School of Engineering, Nagoya University, Graduate School of Engineering, Nagoya University, Institute of Materials and Systems for Sustainability, Nagoya University, Graduate School of Engineering, Nagoya University, Institute of Materials and Systems for Sustainability, Nagoya University, Graduate School of Engineering, Nagoya University

18:00 Improvement of Ohmic Contact by Surface Plasma Treatment on AlGaN/GaN Heterostructures C 01.46

Yogendra K. Yadav, Bhanu B. Upadhyay, Mudassar Meer, Swaroop Ganguly, Dipankar Saha

Applied Quantum Mechanics Laboratory, Centre of Excellence in Nanoelectronics, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India

18:00 Low damage plasma etch processes for AlGaN and GaN substrates C 01.47

Matthew Loveday, Andy Goodyear, Mike Cooke, Andrew Newton, Mark Dineen, Stephanie Baclet, Paolo Abrami

Oxford Instruments Plasma Technology, Bristol University

18:00 N₂ plasma treatment for gate leakage reduction in AlGaN/GaN HEMT C 01.48

Weike, Liuguoguo, Chenshizhe, Zhangyichuan, Huangsen, Wangxinghua, Zhegyingkui, Chenxiaojuan luoweijun and Liuxinyu

Institute of Microelectronics, Chinese Academy of Sciences

18:00 GaN lateral Schottky Diodes and FinFETs for THz applications C 01.49

G. Cywiński^{1*}, P. Kruszewski^{1,2}, K. Szkudlarek¹, I. Yahniuk¹, G. Muzio¹, C. Skierbiszewski¹, D. But³, W. Knap^{1,3}, and S. L. Rumyantsev^{4,5}

¹Institute of High Pressure Physics, Polish Academy of Sciences, ul. Sokołowska 29/37, 01-142 Warsaw, Poland ²Top-GaN Ltd., ul. Sokołowska 29/37, 01-142 Warsaw, Poland ³University of Montpellier and CNRS, UMR 5221, Laboratoire Charles Coulomb (L2C), Pl. E. Bataillon, 34095 Montpellier, France ⁴Ioffe Institute, Russian Academy of Sciences, Politekhnicheskaya ul. 26, 194021 St. Petersburg, Russia ⁵National Research University of Information Technologies, Mechanics, and Optics, 197101 St. Petersburg, Russia

18:00 Improvement of channel mobility of GaN-MOSFETs with thermal treatment for recess surface C 01.50

Kenjiro Uesugi, Aya Shindome, Hisashi Saito, Masahiko Kuraguchi, Shinya Nunoue

Corporate Research & Development Center, Toshiba Corporation

18:00 AlGaN/GaN/AlGaN DH-HEMT grown on patterned Silicon substrate C 01.51

R.Comyn, S.Chenot, M.Nemoz, E.Frayssinet, B.Damilano, Y.Cordier

Université Côte d'Azur, CNRS, CRHEA, rue B.Grégory, 06560, Valbonne, FRANCE.

18:00 Lower growth temperature: a major advantage of Molecular Beam Epitaxy for GaN HEMTs on Silicon C 01.52

Y.Cordier, S.Rennesson, R.Comyn, E.Frayssinet

Université Côte d'Azur, CNRS, CRHEA, rue B.Grégory, 06560, Valbonne, FRANCE.

18:00 **Enhancement-mode Ultrathin-Barrier GaN-cap/ AlN/GaN HEMT with High Ion/loff, Low Leakage Current and Low On-resistance** C 01.53

Ming Xiao, Jincheng Zhang, Xiaoling Duan and Yue Hao

Key Lab of Wide Band-Gap Semiconductor Technology, Taibai South Road, 710071, Xi'an, China

18:00 **m-plane GaN Schottky barrier diode fabricated with MOVPE layer on several off-angled GaN substrate** C 01.54

Atsushi Tanaka, Ousmane 1 Barry, Kentaro Nagamatsu, Manato Deki, Maki Kushimoto, Shugo Nitta, Yoshio Honda, Hiroshi Amano

Institute of Materials and Systems for Sustainability Nagoya University, Department of Electrical Engineering and Computer Science Nagoya University, Akasaki Research Center Nagoya University

18:00 **Barrier inhomogeneity of Ni Schottky contacts to bulk GaN** C 01.55

Fabrizio Roccaforte 1, Filippo Giannazzo 1, Ferdinando Iucolano 2, Giuseppe Greco 1

1 Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi (CNR-IMM), Strada VIII, n.5 – Zona Industriale, 95121 Catania (Italy), 2 STMicroelectronics, Stradale Primosole 50, 95121 Catania (Italy)

18:00 **Comparison of E-mode Fully-recessed GaN MIS-FETs and Partially-recessed MIS-HEMTs with PECVD-SiNx/LPCVD-SiNx Gate Stack** C 01.56

Jiabei He, Mengyuan Hua, Gaofei Tang, Zhaofu Zhang, and Kevin J. Chen

Dept. of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong

18:00 **GaN-based high electron mobility transistors on Si(111) with Au-free device processing** C 01.57

S. Tripathy, L. K. Bera, T. N. Bhat, S. B. Dolmanan

Institute of Materials Research and Engineering, A*STAR (Agency for Science, Technology and Research), Singapore

18:00 **Improvement of the GaN/AlGaN HEMTs? performance with BC13/Cl2/Ar-Based Inductively Coupled Plasma Etching** C 01.58

Zheng Yingkui, Wei Ke, Yuan Tingting, Liu Guoguo and Fan Jie

Institute of Microelectronics of Chinese Academy of Sciences

18:00 **Study of different metal contacts to GaN-based heterostructures for application in normally-off HEMT technology with a pGaN gate** C 01.59

Giuseppe Greco¹, Monia Spera¹, Salvatore Di Franco¹, Domenico Corso¹, Alessandra Alberti¹, Emanuele Smecca¹, Ferdinando Iucolano², Filippo Giannazzo¹, Fabrizio Roccaforte¹

1) Consiglio Nazionale delle Ricerche - Istituto per la Microelettronica e Microsistemi (CNR-IMM), Strada VIII, n.5 – Zona Industriale, 95121 Catania (Italy), 2) STMicroelectronics, Stradale Primosole 50, 95121 Catania (Italy)

18:00 **Modification of Fermi-level pinning at metal/ GaN interface by inserting ultrathin Al₂O₃ interlayers** C 01.60

M. Akazawa and T. Hasezaki

RCIQE, Hokkaido University

D poster : Bruno Daudin

- 18:00 **Ni pattern guided GaN nanowire humidity sensor with high sensitivity enhanced by UV photoexcitation** D 01.1
 Mingzeng Peng
 University of Science and Technology Beijing, China
- 18:00 **High-Performance Ultraviolet Photodetectors Based on Lattice-Matched InAlN/AIGaN HFETs Gated by Transparent ITO Films** D 01.2
 Lei Li, Daiki Hosomi, Makoto Miyoshi and Takashi Egawa
 Research Center for Nano Devices and Advanced Materials, Nagoya Institute of Technology, Japan
- 18:00 **Ionization-enhanced AlGaN heterostructure avalanche photodiodes** D 01.3
 Q. Cai, Z.G.Shao, F.You, D.J.Chen, H.Lu, R.Zhang, Y.D.Zheng
 Nanjing University
- 18:00 **Light-emitting diodes fabricated on an electrical conducting flexible substrate** D 01.4
 Won-Sik Choi, Jun Beom Park, Sin Jae Kim, Jun-Seok Ha, Tak Jeong
 Micro LED Research Center, Korea Photonics Technology Institute, Gwangju 500-779, Republic of Korea
- 18:00 **Self-powered low-dark current AlGaN MSM UV detector with record high responsivity at zero bias** D 01.5
 Anisha Kalra, Shashwat Rathkanthiwar, Rangarajan Muralidharan, Srinivasan Raghavan, Digbijoy Nath
 Center for Nanoscience and Engineering, Indian Institute of Science, Bangalore, India, 560012

- 18:00 **Million-fold dark current reduction in AlGaN solar-blind photodetectors** D 01.6
 Shashwat Rathkanthiwar, Anisha Kalra, Rangarajan Muralidharan, Digbijoy Nath and Srinivasan Raghavan
 Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore, India 560012
- 18:00 **Gain mechanism and carrier transport in highest responsivity AlGaN-based solar blind Metal Semiconductor Metal photodetectors** D 01.7
 Shashwat Rathkanthiwar, Anisha Kalra, Swanand Solanke, Neha Mohta, Rangarajan Muralidharan, Digbijoy Nath and Srinivasan Raghavan
 Centre for Nano Science and Engineering, Indian Institute of Science, Bangalore, India 560012
- 18:00 **Improved performance of AlGaN/GaN heterojunction bipolar phototransistors with a thin low-doped n-AlGaN insertion layer** D 01.8
 Shaoji Tang¹, Lingxia Zhang¹, Hualong Wu¹, Changshan Liu¹, Hailong Wang¹, Zhisheng Wu², Gang Wang² and Hao Jiang²
¹ Sun Yat-Sen University, Guangzhou 510275, China, ²State Key Laboratory of Optoelectronic Materials and Technologies, School of Electronics and Information Technology, Sun Yat-Sen University, Guangzhou 510275, China
- 18:00 **Influence of underlying substrates on material and device properties of MOCVD-grown InGaN/GaN MQW solar cells** D 01.9
 Makoto Miyoshi, Miki Ohta, Takuma Mori, Takashi Egawa
 Nagoya Institute of Technology

18:00 III-nitrides based electro-optic modulators D 01.10

Bandar Alshehri¹, Mohammed El Gibari², Hong Wu Li², Dimitris Pavlidis³, Elhadj Dogheche¹

1 IEMN, Institute of Electronics, Microelectronics and Nanotechnology, CNRS & University of Lille 1, Avenue Poincaré, 59652 Villeneuve d'Ascq, Cedex, France 2 UBL, IETR (Institute of Electronics and Telecommunications of Rennes), UMR CNRS 6164, Université de Nantes, 2 Rue de la Houssinière, BP 32229, 44322 Nantes, France 3 Boston University, Department of Electrical and Computer Engineering, 8 Saint Mary's Str., Boston, MA 02215 USA

18:00 High output voltage generation from Cu₂O/GaN Heterojunction Piezoelectric nanogenerator via suppressed carrier screening D 01.11

Muhammad Ali Johar, Jin-Ho Kang, Dae Kyung Jeong, Sang-Wan Ryu

Department of Physics, Chonnam National University, Gwangju 61186, Republic of Korea

18:00 Fabrication and evaluation of vertical type BGaN diodes by MOVPE using trimethylboron. D 01.12

K. Mochizuki¹, T. Arikawa¹, Y. Inoue¹, H. Nakagawa², S. Usami³, M. Kushimoto³, Y. Honda⁴, H. Amano^{4,5}, K. Kojima⁶, S. Chichibu^{4,6}, H. Mimura⁷, T. Aoki⁷, T. Nakano¹

1. Dept. of Electronics and Materials Science, Shizuoka Univ., 3-5-1 Johoku, Hamamatsu, Japan, 2 Dept. of Nanovision Technology, Shizuoka Univ., 3-5-1 Johoku, Hamamatsu, Japan, 3. Dept. of Engineering and Institute of Materials and Systems for Sustainability, Nagoya Univ., Furo-cho Chikusa-ku, Nagoya, Japan, 4. Institute Materials Systems for Sustainability, Nagoya Univ., Furo-cho Chikusa-ku, Nagoya, Japan, 5. Akasaki Research Center, Nagoya Univ., Furo-cho Chikusa-ku, Nagoya, Japan, 6. Institute of Multidisciplinary Research for Advanced Materials, Tohoku Univ., 1-1-2 Katahira, Sendai, Japan, 7. Research Institute of Electronics, Shizuoka Univ., 3-5-1 Johoku, Hamamatsu, Japan

18:00 Fabrication and characterization of hybrid n-GaN/p-PEDOT structures for optoelectronic applications by oxidative CVD D 01.13

Linus Krieg¹, Florian Meierhofer¹, Priya Moni², Karen Gleason², Tobias Voss¹

1 Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, Braunschweig University of Technology, 38092 Braunschweig, 2 Department of Chemical Engineering, Massachusetts Institute of Technology, 02139 Cambridge

18:00 Design and simulation of InGaN/GaN pin photodiodes D 01.14

M. Elbar¹, B. Alshehri², S. Tobbeche¹, E. Dogheche²

1 Laboratory of Metallic and Semiconducting Materials, University of Biskra, BP.145, 07000 Biskra RP, Algeria. 2 IEMN, Institute of Electronics, Microelectronics and Nanotechnology, CNRS & University of Lille 1, Avenue Poincaré, 59652 Villeneuve d'Ascq, Cedex, France

18:00 The study of photoenhanced chemical etching for GaN and AlGaN/GaN HEMTs D 01.15

Luu Thi Lan Anh, Nguyen Tuyet Mai, Nguyen Van Do, Nguyen Ngoc Trung and Nguyen Xuan Sang

Hanoi University of science and technology- N0 1 Dai Co Viet-Hai Ba Trung- Hanoi Vietnam, Hanoi University of science and technology - N0 1 Dai Co Viet-Hai Ba Trung- Hanoi Vietnam, Hanoi University of science and technology- N0 1 Dai Co Viet-Hai Ba Trung- Hanoi Vietnam, Hanoi University of science and technology- N0 1 Dai Co Viet-Hai Ba Trung- Hanoi Vietnam and Singapore-MIT Alliance for Research & Technology Centre.

18:00 Investigation of dual-wavelength InGaN/GaN multiple-quantum well for scintillation application D 01.16

J. Oswald, F. Hájek, A. Hospodková, K. Kuldová, J. Pangrác and M. Zíková

Institute of Physics of the Czech Academy of Sciences, Cukrovarnická 10, 162 00 Prague, Czech Republic

18:00 **Fine control of the electric field distribution in the heterostructure multiplication region of AlGaN avalanche photodiodes** D 01.17

Haifan You, Zhenguang Shao, Dunjun Chen, Hai Lu, Rong Zhang, and Youdou Zheng

Key Laboratory of Advanced Photonic and Electronic Materials, School of Electronic Science and Engineering, Nanjing University, Nanjing, China

18:00 **The Effects of CaMn₂O₄ co-Catalyst Decorated GaN Photoelectrode for High Efficiency photoelectrochemical Water Splitting** D 01.18

Hyojung Bae¹, Haseong Kim¹, Soon Hyung Kang¹, Hyo-Jong Lee², Koike Kayo³, Katsushi Fujii⁴, and Jun-Seok Ha^{1,*}

Chonnam National University, Gwangju 61186, Korea, Dong-A University, Busan, 49315, Korea, The University of Tokyo, komaba kampus, Tokyo, 113-8656, Japan, The University of Kitakyushu, Kitakyushu, Fukuoka, 802-8577, Japan

18:00 **GaN for Thermoelectric Applications** D 01.19

Ashish Kumar¹, R. C. Meena¹, Parmod Kumar¹, R. Singh², K. Asokan¹ and D. Kanjilal¹

1-Inter-University Accelerator Centre, Aruna Asaf Ali Marg, Vasant Kunj, New Delhi, India – 110067, 2-Department of Physics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi, India –110016,

18:00 **Polarization-engineered InGaN solar cells** D 01.20

S. A. Kazazis¹, E. Papadomanolaki¹, E. Iliopoulos^{1,2}

¹Department of Physics, University of Crete, Heraklion, Greece
²Microelectronics Research Group, IESL-FORTH, Heraklion, Greece

18:00 **Towards Voltage Controlled GaN-based Waveguide Phase Modulator** D 01.21

Ohad Westreich^{1,2}, Moti Katz¹, Yossi Paltiel², Noam Sicron¹

¹Solid State Physics department, Applied Physics Division, Soreq NRC, Yavne 81800, Israel, ²Applied Physics Department, Hebrew University, Jerusalem 91904, Israel

E poster : Bruno Daudin

18:00 **Structural, electronic and optical properties of the wurtzite In_xGa_{1-x}N alloy matched on GaN substrate, within modified Becke?Jo** E 01.1

Amina Benzina^{1, 2}, Abdelhadi Lachebi¹, Ahmad Shuhaimi², Saadah Abdul Rahman², Hamza Abid¹.

¹Applied Materials Laboratory, Research Center, Djillali Liabes University of Sidi Bel Abbès, 22000, Sidi Bel Abbès, Algeria. ²Low Dimensional Materials Research Centre (LDMRC), Department of Physics, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia.

18:00 **Systematic theoretical investigations of polytypism in AlN** E 01.2

Tomonori Ito, Toru Akiyama, Kohji Nakamura

Department of Physics Engineering, Mie University

18:00 **Structures and polarity of III-nitrides: phase diagram calculations using absolute surface and interface energies** E 01.3

Toru Akiyama, Harunobu Nakane, Motoshi Uchino, Kohji Nakamura, Tomonori Ito

Department of Physics Engineering, Mie University

18:00 **Strain detection in AlInN/GaN-based heterostructures using two-dimensional blocking patterns of channelled particles** E 01.4

A. Redondo-Cubero¹, E. David Bosne², U. Wahl², P. Miranda³, M.R. da Silva⁴, J.G. Correia², K. Lorenz⁵

¹Department of Applied Physics, Universidad Autónoma de Madrid, 28049 Madrid, Spain, ²Centro de Ciências e Tecnologias Nucleares, Instituto Superior Técnico, Universidade de Lisboa, 2695-066, Bobadela LRS, Portugal, ³Universidad Tecnológica Metropolitana, Las Palmeras, Santiago de Chile, Chile, ⁴Centro de Física Nuclear, Universidade de Lisboa, 1649-003 Lisboa, Portugal, ⁵IPFN, Instituto Superior Técnico, Universidade de Lisboa, Estrada Nacional 10, 2695-066, Bobadela LRS, Portugal

18:00 **Modeling and investigation of photoinduced entropy of InGaN/GaN p-i-n double-heterostructure nanowires** E 01.5

Nasir Alfaraj, Somak Mitra, Feng Wu, Idris A. Ajia, Bilal Janjua, Aditya Prabaswara, Renad A. Aljefri, Haiding Sun, Tien Khee Ng, Boon S. Ooi, Iman S. Roqan, Xiaohang Li

King Abdullah University of Science and Technology, Thuwal 23955-6900, Kingdom of Saudi Arabia

18:00 **Quantum-Wire-Like Density of States in c-plane AlGaN Quantum Wells in Polarization-Crossover Composition Region** E 01.6

S. Sakai, T. Minami, K. Kojima, S. F. Chichibu, A. A. Yamaguchi

Kanazawa Institute of Technology, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

18:00 **Thermodynamic Analysis of the TMG Decomposition Process Considering the Activation Energy** E 01.7

K. Sekiguchi, H. Shirakawa, K. Chokawa, M. Araida, Y. Kangawa, K. Kakimoto, and K. Shiraishi

Graduate School of Engineering, Nagoya University, Institute of Materials and Systems for Sustainability, Nagoya University, Research Institute for Applied Mechanics, Kyushu University

18:00 **Dissipation/thermalization of the excess energy of the adsorbate via electron transfer - application to nitride growth** E 01.8

Paweł Strak¹, Konrad Sakowski¹, Paweł Kempisty², Agata Kaminska³, Stanisław Krukowski¹

¹Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland , ²Center for Integrated Research of Future Electronics (CIRFE), Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University, Nagoya 464-8603, Japan, ³Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, 01-142 Warsaw, Poland and Cardinal Stefan Wyszyński University, College of Science, Department of Mathematics and Natural Sciences, Dewajtis 5, 01-815 Warsaw, Poland

18:00 **Tight Binding Modeling of AlGaN/GaN and InGaN/GaN Spherical Core/Shell Quantum Dots** E 01.9

Hilmi Ünlü

Department of Physics Engineering, Faculty of Science and Letters İstanbul Technical University, Maslak 34469 İstanbul, TURKEY
E-mail: hunlu@itu.edu.tr Phone: 90-212-285 3201, Fax: 90-212-285 6386

18:00 **Combined XPS model and growth kinetic model of passivating GaN thin film elaborated on GaAs** E 01.10

Hussein Mehdi(a), Guillaume Monier(a), Christine Robert-Goumet(a), Vladimir G. Dubrovskii (b,c,d)

(a)Institut Pascal, Université Clermont Auvergne, CNRS, SIGMA Clermont, F-63000 Clermont-Ferrand, France (b)St. Petersburg Academic University, Khlopina 8/3, 194021 St. Petersburg, Russia (c)Ioffe Physical Technical Institute of the Russian Academy of Sciences, Politekhnicheskaya 26, 194021 St. Petersburg, Russia (d)ITMO University, Kronverkskiy prospekt 49, 197101 St. Petersburg, Russia

18:00 **Numerical study of MOCVD reactor growth conditions based on 3D thermo-kinetic model.** E 01.11

Przemysław Niedzielski, Ewa Raj, Zbigniew Lisik.

Lodz University of Technology, Department of Semiconductor and Optoelectronic Devices, 211/215 Wolczanska str., 90-924 Lodz, Poland, E-mail: przemyslaw.niedzielski@p.lodz.pl, http://www.dsod.p.lodz.pl

18:00 **Nano-cathodoluminescence reveals the effect of electron damage on the optical properties of III-nitride optoelectronics and the** E 01.12

James T. Griffiths, Siyuan Zhang, Jeremy Lhuillier, Dandan Zhu, Ashley Howkins, Ian Boyd, David Stowe, David J. Wallis, Colin J. Humphreys, and Rachel A. Oliver

1 Department of Materials Science and Metallurgy, 27 Charles Babbage Road, Cambridge, CB3 0FS, United Kingdom, 2 Experimental Techniques Centre, Brunel University, Uxbridge, UB8 3PH, United Kingdom, 3 Gatan UK, 25 Nuffield Way, Abingdon, Oxon, OX14 1RL, United Kingdom

18:00 **Using embedded clusters to elucidate the defect-related optical and electronic properties of GaN** E 01.13

John Buckeridge¹, Zijaun Xie², Yu Sui², C. Richard A. Catlow¹, Aron Walsh³, David O. Scanlon¹, Alexey A. Sokol¹

¹University College London, Kathleen Lonsdale Materials Chemistry, Department of Chemistry, 20 Gordon Street, London WC1H 0AJ, U.K., ²Department of Physics, Harbin Institute of Technology, 92 Xidazhi Street, Harbin 150001, P. R. China ³Department of Materials, Imperial College London, London WC1H 0AJ, U.K.

18:00 **Density Functional Theory study on stability of carbon and oxygen at GaN(0001) and GaN(000-1) surfaces** E 01.14

Pawel Kempisty^(1,3), Yoshihiro Kangawa^(2,1), Kenji Shiraishi⁽¹⁾, Stanislaw Krukowski⁽³⁾, Michal Bockowski⁽³⁾, Koichi Kakimoto⁽²⁾, and Hiroshi Amano⁽¹⁾

(1) Center for Integrated Research of Future Electronics (CIRFE), Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University, Japan, (2) Research Institute for Applied Mechanics, Kyushu University, Japan, (3) Institute of High Pressure Physics, Polish Academy of Sciences, Poland,

18:00 **Investigation of atomic structures and interfacial properties of HfO₂ thin films deposited on a GaN wafer by MD simulation** E 01.15

Thoan H. Nguyen*, Do T. Nguyen, Anh T. L. Luu, Trung N. Nguyen, Vinh V. Le

School of Engineering Physics, Hanoi University of Science and Technology, Hanoi, Vietnam

G Poster session : Bruno Daudin

18:00 **MOCVD growth of N-polar InN quantum dots and thin films on vicinal GaN** G 1.1

Cory Lund¹, Massimo Catalano², Thomas E. Mates³, Luhua Wang², Moon Kim², Shuji Nakamura³, Steven P. DenBaars³, Umesh K. Mishra¹, Stacia Keller¹

¹Electrical & Computer Engineering Department, University of California, Santa Barbara, CA 93106, USA, ²Materials Science & Engineering Department, University of Texas at Dallas, Richardson, TX 75080, USA, ³Materials Department, University of California, Santa Barbara, CA 93106, USA

18:00 **Nondestructive measurement of a homoepitaxially grown GaN film thickness with FT-IR** G 1.2

Fumimasa Horikiri, Yoshinobu Narita, and Takehiro Yoshida
SCIOS Co., Ltd

18:00 **GaN/AlGaN Ultraviolet Light-Emitting Diodes with Porous-AlGaN Reflectors** G 1.3

Chia-Feng Lin
Department of Materials Science and Engineering, National Chung Hsing University, 145 Xingda Rd., South Dist., Taichung City 402, Taiwan

18:00 **Suppression of Iron memory-effect in GaN epitaxial layers** G 1.4

S. Leone, F. Benkhelifa, L. Kirste, C. Manz, S. Mueller, R. Quay, T. Stadelmann
Fraunhofer Institute for Applied Solid State Physics IAF, Tullastrasse 72, 79108 Freiburg, Germany

18:00 **GaN-Based Light-Emitting Memory Devices Using ZnO Resistive Switching Materials as N-Type Contact Electrodes** G 1.5

Hyun Tae Kim, Ju Hyun Park, Byeong Ryong Lee, Tae Ho Lee, Kyung Rock Son, Sang Hoon Oh

Tae Geun Kim

18:00 **Optimization of Hybrid GaN Tunnel Junction Contacts to III-Nitrides** G 1.6

Asad J. Mughal, Erin C. Young, Joonho Bak, Shuji Nakamura, James. S. Speck, and Steven P. DenBaars

Materials Department, University of California, Santa Barbara, CA 93106, U.S.A.

18:00 **Sublimation growth of 2 inch AlN bulk crystal: exploration of various substrates and growth parameters** G 1.7

Zhangyong Cheng¹; Liwen Yang¹; Zhenzhou Yuan¹; Zhiyuan Dong²; Youwen Zhao²; Xinyu Liu^{1*}

* Corresponding author: xinyu.liu@cengol.com

1 Beijing Huajin Chuangwei Electronics Co., Ltd. Beijing 100176, China.

2 Materials Science Center, Institute of Semiconductor, Chinese Academy of Sciences, P.O.Box 912, Beijing 100083, China

18:00 **Impacts of Carrier Transport and Deep Level Defects on Delayed Cathodoluminescence in Droop-Mitigating InGaN/GaN LEDs** G 1.8

Zhibo Zhao¹, Akshay Singh¹, Jordan Chasin¹, Rob Armitage², Isaac Wildeson², Parijat Deb², Andrew Armstrong³, Kim Kisslinger⁴, Eric Stach⁴, Silvija Gradecak¹

1 Massachusetts Institute of Technology, Cambridge, MA, USA, 2 Lumileds, San Jose, CA, USA, 3 Sandia National Laboratories, Albuquerque, NM, USA, 4 Brookhaven National Laboratory, Upton, NY, USA

18:00 **Achievement of high-EQE (9.5%) AlGaN deep-UV LED using highly-reflective photonic crystal (HR-PhC) on p-contact layer** G 1.9

Yukio Kashima^{1,2*}, Noritoshi Maeda¹, Eriko Matsuura^{1,2}Masafumi Jo¹, Takeshi Iwai³, Toshiro Morita³, Mitsunori Kokubo⁴, Takaharu Tashiro⁴, Ryuichiro Kamimura⁵, Yamato Osada⁵, Hideki Takagi⁶, Hideki Hirayama¹

1-RIKEN, 2-1 Hirosawa Wako, Saitama 351-0198, Japan,
2-Marubun Corporation, 8-1 Oodenma-cho, Nihonbashi, Chuo Ward, Tokyo, 109-8577, Japan, 3-Tokyo Ohka Kogyo Co., Ltd. 150 Nakamaruko, Nakahara, Kawasaki, Kanagawa 211-0012, Japan, 4-Toshiba Machine Co., Ltd. 2068-3, Ohoka, Numadu, Shizuoka 410-8510, Japan, 5-ULVAC, Inc. 2500, Hagizono, Chigasaki, Kanagawa 253-8543, Japan 6-AIST, Tsukuba-East, Namiki1-2-1, Tsukuba, Ibaraki 305-8564, Japan

18:00 **The Effect of Mg Doping Profiles on Anode Injection Efficiency on MOCVD-grown GaN-on-Sapphire Quasi-Vertical p-i-n Diodes** G 1.10

J. Howell-Clark¹, Z. Guo¹, C. Wetzel¹, T.P. Chow¹, G. Piao², Y. Yano², T. Tabuchi², K. Matsumoto²

1Rensselaer Polytechnic Institute 2Nippon Sanso Corporation

18:00 **Homoepitaxial GaN growth by halogen-free vapor phase epitaxy on native GaN substrates** G 1.11

T. Kimura, K. Horibuchi, K. Kataoka, and D. Nakamura

Toyota central R&D labs., inc.

18:00 **InGaN Resonant Cavity Light Emitting Diode with an embedded Porous-GaN Distributed Bragg Reflector** G 1.12

Chia-Feng Lin¹, Tsung-Lian Tsai¹, Jung Han²

1)Department of Materials Science and Engineering, National Chung Hsing University, 145 Xingda Rd., South Dist., Taichung City 402, Taiwan, 2)Department of Electrical Engineering, Yale University, 15 Prospect Street, New Haven, Connecticut 06511, United States

18:00 **Analysis of the radial growth of GaN nanowires G 1.13 for the fabrication of homogeneous multi-shell nanowire heterostructures**

D. van Treeck, O. Brandt, L. Geelhaar, S. Fernández-Garrido

Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5-7,
10117 Berlin, Germany

18:00 **Determination of Partial Ordering in G 1.15 Pseudomorphic AlGaN Films Grown on AlN Single Crystals**

Milena B. Graziano (1), Randy P. Tompkins (1), Kenneth A. Jones (1)

(1) - Sensors and Electron Device Directorate, Army Research Laboratory, 2800 Powder Mill Rd., Adelphi, Maryland 20783

18:00 **First demonstration of lateral thin-film flip-chip G 1.14 ultraviolet light emitting diodes grown on SiC**

Burhan SaifAddin, Humberto Foronda, Abdullah Almogbel, Chris Zollner, M.E.A. Samsudin, Michael Iza, Shuji Nakamura, Steven P. DenBaars, James S. Speck

Materials Department, UCSB, CA 93106, USA Department of Electrical and Computer Engineering, UCSB, CA 93106, USA.



12th International Conference
on Nitride Semiconductors (ICNS12)
24th-28th July 2017, Strasbourg, France

Wednesday Program

- A - Materials
- B - Optical devices
- C - Electronic devices
- D - Other devices
- E - Theory-basics
- F - Nano

parallel sessions

8:30 - 10:00

Molecular Beam Epitaxy : Fabrice Semond

- 08:30 **Role of MBE in the Development of GaN Optoelectronics** A 7.1

James S. Speck

Materials Department, University of California, Santa Barbara, CA 93106 USA

- 09:00 **Germanium vs. silicon doping of GaN/AlN quantum wells and nanowire heterostructures for intersubband optoelectronics at 1.55 μm** A 7.2

Akhil Ajay, Caroline B. Lim, David A. Browne, Jakub Polaczynski, Joel Bleuse, Edith Bellet-Amalric, Martien I. den Hertog, Eva Monroy

University Grenoble-Alpes, CEA-INAC-PHELIQS and CNRS-Institut Néel, 38000 Grenoble, France

- 09:15 **Morphology control of GaN nanowires: from needles to nanoparasols** A 7.3

Xin Zhang [1, 2, 5], B. Haas [1,3], M. Gruart [1,2], A. M. Siladie [1,2], E. Robin [1,3], C. Bougerol [1,4], J.L. Rouvière [1,3] and B. Daudin [1,2]

[1] Univ. Grenoble Alpes, 38000 Grenoble, France [2] CEA, INAC-PHELIQS «Nanophysics and semiconductors» group, F-38000 Grenoble, France [3] CEA, INAC-MEM, F-38000 Grenoble, France [4] CNRS, Inst. NEEL, F-38042 Grenoble, France [5] ALEDIA, 17 rue des martyrs, Bât. M23, 38054 Grenoble Cedex 9, France

- 09:30 **Monolayer-thick GaN/(Al,Ga)N quantum wells grown by plasma-assisted molecular beam epitaxy for UV emitters in spectral range of**

V.N. Jmerik¹, D.V. Nechaev¹, A.A. Toropov¹, E.A. Evopeytsev¹, V.I. Kozlovsky^{2,3}, D.E. Sviridov², S. Rouvimov⁴, and S.V. Ivanov¹

1Ioffe Institute, Polytekhnicheskaya 26, St. Petersburg 194021, Russia, 2 Lebedev Physical Institute, Leninsky ave.53, Moscow 119991, Russia, 3 National Research Nuclear University MEPhI, Moscow 115409, Russia, 4 University of Notre Dame, Notre Dame, Indiana 46556, USA

- 09:45 **In-situ X-ray Reciprocal Space Mapping Measurements in GaInN growth on GaN and InN by RF-MBE** A 7.5

T. Yamaguchi¹, T. Sasaki², M. Takahasi², T. Onuma¹, T. Honda¹, Y. Nanishi³

1 Department of Applied Physics, Kogakuin University, Hachioji, Tokyo, Japan, 2 Synchrotron Radiation Research Center, National Institutes for Quantum and Radiological Science and Technology, Sayo-cho, Hyogo, Japan, 3 Department of Electrical and Electronic Engineering, Ritsumeikan University, Kusatsu, Shiga, Japan

- 10:00 **Coffee break**

Lasers : Thomas Wunderer

- 08:30 **Watt-class Green (530 nm) and Blue (462 nm) Laser Diodes** B 7.1

Masahiro Murayama (a), Yusuke Nakayama (a), Kenji Yamazaki (a), Yukio Hoshina (a), Hideki Watanabe (a), Noriyuki Fuutagawa (a), Hidekazu Kawanishi (a), Toshiya Uemura (b), and Hironobu Narui (a)

(a) Sony Corporation, Japan, (b) Toyoda Gosei Co., Ltd., Japan

- 09:00 **Status, Applications and Future Perspectives of Visible InGaN Lasers** B 7.2

Harald König

Osram Opto Semiconductors GmbH

Wednesday

09:30 Green laser diodes with low threshold current density via interface engineering of InGaN/GaN quantum well active region B 7.3

Jianping Liu, Aiqin Tian, Liqun Zhang, Zengcheng Li, Masao Ikeda, Shuming Zhang, Deyao Li, Pengyan Wen, Feng Zhang, Yang Cheng, Xiaowang Fan and Hui Yang

Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Science, University of Chinese Academy of Sciences, Suzhou 215123, People's Republic of China

09:45 Optoelectrical properties of (Al,In)GaN optical amplifiers B 7.4

S. Stanczyk¹, A. Kafar¹, A. Nowakowska-Siwinska², I. Makarowa², M. Sarzynski^{1,2}, T. Suski¹, P. Perlin^{1,2}

¹Institute of High Pressure Physics PAS., Al. Prymasa Tysiąclecia 98, 01-142 Warsaw, Poland, ²TopGaN Ltd., ul. Sokolowska 29/37, 01-142 Warsaw, Poland

10:00 Coffee break

Doping, defects : Kazunobu Kojima

08:30 Carrier Transport and Impurity Modeling in III-nitride LEDs E 2.1

Bernd Witzigmann, Friedhard Römer

University of Kassel and CINSaT, Electrical Engineering and Computer Science Department Kassel, Germany

09:00 Unconventional electronic complexes in highly doped GaN:Ge E 2.2

A. Hoffmann¹, G. Callsen¹, C. Nenstiel¹, F. Nippert¹, T. Kure¹, S. Schlichting¹, N. Jankowski¹, M. R. Wagner¹, M. P. Hoffmann², S. Fritze², A. Dadgar², A. Krost², F. Bechstedt³

¹Institut für Festkörperphysik, Technische Universität Berlin, Berlin, Germany, ²Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Magdeburg, Germany, ³Institut für Festkörpertheorie und -optik, Friedrich-Schiller-Universität, Jena, Germany.

09:15 First principles investigation of defect equilibria in AlN E 2.3

Douglas L. Irving¹, Joshua S. Harris¹, Jonathon N. Baker¹, Kelsey J. Mirrieles¹, Brian D. Behrhorst¹, Dorian Alden¹, Ronny Kirste², James Tweedie², Ramón Collazo¹, Zlatko Sitar¹

¹Department of MSE, North Carolina State University, Raleigh, NC USA, ²Adroit Materials Inc., Cary, NC USA

09:30 Ab initio direct slab calculations of polarization in nitrides - the model and experimental verification E 2.4

Pawel Strak¹), Paweł Kempisty^{1, 7}, Konrad Sakowski¹), Agata Kamińska^{2, 3}), Dawid Jankowski²), Krzysztof P. Korona⁴), Kamil Sobczak²), Jolanta Borysiuk^{2,4}), Mark Beeler⁵), Ewa Grzanka^{1, 6}), Eva Monroy⁵) and Stanisław Krukowski¹)

1) Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland 2) Institute of Physics Polish Academy of Sciences, Al. Lotników 32/46, 01-142 Warsaw, Poland 3) Cardinal Stefan Wyszyński University, College of Science, Department of Mathematics and Natural Sciences, Dewajtis 5, 01-815 Warsaw, Poland 4) Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland 5) CEA Grenoble, INAC-SP2M, 17 av. des Martyrs, 38000 Grenoble, France 6) TopGaN Ltd. Sokolowska 29/37, 01-142 Warsaw, Poland 7) Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya 464-8603, Japan

09:45 Lattice location of Mg in GaN of different doping types: direct evidence for amphoteric nature of Mg E 2.5

U. Wahl¹, L.M. Amorim², V. Augustyns², A. Costa¹, E. David Bosne¹, T. A. L. Lima¹, G. Lippertz¹, J. G. Correia¹, M.R. da Silva³, M.J. Kappers⁴, K. Temst², A. Vantomme², L.M.C. Pereira²

¹Centro de Ciências e Tecnologias Nucleares, Instituto Superior Técnico, Universidade de Lisboa, 2695-066, Bobadela LRS, Portugal, ²KU Leuven, Instituut voor Kern- en Stralingsfysica, 3001 Leuven, Belgium, ³Centro de Física Nuclear da Universidade de Lisboa, 1649-003 Lisboa, Portugal, ⁴Cambridge Centre for Gallium Nitride, University of Cambridge, Cambridge CB3 0FS, U.K.

10:00 Coffee break

Nano : Jesus Zuniga Perez

- 08:30 **3D GaN architectures: from core-shell LEDs to a defect free multipurpose material platform** F 1.1

A. Waag (a,d,e), J. Hartmann (a,d), H. Zhou (a), S. Fündling (a,d), H.-H. Wehmann (a,d), F. Steib (a,d), H.S. Wasisto (a,e), M. Müller (b), P. Veit (b), F. Bertram (b), J. Christen (b), T. Schimpke (c), M. Mandl (c), A. Avramescu (c), I. Stoll (c), M. Strassburg (c), H.-J. Lugauer (c)

a) Inst. of Semiconductor Technology, Braunschweig University of Technology, Germany, b) Otto-von-Guericke-Universität Magdeburg, Magdeburg, Germany, c) Osram Opto Semiconductors GmbH, Regensburg, Germany, d) Epitaxy Competence Center, Braunschweig, Germany, e) Laboratory of Emerging Nanometrology, Braunschweig, Germany

- 09:00 **Nanowires, Nanosheets, and Beyond: Three-Dimensional, High Aspect Ratio Nanostructures by Top-Down Etching of GaN** F 1.2

George T. Wang¹, Benjamin Leung¹, Miao-Chan Tsai², Changyi Li², Ganesh Balakrishnan¹

¹ Sandia National Laboratories, Albuquerque, New Mexico 87185, USA, ² Center for High Technology Materials, University of New Mexico, Albuquerque, NM, 87106, USA

- 09:30 **Reduction of Dislocation in GaN on Silicon Substrate Using In-situ Etching** F 1.3

Koji Matsumoto ^{1,2}, Toshiaki Ono ¹, Yoshio Honda ³, Tetsuya Yamamoto ², Shigeyoshi Usami ², Maki Kushimoto ², Satoshi Murakami ¹, Hiroshi Amano ^{3,4,5}

¹ SUMCO Corporation, ² Department of Electrical Engineering and Computer Science, Nagoya University, ³ Institute of Materials and Systems for Sustainability, Nagoya University, ⁴ Venture Business Laboratory (VBL), Nagoya University, ⁵ Akasaki Research Center, Nagoya University

- 09:45 **Unidirectional Emission of Single Quantum Dot Formed on Site-Controlled Inverted Pyramid Structure** F 1.4

Sejeong Kim, Su-Hyun Gong, Jong-Hoi Cho, Yong-Hoon Cho

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea

- 10:00 **Coffee break**

parallel sessions 10:30 - 12:15

Characterization : Martin Albrecht

- 10:30 **Atom probe tomography nanometer scale characterization of alloy fluctuations in ternary nitrides** A 8.1

Bastien Bonef¹, Micha N Fireman¹, Richard Cramer¹, Marco Piccardo², Yuh-Renn Wu³, Claude Weisbuch^{1,2}, James S Speck¹

¹Materials Department, University of California, Santa Barbara, California 93106, USA, ²Laboratoire de Physique de la Matière Condensée, Ecole Polytechnique, CNRS, Université Paris Saclay, 91128 Palaiseau Cedex, France, ³Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taipei 10617, Taiwan

11:00 Novel SEM techniques for rapid structural characterisation of III-N films A 8.2

C. Trager-Cowan [1], G. Naresh-Kumar [1], M. Nouf-Allehiani [1], J. Bruckbauer [1], G. Kusch [1], P. R. Edwards [1], C. Brasser [1], E. Pascal [1], S. Vespucci [1], S. Kraeusel [1], B. Hourahine [1], R. W. Martin [1], Y. Zhang [2], M. Athanasiou [2], Y. Gong [2], J. Bai [2], K. Xing [2], X. Yu [2], B. Xu [2], Z. Li [2], Y. Hou [2], R. M. Smith [2], T. Wang [2], E. Le. Boulbar [3], J. Priesol [3], D. W. E. Allsopp [3], P.A. Shields [3], F. Mehnke [4], T. Wernicke [4], C. Kuhn [4], J. Enslin [4], M. Kneissel [4,5], A. Knauer [5], V. Kueller [5], M. Weyers [5], A. Winkelmann [6], A. Vilalta-Clemente [7], A. J. Wilkinson [7]

[1] Department of Physics, SUPA, University of Strathclyde, Glasgow G4 0NG, UK, [2] Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, UK, [3] Department of Electrical and Electronic Engineering, University of Bath, BA2 7AY, UK, [4] Institute of Solid State Physics, Technische Universität Berlin, 10623 Berlin, Germany, [5] Ferdinand-Braun-Institut, Leibnitz-Institut für Hochstfrequenztechnik, 12489 Berlin, Germany, [6] Bruker Nano GmbH, Am Studio 2D, 12489 Berlin, Germany, [7] Department of Materials, University of Oxford, Oxford OX1 3PH, UK

11:30 Three-dimensional analysis of threading dislocation in HVPE-grown GaN using two-photon-excitation photoluminescence spectroscopy A 8.3

Tomoyuki Tanikawa, Kazuki Ohnishi, Masaya Kanoh, Takashi Mukai, and Takashi Matsuoka

Institute for Materials Research, Tohoku University, Nichia Corporation

11:45 Mg dopant analysis in (Al)GaN by atom probe tomography and off-axis electron holography A 8.4

Catherine Bougerol¹⁻², Lynda Amichi¹⁻³, Isabelle Mouton¹⁻⁴, David Cooper¹⁻⁴, Philippe Vennegues⁵, Philippe De Mierry⁵, Amélie Dussaigne¹⁻⁴, Pierre-Henri Jouneau¹⁻³, Adeline Grenier¹⁻⁴

¹ Univ. Grenoble Alpes, F-38000 Grenoble, France , ² CNRS, Inst. NEEL, F-38042 Grenoble, France , ³ CEA-INAC, F-38054 Grenoble, France , ⁴ CEA-LETI, F-38054 Grenoble, France , ⁵ Université Côte d'Azur, CRHEA, Rue Bernard Grégory, 06560 Valbonne, France

12:00 Point defect reduction in MOCVD Al/GaN by chemical potential and defect quasi Fermi level control A 8.5

Ramon Collazo [1], Pramod Reddy [1,2], Shun Washiyama [1], Felix Kaess [1], Ronny Kirste [2], Seiji Mita [2], James Tweedie [2], Michael Gerhold [3] and Zlatko Sitar [1]

[1] Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC 27695-7919, USA, [2] Adroit Materials, Inc., 2054 Kildaire Farm Rd., Cary NC 27518, USA, [3] Engineering Science Directorate, Army Research Office, P.O. BOX 12211, Research Triangle Park, NC 27703, USA

12:15 Lunch

Lasers and optical properties : Gwénolé jacopin

10:30 III-Nitride Laser Diode Directly Grown on Si B 8.1

Qian Sun, Meixin Feng, Zengcheng Li, Yu Zhou, Jianping Liu, Liqun Zhang, Deyao Li, Shuming Zhang, Hui Yang

Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences (CAS), Suzhou 215123, China, Key Laboratory of Nano-devices and Applications, Chinese Academy of Sciences (CAS), Suzhou 215123, China

11:00 A way to achieve more than 90% of the overlap integral of electron and hole wavefunctions in high AlN mole fraction AlGaN MQWs B 8.2

Shigefusa F. Chichibu[1], Kazunobu Kojima[1], Kentaro Furusawa[1], Yoshiaki Yamazaki[1], Kazumasa Hiramatsu[2], and Hideto Miyake[2,3]

¹ Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Katahira, Aoba, Sendai 980-8577, Japan, ² Department of Electrical and Electronic Engineering, Mie University, Tsu, Mie, Japan, ³ Graduate School of Regional Innovation Studies, Mie University, Tsu, Mie, Japan

- 11:15 Proposal of AlGaN-based uneven multiple quantum well with high internal quantum efficiency grown on macrosteps** B 8.3
- Akira Hirano¹, Michiko Kaneda¹, Yosuke Nagasawa¹, Masamichi Ipponmatsu¹, Yoshio Honda², Hiroshi Amano^{2,3,4}, and Isamu Akasaki^{3,5}
1. UV Craftory Co., Ltd., 2. IMaSS-Nagoya Univ., 3. ARC-Nagoya Univ., 4. VBL-Nagoya Univ., 5. Meijo Univ.
- 11:30 Highly polarised electrically driven single photon emission from a non-polar InGaN quantum dot** B 8.4
- C. C. Kocher¹, T. J. Puchtler¹, J. C. Jarman², T. Zhu², R. A. Oliver², R. A. Taylor¹
- 1 Department of Physics, University of Oxford, Parks Road, Oxford, OX1 3PU, U.K. 2 Department of Material Science, University of Cambridge, Pembroke Street, Cambridge CB2 3QZ, U.K.
- 11:45 Dominance of Radiative Recombination under Electron-beam Excitation of AlGaN MQW's** B 8.5
- Noble Johnson (presenting author)¹, Thomas Wunderer¹, Jorg Jeschke¹, Farsane Tabataba-Vakili¹, Michael Kneissl¹, Zhihong Yang¹, Mark Teepe¹, Max Batres¹, Martin Feneberg², Bernard Vancil³
- 1PARC, a Xerox Company, Palo Alto, CA 94304 USA, 2Institut für Experimentelle Physik, Otto-von-Guericke-Universität, Magdeburg 39106, Germany, 3e beam Inc., Beaverton, OR 97007 USA
- 12:00 Polarization Fields in AlGaN Multiple Quantum Wells** B 8.6
- Qiang Guo, Ronny Kirste, Seiji Mita, Pramod Reddy, Ramón Collazo, and Zlatko Sitar
- Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC 27695, USA, Adroit Materials, 2054 Kildaire Farm Rd, Cary, NC 27518, USA

Power : Mike Uren

- 10:30 High speed GaN HEMT for power electronics** C 5.1
- Y. Miyamoto^{1,2)}, D. Nakajun¹⁾, R. F. T. Fathulah¹⁾, H. Fujita¹⁾, and E. Yagyu³⁾
- 1) Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, Meguro, Tokyo 152-8552, Japan, 2) Center for Integrated Research of Future Electronics, Institute of Materials and Systems for Sustainability, Nagoya University, Chikusa, Nagoya 464-8601, Japan, 3) Advanced Technology R&D Center, Mitsubishi Electric Corporation, Amagasaki, Hyogo 661-8661, Japan
- 11:00 Dynamic ON-Resistance Characteristics of N-polar GaN HEMTs Exhibiting Breakdown Voltage Over 1400 V** C 5.2
- Onur S. Koksalid, Jeffrey Haller, Haoran Li, Brian Romanczyk, Steven Wienecke, Matthew Guidry, Stacia Keller, Umesh K. Mishra
- 1,2, 1,2,3, 1,2, 1,2, 1,2, 1,2, 1,2, 1,2, 1 - University of California Santa Barbara, Santa Barbara, CA 93106, USA 2 - PowerAmerica Institute, 930 Main Campus Dr, St 200, Raleigh, NC 27609, USA 3 - Transphorm Inc., 115 Castilian Dr, Goleta, CA 93117, USA
- 11:15 Substrate grounded GaN-on-Si HEMTs with record vertical breakdown above 2 kV** C 5.3
- Ezgi Dogmus, Astrid Linge, Malek Zegaoui and Farid Medjdoub
- IEMN, Institute of Electronics, Microelectronics and Nanotechnology, Av. Poincaré, 59650 Villeneuve d'Ascq, France
- 11:30 Nearly lattice-matched InAlN/AlGaN 2DEG heterostructures and field- effect transistors for high power applications** C 5.4
- Makoto Miyoshi, Daiki Hosomi, Mayuko Okada, Riku Nakashima, Joseph J. Freedman, and Takashi Egawa
- Nagoya Institute of Technology

11:45 **MOCVD Growth and Characterization of 200 V E-mode p-GaN HEMTs on 200 mm GaN-on-SOI for Monolithic Integration** C 5.5

Ming Zhao¹, Karen Geens¹, Xiangdong Li^{1,2}, Marleen Van Hove¹, Vesa-Pekka Lempinen³, Jaakko Sormunen³, Robert Langer¹, Stefaan Decoutere¹

¹imec, Kapeldreef 75, 3001 Leuven, Belgium, ²Department of Electrical Engineering (ESAT), KU Leuven, 3001 Leuven, Belgium, ³Okmetic Oy, P.O. Box 44, FI-01301, Vantaa, Finland

12:00 **Essential strategies for the realization of monolithically integrated half-bridges operating at 3 MHz using** C 5.6

Patrick Waltereit, Richard Reiner, Beatrix Weiss, Matthias Wespel, Stefan Müller, Dirk Meder, Rüdiger Quay

Fraunhofer IAF Tullastrasse 72 79108 Freiburg Germany

12:15 **Lunch**

Nano : Christophe Durand

10:30 **Selective area sublimation: a top-down approach for the fabrication of InGaN/GaN nanostructures** F 2.1

B. Damilano, S. Vézian, M. Portail, B. Alloing, J. Brault, A. Courville, V. Brändli, M. Leroux, J. Massies

Université Côte d'Azur, CRHEA-CNRS, France

11:00 **Self-assembled growth of GaN nanowires in plasma-assisted molecular beam epitaxy: from dense to sparse nanowire ensembles** F 2.2

S. Fernández-Garrido¹, D. van Treeck¹, G. Calabrese¹, Z. S. Schiaber², V. M. Kaganer¹, G. Gao¹, X. Kong¹, J. Goertz¹, C. Hauswald¹, P. Corfdir¹, B. Jenichen¹, J. H. D. da Silva², A. Trampert¹, O. Brandt¹ and L. Geelhaar¹

¹Paul-Drude-Institut für Festkörperelektronik, Hausvogteiplatz 5-7, 10117 Berlin, Germany, ²Laboratorio de Filmes Semicondutores, Universidade Estadual Paulista Bauru, 17033-360 São Paulo, Brazil

11:30 **Internal structural and optical properties characterization of InGaN/GaN core-shell microLEDs grown by selective area MOVPE** F 2.3

Hao Zhou¹, Jana Hartmann^{1,2}, Angelina Vogt¹, Johannes Ledig^{1,2}, Felix Blumenröther¹, Heiko Bremer³, Sonia Estradé⁴, Tilman Schimpke⁵, Adrian Avramescu⁵, Sönke Fündling^{1,2}, Hergo-Heinrich Wehmann^{1,2}, Andreas Hangleiter³, Francesca Peiró⁴, Martin Straßburg⁵, Tobias Voss¹ and Andreas Waag^{1,2}

1. Institut of Semiconductor Technology and Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, 38092 Braunschweig, Germany, 2. epitaxy competence center ec2, Hans-Sommer-Straße 66, 38106 Braunschweig, Germany, 3. Institute of Applied Physics, Technische Universität Braunschweig, 38192 Braunschweig, Germany, 4. LENS-MIND-IN2UB, Department of Electronics, Universitat de Barcelona, C. Martí Franqués 1, Barcelona 08028, Spain, 5. Osram Opto Semiconductors GmbH, Leibnizstraße 4, 93055 Regensburg, Germany,

11:45 **Kelvin probe force microscopy study of polarity and doping in III-Nitrides nanowires** F 2.4

A. Minj, N. Garro, A. Cros, T. Auzelle, J. Pernot, B. Daudin, P. Ruterana

CIMAP, UMR 6252, ENSICAEN, 6 Bd Maréchal Juin, 14050 Caen Cedex 4, France, Institute of Materials Science (ICMUV), Universidad de Valencia, P.O. Box 22085, E-46071, Valencia, Spain, Univ. Grenoble Alpes, INAC-SP2M, F-38000 Grenoble, France, CEA, INAC-PHELIQS, «Nanophysique et semiconducteurs group», F-38000 Grenoble, France, Univ. Grenoble Alpes, Inst NEEL, F-38042 Grenoble, France, CNRS, Inst NEEL, F-38042 Grenoble, France, Institut Universitaire de France, 103 boulevard Saint-Michel, F-75005 Paris, France

12:00 **InGaN Quantum Dots by Quantum Size Controlled Photoelectrochemical Etching** F 2.5

George T. Wang, Benjamin Leung, Xiaoyin Xiao, Arthur J. Fischer, Daniel D. Koleske, Ping Lu, Philip R. Miller, Miao-Chan Tsai, Michael E. Coltrin, Jeffrey Y. Tsao

Sandia National Laboratories

12:15 **Lunch**

parallel sessions

13:45 - 15:45

InN and InGaN : Peter Parbrook

- 13:45 **Advanced microscopy of InGaN/GaN heterostructures** A 9.1

R. A. Oliver, P. A. J. Bagot, A. Bao, M. A. Caro, I. Boyd, M. J. Davies, P. Dawson, W. Y. Fu, J. T. Griffiths, A. Howkins, C. J. Humphreys, M. J. Kappers, T. L. Martin, M. P. Moody, E. P. O'Reilly, B. Rouet-Leduc, S. Schulz, D. P. Tanner, D. J. Wallis, D. Stowe, D. Sutherland, F. Tang, S. Zhang, D. Zhu

Department of Materials Science and Metallurgy, University of Cambridge, Cambridge CB3 0FS, U.K., Department of Materials, University of Oxford, Oxford OX1 3PH, U.K., Department of Electrical Engineering and Automation, Aalto University, Espoo 02150, Finland, Experimental Techniques Centre, Brunel University, Uxbridge UB8 3PH, U.K., School of Physics and Astronomy, Photon Science Institute, Alan Turing Building, University of Manchester, Manchester M13 9PL, U.K., Photonics Theory Group, Tyndall National Institute, Dyke Parade, Cork, Ireland, Gatan U.K., 25 Nuffield Way, Abingdon, Oxon OX14 1RL, U.K.,

- 14:15 **Enhanced indium incorporation into N-polar (In,Ga)N films grown on relaxed InGaN pseudo-substrates** A 9.2

Cory Lund¹, Karine Hestroffer¹, Nirupam Hatui¹, Shuji Nakamura², Steven P. DenBaars², Umesh K. Mishra¹, Stacia Keller¹

¹Electrical & Computer Engineering Department, University of California, Santa Barbara, CA 93106, USA, ²Materials Department, University of California, Santa Barbara, CA 93106, USA

- 14:30 **Localization effects in InGaN/GaN heterostructures evidenced by scanning tunneling luminescence spectroscopy** A 9.3

P. Polovodov (1), W. Hahn (1), J. S. Speck (2), A. Alhassan (2), J.-M. Lentali (1), M. Filoche (1), L. Martinelli (1), C. Weisbuch (1,2), Y. Lassailly (1) and J. Peretti(1).

1- Laboratoire de Physique de la Matière Condensée, CNRS-Ecole Polytechnique, Université Paris-Saclay, 91128 Palaiseau, France
2- Department of Materials, University of California, Santa Barbara, California 93106, USA

- 14:30 **Fine structural characterizations in green emitting full InGaN structures grown on relaxed InGaN pseudo-substrate** A 9.4

Armelle Even¹, Adeline Grenier¹, David Coopetr¹, Eric Robin², Benedikt Haas², Pierre Ferret¹, François Lévy¹, Ivan-Christophe Robin¹, Amélie Dussaigne¹

¹CEA-Leti, ²CEA-INAC

- 15:00 **Peculiarities in growth of InN/GaN Short Period Superlattices by Plasma Assisted MBE** A 9.5

P. Wolny,¹ M. Sawicka,^{2,4} H. Turski,² G. Muziol,² M. Siekacz,^{2,4} M. Anikeeva,³ T. Schulz,³ M. Albrecht,³ and C. Skierbiszewski,^{2,4}

1. Paul-Drude-Institut für Festkörperforschung, Hausvogteiplatz 5-7, 10117 Berlin, Germany 2. Institute of High Pressure Physics, PAS, Sokolowska 29/37, 01-142 Warsaw, Poland 3. Leibniz-Institute for Crystal Growth, Max-Born-Str. 2 12489 Berlin, Germany 4. TopGaN Ltd, Sokolowska 29/37, 01-142 Warsaw, Poland

- 15:15 **Kinetics of InN Films Growth by Atomic Layer Epitaxy at Low Temperatures ($T_g < 250^\circ\text{C}$)** A 9.6

N. Nepal¹, V.R. Anderson², S.D. Johnson¹, S.G. Rosenberg², A.C. Kozen², C. Wagenbach³, D.J. Meyer¹, B.P. Downey¹, J.K. Hite¹, V.D. Wheeler¹, Z.R. Robinson⁴, D. R. Boris¹, S.G. Walton¹, K.F. Ludwig³, and C.R. Eddy, Jr¹

¹U.S. Naval Research Laboratory, 4555 Overlook Avenue SW, Washington, DC 20375, USA ²Postdoctoral Fellow, ASEE, 1818 N Street NW, Washington, DC 20036 ³Physics Department, Boston University, Boston, Massachusetts 02215, USA ⁴Department of Physics, SUNY College at Brockport, Brockport, NY 14420, USA

15:30 **Small Inhomogeneous Linewidth Broadening of an InGaN/GaN Single Quantum-Dot Formed on a Nano-Pyramid Structure** A 9.7

Jong-Hoi Cho, Y. M. Kim, Hwan-Seop Yeo, Seung-Hyuk Lim, Sejeong Kim, Su-Hyun Gong, Yong-Hoon Cho

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

15:45 **Coffee break**

Vertical lasers : Raphael Butte

13:45 **GaN vertical-cavity surface-emitting lasers with AlInN/GaN DBRs** B 9.1

Tetsuya Takeuchi, Satoshi Kamiyama, Motoaki Iwaya, Isamu Akasaki

Meijo University, Nagoya University

14:15 **AlGaN based Optically Pumped Vertical Cavity Surface Emitter Laser Heterostructure in Sub 250 nm Deep Ultra Violet Range** B 9.2

T. Detchprohm¹, Y. Park¹, K. Mehta¹, S. Wang², O. Moreno¹, Y.-S. Liu¹, S.-C. Shen¹, P.D. Yoder¹, F. Ponce², R.D. Dupuis¹

¹Georgia Institute of Technology, ²Arizona State University

14:45 **Vertical-cavity surface-emitting lasers emitting in the 'green gap'** B 9.3

Yang Mei¹, Guoen Weng^{1,2}, Leiying Ying¹, Rongbin Xu¹, Zhiwei Zheng¹, Werner Hofmann¹, Jianping Liu³, Hui Yang³, and Baoping Zhang^{1*}

1. Department of Electronic Engineering, Optoelectronics Engineering Research Center, Xiamen University¹Xiamen 361005, China 2. Department of Electronic Engineering, East China Normal University, Shanghai 200241, China 3. Suzhou Institute of Nanotech and Nano-bionics, Chinese Academy of Sciences, Suzhou 215123, China *E-mail:bzhang@xmu.edu.cn

15:00 **Long-Cavity GaN-based VCSEL with a Monolithic Curved Mirror** B 9.4

Tatsushi Hamaguchi, Susumu Satou, Masamichi Ito, Hiroshi Nakajima, Jugo Mitomo, Hidekazu Kawanishi, and Hironobu Narui Sony Corporation, Japan

15:15 **GaN-based VCSELs with lateral optical confinement structures** B 9.5

N. Hayashi¹, K. Matsui¹, T. Takeuchi¹, S. Kamiyama¹, M. Iwaya¹, I. Akasaki^{1,2}

¹ Fac.Sci. &Eng., Meijo University, Nagoya-shi, Aichi, 468-8502 Japan, ² Akasaki Research Center, Nagoya University, Nagoya-shi, Aichi 464-8603 Japan

15:30 **III-N-based Distributed Bragg Reflectors Using Complementary Conductivity-Selective Wet-etch Methods** B 9.6

Oliver Moreno, Young Jae Park, Theeradeth Detchprohm, Bill Chaiyasarakul, Karan Mehta, Paul Yoder, Russell D. Dupuis, and Shyh-Chiang Shen

Center for Compound Semiconductors and School of Electrical and Computer Engineering, Georgia Institute of Technology, 777 Atlantic Dr. NW, Atlanta, Georgia 30332-0250, USA

15:45 **Coffee break**

Vertical devices and transport : Eldad Bahat-Treidel

13:45 **Vertical GaN Electronics** C 6.1

Tomás Palacios

Massachusetts Institute of Technology

14:15 III-Nitride Vertical Devices for High Frequency Electronics C 6.3

Choong Hee Lee, Zhichao Yang, Yuewei Zhang, Edwin Lee, Sriram Krishnamoorthy, Siddharth Rajan

Electrical and Computer Engineering, The Ohio State University

14:45 Impact of plasma-damaged-layer removal on GaN HEMT devices C 6.5

Masako Kodera 1, Akira Yoshioka 1, Toru Sugiyama 1, Tatsuya Ohguro 1, Takeshi Hamamoto 1, Naoto Miyashita 1, Koji Kanomaru 2, Miki Yumoto 3, Masahiro Koyama 3, Zhang Xinyu, Steve Lester, Tatsuyoshi Kawamoto 4, Tatsuya Yamanaka 4

1 Advanced Discrete Development Center, Toshiba Corp., 2 Corporate Manufacturing Engineering Center, Toshiba Corp., 3 Research and Development Center, Toshiba Corp., 4 Yokkaichi Research Center, JSR Corp.

15:00 Nanoscale AlGaN/GaN in-plane gate field effect transistors C 6.6

Giovanni Santoruvo, Elison Matioli

Ecole Polytechnique Fédérale de Lausanne, Switzerland

15:15 Superconducting and Metallic epitaxial Nb₂N thin films grown by MBE on SiC substrates and integrated with GaN HEMTs C 6.7

John Wright¹, Rusesen Yan¹, Suresh Vishwanath¹, Guru Bahadur Singh Khalsa¹, Yimo Han¹, Ed Lochocki¹, Scott Katzer², Neeraj Nepal², Brian Downey², Kyle Shen¹, David Muller¹, David Meyer², Huili Grace Xing¹, and Debdeep Jena¹

¹Cornell University ²Naval Research Laboratory

15:30 Vertical GaN nanowire-based transistors: an outlook for 3D logic stacking C 6.8

Feng Yu 1/2, Klaas Stempel 1/2, Muhammad Fahlesa Fatahilah 1/2, Andrey Bakin 1/2, Friedhard Römer 3, Bernd Witzigmann 3, Tilman Schimpke 4, Martin Strassburg 4, Hutomoto Suryo Wasisto 1/2, Andreas Waag 1/2

1 Institut für Halbleitertechnik (IHT), Technische Universität Braunschweig, Hans-Sommer-Str. 66, D-38106 Braunschweig, Germany 2 Laboratory for Emerging Nanometrology (LENA), Technische Universität Braunschweig, Langer Kamp 6a, D-38106 Braunschweig, Germany 3 Computational Electronics and Photonics (CEP), University of Kassel, Wilhelmshöher Allee 71, D-34121 Kassel, Germany 4 OSRAM Opto Semiconductors GmbH, Leibnizstraße 4, 93055 Regensburg, Germany

15:45 Coffee break

Nano : Hans-Jürgen Lugauer

13:45 Visualization of Axial p-n Junction on Single GaN Nanowire F 3.1

Zhihua Fang 1,2,3, Fabrice Donatini 1,2, Bruno Daudin 1,3, Julien Pernot 1,2,4

1 Univ. Grenoble Alpes, F-38000 Grenoble, France 2 CNRS, Inst. NEEL, F-38042 Grenoble, France 3 CEA, INAC-SP2M, "Nanophysique et semiconducteurs" group, F-38000 Grenoble, France 4 Institut Universitaire de France, 103 boulevard Saint-Michel, F-75005 Paris, France

14:15 Microscopic study of the efficiency and optical polarization of core-shell InGaN/GaN microrods F 3.2

Ines Trenkmann¹, Christian Mounir², Tilmann Schimpke³, Georg Rossbach³, Adrian Avramescu³, Martin Strassburg³, Ulrich T. Schwarz¹

1Experimental Sensor Science, Chemnitz University of Technology, Germany, 2Department of Microsystems Engineering, IMTEK, University of Freiburg, Germany, 3OSRAM opto Semiconductors GmbH, Regensburg, Germany

14:30 **Time-resolved cathodoluminescence of InGaN/GaN core-shell microwires** F 3.3

W. Liu¹, C. Mounir², G. Rossbach³, T. Schimpke³, A. Avramescu³, H.-J. Lugauer³, M. Strassburg³, U. Schwarz⁴, B. Deveaud¹, G. Jacopin¹

1. Institute of Physics, École Polytechnique Fédérale de Lausanne (EPFL), 1015 Lausanne, Switzerland, 2. Department of Microsystems Engineering (IMTEK), University of Freiburg, Freiburg, Germany, 3. OSRAM Opto Semiconductors GmbH, Regensburg, Germany, 4. Institute of Physics, Technische Universität Chemnitz, Chemnitz, Germany

14:45 **Growth of self-assembled AlN nanowires on SiO₂/Si substrates** F 3.4

Ž. Gačević¹, J. Grandal², S. Lazić³, M. Varela² and E. Calleja¹

1 ISOM-ETSIT, Universidad Politécnica de Madrid, Avda. Complutense s/n, 28040 Madrid, Spain 2 ICTS Centro Nacional de Microscopía Electrónica, 28040 Madrid, Spain 3 Instituto Nicolás Cabrera and Instituto de Física de Materia Condensada (IFIMAC)

15:00 **Impact of threading dislocations on the growth and optical properties of GaN/AlGaN quantum dots** F 3.5

M. Korytov¹, P. Vennégùès^{1*}, S. Matta¹, J. Brault¹, and M. Kociak²

1 - Université Côte d'Azur, CNRS, CRHEA, 06560m Valbonne, France 2 - Laboratoire de Physique des Solides, Université Paris Sud, Orsay, France

15:15 **III-nitride-based photovoltaic applications on silicon: Comparison between axial and core-shell InGaN nanowire devices** F 3.6

Kaddour Lekhal¹, Geoffrey Avit², Si-Young Bae¹, Ho-Jun Lee³, Barry I Oussman³, Elissa Roche², Yamina André², Yoshio Honda¹, Agnès Trassoudaine², Hiroshi Amano¹

¹Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya, Aichi 464-8603, Japan, ²Université Clermont Auvergne, CNRS, SIGMA Clermont, Institut Pascal, F-63000 Clermont-Ferrand, France, ³Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya, Aichi 464-8603, Japan

15:30 **Radial dopant segregation in Mg-doped GaN nanowires** F 3.7

A.M. Siladie^{1,*}, L. Amichi¹, N. Mollard¹, E. Robin¹, C. Bougerol², A. Grenier³, I. Mouton³, P.H. Jouneau¹, A. Cros⁴, N. Garro⁴ and B. Daudin¹

1 Univ. Grenoble Alpes, CEA, INAC, F-38000 Grenoble 2 Univ. Grenoble Alpes, CNRS, Institut Néel, F-38000 Grenoble 3 CEA-LETI, F-38054 Grenoble, France 4 Institute of Materials Science (ICMUV), 4 Universidad de Valencia, P.O. Box 22085, E-46071, Valencia, Spain

parallel sessions 16:15 – 18:00

Characterization : Philippe Vennégùès

16:15 **Mapping of atomic electric fields and charge densities by four-dimensional STEM** A 10.1

Knut Müller-Caspary [1], M. Duchamp [2], F.F. Krause [3], A. Beche [1], F. Winkler [2], S. Löffler [4], M. Huth [5], S. Ihle [5], R. Ritz [5], H. Soltau [5], J. Zweck [6], P. Schattschneider [7], J. Verbeeck [1], S. van Aert [1], R.E. Dunin-Borkowski [2], A. Rosenauer [3]

[1] EMAT, Universiteit Antwerpen, Antwerpen, Belgium [2] Forschungszentrum Jülich, Jülich, Germany, [3] IFP, University of Bremen, Bremen, Germany, [4] USTEM, TU Wien, Wien, Austria, [5] PN Detector GmbH, Munich, Germany, [6] University of Regensburg, Regensburg, Germany, [7] IFP, TU Wien, Wien, Austria

16:45 **Isoelectronic doping of GaN by Indium: impurity band formation** A 10.2

Gordon Callsen, Marina Castelli, Wei Liu, Gwénolé Jacopin, Shojiki Kanako, Sebastian P. Tamariz Kaufmann, Ian M. Rousseau, Camille Haller, Joachim Ciers, Pirouz Sohi, Denis Martin, Jean-François Carlin, Raphaël Butté, and Nicolas Grandjean

Institute of Physics, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

17:00 **Calcium impurity as non-radiative recombination center in (In,Ga)N grown by molecular beam epitaxy** A 10.3

Erin C. Young^[1], Thomas E. Mates^[1], Christian Robertson^[1], Saulius Marcinkevicius^[2], Nicolas Grandjean^[3], James S. Speck^[1]

[1] University of California, Santa Barbara, USA, [2] KTH Royal Institute of Technology, Sweden, [3] Ecole Polytechnique Federale de Lausanne, Switzerland

17:15 **High electron concentrations in MOCVD-grown Si-doped dilute Al_xGa_{1-x}N on sapphire** A 10.4

B. Monemar¹, P. P. Paskov¹, J. P. Bergman¹, K. Takeda², M. Iwaya², T. Takeuchi², S. Kamiyama² and I. Akasaki²

¹Department of Physics, Chemistry and Biology, IFM, Linköping University, S-58183 Linköping, Sweden, ²Faculty of Science and Technology, Meijo University, Nagoya 468-8502, Japan

17:30 **Plasmonic properties of degenerately Ge-doped cubic GaN** A 10.5

Elias Baron¹, Martin Feneberg¹, Rüdiger Goldhahn¹, Michael Deppe², and Donat J. As²

¹Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Germany, ²Department Physik, Universität Paderborn, Germany

17:45 **Nanoscale cathodoluminescence of a narrow band distributed Bragg reflector realized by GaN:Ge modulation doping** A 10.6

Frank Bertram¹, Andreas Voß¹, Alexander Reuper¹, Gordon Schmidt¹, Peter Veit¹, Sebastian Metzner¹, Christoph Berger¹, Jürgen Bläsing¹, Armin Dadgar¹, Emanuele Poliani², Markus Wagner², Janina Maultzsch^{2,3}, André Strittmatter¹, and Jürgen Christen¹

¹ Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Germany, ² Institut für Festkörperphysik, Technische Universität Berlin, Germany, ³ Institut für Physik der Kondensierten Materie, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Nanophotonics : Maria Tchernycheva

16:15 **Fabrication of Nanocolumn Photonic Crystal Based on Cluster Array** B 10.1

Y.Matsui, J.Yoshida, S.Ihsizawa, K.Motoyama, K.Kishino
Sophia University, Sophia nanotechnology research center

16:30 **Large Rabi Splitting of Whispering Gallery Polaritons Formed in Core/Shell GaN/InGaN Quantum Well Wire Structures** B 10.2

Su-Hyun Gong, Suk-Min Ko, Min-Ho Jang, Hyun Gyu Song, and Yong-Hoon Cho *

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

16:45 **Vacuum-field Rabi splitting at SWIR in photocurrent of IR QCD coupled to meta-material nano-antennas** B 10.3

M. Katz⁽¹⁾, O. Sorias⁽¹⁾, B. Dror⁽¹⁾, M. Orenstein⁽¹⁾, G. Bahir⁽¹⁾, E. Giraud⁽²⁾, N. Grandjean⁽²⁾

1. Department of Electrical Engineering, Technion – Israel Institute of Technology, Haifa, Israel 2. Institute of Condensed Matter Physics, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland

17:00 **GaN polariton lasers on Si substrates: polariton condensation phase diagram** B 10.4

J. Zuniga-Perez¹, O. Jamadi², F. Reveret², M. Leroux¹, F. Semond¹, J. Leymarie², P. Disseix², F. Medard², M. Mihailovic², T. Guillet³, C. Brimont³, S. Bouchoule⁴, X. Lafosse⁴, D. Solnyshkov² and G. Malpuech²

1. UCA, CRHEA-CNRS, Rue Bernard Gregory, 06560 Valbonne, France 2. Clermont Université/CNRS UMR6602, Institut Pascal (IP), BP 10448, F-63000 Clermont-Ferrand, France 3. Laboratoire Charles Coulomb (L2C), UMR 5221, CNRS-Université de Montpellier, Montpellier, France 4. C2N-CNRS, Route de Nozay, 91460 Marcoussis, France

17:15 Comparison of UV-C and blue emitting nitride-on-silicon microdisk lasers B 10.5

J. Sellés¹, T. Guillet¹, V. Crepel¹, B. Gayral², B. Damilano³, M. Leroux³, M. Mexis³, S. Rennesson³, F. Semond³, F. Tabatabae-Vakili⁴, I. Roland⁴, X. Checoury⁴, P. Boucaud⁴, C. Brimont¹

¹Laboratoire Charles Coulomb (L2C), UMR 5221, CNRS-Université de Montpellier, Montpellier, F-France ²Univ. Grenoble Alpes, F-38000 Grenoble, France et CEA, INAC-PHELIQS, “Nanophysique et Semiconducteurs” group, F-38000 Grenoble, France ³Université Côte d’Azur, CRHEA-CNRS, rue Bernard Grégoire, 06560 Valbonne-Sophia Antipolis, France ⁴Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris Sud, Université Paris-Saclay, Bâtiment 220, F-91045 Orsay, France

17:30 Synergistic Effect of In and Sb in Dilute-Antimonide InGaSbN Nanowire Heterostructures for Deep-visible Light Emitting Devices B 10.6

Faqrul Alam Chowdhury (1), Renjie Wang (1), Ishiang Shih (1), Hong Guo (2), Zetian Mi (1,3)

(1) Department of Electrical and Computer Engineering, McGill University, Montreal, Quebec H3A0E9, Canada, (2) Department of Physics, McGill University, Montreal, Quebec H3A0E9, Canada, (3) Department of Electrical Engineering and Computer Science, Centre for Photonics and Multiscale Nanomaterials, University of Michigan, Ann Arbor, MI 48105, USA.

17:45 Modified Shockley diode equation suitable for InGaN-based light-emitting diodes B 10.7

Dong-Pyo Han, Jong-In Shim, Dong-Soo Shin, Tetsuya Takeuchi, Motoaki Iwaya, Satoshi Kamiyama, Isamu Akasaki

Faculty of Science and Technology, Meijo University, Nagoya, Japan, Hanyang University, ERICA Campus, Ansan, Korea

Device characterization and reliability : Matteo Meneghini

16:15 Latest Progress in the Non-destructive Optical Characterization of III-N Electronic Devices C 7.1

Martin Kuball

University of Bristol, Center for Device Thermography and Reliability, Bristol BS8 1TL, United Kingdom

16:45 Reliability physics of GaN HEMTs for power switching applications: role of the gate structure C 7.2

Enrico Zanoni, Alessandro Barbato, Davide Bisi (*), Carlo De Santi, Fabiana Rampazzo, Isabella Rossetto, Maria Ruzzarin, Nicola Trivellin, Alessandro Chini (**), Giovanni Verzellesi, Gaudenzio Meneghesso, Matteo Meneghini

Department of Information Engineering, University of Padova, 1DEI, Via Gradenigo 6/B, 35131 Padova, Italy, phone: +39-049-827-7658, fax: +39-049-827-7699 e-mail: corresponding author enrico.zanoni@unipd.it (*) Davide Bisi is now with Transphorm, USA (**) Alessandro Chini and Giovanni Verzellesi are with the Department of Engineering & Enzo Ferrari, University of Modena and Reggio Emilia

17:15 Design Principles for Suppression of Buffer Induced Current-Collapse in GaN Power HEMTs C 7.3

Michael J Uren, Serge Karboyan, Martin Kuball

H H Wills Physics Laboratory, University of Bristol, Bristol BS8 1TL, UK

17:30 PTI and NBTI of Fully-recessed E-mode LPCVD-SiNx/GaN MIS-FETs with PECVD-SiNx Interfacial Protection Layer C 7.4

Mengyuan Hua, Qingkai Qian, Jin Wei, Zhaofu Zhang, Gaofei Tang, and Kevin J. Chen

Department of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong, China

17:45	Graphene-base Hot Electron Transistor with GaN emitter	C 7.5	A 2.3
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Ahmad Zubair¹, Amirhasan Nourbakhsh¹, Jin-Yong Hong¹, Meng Qi, Yi Song², Debdeep Jena¹, Jing Kong³, Mildred Dresselhaus¹, Tomás Palacios¹

¹Massachusetts Institute of Technology, ²University of Notre Dame, ³Cornell University

poster sessions: 18:00 - 20:00

A Poster : Juergen Christen

18:00	Spontaneous strain accumulation and growth disruption in lattice matched InAl(Ga)N/GaN heterostructures	A 2.1
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H. Ben Ammar¹, R. Mohamad¹, M. P. Chauvat¹, A. Minj¹, P. Gamarra², C. Lacam², M. Tordjman², M. Morales¹, Jun Chen¹ and P. Ruterana¹

1 Centre de Recherche sur les Ions, les Matériaux et la Photonique UMR 6252, CNRS ENSICAEN UCBN CEA, 6 Boulevard du Maréchal Juin, 14050 Caen Cedex, and Domaine Universitaire du Mont Foulon, 61000 Damigny, France 2 III-V Lab, 1 Avenue Augustin Fresnel, Campus Polytechnique, 91767 Palaiseau, France

18:00	Growth of Nitrides over graphene/SiC	A 2.2
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B. Pécz¹, I. Cora¹, I. Lukacs¹, A. Georgakilas², A. Adikimenakis² and R. Yakimova³

1 Institute of Technical Physics and Materials Sciences, MTA EK, Konkoly T. M. út 29-33, H-1121 Budapest, Hungary 2 Microelectronics Research Group, IESL, FORTH and Physics Department, University of Crete, P.O. Box 1527, GR-71110 Heraklion, Crete, Greece 3 Department of Physics Chemistry and Biology Linköping University 581 83 , Linköping , Sweden

18:00	Development of a GaN epi-stack on 200mm Si (111) for Semi-vertical Power Devices	A 2.3
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Hu Liang, Steve Stoffels, Karen Geens, and Stefaan Decoutere
imec vzw

18:00	Characterization of basal stacking faults of (11-22) GaN using X-ray scattering techniques	A 2.4
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Markus Pristovsek¹, Martin Frentrup, Tongtong Zhu, Fengzai Tang, Rachel. A. Oliver, Colin J. Humphreys

Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge, CB3 0FS, UK ¹ current address: Center for Integrated Research for Future Electronics, Institute for Materials and Systems for Sustainability, Nagoya University, Furo-Cho, Chikusa-Ku, 464-8603 Nagoya, Japan

18:00	Optically Active Dilute-Antimonide GaSbN Nanowire Heterostructures for Visible Optoelectronic Devices	A 2.5
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Faqrul Alam Chowdhury (1), Sharif Sadaf (1), Qing Shi (2), Ishiang Shih (1), Hong Guo (2), Zetian Mi (1,3).

(1) Department of Electrical and Computer Engineering, McGill University, Montreal, Quebec H3A0E9, Canada, (2) Department of Physics, McGill University, Montreal, Quebec H3A0E9, Canada, (3) Department of Electrical Engineering and Computer Science, Centre for Photonics and Multiscale Nanomaterials, University of Michigan, Ann Arbor, MI 48105, USA.

18:00	Characteristics of hexagonal boron nitride buffer layer for the direct growth of III-Nitride materials using MOCVD	A 2.6
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Min Han, Beo Deul Ryu, Kang Bok Ko, Chang Hee Jo, Yongsu Lim, Kwan Seon Joo, Do Trong Thanh, Tran Viet Cuong and Chang-Hee Hong

School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Jeonju, Jeollabuk-do 54896, Korea

18:00 **Investigation of the sputtered AlN films qualitative improvement process by high-temperature annealing** A 2.7

Shi-yu Xiao^{1*}, Yi-kang Liu², Hideto Miyake^{1,2}, Kazumasa Hiramatsu², Shunta Harada³, Toru Ujihara³

1. Graduate School of Regional Innovation Studies, Mie University, Tsu, Japan, 2. Department of Electrical and Electronics Engineering, Mie University, Tsu, Japan, 3. Department of Materials Science and Engineering and Center for Integrated Research of Future Electronics (CIRFE), Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University, Furo-cho, Chikusa-ku, Nagoya, Japan

18:00 **Crystalline quality improvement of sputtered AlN on sapphire substrates by high-temperature annealing** A 2.8

Yanan Guo^{1,2}, Lu Zhao^{1,2}, Yun Zhang^{1,2*}, Shuo Zhang^{1,2}, Kun Yang³, Jun Wang⁴, Boyu Dong⁴, Shuai Yang^{1,2}, Yujie Ai^{1,2}, Junxi Wang^{1,2}, Jinmin Li^{1,2}

1 Institute of Semiconductors, Chinese Academy of Sciences, Beijing 100083, China, 2 University of Chinese Academy of Sciences, Beijing 100049, China, 3 Hebei Synlight Crystal Co. Ltd., Baoding 071000, Hebei, China, 4 North Microelectronics, Beijing 100176, China

18:00 **Polarity control at the GaN/ZnO interface** A 2.9

S. Q. Li¹, H. Lei², Y. Wang³, M. B. Ullah⁴, H. Morkoç⁴, P. A. van Aken³, J. Chen¹ and P. Ruterana¹

1CIMAP, UMR 6252 CNRS, ENSICAEN, UCBN, CEA, 6 Boulevard du Maréchal Juin, 14050 Caen Cedex, France 2Institute of Solid State Physics, Hefei Institutes of Physical Science, CAS, 350 Shushanhu Road, Hefei 230031, China 3Max Planck Institute for Solid State Research, Heisenbergstrasse 1, 70569 Stuttgart, Germany 4Department of Electrical and Computer Engineering, Virginia Commonwealth University, Richmond, Virginia 23284, USA

18:00 **Strain effects in the (In,Ga)N/GaN short-period superlattices on lattice-matched substrates grown by MBE** A 2.10

Mariia Anikeeva¹, Tobias Schulz¹, Tadeusz Suski², Marcin Siekacz^{2,3}, Thorsten Ernst³, Ewa Grzanka^{2,3}, Grzegorz Staszczak^{2,3}, Czesław Skierbiszewski^{2,3}, and Martin Albrecht¹

¹Leibniz-Institute for Crystal Growth, Berlin, Germany, ²Institute of High Pressure Physics, Polish Academy of Sciences, Warsaw, Poland, ³TopGaN Ltd, Warsaw, Poland,

18:00 **Influence of the electron beam on the initial stage of AlN formation in ammonia MBE** A 2.11

D.S. Milakhin, T.V. Malin, V.G. Mansurov, Y.G. Galitsyn, K.S. Zhuravlev

A.V.Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Science, pr. Lavrentieva 13, Novosibirsk 630090, Russia

18:00 **Defect reduction methods for heteroepitaxial semipolar GaN: a trip from mid 107cm⁻² to mid 106cm⁻² dislocation density** A 2.12

R. Mantach^{1,2}, F. Tendille¹, M. Khouri^{1,2}, P. De Mierry¹, J. Zuniga-Perez¹, G. Feuillet², D. Martin³, N. Grandjean³, P. Vennéguès¹

1 Université Côte d'Azur, CRHEA-CNRS, rue B. Grégory, F-06560 Valbonne, France, 2 Université Grenoble Alpes, CEA, LETI, MINATEC Campus, F-38054 Grenoble, France, 3 Institute of Physics, EPFL, CH-1015 Lausanne, Switzerland

18:00 **The structure of residual crystallographic defects in 4H SiC substrates for high performance InAlGaN/GaN HEMTs** A 2.13

M-P. Chauvat¹, A. Minj¹, P. Gamarra², C. Lacam², S. Delage², J. ul Hassan³, Ö. Danielsson³ and P. Ruterana¹

1 Centre de Recherche sur les Ions, les Matériaux et la Photonique UMR 6252, CNRS ENSICAEN UCBN CEA, 6 Boulevard du Maréchal Juin, 14050 Caen Cedex, France 2 III-V Lab, 1 Avenue Augustin Fresnel, Campus Polytechnique, 91767 Palaiseau, France 3 Dept. of Physics, Chemistry and Biology, Linköping University, 581 83 Linköping, Sweden

18:00 **Photoluminescence properties of polycrystalline zinc nitride thin films** A 2.14

A. Trapalis (1), J. Heffernan (1), I. Farrer (1), A. Kean (2,3), J. Sharman (2)

1 Department of Electronic and Electrical Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD, United Kingdom 2 Johnson Matthey, Blount's Court, RG4 9NH, United Kingdom 3 NikaWorks Ltd, United Kingdom

18:00 **Fast growth of smooth AlN in a 3x2" showerhead type vertical flow MOVPE reactor** A 2.15

V. Z. Zubialevich 1,* , P. Pampili 1,2, P. J. Parbrook 1,2

1 Tyndall National Institute, Dyke Parade, Cork City, Ireland, * E-mail: vitaly.zubialevich@tyndall.ie, 2 School of Engineering, University College Cork, Cork City, Ireland

18:00 **Defect-free InGaN nanowires on silicon whatever the indium composition** A 2.16

Geoffrey Avit 1, Elissa Roche 1, Mohammed Zeghouane 1, Yamina André 1, Catherine Bougerol 2,3, Joël Leymarie 1, François Médard 1, Benjamin Damilano 4, Evelyne Gil 1, Dominique Castelluci 1 and Agnès Trassoudaine 1

1Université Clermont Auvergne, CNRS, SIGMA Clermont, Institut Pascal, F-63000 Clermont-Ferrand, France 2Univ. Grenoble Alpes, F-38000 Grenoble, France 3CNRS, Institut Néel, F-38042 Grenoble, France 4CRHEA, CNRS, Rue Bernard Gregory, F-06560 Valbonne, France

18:00 **Thermal Stability of Bare and Capped GaN Under Moderate Nitrogen Pressures** A 2.17

Alan Jacobs(1), Boris N. Feigelson(2), Jennifer K. Hite(2), Francis J. Kub(2)

(1)ASEE Postdoctoral Fellow at U.S. Naval Research Laboratory
(2)U.S. Naval Research Laboratory, 4555 Overlook Ave., SW, Washington, DC 20375, USA

18:00 **Structural and optical properties in InGaN/GaN single quantum wells on GaN nanocolumns** A 2.18

Takao Oto 1, Yutaro Mizuno 1, Jun Yoshida 1, Ai Yanagihara 1, Rin Miyagawa 1, Kazuhiro Ema 1,2, and Katsumi Kishino 1,2

1. Department of Engineering and Applied Sciences, Sophia University, Japan, 2. Sophia nanotechnology Research Center, Sophia University, Japan

18:00 **Biexciton emission from single quantum-confined structures in N-polar (000-1) InGaN/GaN multiple quantum wells** A 2.19

Kengo Takamiya, Shuhei Yagi, Hiroyuki Yaguchi, Hidefumi Akiyama, Kanako Shojiki, Tomoyuki Tanikawa, and Ryuji Katayama,

Saitama University, University of Tokyo, Tohoku University, Osaka University

18:00 **Nitrogen-rich growth of Atomically Smooth N-polar GaN Layers by Plasma-assisted MBE** A 2.20

H. Turski, A. Feduniewicz-Żmuda, D. Jena, C. Skierbiszewski

Department of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853 USA, Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland, Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland, Department of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853 USA, Department of Material Science and Engineering, Cornell University, Ithaca, NY 14853, USA, Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland

18:00 **Study on the growth mechanism of In(Ga)N monolayer embedded in GaN** A 2.21

Zhaoying Chen¹, Tao Wang¹, Ping Wang¹, Xiantong Zheng¹, Tobias Schulz², Martin Albrecht², Bo Shen¹, Xinqiang Wang¹

¹State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing, 100871, China. ²Leibniz-Institute for Crystal Growth, Berlin, Germany

18:00 **Fabrication and characterization of AlGaN templates on annealed sputtering AlN layer** A 2.22

Junya Hakamata¹, Yuta Kawase¹, Sho Iwayama¹, Motoaki Iwaya¹, Tetsuya Takeuchi¹, Satoshi Kamiyama¹, Isamu Akasaki^{1,2}, Hideto Miyake³

¹Faculty of Science and Technology, Meijo University, Japan,²Akasaka Research Center, Nagoya University, Japan,³Graduate School of Regional Innovation Studies, Mie University, Japan

18:00 **Polarity imaging of GaN nanowires grown by PA-MBE on various substrates at different growth conditions** A 2.23

Nikhilendu Tiwary, Ritam Sarkar, Kankat Ghosh, V. Ramgopal Rao and Apurba Laha.

Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India

18:00 **Optical gain of heavily silicon doped AlGaN:Si layers grown by ammonia MBE** A 2.24

I. V. Osinnykh, T. V. Malin, P. A. Bokhan, Dm. E. Zakrevsky, N.V. Fateev, K. S. Zhuravlev

Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences

18:00 **Structural disturbances in GaN HEMT layers as source of leakage current, influencing device performance and reliability** A 2.25

S. Besendorfer¹, E. Meissner², S. Müller³, S. Breuer³, J. Friedrich², L. Frey¹

¹Chair of Electron Devices, Friedrich-Alexander-University of Erlangen-Nuremberg, Cauerstr. 6, 91058 Erlangen, Germany, ²Fraunhofer Institute for Integrated Systems and Device Technology (IISB), Schottkystr. 10, 91058 Erlangen, Germany, ³Fraunhofer Institute for Applied Solid State Physics (IAF), Tullastr. 72, 79108 Freiburg, Germany

18:00 **Studies of Surface Structure and Surface Chemistry During Plasma-Assisted Atomic Layer Epitaxial Growth of InN Thin Films on GaN** A 2.26

Samantha G Rosenberg ¹, Dan Pennachio ², Virginia Anderson ¹, Neeraj Nepal ³, Christa Wagenbach ⁴, Alexander C. Kozen ¹, Zachary Robinson ⁵, John A. Logan ², Sukgeun Choi ², Jennifer Hite ³, Karl Ludwig ⁴, Chris J. Palmstrøm ², Charles R. Eddy, Jr. ³

¹ASEE, Washington DC (residing at NRL) ¹, University California, Santa Barbara, Santa Barbara, CA ², U.S. Naval Research Laboratory, Washington DC ³, Boston University, Physics Department, Boston, MA ⁴, SUNY Brockport, Brockport, NY ⁵

18:00 **Comprehensive investigation of In-rich core-shell MQWs along GaN nanowires for green emission** A 2.27

A.Kapoor [1,2], C. Durand [1,2], M. Vallo [1,2], A. Messanvi [1,2,3], N. Guan [3], X. Dai [3], H. Zhang [3], E. Gautier [1,4], C. Bougerol [1,5], F. H. Julien [3], M. Tchernycheva [3] and J. Eymer [1,2]

1 - University Grenoble Alpes, 38000 Grenoble, France, 2 - « Nanophysique et Semiconducteurs » group, INAC-PHELIQS, CEA, 17 rue des Martyrs, 38000 Grenoble, France, 3 -Center of Nanoscience and Nanotechnologies (C2N), UMR 9001 CNRS, University Paris-Sud, Univ. Paris-Saclay, France, 4 - INAC-SPINTEC, CEA, 17 rue des Martyrs, 38000 Grenoble, France, 5 - « Nanophysique et Semiconducteurs » group, CNRS, Institut Néel, 25 rue des Martyrs, 38000 Grenoble, France

18:00 **Effects of Ga supply on the growth of (11-22) AlN on m-plane (1-100) sapphire substrates** A 2.28

Masafumi Jo, Hideki Hirayama

RIKEN

18:00 **Effect of nitrogen-doped carbon additives on the LPE-Growth of GaN single crystal using the Na flux method** A 2.29

Z. L. Liu^(a), G. Q. Ren^(a,b), X. J. Su^(a), J. F. Wang^(a,b), K. Xu^(a,b)

^(a) Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, Suzhou 215123, People's Republic of China, ^(b) Suzhou Nanowin Science and Technology Co., Ltd., Suzhou 215123, People's Republic of China

18:00 **Anharmonic decay of the E2g modes in layered BN** A 2.30

Ramon Cuscó (1) ,Guillaume Cassabois (2), Bernard Gil (2), and Luis Artús (1)

(1) Institut Jaume Almera ,Consejo Superior de Investigaciones Científicas (ICTJA-CSIC), 08028 Barcelona, Spain , (2) Laboratoire Charles Coulomb (L2C), UMR 5221 CNRS-Université de Montpellier, F-34095, Montpellier,France

18:00 **Circular Ring Defects on In_{0.7}Ga_{0.3}N films Studied by Reflectance Difference Spectroscopy Microscope** A 2.31

Wei Huang¹, Yu Liu¹, Xiantong Zheng², Yuan Li¹, Qing Wu¹, Xinqiang Wang², Yonghai Chen¹

1. Key Laboratory of Semiconductor Materials Science, Institute of Semiconductors, CAS, Beijing, 100083, China 2.School of Physics, Peking University, Beijing, 100871, China

18:00 **AlN Crystal Growth Using Vaporized Al from Ga-Al flux with Nitrogen Injection** A 2.32

Keigo Takahashi, Masayoshi Adachi, and Hiroyuki Fukuyama

Institute of Multidisciplinary Research for Advanced Materials, Tohoku University

18:00 **Nanoscopic cathodoluminescence study of optical and structural properties of preferentially nucleated InGaN on GaN microrods** A 2.33

S. Metzner¹, M. Müller¹, M. Loos¹, F. Bertram¹, P. Veit¹, L. Caccamo², J. Hartmann², H. Zhou², H.-H. Wehmann², A. Waag², and J. Christen¹

¹ Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, 39106 Magdeburg, Germany ² Institut für Halbleitertechnik and Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, 38092 Braunschweig, Germany

18:00 **Surface and Bulk Electronic Structures of Mg-doped In_{0.7}Ga_{0.3}N Epilayer by Hard X-ray Photoelectron Spectroscopy** A 2.34

Masataka Imura,¹ Shunsuke Tsuda,¹ Takahiro Nagata,¹ AnLi Yang,^{1,2} Yoshiyuki Yamashita,^{1,2} Hideki Yoshikawa,^{1,2} Keisuke Kobayashi,^{1,2} Yasuo Koide,¹ Tomohiro Yamaguchi,^{3,4} Masamitsu Kaneko,⁴ Ke Wang,⁴ Tsutomu Araki,⁴ and Yasushi Nanishi⁴

¹National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan ²Synchrotron X-ray Station at SPring-8, NIMS, 1-1-1 Kouto, Sayo-cho, Sayo, Hyogo 679-5148, Japan ³Faculty of Engineering, Kogakuin University, 2665-1 Nakano-machi, Hachioji, Tokyo 192-0015, Japan ⁴Faculty of Science and Engineering, Ritsumeikan University, 1-1-1 Noji-Higashi, Kusatsu 525-8577, Japan

18:00 **Understanding the effect of stoichiometric variation on structural and electrical properties of InN thin films grown by PA-MBE** A 2.35

Kankat Ghosh¹, S. Bhunia², and Apurba Laha¹.

¹Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India. ²Department of Physics, Indian Institute of Technology Bombay, Mumbai, India.

18:00 **Edge Dislocations Triggered Surface Instability in Tensile Epitaxial Hexagonal Nitride Semiconductor** A 2.36

Jianpeng Cheng, Xuelin Yang, and Bo Shen

School of Physics, Peking University, Beijing 100871, China

18:00 **Margin-mask effect on NSAG for InGaN nanopyramids grown by MOCVD on AlN/Si(111) substrates** A 2.37

Y. EL Gmili¹, P. L. Bonanno^{1,2}, S. Sundaram¹, X. Li¹, R. Puybaret³, G. Patriarche⁴, C. Pradalier³, J. Decobert⁵, P. L. Voss^{1,2}, J.P. Salvestrini^{1,6}, A. Ougazzaden^{1,2,*}

¹CNRS, UMI 2958 GT - CNRS, 2 Rue Marconi, 57070 Metz, France, ²School of Electrical and Computer Engineering, GIT, Atlanta, Georgia 30332-0250, USA, ³GT Lorraine, GT-CNRS, UMI2958, 57070, Metz, France, ⁴CNRS, UPR LPN, Route de Nozay, 91460 Marcoussis, France, ⁵III-V Lab, joint laboratory between Nokia Bell Labs France, Thales Research and Technology, and CEA-LETI, 1 av Augustin Fresnel, 91767 Palaiseau, France, ⁶Université de Lorraine et CentraleSupélec, LMOPS, EA44231, 57070 Metz, France,

18:00 **Transient capacitance analysis of thin carbon-doped GaN layers** A 2.38

Christian Koller¹, Gregor Pobegen¹, Clemens Ostermaier², Martin Huber², Dionyz Pogany³

¹KAI GmbH, Europastrasse 8, 9524 Villach, Austria, ²Infineon Technologies Austria AG, Siemensstrasse 2, 9500 Villach, Austria, ³Institute of Solid State Electronics, Vienna University of Technology, Floragasse 7, 1040 Wien, Austria

18:00 **Effects of Mask Patterns on Threading Dislocation Density during the Na-Flux GaN Growth on a Point Seed Technique** A 2.39

Yuki Sawada¹, Takumi Yamada¹, Kousuke Murakami¹, Masatomo Honjo¹, Hiroki Imabayashi¹, Keisuke Kakinouchi¹, Kenta Harimiya¹, Kousuke Nakamura¹, Tomoko Kitamura¹, Masayuki Imanishi¹, Mamoru Imade¹, Masashi Yoshimura², Yusuke Mori¹

¹Grad. Sch. of Eng. Osaka Univ., ²ILE. Osaka Univ.

18:00 **Growth of highly homogeneous In-rich InGaN NW heterostructures by Plasma-Assisted MBE** A 2.40

Martina Morassi⁽¹⁾, L. Largeau⁽¹⁾, F. Oehler⁽¹⁾, L. Mancini⁽¹⁾, V. Piazza⁽¹⁾, L. Travers⁽¹⁾, F.-H. Julien⁽¹⁾, J.-C. Harmand⁽¹⁾, M. Tchernycheva⁽¹⁾, N. Gogneau⁽¹⁾

(1) - Center for Nanoscience and Nanotechnologies (C2N), CNRS, Univ. Paris-Sud, Univ. Paris-Saclay, Orsay & Marcoussis sites, France

18:00 **Pressure Dependence of Band Gap in InGaN/GaN Short Period Superlattices Grown by Molecular Beam Epitaxy** A 2.41

G. Staszczak¹, I. Gorczyca¹, M. Siekacz¹, C. Skierbiszewski^{1,2}, E. Grzanka^{1,2}, J. Smalc-Koziorowska^{1,2}, X. Q. Wang³, M. Anikeeva⁴, T. Schulz⁴, M. Albrecht⁴ and T. Suski¹

¹ Institute of High Pressure Physics, Sokolowska 29/37, 01-142 Warsaw, Poland ² TopGaN Ltd, Sokolowska 29/37, 01-142 Warsaw, Poland ³ State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, Beijing, P.R. China ⁴ Leibniz Institute for Crystal Growth, 1248 Berlin, Germany

18:00 **Effect of gaseous carbon addition in GaN crystal growth by Na-flux method** A 2.42

Naoki Takeda, Masayuki Imanishi, Kousuke Murakami, Masatoshi Hayashi, Mamoru Imade, Masashi Yoshimura, Yusuke Mori

Grad. Sch. of Eng. Osaka Univ.

18:00 **Microscopic structural and optical properties of AlGaN/AlN quantum discs embedded in nanowires correlated by cathodoluminescence** A 2.43

B. Sheng^{1,2}, F. Bertram², P. Wang¹, X. Sun¹, M. Müller², P. Veit², T. Hempel², J. Christen² and X. Wang¹

¹State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing, 100871, China ²Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, 39106 Magdeburg, Germany

18:00 **Study of HEMT capping layers, including GaN, SiN and a combination of these** A 2.44

Matthew Charles, Yannick Baines, Renan Bouis, Anne-Marie Papon

Univ. Grenoble Alpes, F-38000 Grenoble, France, CEA, LETI, MINATEC Campus, F-38054 Grenoble, France

18:00 **Control of dislocation propagation behaviors in Na flux GaN bulk crystals** A 2.45

Shotaro Takeuchi¹, Yuki Mizuta¹, Masayuki Imanishi², Mamoru Imade², Yusuke Mori², Yasuhiko Imai³, Shigeru Kimura³, Akira Sakai¹

¹Graduate School of Engineering Science, Osaka University,
²Graduate School of Engineering, Osaka University, ³Research & Utilization Division, Japan Synchrotron Radiation Research Institute (JASRI)

18:00 **Composition control of AlGaN nanowires using N2 flow and growth temperature** A 2.46

Mun-Do Park [1], Jung-Wook Min [2], Ci Hyun Kim [3], Jun Youb Lee [1], Hoe-Min Kwak [1], Sang-Min Kim [1], Kyung-Pil Kim [1], Dong-Seon Lee [1]

[1] School of Electrical Engineering and Computer Science, Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea, [2] Photonics Laboratory, King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia, [3] School of Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea

18:00 **Blocking of Dislocation Propagation by Bunched Steps in GaN crystals Grown by the Na-flux Method** A 2.47

R. Kuramoto, M. Imanishi, M. Honjo, K. Murakami, H. Imabayashi, M. Imade, M. Yoshimura, and Y. Mori

Department of Electrical, Electronic and Information Engineering, Osaka University

18:00 **Raman Spectroscopy of zincblende GaN grown on 3C-SiC on (001)Si** A 2.49

P W Mitchell [1](corresponding author), S Church [1], P Dawson [1], D J Birks [1], D Nilsson [2], L J Shaw [2], M J Kappers [3], M Frentrup [3], S L Sahonta [3], D J Wallis [3], R A Oliver [3], C J Humphreys [3]

[1] School of Physics and Astronomy, University of Manchester, M13 9PL, UK, [2] Anvil Semiconductors, Future Business Centre, King's Hedges Road, Cambridge, CB4 2HY, UK, [3] Department of Materials Science and Metallurgy, University of Cambridge, CB3 0FS, UK

18:00 **Van der Waals epitaxy of GaN on graphene by MOCVD** A 2.50

T. Journot 1,2, J. Dijon 1,3, B. Hyot 1,2

1 Univ. Grenoble Alpes, 38000 Grenoble, France. 2 CEA, LETI, MINATEC campus, 38000 Grenoble, France. 3 CEA, LITEN, 38000 Grenoble, France.

18:00 **Broadband Ultraviolet Light Emitter Based on GaN Quantum Dots on Truncated Pyramid Structures** A 2.51

Jong-Hoi Cho¹, Seung-Hyuk Lim¹, Min-Ho Jang¹, Samuel Matta², Julien Brault², Yong-Hoon Cho¹

¹Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea , ²Centre de Recherche sur l'Hetero-Epitaxie et ses Applications, Centre National de la Recherche Scientifique, Rue B. Gregory, 06560 Valbonne, France

18:00 **Influence of GaN template thickness on GaN wafer bowing grown by the Na-flux method with a sapphire dissolution process** A 2.52

Takumi Yamada, Kosuke Murakami, Kosuke Nakamura, Hiroki Imabayashi, Masatomo Honjo, Keisuke Kakinouchi, Tomoko Kitamura, Kenta Harimiya, Masayuki Imanishi, Mamoru Imade, Masashi Yoshimura, Yusuke Mori

Grad. Sch. of Eng. Osaka Univ.

18:00 **Optical and structural properties of GaN nanowires grown by pulsed laser deposition on different substrates without catalyst** A 2.53

Daifallah R Almalawi¹, Mufasila M Muhammed¹, Idris A Ajia¹, Katharina Lorenz², Iman S Roqan¹

¹Physical Sciences and Engineering Division, King Abdullah University of Science and Technology (KAUST), Thuwal 23955-6900, Saudi Arabia ²IPFN, Instituto Superior Técnico (IST), Campus Tecnológico e Nuclear, Estrada Nacional 10, P-2695-066 Bobadela LRS, Portugal

18:00 **Effect of AlN Capping on Thermal Stability of GaN Nanowires Grown by PAMBE Technique** A 2.54

S.Bhunia¹, K.Ghosh², R. Sarkar², S. Chouksey², S. Mahapatra¹, D. Saha², and Apurba Laha².

¹Department of Physics, Indian Institute of Technology Bombay, Mumbai, India. ²Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India.

18:00 **Spatially Resolved Doping Properties Along Single Mg-Doped p-Type GaN Micro-Rods** A 2.55

Sunghan Choi¹, Hyun-Gyu Song¹, Wonho Kim², Eunhyung Lee², Sungwon David Roh², Yong-Hoon Cho¹

¹Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea , ²Advanced Materials & Components Lab, R&D Center, LG Innotek, Seoul, Republic of Korea

18:00 **Controlled Coalescence of AlGaN Nanowire Arrays: An Architecture for Nearly Dislocation-Free Planar Ultraviolet Photonic Device** A 2.56

B. H. Le¹ 2, S. Zhao¹, X. Liu¹ 2, S. Y. Woo³, G. A. Botton³ and Z. Mi¹ 2* * Author for correspondence: zetian.mi@mcgill.ca

¹Department of Electrical and Computer Engineering, McGill University, Montreal, QC H3A0E9, Canada, ²Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI 48109-2099, USA, ³Department of Materials Science and Engineering, Canadian Centre for Electron Microscopy, McMaster University, 1280 Main Street West, Hamilton, ON L8S 4M1 , Canada.

18:00 **Growth of GaN on AlN Single Crystal: Strain Relaxation Mechanism and Surface Kinetics** A 2.57

P. Sohi¹, D. Martin¹, P. Vernégues², N. Grandjean¹

¹Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (EPFL), 1015 Lausanne, Switzerland, ²Université Côte d'Azur, CRHEA-CNRS, rue B. Grégory, F-06560 Valbonne, France

18:00 **Electrical Properties of Si-Ion Implanted AlN** A 2.58

Hironori Okumura, Sami Suihkonen, and Tomas Palacios

Faculty of Pure and Applied Sciences Tsukuba University, Department of Electronics- and Nanoengineering Aalto University, Department of Electrical Engineering and Computer Science MIT

18:00 **Impact of Surface Polish on the Structural and Optical Properties of bulk GaN crystals prepared by HVPE** A 2.59

M. Himmerlich¹, S. Shokhovets¹, J. Pezoldt¹, L. Kirste², V. M. Polyakov², J. H. Leach³, S. Krischok¹

¹Institut für Mikro- und Nanotechnologien MacroNano, Technische Universität Ilmenau, PF 100565, 98684 Ilmenau, Germany, ²Fraunhofer-Institut für Angewandte Festkörperphysik, Tullastr. 72, 79108 Freiburg, Germany, ³Kyma Technologies Inc., 8829 Midway West Road, Raleigh, North Carolina 27617, USA

18:00 **Structural properties of high-reflectivity crack-free AlN/AlGaN Bragg mirrors grown on patterned Si substrates** A 2.60

M. Nemoz¹, F. Semond¹, S. Rennesson¹, J. Zuniga-Perez¹, D. Lefebvre¹, A. Courville¹, S. Chenot¹, X. Lafosse², S. Bouchoule², G. Patriarche²

¹Université Côte d'Azur, CNRS, CRHEA, France ²Laboratoire Photonique et de Nanostructures, CNRS, Marcoussis

18:00 **Electronic properties of GaN & InN surfaces – Influence of crystal orientation, surface states and adsorbates** A 2.61

A. Himmerlich, R. Rataj, P. Lorenz, V. Irkha, S. Krischok, M. Himmerlich

Institut für Physik and Institut für Mikro- und Nanotechnologien MacroNano, Technische Universität Ilmenau, PF 100565, 98684 Ilmenau, Germany

18:00 **Controlling morphological properties of three-fold symmetric GaN nanostructure grown by metalorganic chemical vapor deposition** A 2.62

Hwan-Seop Yeo, Young-Chul Sim, Seung-Hyuk Lim, Yong-Hoon Cho

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

18:00 **Study of Zn(Sn,Ge)N₂ for optoelectronic applications** A 2.63

Nicole Fèvre^{1,2}, Nathaniel Feldberg¹, Patrice Miska¹, Elhadj Dogheche³, Christophe Licitra², Bérangère Hyot², Anne Roule²

¹IJL, Parc de Saurupt, 54011 Nancy Cedex, ²CEA Grenoble, 17 rue des Martyrs, 38054 Grenoble Cedex 9, ³IEMN, Cité Scientifique, Avenue Poincaré, 59652 Villeneuve d'Ascq Cedex

18:00 **Growth of β-Ga₂O₃ and GaN films and heterostructures by HVPE** A 2.64

V.I.Nikolaev, A.I.Pechnikov, S.I.Stepanov

Perfect crystals LLC

18:00 **The Impact of Barrier Width on Photoluminescence Wavelength in In(Ga)N/InGaN Short Period Superlattices Grown by Plasma Assisted** A 2.65

T. Ernst¹, M. Siekacz^{1,2}, G. Staszczak², T. Suski², E. Grzanka^{1,2}, I. Gorczyca², H. Turski², M. Anikeeva³, T. Schulz³, M. Albrecht³, C. Skierbiszewski^{1,2}

¹ TopGaN Ltd, Sokolowska 29/37, 01-142 Warsaw, Poland, ²Institute of High Pressure Physics, PAS, Sokolowska 29/37, 01-142 Warsaw, Poland, ³ Leibniz-Institute for Crystal Growth, Max-Born-Str. 2 12489 Berlin, Germany,

18:00 **Thermodynamic and dynamic processes in the self-separation of thick GaN layer from sapphire substrate** A 2.66

Yutian Cheng¹, Duanjun Cai², Jiejun Wu^{1*}, Xiangshun Liu¹, Xiaohui Feng¹, Guoyi Zhang¹, Tongjun Yu^{1*}

¹ Research Center for Wide-gap Semiconductors, State Key Laboratory for Artificial Microstructures and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, P. R. China ²Fujian Key Laboratory of Semiconductor Materials and Applications and Department of Physics, Xiamen University, Xiamen 361005, China

18:00 **Surface Structure of Cleaved ScAlMgO₄(0001) Substrate for III-nitrides Analyzed by X-ray Crystal Truncation Rod Scattering** A 2.67

Takashi Hanada¹, Hiroo Tajiri², Osami Sakata³, Tsuguo Fukuda⁴, and Takashi Matsuoka¹

¹ Institute for Materials Research, Tohoku University, ² Japan Synchrotron Radiation Research Institute, ³ National Institute for Materials Science, ⁴ Fukuda Crystal Laboratory

18:00 **Applying the Alloyed Contact Model to Ni/Au contacts on p-GaN** A 2.68

Biplab Sarkar, Andrew Klump, Seiji Mita, Pramod Reddy, Erhard Kohn, Ronny Kirste, Ramon Collazo, and Zlatko Sitar

Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC 27695, USA, Adroit Materials, Cary, NC 27518, USA

18:00 **Relaxation Mechanisms in High Al-content AlGaN on AlN Single Crystal Substrates** A 2.69

Milena B. Graziano⁽¹⁾, Randy P. Tompkins⁽¹⁾, Baxter Moody⁽²⁾, James Tweedie⁽³⁾, Ramon Collazo⁽⁴⁾, Zlatko Sitar⁽⁴⁾, and Kenneth A. Jones⁽¹⁾

(1) - Sensors and Electron Device Directorate, Army Research Laboratory, 2800 Powder Mill Rd., Adelphi, Maryland 20783 (2) - Hexatech, Inc., 991 Aviation Pkwy, Suite 800, Morrisville, North Carolina 27560 (3) - Adroit Materials, Inc., 2054 Kildaire Farm Rd., Suite 205, Cary, North Carolina 27518 (4) - Department of Materials Science and Engineering, North Carolina State University, Raleigh, North Carolina 27695

18:00 **Optical characterization of polarity domains in GaN micro-wires on silicon substrates** A 2.70

François Médard, Elissa Roche, Geoffrey Avit, François Réveret, Dominique Castelluci, Yamina André, Agnès Trassoudaine, Joël Leymarie

Université Clermont Auvergne, CNRS, Institut Pascal, F-63000 CLERMONT-FERRAND, FRANCE

18:00 **GaN quantum dots on AlN single crystal** A 2.71

Sebastian Tamariz, Denis Martin, Nicolas Grandjean

Institute of Physics, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

18:00 **Progress towards thick InGaN for optoelectronic templates** A 2.72

1) Evan A. Clinton, Ehsan Vadiee, Chloe A.M. Fabien, Joseph J. Merola, W. A. Doolittle* 2) Alec M. Fischer, Yong O. Wei, Hongen Xie, Fernando A. Ponce

1) School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA 2) Department of Physics, Arizona State University, Tempe, AZ 85281, USA

18:00 **Characterization of μ m thin GaN layers grown by High Temperature Vapour Phase Epitaxy** A 2.73

Franziska C. Beyer¹, Friederike Zimmermann¹, Christian Röder², Mykhailo Barchuk³, Gleb Lukin⁴, Tom Schneider⁴, Olf Pätzold⁴, Johannes Heitmann¹

1Institute of Applied Physics, TU Bergakademie Freiberg, Leipziger Str. 23, D-09599 Freiberg, Germany, 2Institute of Theoretical Physics, TU Bergakademie Freiberg, Leipziger Str. 23, D-09599 Freiberg, Germany, 3Institute of Materials Science, TU Bergakademie Freiberg, Gustav-Zeuner-Straße 5, D-09599 Freiberg, Germany, 4Institute for Nonferrous Metallurgy and Purest Materials, TU Bergakademie Freiberg, Leipziger Str. 34, D-09599 Freiberg, Germany

18:00 **AlInN layers deposited at low temperature on sapphire, Si(111) and glass by RF-sputtering** A 2.74

R. Blasco¹, A. Núñez-Cascajero¹, E. Monroy^{2,3}, M. González-Herráez¹, F. B. Naranjo¹, and S. Valdueza-Felip¹

1 University of Alcalá (GRIFO), Madrid-Barcelona Road, km 33.6, 28871 Alcalá de Henares, Spain 2 CEA-Grenoble, INAC/PHELIQS, 17 rue des Martyrs, 38054 Grenoble, France 3 University Grenoble Alpes, 38000 Grenoble, France

18:00 **Peculiarities in Mg doping of Ga(Al)N layers grown by plasma-assisted MBE** A 2.75

Henryk Turski¹, Grzegorz Muziol¹, Marcin Siekacz¹, Paweł Wolny¹, Anna Feduniewicz-Zmuda¹, and Czesław Skierbiszewski¹

1Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland, 2Department of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853 USA, 3Top GaN Ltd Sokolowska 29/37, 01-142 Warsaw, Poland

18:00 **N-polar and Ga-polar p-type GaN grown via Metal Modulated Epitaxy** A 2.76

1) Evan A. Clinton, Ehsan Vadiee, Brendan P. Gunning, Chloe A.M. Fabien, Joseph J. Merola, W. A. Doolittle* 2) Alec M. Fischer, Shuo Wang, Fernando A. Ponce

1) School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA 2) Department of Physics, Arizona State University, Tempe, AZ 85281, USA

18:00 **GaN Epitaxy Inspection for Power Device** A 2.77

Varun Gupta, Mukundkrishna Raghunathan, Anoop Somanchi, Thomas Pierson

Candela, KLA-Tencor Corporation, Milpitas, California, U.S.A.

18:00 **GaN Epitaxy on Glass Using a (111) Silicon Seed Layer Formed by Aluminum-induced Crystallization** A 2.78

Mel F. Hainey, Jr.¹, Zakaria Y. Al Balushi¹, Ke Wang², Nathan C. Martin¹, Dr. Joan M. Redwing¹

1. Department of Materials Science and Engineering, Materials Research Institute, Penn State University, University Park, PA 16802
2. Materials Characterization Laboratory, Materials Research Institute, Penn State University, University Park, PA 16802

18:00 **Current Status in Single Crystal AlN Substrates Grown by Physical Vapor Transport** A 2.79

H.S. Craft, R.F. Dalmau, J. Britt, R. Schlesser

HexaTech, Inc.

18:00 **Deep photoenhanced wet etching of bulk GaN materials** A 2.82

Chris Youtsey, Robert McCarthy

MicroLink Devices, Inc.

18:00 **Temperature-modulation epitaxial growth of thick AlInN layer for fabrication of GaN-based nano-scale photonic devices** A 2.83

Tomohiro Inaba, Takanori Kojima, Yasufumi Fujiwara

Graduate School of Engineering, Osaka University, Japan

18:00 **Study of curvature during thermal annealing of AlN on sapphire** A 2.84

Shunsuke Okada, Hideto Miyake, Kazumasa Hiramatsu

Department of Electrical and Electronic Engineering, Mie University, Tsu, Japan , Graduate School of Regional Innovation Studies, Mie University, Tsu, Japan

18:00 **AlN homoepitaxy on high-temperature annealed AlN template by HVPE** A 2.85

Yikang Liu¹, Hideto Miyake^{1,2}, Kazumasa Hiramatsu¹, Motoaki Iwaya³, Isamu Akasaki³

1Department of Electrical and Electronic Engineering, Mie University, Japan 2Graduate School of Regional Innovation Studies, Mie University, Japan 3Faculty of Science and Technology, Meijo University, Japan

18:00 **Selective Area Growth of N-Polar GaN Nanowires by Molecular Beam Epitaxy** A 2.86

Alexander Chaney, Huili (Grace) Xing, Debdeep Jena

Cornell University Ithaca NY 14850

18:00 **Effect of Formation Temperature for Ohmic Contacts to n-GaN on Electrically Active Defects** A 2.87

Ievgen Boturchuk (1), Leopold Scheffler (2), Raghavendra Rao Juluri (1), Bjarke Rolighed Jeppesen (1), and Brian Julsgaard (1,2).

1: Interdisciplinary Nanoscience Center (iNANO), Aarhus University, Gustav Wieds Vej 14, 8000 Aarhus C, Denmark. 2: Department of Physics and Astronomy, Aarhus University, Ny Munkegade 120, 8000 Aarhus C, Denmark.

18:00 **3D AlGaN microstructures for efficient UV emission from nonpolar crystal facets** A 2.88

Christoph Margenfeld¹, Jana Hartmann¹, Hao Zhou¹, Sönke Fündling¹, Hendrik Spende¹, Hergo-Heinrich Wehmann¹, Hans-Jürgen Lugauer², Martin Straßburg², Marc Patrick Hoffmann², Adrian Avramescu², Andreas Waag¹

1Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, Technische Universität Braunschweig, 38092 Braunschweig, Germany, epitaxy competence center ec2, Hans-Sommer-Straße 66, 38106 Braunschweig, Germany, 2Osram Opto Semiconductors GmbH, Leibnizstraße 4, 93055 Regensburg, Germany

18:00 **Crossover of polarized excitonic transitions with Al composition in strained a-plane (Al,Ga)N and (Al,In)N alloys** A 2.89

Nirupam Hatui, A. Azizur Rahman, Carina B Maliakkal, Ashish Arora, Arnab Bhattacharya

DCMP&MS, Tata Institute of Fundamental Research, Mumbai

18:00 **HVPE and ammonothermal GaN crystal growth on seeds of each other** A 2.90

Guoqiang Ren, Jiangfeng Wang, Xujun Su, Yumin Zhang, Tengkui Li, Ke Xu

Suzhou Institute of Nano-tech and Nano-bionics, Chinese Academy of Sciences, Suzhou Nanowin Science and Technology Co., Ltd.

18:00 **Free-standing GaN grown on magnetron sputtered AlN/GaAs template by HVPE** A 2.92

Yutian Cheng¹, Jiejun Wu^{1*}, Boyu Dong², Bingliang Guo², Xiaohui Feng¹, Guoyi Zhang¹, Tongjun Yu^{1*}

1. Research Center for Wide-gap Semiconductors, State Key Laboratory for Artificial Microstructures and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, P. R. China
2. North Microelectronics Corporation, Beijing 100176, P. R. China

18:00 **The role of v-pits in the performance of InGaN solar cells** A 2.93

Matthew B. Jordan¹, Muhammad Arif², Suresh Youssef El Gmili¹, Suresh Sundaram¹, Xin Li¹, Gilles Patriarche³, Paul L. Voss⁴, Jean Paul Salvestrini⁵, Abdallah Ougazzaden⁴

¹CNRS, UMI 2958 Georgia Tech - CNRS, 57070 Metz, France,
²Université de Lorraine, Centrale Supélec, LMOPS, EA4423, 57070 Metz, France, ³CNRS, UPR LPN, Route de Nozay, 91460 Marcoussis, France, ⁴Georgia Institute of Technology, UMI 2958 Georgia Tech - CNRS, 57070 Metz, France, ⁵Université de Lorraine, Centrale Supélec, LMOPS, EA4423, 57070 Metz, France

18:00 **Threading dislocation reduction in GaN on Si(111) by using three dimensional island growth** A 2.94

Shane Chang, Tung Loung ,Li Chang

National Chiao-Tung University

18:00 **GaN growth on Patterned Silicon Substrates: Evolution and Prevention of Meltpack Etching** A 2.95

Michel Khouri^{1,2/}, Olivier Tottreau¹, Guy Feuillet², Philippe Vennégùès¹ and Jesus Zúñiga-Pérez¹

¹Université Côte d'Azur, CRHEA - CNRS, Rue Bernard Grégoire, 06560 Valbonne, France ²Université Grenoble Alpes, CEA - LETI, 17 Rue Des Martyrs, 38054 Grenoble Cedex 9, France

10:00 **Coffee break**

B poster : Juergen Christen

18:00 **Optical characterisation of coreshell InGaN/GaN microtubes emitting in the green spectral range** B 2.1

G. Kusch¹, P. R. Edwards¹, E. Le Boulbar², P.-M. Coulon², P. A. Shields², R. W. Martin¹

¹Department of Physics, SUPA, University of Strathclyde, 107 Rottenrow East, Glasgow G4 0NG, United Kingdom, ²Department of Electronic and Electrical Engineering, University of Bath, Bath BA2 7AY, United Kingdom

18:00 **Design, growth and characterization of AlGaN-based UV distributed Bragg reflectors with enhanced refractive index contrast** B 2.2

Karan Mehta¹, Theeradetch Detchprohm¹, Yuh-Shiuan Liu¹, Shuo Wang², Oliver Moreno¹, Young Jae Park¹, Shyh-Chiang Shen¹, Fernando A. Ponce², Russell D. Dupuis¹, Paul D. Yoder¹

³Georgia Institute of Technology, ²Arizona State University,

18:00 **AlGaN Nanowire Tunnel Junction LEDs in the UV-C Band** B 2.3

S. Zhao¹, S. Sadaf¹, and Z. Mi^{1,2}

¹ Department of Electrical and Computer Engineering, McGill University, 3480 University Street, Montreal, QC H3A 0E9, Canada
² Department of Electrical Engineering and Computer Science, Center for Photonics and Multiscale Nanomaterials, University of Michigan, Ann Arbor, Michigan 48109, United States

18:00 **Carrier and Photon Dynamics in InGaN/GaN Lateral Nanowires** B 2.4

Shonal Chouksey, Pratim Saha, Swaroop Ganguly and Dipankar Saha

Applied Quantum Mechanics Laboratory, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India

18:00 **Improving the lifetime of InGaN/GaN near-ultraviolet laser diodes** B 2.5

Dario Schiavon, Szymon Grzanka, Ewa Grzanka, Julita Smalc-Koziorowska, Piotr Perlin

Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, Warsaw, Poland, TopGaN Lasers, Sokolowska 29/37, Warsaw, Poland

18:00 **Comprehensive optical and structural Study of Highly Efficient Deep UV AlGaN/AlGaN MQWs Grown on AlN** B 2.6

Idris A. Ajia¹, Zhiqiang Liu², Iman Roqan¹

¹Physical Sciences and Engineering division, KAUST, Thuwal, Saudi Arabia, ²R&D Center for Semiconductor Lighting, Chinese Academy of Science, Beijing, China

18:00 **Enhanced deep ultraviolet luminescence from AlGaN MQWs grown by using AlN template on cylindrical patterned sapphire substrate** B 2.7

Seung-Jae Lee¹, Seong-Ran Jeon¹, Jung-Young Jung², Ju-Hyeong Ha², Hae-Gon Oh², Young-Jun Choi², Hae-Yong Lee², Yoon Seok Kim³, and Dong-Wook Lee⁴

¹Korea Photonics Technology Institute, Gwangju 61007, Korea, ²LumiGNtech Co., Ltd., Gyeonggi 14322, Korea, ³Korea Polytechnic University, Gyeonggi 15037, Korea, ⁴LGS Co., Ltd., Jeonbuk 54853, Korea

18:00 **Manipulable and hybridized, ultralow-threshold lasing in a plasmonic laser using elliptical InGaN/GaN nanorods** B 2.8

Bin Liu, Tao Tao, Ting Zhi, Jiangping Dai, Zhe Zhuang, Zili Xie, Peng Chen, Fangfang Ren, Dunjun Chen, Youdou Zheng, Rong Zhang, Yaonan Hou, Modestos Athanasiou, Tao Wang

(1) Jiangsu Provincial Key Laboratory of Advanced Photonic and Electronic Materials, School of Electronic Science and Engineering, Nanjing University, Nanjing 210093, China (2) Department of Electronic and Electrical Engineering, The University of Sheffield, Mappin Street S1 3JD, Sheffield, United Kingdom

18:00 **Anomalous photocurrent reversal in AlGaN deep-ultraviolet light emitting diodes** B 2.9

Seung-Young Lim, Tea-Soo Kim, Hyun-Woo Kim, Youngbo Moon, Jung-Hoon Song

Department of Physics, Kongju National University, Gongju, Chungnam 32588, South Korea, UJL Co., Ltd., 87, Gunjacheon-ro 21beon-gil, Siheung-si, Gyeonggi-do, Republic of Korea

18:00 Pressure-dependent studies of Be-doped GaN: identification of yellow luminescence centers B 2.10

Henryk Teisseyre^{1,2}, John L. Lyons³, Agata Kaminska^{1,4}, Dawid Jankowski¹, Dawid Jarosz¹ Michał Boćkowski², Andrzej Suchocki¹ and Chris G. Van de Walle⁵

1 Institute of Physics, Polish Academy of Sciences, Aleja Lotników 32/46, PL-02668 Warsaw, Poland 2 Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland 3 Center for Computational Materials Science, Naval Research Laboratory, Washington, DC 20375, USA 4 Cardinal Stefan Wyszyński University, College of Science, Department of Mathematics and Natural Sciences, Dewajtis 5, 01-815 Warsaw, Poland 5 Materials Department, University of California, Santa Barbara, CA 93106-5050 USA

18:00 High-power AlGaN-based 385 nm ultraviolet light-emitting diodes grown on Si(111) substrates B 2.12

Zengcheng Li^{1,2} Legong Liu^{2,3} Qian Sun^{1,2} Meixin Feng¹ Yu Zhou¹ Hanmin Zhao^{2,3} and Hui Yang¹

1 Key Laboratory of Nanodevices and Applications, Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences (CAS), Suzhou 215123, China 2 Lattice Power (Changzhou) Corporation, Changzhou, 213164, China 3 Lattice Power (Jiangxi) Corporation, Nanchang, 330029, China

18:00 AlN/h-BN Nanowire Heterostructures for Deep Ultraviolet Photonics B 2.13

D.A. Laleyan¹, S. Zhao², S.Y. Woo³, H.N. Tran², H.B. Le², T. Szkopek², H. Guo², G.A. Botton³, Z. Mi¹

¹University of Michigan, ²McGill University, ³McMaster University

18:00 Photovoltaic properties of AlInN on Silicon heterojunctions deposited by sputtering: effect of AlN interfacial layer B 2.14

S. Valdueza-Felip¹, A. Núñez-Cascajero¹, R. Blasco¹, D. Montero², L. Grenet³, L. Rodríguez⁴, J. A. Méndez⁴, J. Olea², M. González-Herráez¹, E. Monroy^{5,6}, and F. B. Naranjo¹

1 GRIFO, University of Alcalá, 28871 Alcalá de Henares, Spain, 2 Applied Physics Dept. III, University Complutense of Madrid, 28040 Madrid, Spain, 3 CEA-Grenoble, LITEN, 38054 Grenoble, France, 4 GOLD, Instituto de Óptica-CSIC, 28006 Madrid, Spain, 5 CEA-Grenoble, INAC/PHELIQS, 38054 Grenoble, France, 6 University Grenoble Alpes, 38000 Grenoble, France

18:00 Emission of linearly polarized single photons from quantum dots contained in nonpolar, semipolar and polar sections of pencil-like nanowires B 2.15

Ž. Gačević¹, M. Holmes², E. Chernysheva³, M. Müller⁴, A. Torres-Pardo⁵, P. Veit⁴, F. Bertram⁴, J. Christen⁴, J. M. González-Calbet^{5,6}, Y. Arakawa^{2,7}, E. Calleja¹, and S. Lazić³

1 ISOM-ETSIT, Universidad Politécnica de Madrid, Avda. Complutense s/n, 28040 Madrid, Spain 2 Institute for Nano Quantum Information Electronics, The University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan 3 Instituto Nicolás Cabrera and Instituto de Física de Materia Condensada (IFIMAC), Universidad Autónoma de Madrid - Francisco Tomás y Valiente 7, 28049 Madrid, Spain 4 Institute of Experimental Physics, Otto-von-Guericke-University Magdeburg, 39106 Magdeburg, Germany 5 Departamento de Química Inorgánica, Facultad de Químicas, Universidad Complutense CEI Moncloa, 28040 Madrid, Spain 6 ICTS Centro Nacional de Microscopía Electrónica, 28040 Madrid, Spain 7 Institute of Industrial Science, The University of Tokyo, 4-6-1 Komaba, Meguro-ku, Tokyo 153-8505, Japan

18:00 Enhancing Carrier Injection by Increasing Mg Doping in the AlGaN Electron Blocking Layer of an LED Based on a Pre-flow Technique B 2.16

Chia-Ying Su, Charng-Gan Tu, Wei-Heng Liu, Chun-Han Lin, Hao-Tsung Chen, Yu-Feng Yao, Yean-Woei Kiang, C. C. Yang

Institute of Photonics and Optoelectronics, National Taiwan University

18:00 Electrically pumped GaN-based microcavity lasers directly grown on Si B 2.17

Meixin Feng, Junlei He, Yu Zhou, Yaozong Zhong, Shujun Dai, Hongwei Gao, Qian Sun, Jianping Liu, Shuming Zhang, and Hui Yang.

1. Key Laboratory of Nano-devices and Applications, Chinese Academy of Sciences (CAS), Suzhou 215123, China 2. Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences (CAS), Suzhou 215123, China

18:00 Enhanced light output power of GaN-based LEDs by a nanoimprinting-lithography-patterned SiO₂ current blocking layer B 2.18

Jae-Seong Park¹, Daesung Kang², Sun-Kyung Kim³, Tae-Yeon Seong¹

¹Dept. of Materials Science and Engineering, Korea University, Seoul, 02841 Korea ²LED Division, LG Innotek Co., Ltd., Paju, Gyeonggi 10842, Korea ³Dept. of Applied Physics, Kyung Hee University, Yongin, Gyeonggi, 17104, Korea.

18:00 Optical and thermal improvement of flip-chip ultraviolet light-emitting diodes through graphene oxide silicone embedding B 2.19

Renli Liang, Jun Zhang, Jiangnan Dai, and Changqing Chen

Renli Liang: liangrenli@mail.hust.edu.cn, Jun Zhang: narutozj@live.com, Jiangnan Dai: daijiangnan@mail.hust.edu.cn, Changqing Chen: cqchen@mail.hust.edu.cn

18:00 Fabrication of smooth GaN nanomembranes for device integration by electrochemical etching B 2.20

Michael A. Bergmann¹, Ehsan Hashemi¹, Björn Wickman², Åsa Haglund¹

¹Photonics Laboratory, Department of Microtechnology and Nanoscience, Chalmers University of Technology, Gothenburg 41296, Sweden, ²Chemical Physics, Department of Physics, Chalmers University of Technology, Gothenburg 41296, Sweden

18:00 Enhanced Performance of InGaN Green Emitters Using Cobalt-doped ZnO as an External Electron Retarding Layer B 2.21

Dong-Sing Wuu, Yi Ouyang, Sin-Liang Ou, Ching-Ho Tien

Department of Materials Science and Engineering, National Chung Hsing University, Taichung 40227, Taiwan

18:00 Improved p-type conduction in Gallium Nitride using Phosphorus Doping B 2.22

P. Upadhyay, K. Takhar, Bhanu B. Upadhyay, Yogendra K. Yadav and D. Saha

Centre of Excellence in Nanoelectronics, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai Mumbai – 400076, India

18:00 TIME-RESOLVED SPECTROSCOPY OF InGaN STRUCTURES GROWN BY PULSED MOCVD B 2.23

Kazimieras Nomeika (1), Milda Budreckaitė (2), Saulius Nargelias (1), Arūnas Kadys (1), and Ramūnas Aleksiejūnas (1)

(1) - Institute of Applied Research, Vilnius University, Saulėtekis ave. 3, LT-10257, Vilnius, Lithuania, (2) - Faculty of Physics, Vilnius University, Saulėtekis ave. 9, LT-10222, Vilnius, Lithuania

18:00 Formation of low-density GaN quantum dots on (0001)AlN surface by the decomposition of GaN wetting layer B 2.24

K.A. Konfederatova, V.G. Mansurov, T.V. Malin, Yu.G. Galitsyn, I.A. Aleksandrov, V.I. Vdovin, K.S. Zhuravlev

A.V.Rzhanov Institute of Semiconductor Physics, Siberian Branch of Russian Academy of Sciences

18:00 Accelerated Degradation of AlGaN-based white LEDs under Exposure to Air Pollutants B 2.25

A. Zibold, M. Kunzer, R. Schmidt, H. Konstanzer, M. Dammann, I. Kinski* and J. Wagner

Fraunhofer Institute for Applied Solid State Physics, Tullastrasse 72, 79108 Freiburg, Germany *Fraunhofer Institute for Ceramic Technologies and Systems, Michael-Faraday-Straße 1, 07629 Hermsdorf, Germany

18:00 **Thin-film InGaN multiple quantum well light-emitting diodes transferred from Si (111) substrate onto a thin epoxy resin carrier** B 2.26

Qiang Liao, Yibin Yang, Weijie Chen, Xiaobiao Han, Jie Chen, Wenjie Zang, Hui Luo, Jiali Lin, Yunling Qiu, Yinsong Chen, Zhisheng Wu, Yang Liu, and Baijun Zhang

School of Electronics and Information Technology, State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-sen University, Guangzhou 510275, China

18:00 **Long-term Lifetime of Nitride-based LEDs with Graphene Oxide and Metal Nanoparticles platform** B 2.28

Beo Deul Ryu, Min Han, Kang Bok ko, Yongsu Lim, Do Trong Thanh, Chang Hee Jo, Kwan Seon Joo, Tran Viet Cuong, Chang-Hee Hong

School of Semiconductor and Chemical Engineering, Semiconductor Physics Research Center, Chonbuk National University, Jeonju, Jeollabuk-do 54896, Korea

18:00 **2D Transport Modeling and Optimization of p-type and n-type AlGaN Supper Lattice for Deep UV Light Emitting Diodes with Localize** B 2.29

Hung-Hsiang Chen (1), Shuan Wang (1), Yi-Keng Fu(2), and Yuh-Renn Wu (1,2)

1. Graduate Institute of Photonics and Optoelectronics and Department of Electrical Engineering, National Taiwan University, Taipei 10617, Taiwan 2. Electronics and Opto-Electronics Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan 31040, R.O.C.

18:00 **Strain-inducing nanostructure for spectral red-shift** B 2.30

Wai Yuen Fu, Hoi Wai Choi

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

18:00 **Improved Performance of AlGaN-Based Deep Ultraviolet Light-Emitting Diodes with Nano-Patterned AlN/Sapphire Substrates** B 2.31

Donghyun Lee¹, Jong Won Lee², Jeonghwan Jang¹, In-Su Shin¹, Lu Jin¹, Jun Hyuk Park², Jungsub Kim³, Jinsub Lee³, Hye-Seok Noh³, Yong-II Kim³, Youngssoo Park³, Gun-Do Lee¹, Yongjo Park^{1,4}, Jong Kyu Kim², Euijoon Yoon^{1,4}

¹Department of Materials Science and Engineering, Seoul National University, Seoul 08826, Republic of Korea, ²Department of Materials Science and Engineering, Pohang University of Science and Technology, Pohang 37673, Republic of Korea, ³Advanced Development Team, LED business, Samsung Electronics, Yongin 17113, Republic of Korea, ⁴Energy Semiconductor Research Center, Advanced Institutes of Convergence Technology, Seoul National University, Suwon 16229, Republic of Korea

18:00 **Demonstration of electron beam pumped GaN-based laser** B 2.32

T. Hayashi 1, N. Nagata 1, T. Senga 1, S. Iwayama, M. Iwaya 1, T. Takeuchi 1, S. Kamiyama 1, I. Akasaki 1, 2, and Takahiro Matsumoto 3, 4

1. Faculty of Science and Technology, Meijo University, Japan, 2. Akasaki Research Center, Nagoya University, Japan, 3. Graduate School of Design and Architecture, Nagoya City University, Japan, 4. Graduate School of Medical Sciences, Nagoya City University, Japan

18:00 **Micro chip-sized GaN growth on thin alumina membrane** B 2.33

Seungmin Lee, Daeyoung Moon, Daehan Choi, Hyejin Lim, Yongjo Park, Euijoon Yoon

Dept. of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea, Dept. of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea, Dept. of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea, Dept. of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea, Energy Semiconductor Research Center, Advanced Institutes of Convergence Technology (AICT), Seoul National University, Gyeonggi 443-270, Korea, Dept. of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea

18:00 **Probing the electronic and optical properties of InGaN/GaN microrod LEDs by nanocathodoluminescence and μ -Raman spectroscopy** B 2.34

Marcus Müller¹, Sebastian Metzner¹, Peter Veit¹, Frank Bertram¹, Christian Nenstiel², Gordon Callsen², Matin Mohajerani³, Jana Hartmann³, Hao Zhou³, Hergo-H. Wehmann³, Axel Hoffmann², Andreas Waag³, and Jürgen Christen¹

¹ Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Germany ² Institut für Festkörperphysik, Technische Universität Berlin, Germany ³ Institut für Halbleitertechnik, Technische Universität Braunschweig, Germany

18:00 **Lasing effect under optical pumping in single p-i-n core-shell GaN nanowires grown by metalorganic chemical vapor deposition** B 2.35

M. Dechaux (1,2,3), B. Alloing (1), J. Zuniga-Pérez (1), M. Leroux (1), M. Richard (4), F. Réveret (2,3), J. Leymarie (2,3)

(1) UCA, CRHEA-CNRS, Rue Bernard Gregory, Sophia Antipolis, 06560 Valbonne, France, (2) Clermont Université, Institut Pascal, BP 10448, F-63000 Clermont-Ferrand, France, (3) CNRS, UMR 6602, Institut Pascal, F-63171 Aubière, France, (4) Institut Néel, CNRS-CEA, BP 166, F-38042 Grenoble, France

18:00 **Polarized Photoluminescence of C-plane GaN Grown on Stripe-Shaped Cavity-Embedded Al₂O₃ Membrane on C-plane Sapphire Substrate** B 2.36

Jongmyeong Kim, Jeonghwan Jang, Donghyun Lee, Yongjo Park, Euijoon Yoon

Department of Materials Science and Engineering, Seoul National University, Korea, Department of Materials Science and Engineering, Seoul National University, Korea, Department of Materials Science and Engineering, Seoul National University, Korea, Energy Semiconductor Research Center, Advanced Institutes of Convergence Technology (AICT), Seoul National University, Korea, Department of Materials Science and Engineering, Seoul National University, Korea

18:00 **Nanosecond spectral diffusion in a single photon emitting GaN quantum dot** B 2.37

Kang Gao (1), Ivan Solovev (1,3), Mark Holmes (1,2), Munetaka Arita (1,2), Yasuhiko Arakawa (1,2)

1, Institute of Industrial Science, University of Tokyo, Japan, 2, NanoQuine, University of Tokyo, Japan, 3, Spin Optics Laboratory, SPbSU, 1 Ul'anovskaya, Peterhof, St. Petersburg 198504, Russia

18:00 **Thickness-dependent threshold of stimulated emission in MOCVD grown GaN layers** B 2.38

S. Nargelas, T. Malinauskas, A. Kadys, I. Reklaitis and K. Jarašūnas

Institute of Applied Research, Vilnius University, Saulėtekio ave 3, LT-10257 Vilnius, Lithuania

18:00 **Enhancement of optical and electrical properties of Nanowires-Light emitting diodes by passivation processes and facet coatings** B 2.39

Abdullah A. Alatawi^{1,2}, Mohd S. Alias¹, Tien Khee Ng¹, Abdullah A. Alhamoud^{1,2}, Chao Zhao¹, Bilal Janjua¹, Davide Priante¹, Aditya Prabaswara¹, Abdulrahman M. Albadri², Ahmed Y. Alyamani², Munir M. El-desouki² and Boon S. Ooi^{1,*}

Computer, Electrical and Mathematical Sciences and Engineering (CEMSE) Division, King Abdullah University of Science & Technology (KAUST), Thuwal 23955-6900, Kingdom of Saudi Arabia (KSA). National Center for Nanotechnology, King Abdulaziz City for Science and Technology (KACST), Riyadh, 11442-6086, Kingdom of Saudi Arabia (KSA).

18:00 **On the minimization of Quantum confinement stark effect in GaN/AlN nanowire heterostructures grown on GaN nanowires by PA-MBE** B 2.40

R. Sarkar¹, K. Ghosh¹, S. Bhunia², S. Chouksey¹, S. Mahapatra², D. Saha¹, Apurba Laha¹

¹Department of Electrical Engineering, Indian Institute of Technology Bombay, Mumbai, India ²Department of Physics, Indian Institute of Technology Bombay, Mumbai, India

18:00 The Role of InGaN interlayer on InGaN/GaN Quantum Well Efficiency B 2.41

C. Haller, J.-F. Carlin, G. Jacopin, K. Shojiki, G. Callsen, R. Butté, D. Martin, N. Grandjean

Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (EPFL), 1015 Lausanne, Switzerland

18:00 Position-controlled GaN nanostructures embedded in AlN films grown on Si substrate B 2.42

Kanako Shojiki, Sebastian P. T. Kaufmann, Jean-François Carlin, Gordon Callsen, Ian M. Rousseau, Joachim Ciers, Gwénolé Jacopin, Raphaël Butté, and Nicolas Grandjean

Institute of Physics, Ecole Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

18:00 GaN-based nano-optoelectronic platform for in situ diagnostics of electrochemically active biofilms B 2.43

Heidi Boht 1/2, Gregor Scholz 1/2, Hilke Wichmann 3, Tony Granz 1/2, Muhammad Fahlesa Fatahilah 1/2, Jana Hartmann 1/2, Hao Zhou 1/2, Sönke Fündling 1/2, Joan Daniel Prades 4, Uwe Schröder 3, Hutomo Suryo Wasisto 1/2, Andreas Waag 1/2

1 Institut für Halbleitertechnik (IHT), Technische Universität Braunschweig, Hans-Sommer-Str. 66, D-38106 Braunschweig, Germany, 2 Laboratory for Emerging Nanometrology (LENA), Technische Universität Braunschweig, Langer Kamp 6a, D-38106 Braunschweig, Germany, 3 Institut für Ökologische und Nachhaltige Chemie (ÖNC), Technische Universität Braunschweig, Hagenring 30, D-38106 Braunschweig, Germany, 4 MIND-IN²UB, Department of Engineering: Electronics, University of Barcelona, C/Martí i Franquès 1, E-08028 Barcelona, Spain

18:00 Step-flow growth of green InGaN quantum well B 2.44

Aiqin Tian, Jianping Liu, Lingrong Jiang, Liqun Zhang, Masao Ikeda, Shuming Zhang, Deyao Li, Pengyan Wen, Yang Cheng, Xiaowang Fan, and Hui Yang

Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences

18:00 Optical characterization of green-emitting In-rich InGaN/GaN NW heterostructures B 2.45

Martina Morassi(1), H-G. Song(2) , F. Oehler(1), L. Mancini(1), L. Largeau(1), N. Jegenyés(1), V. Piazza(1), L. Travers(1), F. H. Julien(1), J-C. Harmand(1), N. Gogneau(1), Y-H. Cho(2) and M. Tchernycheva(1)

(1) - Center of Nanoscience and Nanotechnologies (C2N), CNRS, Univ. Paris-Sud, Univ. Paris-Saclay, Orsay & Marcoussis sites, France (2) - Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

18:00 Radiative and Nonradiative Recombination Processes via Intermediate Band in GaPN by Two-Wavelength Excited Photoluminescence B 2.46

Chika Negishi, Norihiko Kamata, Md Dulal Haque, Takeshi Fukuda, and Hiroyuki Yaguchi

Graduate School of Science and Engineering, Saitama University

18:00 High Efficiency InGaN-Based Vertical Light-Emitting Diodes on β -Ga₂O₃ Substrate for Reliable Applications B 2.47

Mufasila Mumtaz Muhammed, Norah Alwadai, Takekazu Masui, Akito Kuramata, Iman S Roqan

King Abdullah University of Science and Technology, Jeddah, Saudi Arabia. Novel Crystal Technology, Inc. Saitama, Japan

18:00 Direct Observation of Localized Surface Plasmon Field Enhancement of Ag nanoparticles on GaN by Kelvin Probe Force Microscopy B 2.48

Yuping Jia, Dabing Li*, Xiaojuan Sun, Hang Song, Hong Jiang, Zhiming Li

State Key Laboratory of Luminescence and Applications, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun 130033, P. R. China

18:00 **Phosphor-Free White Light-Emitting Diode Using GaN Based Three-Dimensional Stuructures** B 2.49

Seung-Hyuk Lim, Young Chul Sim, Kie Young Woo, and Yong-Hoon Cho

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea

18:00 **Molecular Beam Epitaxial Growth and Characterization of AlN Nanowall Deep UV Light Emitting Diodes** B 2.50

X. Liu¹, S. Zhao¹, B. H. Le¹, Ishiang Shih¹, and Z. Mi^{1,2*}

*Author for correspondence: zetian.mi@mcgill.ca, ¹Department of Electrical and Computer Engineering, McGill University, Montreal, QC H3A0E9, Canada, ²Department of Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI 48109-2099, USA.

18:00 **Highly efficient phosphor-free warm white light emission based on InGaN/GaN dodecagonal ring structures** B 2.51

Youngchul Sim, Seung-Hyuk Lim, Yang-Seok Yoo, Min-Ho Jang, and Yong-Hoon Cho*

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

18:00 **High efficiency deep ultraviolet light emitting diodes using polarization doped p-Al_xGa_{1-x}N/A_yGa_{1-y}N superlattice structures** B 2.52

Jinwan Kim, Byeongchan So, Taemyung Kwak, Eunyoung Shin, Taeyoung Kim, and Okhyun Nam*

CANS (Convergence Center for Advanced Nano Semiconductor), Department of Nano-optical engineering, Korea Polytechnic University

18:00 **One-dimensional polariton codensate of GaN microwire with whispering gallery mode at room temeperature** B 2.53

Hyun Gyu Song, MinKwan Kim, Min-Sik Kown, Sunghan Choi, Kie Yong Woo and Yong-Hoon Cho*

Department of Physics and KI for the NanoCentury, Korea Advanced Institute of Science and Technology, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, Republic of Korea.

18:00 **Hybrid top-down/bottom up fabrication of regular arrays of AlN/AlGaN core-shell nanorods for UV emission** B 2.54

P.M. Coulon¹, E.D. Le Boulbar¹, C. Bryce², B. Alloing³, R. Dagher³, P.R. Edwards², A. Michon³, R.W. Martin², J. Zuniga-Pérez³, D. W. E. Allsopp¹, P.A. Shields¹

¹Dept. Electrical & Electronic Engineering, University of Bath, Bath, BA2 7AY, UK 0FS, U.K., ²Department of Physics, SUPA, University of Strathclyde, G4 0NG, U.K., ³UCA, CRHEA-CNRS, Rue Bernard Grégoire, F-06560 Valbonne, France

18:00 **Optical and structural properties of semipolar GaN on patterned Si substrates** B 2.55

J. Bruckbauer¹, G. Naresh-Kumar¹, X. Yu², J. Pugh³, M. J. Cryan³, T. Wang², C. Trager-Cowan¹, and R. W. Martin¹

¹ Department of Physics, SUPA, University of Strathclyde, Glasgow G4 0NG, United Kingdom ² Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, United Kingdom ³ Department of Electrical and Electronic Engineering, University of Bristol, Bristol BS8 1UB, United Kingdom

18:00 **Design of electrically injected mid-UV laser diodes** B 2.56

Ronny Kirste, Pramod Reddy, Biplob Sakar, Qiang Guo, Ramon Collazo, Zlatko Sitar

Adroit Materials, Cary, NC 27518, USA, Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC 27695, USA

18:00 **Optical polarization switching in In_{0.03}Ga_{0.97}N/ Al_{0.12}Ga_{0.88}N MQWs on partially relaxed (20-21) AlGaN** B 2.57

Roy B. Chung, Gregory A. Garrett, Ryan W. Enck, Anand V. Sampath, Michael Wraback, and Meredith L. Reed

U.S. Army Research Laboratory

18:00 **Nanoscopic luminescence properties of an InGaN single quantum well intersected by individual dislocations** B 2.58

Gordon Schmidt, Peter Veit, Sebastian Metzner, Christoph Berger, Frank Bertram, Armin Dadgar, André Strittmatter, and Jürgen Christen

Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, Germany

18:00 **Experimental Measurements and Modeling of Carrier Dynamics in UVC Emitting AlGaN Quantum Wells** B 2.59

Gregory A. Garrett, Chelsea Haughn, Gregory Rupper, Sergey Rudin, and Michael Wraback (1) Thomas Wunderer, Zhihong Yang, and Noble M. Johnson (2)

(1) U.S. Army Research Laboratory, 2800 Powder Mill Road, Adelphi, MD 20783 USA, (2) Palo Alto Research Center, 3333 Coyote Hill Road, Palo Alto, CA 94304 USA

18:00 **Study on Modulation Bandwidth for GaN-Based Plasmonic LED with Cathodoluminescence Spectroscopy** B 2.60

Yulong Feng, Zhizhong Chen*, Shuang Jiang, Shengxiang Jiang, Qianqian Jiao, Tongjun Yu, Guoyi Zhang

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

18:00 **Improvement of crystalline quality and light emission for cyan LEDs grown on nanoscale patterned sapphire substrates by MOCVD** B 2.61

Yifan Chen¹, Zhizhong Chen^{1*}, Qianqian Jiao¹, Junze Li¹, Shengxiang Jiang¹, Yulong Feng¹, Jinglin Zhan¹, Tongjun Yu¹, X.N.Kang¹, Bo Shen¹, Guoyi Zhang^{1,2}

¹ State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China, ² Sino Nitride Semiconductor Co., Ltd, Dongguan 523500, Guangdong, China

18:00 **Theoretical study of the feasibility of ZnGeN₂-based LEDs** B 2.62

Rolles Mélanie^{1,2}, Hyot Bérangère¹, Ferron Alexandre¹, Miska Patrice²

¹ CEA LETI, 17 avenue des Martyrs F38054 Grenoble France, ² Université de Lorraine, Institut Jean Lamour F54000 Nancy France

18:00 **Kelvin Probe Force Microscopy for Strain relaxation Distribution Measurement of GaN-based μLEDs** B 2.63

Jinglin Zhan, Zhizhong Chen, Qianqian Jiao, Junze Li, Shengxiang Jiang, Yulong Feng, Yifan Chen, Tongjun Yu, Bo Shen, Guoyi Zhang

State Key Laboratory for Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China, Sino Nitride Semiconductor Co., Ltd, Dongguan 523500, Guangdong, China

18:00 **Study on Recombination Behavior for GaN-Based Plasmonic LED by Cathodoluminescence Spectra** B 2.64

Yulong Feng, Zhizhong Chen*, Shuang Jiang, Shengxiang Jiang, Fei Jiao, Xiangning Kang, Shunfeng Li, Tongjun Yu, Guoyi Zhang, Bo Shen

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

18:00 **Temperature-dependent photoluminescence in InGaN/GaN blue laser diodes** B 2.65

Pengyan Wen*, Ying Huang, Jianping Liu, Shuming Zhang, Deyao Li, Liqun Zhang, Aiqin Tian, Feng Zhang and Hui Yang

Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, Suzhou 215123, China

18:00 **GaN-based tunnel homojunction for LED applications** B 2.66

V. Fan Arcara^{1, 2*}, B. Damilano¹, G. Feuillet², J. Brault¹, S. Chenot¹, A. Courville¹, J-Y. Duboz¹

¹: Université Côte d'Azur, CNRS, CRHEA, Rue B. Gregory, 06560 Valbonne, France ²: Université Grenoble Alpes, CEA, LETI, 17 Avenue des Martyrs, 38000 Grenoble, France * Corresponding author: vfa@crhea.cnrs.fr

C poster : Juergen Christen

18:00 **Enhancement-Mode HEMTs with a p-GaN Gate through a Highly Uniform Self-terminated Etching Process** C 02.1

Yu Zhou^{1,2}, Yaozong Zhong^{1,2,3}, Shujun Dai^{1,2}, Hongwei Gao^{1,2}, Meixin Feng^{1,2}, Qian Sun^{1,2*}, Hui Yang^{1,2}

1. Key Laboratory of Nano-devices and Applications, Chinese Academy of Sciences (CAS), Suzhou 215123, China 2. Suzhou Institute of Nano-Tech and Nano-Bionics (SINANO), Chinese Academy of Sciences (CAS), Suzhou 215123, China, 3. Shanghai University, School of Material Science and Engineering, Shanghai 200444, China, (*Email: qsun2011@sinao.ac.cn),

18:00 **14 MeV neutron irradiation impact on AlGaN/GaN HEMT drain current transients** C 02.2

Peter Butler (1,2), Michael J Uren (1), Benoit Lambert (3), Martin Kuball (1)

(1) H.H. Wills Physics Laboratory, University of Bristol, Tyndall Avenue, United Kingdom, (2) AWE Plc., Aldermaston, Reading, United Kingdom, (3) UMS Semiconductors, Villebon-sur –Yvette, France

18:00 **Improved Characteristics for Thermally Grown TiO₂ and Al₂O₃ Based MOS-HEMTs** C 02.3

Akanksha Rawat, Vivek K. Surana, Yogendra K. Yadav, Bhanu B. Upadhyay, Swaroop Ganguly, Dipankar Saha

Applied Quantum Mechanics Laboratory, Centre of Excellence in Nanoelectronics, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India

18:00 **Positive and negative V_{th} instabilities in Vertical GaN-on-GaN FinFET** C 02.4

Maria Ruzzarin¹, Matteo Meneghini¹, Davide Bisi², Carlo De Santi¹, Min Sun³, Tomas Palacios³, Gaudenzio Meneghesso¹, Enrico Zanoni¹

¹Department of Information Engineering, University of Padua, Padua 35131, Italy, ²Department of Information Engineering, University of Padua, Padua 35131, Italy, now with the University of California, Santa Barbara, CA 93106, USA, ³Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, MA 02139, USA

18:00 **SiC/AlGaN vertical MOSFET based on SiC and AlN/GaN short period super lattice structure** C 02.5

Eiji Kojima, Kenta Chokawa, Hiroki Shirakawa, Masaaki Araida, Kenji Shiraishi

Graduate School of Engineering, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan Institute of Materials and System for Sustainability, Nagoya University, Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan

18:00 **Modification of donor-like states on (0001) AlN surface at silicon nitride layer formation in ammonia MBE** C 02.6

V.G.Mansurov_1, T.V.Malin_1, Yu.G.Galitsyn_1, K.S.Zhuravlev_1,2, O.E.Tereshenko_1,2, V.E.Zemlyakov_3, V.I.Egorkin_3, Ya.M.Parnes_4, I.P.Prosvirin_5

1 A.V.Rzhanov Institute of Semiconductor Physics Siberian Branch of RAS, 13, Lavrentiev avenue, Novosibirsk, 630090, Russia 2 Novosibirsk State University, 2, Pirogova str., 630090 Novosibirsk, Russia 3 National Research University of Electronic Technology «MIET», Bld. 1, Shokin Square, Zelenograd, Moscow, 124498, Russia 4 CJSC “Svetlana-Electronpribor”, 27, Engels avenue, Saint Petersburg, 194156, Russia 5 Boreskov Institute of Catalysis Siberian Branch of Russian Academy of Sciences, 5, Lavrentiev avenue, Novosibirsk, 630090, Russia

18:00 **3D GaN fin arrays for vertical field-effect transistors** C 02.7

Klaas Strempel 1/2, Jana Hartmann 1/2, Feng Yu 1/2, Hendrik Spende 1/2, Muhammad Fahlesa Fatahilah 1/2, Friedhard Römer 3, Kristian Frank 3, Bernd Witzigmann 3, Sönke Fündling 1/2, Hutomu Suryo Wasisto 1/2, Andreas Waag 1/2

1 Institut für Halbleitertechnik (IHT), Technische Universität Braunschweig, Hans-Sommer-Str. 66, D-38106 Braunschweig, Germany 2 Laboratory for Emerging Nanometrology (LENA), Technische Universität Braunschweig, Langer Kamp 6a, D-38106 Braunschweig, Germany, 3 Computational Electronics and Photonics (CEP), University of Kassel, Wilhelmshöher Allee 71, D-34121 Kassel, Germany

18:00 **Temperature dependent capacitance-voltage spectroscopy of AlGaN/GaN HEMT-on-Si with a C-doped buffer** C 02.8

Sandeep Kumar1, Priti Gupta2, Ivor Guiney2, S. Raghavan1, C. J. Humphreys2, R. Muralidharan1, Digbijoy N. Nath1

1 Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science, Bangalore, Karnataka, India, 2 Cambridge Centre for Gallium Nitride, Department of materials science and metallurgy, University of Cambridge, Cambridge, United Kingdom

18:00 **Investigation of Al₂O₃/InAlN/GaN-on-Si HEMT by Capacitance Dispersion Technique** C 02.9

Sandeep Kumar1, Nayana Remesh1, S. B. Dolmanan2, S. Tripathy2, S. Raghavan1, R. Muralidharan1, Digbijoy N. Nath1

1Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science (IISc), Bengaluru, India, 2Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology, and Research (A*STAR), Singapore

18:00 **Enhanced Performance of Pre-Gate N₂- Plasma Processed AlGaN/GaN HEMTs and Schottky Diodes** C 02.10

Bhanu B. Upadhyay, Kuldeep Takhar, Yogendra K. Yadav and Dipankar Saha

Centre of Excellence in Nano-Electronics, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai – 400076, India

18:00 **Hot electron assisted vertical leakage/ breakdown in AlGaN/GaN heterostructures on Si substrates** C 02.11

Anqi Hu, Xuelin Yang, Bo Shen

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China

18:00 **Mapping of n-GaN Schottky contacts with wavy surface morphology using scanning internal photoemission microscopy** C 02.12

K. Shiojima, T. Hashizume, F. Horikiri, T. Tanaka, and T. Mishima
University of Fukui, SCIOCS, Hosei University

18:00 GaN nanocolumn based Schottky diode C 02.13

V. Z. Zubialevich 1, P. Pampili 1,2, M. White 1, D. O'Connell 1, A. Hydes 1, A.-M. Kelleher 1, M. McLaren 3, M. Arredondo-Arechavala 3, G. Sabui 4, Z. J. Shen 4 and P. J. Parbrook 1,2

1 Tyndall National Institute, University College Cork, T12 R5CP, Cork, Ireland, 2 School of Engineering, University College Cork, Cork, Ireland, 3 School of Mathematics and Physics, Queen's University Belfast, BT7 1NN Belfast, Northern Ireland, 4 Electrical and Computer Engineering Department, Illinois Institute of Technology, IL-60616 Chicago, USA

18:00 Lateral transport mechanism outside the device isolated area in GaN:C doped HEMTs C 02.14

Serge Karboyan¹, Michael J. Uren¹, Indranil Chatterjee¹, Peter Moens², Abishek Banerjee², Martin Kuball¹

¹H.H. Wills Physics Laboratory, University of Bristol, Bristol, U.K. , ²ON Semiconductor, Oudenaarde, Belgium.

18:00 Reliability Study on Gate Recessed Normally-On and Normally-Off AlGaN/GaN MOS-HEMTs C 02.15

Ahmed Chakroun¹, Meriem Bouchilaoun¹, Ali Soltani¹, Gilles Patriarche², Abdelatif Jaouad¹, François Boone¹ and Hassan Maher¹

1- Institut Interdisciplinaire d'Innovation Technologique (3IT), Laboratoire Nanotechnologies Nanosystèmes (LN2) - CNRS UMI-3463, Université de Sherbrooke, 3000 Boulevard Université, Sherbrooke, J1K 0A5, Québec, Canada, 2- Laboratoire de Photonique et de Nanostructures (LPN), C2N, UMR-CNRS 9001, Université Paris-Saclay, Route de Nozay, 91460 Marcoussis, France

18:00 New gate process for the fabrication of highly reliable AlGaN/GaN HEMT C 02.16

Meriem Bouchilaoun, Ahmed Chakroun, Ali Soltani, Maxime Darnon, Abdelatif Jaouad, Francois Boone and Hassan Maher

Laboratoire Nanotechnologies Nanosystèmes (LN2) - CNRS UMI-3463, Institut Interdisciplinaire d'Innovation Technologique (3IT), Université de Sherbrooke, 3000 Boulevard Université, Sherbrooke J1K 0A5, Québec, Canada

18:00 Reduction of impurities and realization of high breakdown voltage Schottky barrier diodes using homoepitaxial m-plane GaN grown C 02.17

K. Nagamatsu¹, Z. Ye², O. Barry², A. Tanaka¹, M. Deki¹, S. Nitta¹, Y. Honda¹, and H. Amano^{1,3,4}

¹Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya 464-8603, Japan ²Department of Electrical Engineering and Computer Science, Nagoya University, Nagoya 464-8603, Japan ³Akasaki Research Center, Nagoya University, Nagoya 464-8603, Japan ⁴Venture Business Laboratory, Nagoya University, Nagoya 464-8603, Japan

18:00 4x reduction in GaN MOSCAP flatband voltage hysteresis with an in-situ deposited SiN cap and device processing in a cluster tool C 02.18

Dilini Tania Hemakumara (1), Xu Li (1), Konstantinos Floros (1), Sung-Jin Cho (1), Ivor Guiney (2), David Moran (1), Colin Humphreys (2), Aileen O'Mahony (3), Harm Kroops (3) and Iain G Thayne (1)

(1) School of Engineering, University of Glasgow, Rankine Building, Oakfield Avenue, Glasgow, G12 8LT, Scotland, UK, (2) Department of Materials Science and Metallurgy, University of Cambridge, 27 Charles Babbage Road, Cambridge, CB3 0FS, UK, (3) Oxford Instruments Plasma Technology, Yatton, Bristol, BS49 4AP, United Kingdom

18:00 PECVD SiON Gate Insulator for Normally-off AlGaN/GaN-on-Si recessed MIS-HFET C 02.19

Hyun-Seop Kim¹, Sang-Woo Han¹, Won-Ho Jang¹, Hyungtak Kim¹, Chun-Hyung Cho¹, Kwang-Seok Seo², Ho-Young Cha¹

¹Hongik University, ²Seoul National University

18:00 Characterization and modeling of transient self-heating in GaN HEMTs C 02.20

Adrien Cutivet, Meriem Bouchilaoun, Ahmed Chakroun, Ali Soltani, Abdelatif Jaouad, Francois Boone, and Hassan Maher

Université de Sherbrooke, Sherbrooke, QC J1K2R1, Canada

18:00 **1 MHz DC-DC convertor implemented with clamped AlGaN/GaN MOS-HFET** C 02.21

Sang-Woo Han, Min-Gi Jo, Hyun-Seop Kim, Hyungtak Kim, and Ho-Young Cha

School of Electronic and Electrical Engineering, Hongik University, Korea

18:00 **Effects of passivation layers on carrier transport in AlGaN/GaN HFETs** C 02.22

Sejoon Oh, Taehoon Jang, Jaehye Cho

School of Semiconductor and Chemical Engineering, Chonbuk National University, Jeonju 54896, Republic of Korea

18:00 **GaN planar Schottky barrier diode with cut-off frequency of 627 GHz** C 02.23

Ning An, Qian Li, Jianping Zeng*, Jun Jiang, Bin Lu, Li Li, Haitao Liu, Wei Tan * Corresponding author: zengjp@semi.ac.cn

Microsystem & Terahertz Research Center, China Academy of Engineering Physics, Chengdu, 610200, China

18:00 **Investigation of hole traps in n-type homoepitaxial GaN by ODLTS focusing on sub-bandgap-light optical excitation process** C 02.24

Kazutaka Kanegae, Tsunenobu Kimoto, Masahiro Horita, Jun Suda

Kyoto University, Kazutaka Kanegae, Tsunenobu Kimoto, Masahiro Horita, Jun Suda Nagoya University IMaSS, Jun Suda

18:00 **Nearly Ideal Vertical-type GaN Schottky Barrier Diodes with Ultra-Low Turn-on Voltage and On-Resistance** C 02.25

Liwen Sang*, Bing Ren, Meiyong Liao, Masatomo Sumiya, Yasuo Koide

National Institute for Materials Science

18:00 **Research of GaN Schottky Barrier Diode (SBD) based on AlGaN/GaN heterojunction with Metal-2DEG Schottky contact** C 02.26

Qian Li, Ning An, Jianping Zeng*, Li Li, Bin Lu, Jun Jiang, Haitao Liu, Wei Tan

Terahertz Physics Laboratory, Microsystem and Terahertz Research Center, China Academy of Engineering Physics

18:00 **Effects of 2D-Graphene on SiN passivated AlGaN/GaN based-MISHEMTs** C 02.27

M. F. Romero, A. Boscá, J. Martínez, J. Pedrós, T. Palacios and F. Calle

M. F. Romero, A. Boscá, J. Martínez, J. Pedrós, and F. Calle are with the ISOM and Dpto. Ingeniería Electrónica, ETSI de Telecomunicación, Universidad Politécnica de Madrid (UPM), Madrid, Spain, T. Palacios is with the Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139, USA

18:00 **Mg-compensation effect in GaN buffer layer for AlGaN/GaN high-electron-mobility transistors grown on 4H-SiC substrate** C 02.28

Kyeongjae Lee, Kwangse Ko, Uiho Choi, Jaeyeon Han and Okhyun Nam*

Korea Polytechnic University

18:00 **Post dielectric under gate N₂-plasma for improved performance of wet grown Al₂O₃/AlGaN/GaN MISHEMTs** C 02.29

Kuldeep Takhar, Bhanu B. Upadhyay, Swaroop Ganguly and Dipankar Saha

Centre of Excellence in Nano-Electronics, Department of Electrical Engineering, Indian Institute of Technology Bombay, Powai, Mumbai – 400076, India

18:00 Investigation of photoluminescence, stimulated emission, photoreflectance and 2DEG properties of AlGaN/GaN HEMT heterostructures

C 02.30

E. V. Lutsenko¹, M. V. Rzheutski¹, A. G. Vainilovich¹, I. E. Svitsiankou¹, G. P. Yblonskii¹, A. Alyamani², S. I. Petrov³, V. V. Mamaev³, A. N. Alexeev³

1 Stepanov Institute of physics of NAS of Belarus. Nezalezhnosti ave. 68, 220072, Minsk, Belarus, 2 National Nanotechnology Centre, King Abdulaziz City for Science and Technology, PO Box No. 6086, 11442 Riyadh, Saudi Arabia, 3 SemiTEq JSC. Engels avenue 27, Saint-Petersburg, Russia.

18:00 ZrO₂ as a High-k Gate Dielectric for Enhancement-mode AlGaN/GaN MOS HEMTs

C 02.31

C. Eddy, Jr.(a), V. Wheeler(a), D. Shahin(b), T. Anderson(a), M. Tadjer(a), A. Koehler(a), K. Hobart(a), A. Christou(b) and F. Kub(a)

(a) U.S. Naval Research Laboratory, 4555 Overlook Ave., SW, Washington, DC 20375 (b) University of Maryland, Materials Science & Eng. Dept., College Park, MD 20742

18:00 Electrical and optical characterization of GaN-based LEDs with ZnO:Al transparent contacts by EBIC and electroluminescence

C 02.32

J. Priesol¹, K. Cavanagh², M.A. Hopkins², D. W. E. Allsopp², S. Thornley³, J. Dutson³, M. Creatore⁴, J. Niemela⁴, F. Uherek¹, A. Satka¹

¹Institute of Electronics and Photonics, Slovak University of Technology in Bratislava, Ilkovičova 3, 812 19 Bratislava, Slovakia
²Department of Electronic and Electrical Engineering, University of Bath, Claverton Down, BA2 7AY, Bath, UK
³Plasma Quest Ltd, Unit 1B Rose Estate, Osborn Way, Hook, Hampshire, RG27 9UT, UK
⁴Department of Applied Physics, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands

18:00 Structural and electrical characterization of graphene heterostructures with Nitrides for high frequency vertical transistors

C 02.33

F. Giannazzo (1), G. Fisichella (1), G. Greco (1), E. Schilirò (1), I. Deretzis (1), R. Lo Nigro (1), A. La Magna (1), F. Roccaforte (1), F. Iucolano (2), S. Lo Verso (2), S. Ravesi (2), P. Prystawko (3), P. Kruszewski (3), M. Leszczyński (3), R. Dagher (4), E. Frayssinet (4), A. Michon (4), Y. Cordier (4)

(1) CNR-IMM, Strada VIII, 5, Zona Industriale, 95121 Catania, Italy,
(2) STMicroelectronics, Stradale Primosole 50, 95121 Catania, Italy,
(3) TopGaN, Prymasa TysiÄœcia 98 01-424 Warsaw, Poland, (4)
CRHEA-CNRS, Rue Bernard Gregory, 06560 Valbonne, France.

18:00 Electron transport in GaN-based nanoribbons: effect of UV excitation C 02.34

Andrey Naumov 1,2, Ihor Zadorozhnyi 1, Hilde Hardtdegen 1, Vyacheslav Kochelap 2, Alexander Belyaev 2, and Svetlana Vitusevich 1

1 Peter Grünberg Institute (PGI-8, PGI-9), Forschungszentrum Jülich GmbH, Jülich 52425, Germany, 2 Lashkaryov Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Kiev 03028, Ukraine

18:00 Correlation of lattice damage related traps and threshold voltage hysteresis in recessed gate Al₂O₃/GaN MOSFETs on Si substrate C 02.35

Liang He¹, Liuan Li¹, Fan Yang¹, Wenjing Wang¹, Jialin Zhang¹, Zijun Chen¹, Zhen Shen¹, Yue Zheng¹, Xiaorong Zhang¹, Lei He^{1,2}, Zhisheng Wu^{1,3}, Baijun Zhang^{1,3}, Yang Liu^{1,2,3}

1-School of Electronics and Information Technology, Sun Yat-Sen University, 2-Institute of Power Electronics and Control Technology, Sun Yat-Sen University, 3-State Key Laboratory of Optoelectronic Materials and Technologies, Sun Yat-Sen University

18:00 **Gate Recessed E-mode AlGaN/GaN MIS-HEMT With Dual Gate Insulator Employing PEALD SiON and HfON** C 02.36

Il-Hwan Hwang¹, Gwang-Ho Choi¹, Su-keun Eom¹, Myung-Jin kang¹, Ho-Young Cha² and Kwang-Seok Seo¹

¹Department of Electrical and Computer Engineering and Inter-University Semiconductor Research Center, Seoul National University, Seoul 151-744, Republic of Korea ²School of Electronic and Electrical Engineering, Hongik University, Seoul 121-791, Republic of Korea

18:00 **Comparison of semi-insulating iron and carbon doped GaN layers grown on Si (111) for high-power applications.** C 02.37

Jonas Hennig, Andreas Lesnik, Seshagiri Rao Challa, Jürgen Bläsing, Marc Hoffmann, Armin Dadgar, and André Strittmatter

Otto-von-Guericke-Universität Magdeburg, Institut für Experimentelle Physik, Universitätsplatz 2, 39106 Magdeburg, Germany

18:00 **GaN vertical nanowire transistor with the channel of 300 nm** C 02.38

Dong-Hyeok Son¹, Young-Woo Jo¹, Chan Heo¹, Ryun-Hwi Kim¹, Dai quan¹, Jae Hwa Seo¹, Hwan Soo Jang², Ki-Sik Im¹, Yong Soo Lee¹, Yong-Tae Kim³, In man Kang¹ and Jung-Hee Lee¹

¹School of electronics engineering, Kyungpook National University, Daegu 41566, Korea ²Center for Core Research Facilities, Daegu Gyeongbuk Institute of Science & Technology, Daegu 42988, Korea ³Semiconductor Materials and Devices Laboratory, Korea Institute of Science and Technology, Seoul 02792, Republic of Korea

18:00 **The effect of surface states on thermal stability in InAlGaN/GaN heterostructures** C 02.39

Jie Zhang, Xuelin Yang, Jianpeng Cheng, Anqi Hu, Bo Shen

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China

18:00 **High breakdown voltage on GaN HEMT thanks to a 3C SiC interlayer on silicon substrate** C 02.40

A. Soltani¹, A. Chakroun¹, Y. Cordier², H. Maher¹

¹. LN2 CNRS - Université de Sherbrooke, 3000 Bld de l'Université, Sherbrooke, QC Canada ². CNRS CRHEA, Sophia antipolis, Valbonne, France

18:00 **Fabrication of AlGaN-channel High Electron Mobility Transistors and Their Application in High Voltage Electronic Devices** C 02.41

Junshuai Xue, Jincheng Zhang, and Yue Hao

Key Laboratory of Wide Bandgap Semiconductor Materials and Devices, School of Microelectronic, Xidian University, 710071 China

18:00 **Engineering of electric field distribution in GaN(cap)/AlGaN/GaN heterostructures** C 02.42

Ł. Janicki¹, M. Gladysiewicz¹, J. Misiewicz¹, M. Sobanska², K. Klosek², Z.R. Zytkiewicz², and R. Kudrawiec¹

¹ Faculty of Fundamental Problems of Technology, Wrocław University of Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland ² Institute of Physics, Polish Academy of Science, al. Lotników 32/46, 02-668 Warsaw, Poland

18:00 **Field Emission Characteristics of GaN Nanowall Network Structures grown by Laser Molecular Beam Epitaxy Technique** C 02.43

M. Senthil Kumar, Prashant Tyagi, Ramesh Ch. and Sunil Singh Kushvaha

Division of Advanced Materials and Devices CSIR-National Physical Laboratory, New Delhi 110012, INDIA

18:00 **Transient Electroluminescence Characterization of GaN-on-Si HEMTs** C 02.44

Georges Pavlidis, Luke Yates, Samuel Graham

Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA

18:00 Field Plate Design in AlGaN Integrated Cascode Configuration C 02.45

S. Jiang¹, K. B. Lee¹, I. Guiney², Z. H. Zaidi¹, J. S. Cheong¹, P. Li¹, H. Qian¹, D. J. Wallis², C. J. Humphreys², A. J. Forsyth³, M. J. Uren⁴, M. Kuball⁴ and P. A. Houston¹

¹Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield S1 3JD, UK, ²Department of Materials Science and Metallurgy, University of Cambridge, Cambridge CB3 0FS, UK, ³School of Electrical and Electronic Engineering, University of Manchester, Manchester M13 9PL, UK, ⁴School of Physics, University of Bristol, Bristol BS8 1TL, UK

18:00 Current transport enhancement in GaN/AlN based double barrier heterostructures using AlN as barrier layer C 02.46

Shibin Krishna, Anurag G. Reddy, Neha Aggarwal, Mandeep Kaur, Sudhir Husale, Dinesh Singh, Manju Singh, Rajib Rakshit, K.K. Maurya and Govind Gupta

Advanced Materials & devices, CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Road New Delhi-110012, India, Department of Electronic Engineering, Graduate School of Engineering, Research Center for Advanced Science and Technology, University of Tokyo, 4-6-1 Komaba, Maguro-Ku, Tokyo, 153-8904, Japan, Quantum Phenomena and Applications, CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Road, New Delhi-110012, India, Sophisticated and Analytical Instrumentation, CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Road, New Delhi-110012, India, Academy of Science & Innovative Research (AcSIR), CSIR-NPL Campus, Dr. K.S. Krishnan Road, New Delhi-110012, India.

18:00 GaN pn-junction fabricated by selective area epitaxy C 02.47

Simon Kotzea, Arne Deball, Holger Kalisch, Andrei Vescan
GaN Device Technology, RWTH Aachen University, Sommerfeldstr. 24, 52074 Aachen, Germany

18:00 Multiuse High Al-content Al_xGa_{1-x}N pn-junctions C 02.48

Fatima Asif, Sakib Muhtadi, Seong Mo. Hwang, Antwon. Coleman, Alexander Lunev, V.S.N. Chava, MVS Chandrashekhar, and Asif Khan

EE Department, University of South Carolina, Columbia SC29208

18:00 First Experimental Demonstration of High-Voltage, Quasi-Vertical Al_{0.8}Ga_{0.2}N Schottky Diodes on AlN Substrates C 02.50

Collin Hitchcock¹, Gyanesh Pandey¹, T.P. Chow¹, Baxter Moody², Seiji Mita², Joe Smart², Rafael Dalmau²

¹Rensselaer Polytechnic Institute, ²HexaTech, Inc.

18:00 Investigation of the Impact of Interfacial Layers on the Degradation of GaN-on_Si HEMTs subjected to Electrical Stress Testing C 02.51

Luke Yates¹, Georges Pavlidis¹, Chien-Fong Lo², Tingyu Bai³, Mark S. Goorsky³, Wayne Johnson², Samuel Graham¹

¹George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, 30332, ²IQE, 200 John Hancock Rd., Taunton, MA, 02780, ³Department of Materials Science and Engineering, University of California, Los Angeles, California, 90095

18:00 Proton irradiation characteristics of AlGaN/GaN-on-Si HEMTs with Ni, W, TiN, and TaN schottky gates C 02.52

Hee Hyung Cho, Dongmin Keum, Geunho Cho, Guhyeok Chung, Ho-young Cha, Hyungtak Kim

School of Electronic and Electrical Engineering Hongik University Seoul, Korea

18:00 **Recessed Gate GaN HEMTs on Si using Low-Temperature Atomic Layer Deposited-ZrO₂** C 02.53

Young-Chul Byun, Xin Meng, Jae-Gil Lee, Antonio T. Lucero, Joy S. Lee, Si Joon Kim, Chadwin D. Young, Moon J. Kim and Jiyoung Kim*

Department of Materials Science and Engineering, The University of Texas at Dallas, Richardson, Texas 75080, USA

18:00 **High V_{th} stability of AlGaN/GaN MIS-HEMTs using hollow cathode plasma-enhanced ALD SiNx as a gate dielectric** C 02.54

Xin Meng 1, Young-Chul Byun2, Jae-Gil Lee2, Harrison S. Kim2, Joy S. Lee2, Antonio T. Lucero2, Si Joon Kim2, Lanxia Cheng2, Jiyoung Kim1, 2

1Department of Electrical Engineering, University of Texas at Dallas, 800 West Campbell Rd., Richardson, Texas, 75080, USA

2Department of Materials Science and Engineering, University of Texas at Dallas, 800 West Campbell Rd., Richardson, Texas, 75080, USA

18:00 **Homogeneous InGaN Light-Emitting Diode Tube** C 02.55

Y. Park, K.H. Li, Y.F. Cheung, H.W. Choi

The University of Hong Kong

18:00 **The Optimization of Drain Delay in Short-Chanel GaN HEMT** C 02.56

Xidong Tong, Shiyong Zhang, Wei Tan

Microsystem & Terahertz Research Center, Chengdu, China

18:00 **Lateral 1-D Transistors on AlGaN/GaN Heterostructure with Non-Contacting Side Gate** C 02.57

Akhil S. Kumar, Dolar Khachariya, Mudassar Meer, Swaroop Ganguly, Dipankar Saha

Applied Quantum Mechanics Laboratory, Indian Institute of Technology Bombay, Powai, Mumbai 400076, India

D poster : Juergen Christen

18:00 **Avalanche multiplication in AlGaN-based pin diodes for the ultraviolet spectral range** D 02.1

L. Hahn, R. Rehm, F. Fuchs, L. Kirste, R. Driad, K. Köhler, T. Passow, O. Ambacher

Fraunhofer-Institute for Applied Solid State Physics IAF, Tullastrasse 72, D-79108 Freiburg

18:00 **Top-down III-N single nanowire p-i-n photodetector** D 02.2

Xu Zhang1, Xinbo Zou1 2, Chak Wah Tang1, Kei May Lau1 2

1Department of Electronic and Computer Engineering, HKUST, Hong Kong, 2Jockey Club Institute for Advanced Study (IAS), HKUST, Hong Kong

18:00 **Carrier generation and recombination dynamics and reliability of InGaN-based photodetectors for high power densities** D 02.3

C. De Santi, M. Meneghini, A. Caria, E. Dogmus, M. Zegaoui, F. Medjdoub, G. Meneghesso, E. Zanoni

Department of Information Engineering, University of Padova, via Gradenigo 6/B, Padova, 35131, Italy, IEMN-CNRS, Avenue Poincaré CS 60069, 59652, Villeneuve d'Ascq, France

18:00 **Optically switched gate-less normally-off III-nitride HEMT** D 02.4

Sandeep Kumar1, Anamika Singh Pratiyush1, S. B. Dolmanan2, S. Tripathy2, S. Raghavan1, R. Muralidharan1, Digbijoy N. Nath1

1Centre for Nano Science and Engineering (CeNSE), Indian Institute of Science (IISc), Bengaluru, India, 2Institute of Materials Research and Engineering (IMRE), Agency for Science, Technology, and Research (A*STAR), Singapore

18:00 NITRIDE HETEROSTRUCTURE OPTIMIZATION FOR PHOTODETECTORS and SOLAR CELLS D 02.5

S. Didenko, O. Rabinovich, S. Legotin, M. Orlova
National University of Science and Technology "MISiS"

18:00 GaN simulation for photodetector D 02.6

S. Didenko, O. Rabinovich, S. Legotin, M. Orlova
National University of Science and Technology "MISiS"

18:00 Simulation and verification of InGaN heterostructure based gas and bio sensor design D 02.7

J. Shahbaz¹, M. Schneidereit¹, D. Heinz¹, B. Hörbrand², F. Huber², S. Bauer², K. Thonke² and F. Scholz¹

¹ Institute of Optoelectronics, Ulm University, 89081 Ulm, Germany
² Inst. of Quantum Matter / Semicond. Physics Group, Ulm University, 89081 Ulm, Germany

18:00 Monolithic integration of GaN SB-MOSFET-based logic circuitry with LED arrays D 02.8

J.X. Yu, W.Y. Fu, K.H. Li and H.W. Choi
Department of Electrical and Electronic Engineering, The University of Hong Kong, Hong Kong

18:00 Bias-controlled spectral response in GaN/AlN nanowire photodetectors D 02.9

Maria Spies (1), Jonas Lähnemann (1), Pascal Hille (2,3), Jörg Schörmann (2), Jakub Polaczynski (1), Martien I. Den Hertog (1), Bruno Gayral (1), Martin Eickhoff (2,3), Eva Monroy (1)

(1) Université Grenoble-Alpes, CEA-INAC-PHELIQS and CNRS-Institut Néel, 38000 Grenoble, France (2) I. Physikalisches Institut, Justus Liebig Universität Giessen, 35390 Giessen, Germany (3) Institut für Festkörperphysik, Universität Bremen, 28359 Bremen, Germany

18:00 Enhanced Detectivity from a Low Dimensional GaN based Self-Driven UV Photodetector D 02.10

Neha Aggarwal¹ 3, Shabin Krishna¹ 3, Alka Sharma² 3, Lalit Goswami¹, Dinesh Kumar², Sudhir Husale², Govind Gupta¹

¹Advanced Material & Devices Division, CSIR-National Physical Laboratory (CSIR-NPL), Dr K. S. Krishnan Road, New Delhi-110012, India, ²Quantum Phenomena and Applications, CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Road, New Delhi-110012, India, ³Academy of Science & Innovative Research (AcSIR), CSIR-NPL Campus, Dr. K.S. Krishnan Road, New Delhi-110012, India.

18:00 Backside illuminated AlGaN based solar-blind ultraviolet metal-semiconductor-metal photodetectors on high quality AlN template D 02.11

Joocheol Jeong, Junghwan Son, Ji won Jeong, Joo Jin

Department of UV-Sensor Lab, Genicom, 237, Baeul 1-ro, Yusung-gu, daejeon,34036 Korea

18:00 Graphene/GaN based Dual-Band Photodetector D 02.12

Neha Aggarwal¹ 2, Shabin Krishna¹ 2, Munu Borah¹, Alka Sharma^{3,2}, Lalit Goswami¹, Sudhir Husale³ and Govind Gupta¹

¹Advanced Materials & Devices Division, CSIR-National Physical Laboratory (CSIR-NPL), Dr K. S. Krishnan Road, New Delhi-110012, India, ²Academy of Science & Innovative Research (AcSIR), CSIR-NPL Campus, Dr. K.S. Krishnan Road, New Delhi-110012, India, ³Quantum Phenomena and Applications, CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Road, New Delhi-110012, India

18:00 GaN epitaxially grown on graphene, a new model system for UV photodetection D 02.13

T. Journot 1,2, V. Bouchiat 1,3, B. Gayral 1,4, J. Dijon 1,5, B. Hyot 1,2

¹ Univ. Grenoble Alpes, 38000 Grenoble, France. ² CEA, LETI, MINATEC campus, 38000 Grenoble, France. ³ CNRS-Grenoble, Institut Néel, 38000 Grenoble, France. ⁴ CEA, INAC-PHELIQS, 38000 Grenoble, France. ⁵ CEA, LITEN, 38000 Grenoble, France.

18:00 **Realization of ultraviolet/infrared dual photodetectors by integration of Graphene to GaN** D 02.14

Xiaojuan Sun, Dabing Li*, Yiping Jia, Xiaotong Liu, You Wu, Hong Jiang, Hang Song, Zhiming Li

State Key Laboratory of Luminescence and Applications,
Changchun Institute of Optics, Fine Mechanics and Physics,
Chinese Academy of Sciences, Changchun 130033, P. R. China

18:00 **Design and fabrication of Gallium Nitride grating couplers using Displacement Talbot Lithography** D 02.15

E. D. Le Boulbar¹, S. Jia², J.R. Pugh², D.W.E. Allsopp¹, M.J. Cryan², and P.A. Shields¹

¹Department of Electrical and Electronic Engineering, University of Bath, BA2 7AY, U.K., ²Department of Electrical and Electronic Engineering, University of Bristol, BS8 1UB, U.K.

18:00 **Persistent Photoconductivity, Nanoscale Topography and Chemical Functionalization Collective Influence on the Behavior of PC12 C** D 02.16

Patrick J. Snyder, Ronny Kirste, Ramon Collazo, Albena Ivanisevic

Department of Materials Science and Engineering, North Carolina State University, 911 Partners Way, Raleigh, North Carolina 27606, USA , Adroit Materials, 2054 Kildaire Farm Rd., Suite 205, Cary, North Carolina 27518, USA

18:00 **Carrier transport in reverse-biased AlGaN p-i-n deep-UV photodetectors** D 02.17

Anisha Kalra, Shashwat Rathkanthiwar, Rangarajan Muralidharan, Srinivasan Raghavan, Digbijoy Nath

Center for Nanoscience and Engineering, Indian Institute of Science, Bangalore, India, 560012

18:00 **High responsivity and fast detection non-polar GaN based UV Photodetector** D 02.18

Abhiram Gundimeda, Shabin Krishna T.C., Neha Aggarwal, Alka Sharma, Nita Dilawar Sharma, K. K. Maurya, Sudhir Husale and Govind Gupta

1.Advanced Materials and Devices, 2.Quantum Phenomena and Applications, 3.Apex Level Standards & Industrial Metrology, 4.Sophisticated and Analytical Instrumentation, CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Marg, New Delhi- 110012, India. † Academy of Scientific and Innovative Research, CSIR-NPL Campus, Dr. K. S. Krishnan Road, New Delhi- 110012, India.

18:00 **Ultrafast Indium Nitride based VIS-NIR photo-detector** D 02.19

Shabin Krishna, Alka Sharma, Neha Aggarwal, Sudhir Husale and Govind Gupta

Physics of Energy Harvesting, CSIR-National Physical Laboratory (CSIR-NPL), New Delhi, India Quantum Phenomena and Applications, CSIR-NPL, New Delhi, India Academy of Science & Innovative Research (AcSIR), CSIR-NPL Campus, New Delhi - 110012, India

E poster : Juergen Christen

18:00 **Theoretical calculations of miscibility of III nitride quaternary alloys** E 02.1

R. Mohamad¹, A. Béré², H. Ben Ammar¹, A. Minj¹, P. Gamarra³, C. Lacam³, J. Chen¹ and P. Ruterana¹

¹CIMAP, UMR 6252, UNICAEN, CNRS, ENSICAEN, CEA, 6 Boulevard Maréchal Juin, 14050 Caen and Pôle Universitaire d'Alençon, Campus de Damigny, 61250 Damigny ²Laboratoire de Physique et de Chimie de l'Environnement, Université de Ouagadougou, 03 BP: 7021 Ouagadougou 03, Burkina Faso ³III-VLab, 1 Avenue Augustin Fresnel, Campus Polytechnique, 91767 Palaiseau, France

18:00 **Calculated band bowing and band alignment of dilute Sb alloy GaN_{1-x}S_x** E 02.2

Qing Shi¹, Ying-Chih Chen¹, Faqrul A. Chowdhury², Zetian Mi², Vincent Michaud-Rioux¹, Hong Guo¹

¹Department of Physics, McGill University, Montréal, QC, H3A 2T8, Canada ²Department of Electrical and Computer Engineering, Montréal, QC, H3A 0E9, Canada

18:00 **Simulation of transient carrier-exciton-phonon energy transport in GaN** E 02.3

Bei Ma, and Yoshihiro Ishitani
Chiba University

18:00 **Estimation of strain relaxation in InGaN/GaN nanowires through excitonic binding energy** E 02.4

Sandeep Sankaranarayanan, Swaroop Ganguly, Dipankar Saha
Research scholar at department of electrical engineering IIT Bombay

18:00 **First-principles Investigation of artificial photosynthesis on Ga(In)N surface** E 02.5

Xianghua Kong, Wei Ji, Zetian Mi, Hong Guo
Department of Physics, McGill University, Montreal, QC H3A2T8, Canada, Department of Physics and Beijing Key Laboratory of Optoelectronic Functional Materials and Micro-Nano Devices, Renmin University of China, Beijing 100872 , P. R. China, Department of Electrical & Computer Engineering, McGill University, Montreal, QCH3A0E9, Canada, Department of Physics, McGill University, Montreal, QC H3A2T8, Canada,

18:00 **Exploring the Mechanism of Reducing the LED Efficiency Droop Effect through Surface Plasmon Coupling** E 02.6

Chien-Chih Chen, Wen-Yen Chang, Yang Kuo, Yean-Woei Kiang, C. C. Yang
Institute of Photonics and Optoelectronics, National Taiwan University

18:00 **Modeling of localization effects in disordered GaN-based materials measured by STL** E 02.7

J.-M. Lentali,¹ M. Filoche,¹ W. Hahn,¹ J. S. Speck,² A. Alhassan,² L. Martinelli,¹ C. Weisbuch,^{1,2} Y. Lassailly,¹ and J. Peretti¹

¹ Laboratoire de Physique de la Matière Condensée, CNRS-Ecole Polytechnique, Université Paris-Saclay, 91128 Palaiseau, France ² Department of Materials, University of California, Santa Barbara, California 93106, USA

18:00 **Towards 3D GaN characterization: Influence of spot size, beam current and temperature on the cathodoluminescence spectrum of InG** E 02.8

Hendrik Spende ^{1,2,*}, Johannes Ledig ^{1,2,3}, Klaas Stremmel ^{1,2}, Hergo-Heinrich Wehmann ^{1,2}, Sönke Fündling ^{1,2}, Andreas Waag ^{1,2}

¹ Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, Braunschweig University of Technology, 38092 Braunschweig, Germany ² epitaxy competence center ec2, Hans-Sommer-Straße 66, 38106 Braunschweig, Germany ³ Physikalisch-Technische Bundesanstalt (PTB), Bundesallee 100, 38116 Braunschweig, Germany

18:00 **Structure of dislocation core in pyramidal plane of n- and p- doped wurtzite GaN** E 02.9

I.G. Batyrev, N.S. Weingarten, K. A. Jones

US Army Research Laboratory, 2800 Powder Mill Road Adelphi, MD 20783-1138

18:00 **Influence of tunneling interaction with defects on the recombination dynamics in GaN/AlN quantum dots** E 02.10

Ivan A. Aleksandrov, Konstantin S. Zhuravlev, Vladimir G. Mansurov, Timur V. Malin

A.V. Rzhanov Institute of Semiconductor Physics, Lavrentieva 13, Novosibirsk 630090, Russia

18:00 **Thermodynamic analysis of InGaN MOVPE: influence of lattice constraint** E 02.11

Yuya Inatomi¹, Yoshihiro Kangawa^{1,2,3}, Tomonori Ito⁴, Tadeusz Suski⁵, Koichi Kakimoto², and Akinori Koukitu⁶

¹ Department of Aeronautics and Astronautics, ² Research Institute for Applied Mechanics (RIAM), Kyushu University, ³ Institute of Materials and Systems for Sustainability (IMaSS), Nagoya University, ⁴ Department of Physics Engineering, Mie University, ⁵ Institute of High Pressure Physics PAS, ⁶ Department of Applied Chemistry, Tokyo University of Agriculture and Technology

18:00 **Theoretical calculation of rate coefficients, densities, and decay time of excitons and free carriers in GaN** E 02.12

Kensuke Oki, Kentaro Nomachi, Bei Ma, Ken Morita, Yoshihiro Ishitani

Chiba University

18:00 **A Methodology for Multiphysics Simulation of GaN MOVPE Using Thermodynamic Analysis of Driving Force of GaN Crystal Growth** E 02.13

K. Kawakami, Y. Yamamoto, K. Yoshimatsu, N. Okamoto, Y. Kangawa, K. Kakimoto and K. Shiraishi

Nagoya Univ., Graduate School of Engineering, Nagoya Univ., IMaSS, Nagoya Univ., RIAM, Kyushu Univ.

18:00 **Multiphysics Flow Simulation with Suitable Conditions Predicted by Thermodynamic Analysis of Driving Force of GaN Crystal Growth** E 02.14

Y. Yamamoto, K. Kawakami , K. Yoshimatsu, N. Okamoto, Y. Kangawa, K. Kakimoto and K. Shiraishi

Graduate School of Engineering, Nagoya University, Institute of Materials and Systems for Sustainability, Nagoya University, Research Institute for Applied Mechanics, Kyushu University

18:00 **On the nature of light emission in polar GaN/(AlGa)N quantum wells** E 02.15

C. Brumont¹, T. Guillet¹, D. Scalbert¹, B. Jouault¹, P. Valvin¹, T. Bretagnon¹, P. Lefebvre¹, L. Lahourcade², N. Grandjean², B. Damilano³, M. Vladimirova¹

¹Laboratoire Charles Coulomb, CNRS/Université de Montpellier, Montpellier, France, ²Institute of Physics, EPFL, Lausanne, Switzerland, ³Centre de Recherche sur l?Hétéro-Epitaxie et ses Applications, CNRS, Valbonne Sophia Antipolis, France

18:00 **Role of oxygen atoms on polarity inversion of N-polar AlN buffer layers: a first-principles study** E 02.16

1Motoshi Uchino, 1Toru Akiyama, 1Kohji Nakamura, 1Tomonori Ito, 2,3Hideto Miyake, 3Kazumasa Hiramatsu

1Department of Physics Engineering, Mie University, 2Graduate school of Regional Innovation Studies, Mie University, 3Department of Electrical and Electronic Engineering, Mie University

18:00 **Density Functional Theory study of adsorption of molecular oxygen and water at GaN(0001) surface** E 02.17

Paweł Strak 1), Yoshihiro Kangawa 2,3), Stanisław Krukowski 1), Paweł Kempisty 1,3), Michał Bockowski 1)

1) Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland 2) Research Institute for Applied Mechanics, Kyushu University, Kasuga, Fukuoka 816-8580, Japan 3) Institute of Materials and Systems for Sustainability, Nagoya University, Nagoya 464-8603, Japan

18:00 **Calculation of material gain in polar AlGaN quantum wells grown on virtual AlGaN substrates** E 02.18

Marta Gladysiewicz Robert Kudrawiec

Faculty of Fundamental Problems of Technology, Wroclaw University of Science and Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wroclaw, Poland

18:00 **Density functional theory study of the polar
AlN(0001) surface reactivity** E 02.19

B. Eydoux^{1,2}, B. Baris¹, S. Gauthier¹, X. Bouju¹, D. Martrou¹

1-Centre d'élaboration de matériaux et d'études structurales
CEMES-CNRS UPR 8011, Nanosciences Group, 29 rue Jeanne
Marvig, F-31055, Toulouse, France 2-Université Toulouse III, UPS,
118 route de Narbonne, F-31062 Toulouse, France,

18:00 **Role of Hydrogen during Metalorganic Vapor
Phase Epitaxy of N-polar III-nitrides** E 02.20

Takashi Hanada, Takashi Matsuoka

Institute for Materials Research, Tohoku University

18:00 **Systematic theoretical investigations for crystal
structure deformation in group-III nitrides : a
first-principles study** E 02.21

Yuma Tsuboi, Toru Akiyama, Kohji Nakamura, Tomonori Ito

Department of Physics Engineering, Mie University, Tsu 514-8507,
Japan.



12th International Conference
on Nitride Semiconductors (ICNS12)
24th-28th July 2017, Strasbourg, France

Thursday Program

- A - Materials
- B - Optical devices
- C - Electronic devices
- G - Late news

Thursday

parallel sessions

8:30 - 10:00

Nanophotonics : Rachel Oliver

- 08:30 **GaN-on-silicon integrated photonics for IR to visible light frequency conversion** B 11.1

P. Boucaud 1, I. Roland 1, Y. Zeng 1, F. Tabataba-Vakili 1, M. El Kurdi 1, S. Sauvage 1, X. Checouri 1, M. Gromovyi 2, S. Rennesson 2, F. Semond 2, J.-Y. Duboz 2, M. de Micheli 3, J. Selles 4, C. Brimont 4, T. Guillet 4, B. Gayral 5,6

1 Centre de Nanosciences et de Nanotechnologies, CNRS, Univ. Paris-Sud, Université Paris-Saclay, Bâtiment 220, Rue André Ampère, F-91405 Orsay, France , 2 Centre de Recherche pour l'Hetero-Epitaxie et ses Applications (CRHEA-CNRS), Université Côte d'Azur, Rue Bernard Grégory, F-06560 Valbonne, France , 3 Institut de Physique de Nice, Université de Nice-Sophia-Antipolis, 06108 Nice, France , 4 Laboratoire Charles Coulomb (L2C), UMR 5221, CNRS-Université de Montpellier, F-34905 Montpellier, France, 5 CEA, INAC-PHELIQS, Nanophysique et semiconducteurs group, F-38000 Grenoble, France , 6 Univ. Grenoble Alpes, F-38000 Grenoble, France

- 09:00 **Comparison of Low-Threshold lasing in InGaN/GaN Quantum Dot and Quantum Well Micro-Ring Cavities** B 11.2

Danqing Wang, Tongtong Zhu, Rachel A. Oliver, Evelyn L. Hu

John A. Paulson School of Engineering and Applied Sciences, Harvard University, USA, Department of Materials Science and Metallurgy, University of Cambridge, UK

- 09:15 **Interface phonon polariton propagation and LO phonon-resonant absorption of infrared light in AlN/metal-composites** B 11.3

Hironori Sakamoto, Bei Ma, Ken Morita, Yoshihiro Ishitani

Chiba University

- 09:30 **Recombination dynamics in 3D InGaN/GaN microrod and fin heterostructures**

Angelina Vogt (1), Jana Hartmann (1,2), Hao Zhou (1), Felix Blumenröther (1), Sönke Fündling (1,2), Hergo-Heinrich Wehmann (1,2), Andreas Waag (1,2), Tobias Voss (1)

1 Institute of Semiconductor Technology and Laboratory for Emerging Nanometrology, TU Braunschweig, 38092 Braunschweig, Germany, 2 Epitaxy Competence Center, ec2, 38092 Braunschweig, Germany

- 09:45 **Coffee break**

Electronics and future : Tomas Palacios

- 08:30 **To be announced** C 8.1

U. Mishra
UCSB, USA

- 09:00 **Pursuing the Promise of Ultra-Wide-Bandgap Ga2O3 Power Device Technology** C 8.2

Masataka Higashiwaki¹, Man Hoi Wong¹, Keita Konishi^{1,2}, Kohei Sasaki³, Ken Goto^{3,2}, Hisashi Murakami², Yoshinao Kumagai², Akito Kuramata³, Shigenobu Yamakoshi³

1) National Institute of Information and Communications Technology, Koganei, Tokyo 184-8795, Japan, 2) Department of Applied Chemistry, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184-8588, Japan, 3) Tamura Corporation, Sayama, Saitama 350-1328, Japan

- 09:30 **Monolithic Integration of E/D-Mode HEMTs for Logic Circuits on the p-GaN Gate Technology Platform** C 8.3

Gaofei Tang, Hanxing Wang, Jiacheng Lei, Kevin J. Chen

Dept. of Electronic and Computer Engineering, The Hong Kong University of Science and Technology, Hong Kong

Thursday

09:45 **The high temperature performances of AlGaN-based high electron mobility transistors** C 8.4

Weihang Zhang, Jincheng Zhang, Li Zhang, Tao Zhang, Yue Hao

Key Laboratory of Wide Band-Gap Semiconductor Materials and Devices, School of Microelectronics, Xidian University, Xi'an, 710071, People's Republic of China

10:00 **Coffee break**

LATE NEWS : Bruno Gayral

08:30 **Pure single photon emission and its temperature dependence from interface-fluctuation GaN quantum dots** G 2.1

F. Le Roux, K. Gao, M. Holmes, S. Kako, M. Arita, Y. Arakawa

Institute for Nano Quantum Information Electronics, The University of Tokyo, Japan, Institute of Industrial Science, The University of Tokyo, Japan.

08:45 **Degradation process of nitride laser diodes: MOVPE versus MBE - who is the winner?** G 2.2

Agata Bojarska¹, Przemysław Wiśniewski², Irina Makarowa², Grzegorz Muzioł¹, Robert Czernecki^{1,2}, Czesław Skierbiszewski¹, Tadek Suski¹ and Piotr Perlin^{1,2}

¹Institute of High Pressure Physics, „Unipress” Sokolowska 29/37 01-142 Warsaw, Poland, ²TopGaN Limited, Sokolowska 29/37 01-142 Warsaw, Poland

09:00 **High-voltage AlGaN/GaN MOSHEMTs on silicon with slanted tri-gate structures** G 2.3

Jun Ma, Elison Matioli

Power and Wide-band-gap Electronics Research Laboratory (POWERlab), École polytechnique fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland

09:15 **Quantum modeling of GaN/InGaN/GaN tunnel junctions** G 2.4

Nicolas Cavassilas, Yann Claveau, Marc Bescond, Fabienne Michelini

Aix Marseille Université, CNRS, Université de Toulon, IM2NP UMR 7334, 13397, Marseille, France

09:30 **Achievement of extremely high WPE (9.6%) of AlGaN deep-UV LED by using transparent contact layer, reflective electrode and lens** G 2.5

Hideki Hirayama^{1*}, Tomohiko Shibata², Yukio Kashima^{1,3*}, Eriko Matsuura^{1,3,□} Hideki Takagi⁴, Noritoshi Maeda¹, Masafumi Jo¹, Takeshi Iwai⁵, Toshiro Morita⁵, Mitsunori Kokubo⁶, Takaharu Tashiro⁶, Ryuichiro Kamimura⁷, Yamato Osada⁷,

1-RIKEN, 2-1 Hirosawa Wako, Saitama, 351-0198 Japan,
2-DOWA Electronics Co. Ltd. 1 Sata, Iijima, Akita, 011-0911 Japan,
3-Marubun Corporation, 8-1 Oodenma-cho, Nihonbashi, Chuo Ward, Tokyo, 109-8577 Japan, 4-AIST, Tsukuba-East, 1-2-1 Namiki, Tsukuba, Ibaraki, 305-8564 Japan 5-Tokyo Ohka Kogyo Co., Ltd. 150 Nakamaruko, Nakahara, Kawasaki, Kanagawa, 211-0012 Japan, 6-Toshiba Machine Co., Ltd. 2068-3, Ohoka, Numadu, Shizuoka, 410-8510 Japan, 7-ULVAC, Inc. 2500, Hagizono, Chigasaki, Kanagawa, 253-8543 Japan

09:45 **Light Emitting Diodes on Semipolar (11-22) and (20-21) GaN on Patterned Sapphire Templates** G 2.6

Michel Khouri (1), Hongjian Li (1), Leah Kuritzky (1), Asad Mughal (1), Philippe De Mierry (2), James. S. Speck (1) and Steven P. DenBaars (1)

(1) Materials Department, University of California Santa Barbara, California 93106, USA. (2) CNRS - CRHEA, Rue Bernard Gregory, 06560 Valbonne, France

parallel sessions

10:30 - 12:15

Characterization : Carol Trager-Cowan

- 10:30 **Carrier dynamics studies of III-nitride materials using photo-acoustic and photoluminescence measurements** A 11.1

A. A. Yamaguchi, N. Shimizu, S. Sakai, T. Nakano, H. Fukada, Y. Kanitani, and S. Tomiya

Kanazawa Institute of Technology, Sony Corporation

- 11:00 **Interband Carrier Dynamics of Gamma3 and Gamma1 Energy Bands of InN using Ultrafast Spectroscopic Techniques** A 11.2

Blair C. Connelly, Chad S. Gallatin, Michael Wraback

U.S. Army Research Laboratory, Sensors and Electron Devices Directorate, Adelphi, MD USA 20873

- 11:15 **Studies of free charge carrier properties in AlGaN and InGaN based structures by infrared and terahertz optical Hall effect** A 11.3

Nerijus Armakavicius, Jr-Tai Chen, Tino Hofmann, Sean Knight, Philipp Kühne, Mengyao Xie, Enrique Calleja, Ming-Shien Hu, Daniel Nilsson, Urban Forsberg, Erik Janzén, Mathias Schubert, Vanya Darakchieva

1) Terahertz Materials Analysis Center, Department of Physics, Chemistry and Biology IFM, Linköping University, Sweden 2) Semiconductor Materials, Department of Physics, Chemistry and Biology IFM, Linköping University, Sweden 3) Department of Electrical and Computer Engineering, University of Nebraska-Lincoln, USA 4) Institute of Optoelectronical and Microtechnological Systems, Universidad Politcnica de Madrid, Madrid, Spain

- 11:30 **Nitrogen displacement related deep level traps in homoepitaxial n-type GaN** A 11.4

Masahiro Horita¹, Tetsuo Narita², Tetsu Kachi³, Tsutomu Uesugi², Jun Suda¹ 3

¹Kyoto University, ²Toyota Central R&D Labs., ³Nagoya University

- 11:45 **Bistability of the Fermi level position at the air/ GaN(0001) interface** A 11.5

Ł. Janicki¹, M. Gladysiewicz¹, J. Misiewicz¹, K. Klosek², M. Sobanska², P. Kempisty³, Z. R. Zytkiewicz², and R. Kudrawiec¹

¹ Faculty of Fundamental Problems of Technology, Wrocław University of Technology, Wybrzeże Wyspiańskiego 27, 50-370 Wrocław, Poland ² Institute of Physics, Polish Academy of Science, al. Lotników 32/46, 02-668 Warsaw, Poland ³ Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland

- 12:00 **Lifetime killers in as-grown and irradiated n-GaN films and crystals** A 11.6

A.Y. Polyakov¹, E.B. Yakimov¹ and 2, N.B. Smirnov¹, I.V. Shchemberov¹, S.I. Didenko¹, In-Hwan Lee³, S.J. Pearton⁴

¹National University of Science and Technology MISiS, Leninskiy pr. 4, Moscow 119049, Russia, ²Institute of Microelectronics Technology and High Purity Materials, Russian Academy of Science, 6, Academician Ossipyan str., Chernogolovka, Moscow Region 142432, Russia, ³School of Materials Science and Engineering, Korea University, Seoul 02841, Korea, ⁴University of Florida, Gainesville, Florida 32611, USA

12:15 Lunch

Tunnel junctions : Nicolas Grandjean

- 10:30 **Tunnel junction contacts for high efficiency InGaN edge emitting lasers and VCSELs** B 12.1

Erin C. Young, Benjamin P. Yonkee, Changmin Lee, John T. Leonard, Daniel A. Cohen, Steven P. DenBaars, Shuji Nakamura, James S. Speck

University of California, Santa Barbara, USA

11:00 **Deep Ultraviolet Tunnel Junction Nanowire LEDs and Electrically Pumped Lasers** B 12.2

Zetian Mi, Songrui Zhao, Sharif Sadaf, Xianhe Liu, Bin Le, Nhung Tran

Department of Electrical Engineering and Computer Science, Center for Photonics and Multiscale Nanomaterials, University of Michigan, Ann Arbor, Michigan 48109, United States Department of Electrical and Computer Engineering, McGill University, 3480 University Street, Montreal, QC H3A 0E9, Canada

11:30 **High efficiency tunnel-injected deep UV LEDs** B 12.3

Yuewei Zhang^{1,a)}, Sriram Krishnamoorthy¹, Fatih Akyol¹, Zane Jamal-Eddine¹, Sanyam Bajaj¹, Andrew Allerman², Michael W. Moseley², Andrew Armstrong², and Siddharth Rajan^{1,a)}

¹ Department of Electrical and Computer Engineering, The Ohio State University, Columbus, Ohio, 43210, USA ² Sandia National Laboratories, Albuquerque, New Mexico 87185, USA Email: (a) zhang.3789@osu.edu (b) rajan@ece.osu.edu.

11:45 **Dipolar excitons in InGaN/GaN Light Emitting Diode Structures with tunnel junction.** B 12.4

T. Suski(1)*, G. Staszczak(1), K. P. Korona(2), P. A. Dró?d?(1,2), G. Muzio?(1), C. Skierbiszewski(1), M. Kulczykowski(3), M. Matuszewski(3), E. Grzanka(1,4), S. Grzanka(1,4), A. Khachapuridze(1), J. Smalc-Koziorowska(1), P. Perlin(1,4) * presenting author

(1) Institute of High Pressure Physics, UNIPRESS, PAS, 01-142 Warsaw, Poland , (2) Faculty of Physics, University of Warsaw, Pasteura 5, 02-093 Warsaw, Poland, (3) Institute of Physics, Polish Academy of Sciences, 02-668 Warsaw, Poland, (4) TopGaN, 01-142 Warsaw, Poland,

12:00 **Tunnel junction nitride laser diodes grown by plasma assisted molecular beam epitaxy** B 12.5

C. Skierbiszewski, G. Muziol, K. Szkudlarek, A. Nowakowska-Siwińska, H. Turski, M. Siekacz, S. Grzanka, P. Perlin

Institute of High Pressure Physics, Polish Academy of Sciences, Sokolowska 29/37, 01-142 Warsaw, Poland, Top-GaN Ltd., Sokolowska 29/37, 01-142 Warsaw, Poland

12:15 **Lunch**

Nanotechnology for electronics : Kevin Chen

11:00 **Nanoscale technologies for high-voltage GaN power devices** C 9.1

Elison Matioli

Ecole Polytechnique Fédérale de Lausanne (EPFL)

11:30 **Self-aligned source-first process for vertical conduction GaN fin MOSFETs** C 9.2

Maher Tahhan, Anchal Agarwal, Brian Romanczyk, Silvia Chan, Chirag Gupta, Stacia Keller, Umesh Mishra

University of California, Santa Barbara, Department of Electrical and Computer Engineering, University of California, Santa Barbara, Department of Material Science

11:45 **80 nm-gate Fin-like Nanowire-Channel Al₂O₃/InAlN/GaN MISHEMTs on Si with Improved Linearity** C 9.3

Weichuan Xing^{1, 2}, Zhihong Liu¹, Haodong Qiu², Geok Ing Ng^{1, 2}, and Tomás Palacios³

¹Singapore-MIT Alliance for Research and Technology, 117543, Singapore ²School of EEE, Nanyang Technological University, 639798, Singapore ³Microsystem Technology Lab, Massachusetts Institute of Technology, 02139-4307, USA

12:00 **Current Collapse-free AlGaN/GaN Nanowire Gate-All-Around FETs** C 9.4

Chul-Ho Won, Ki-Sik Im, Jeong-Gil Kim, Seung-Hyeon Kang*, Jun-Hyek Lee, Young Soo Lee, Jung-Hee Lee

School of Electronics Engineering, Kyungpook National University

12:15 **Lunch**

parallel sessions

13:45 - 15:45

AIN/AlGaN : Julien Brault

- 13:45 **Investigation of the mechanisms behind the AlN on Si (111) microstructure** A 12.1

N. Mante¹, S. Rennesson², E. Frayssinet², L. Largeau³, F. Semond², G. Feuillet, P. Vennégùès²

1 Université Grenoble Alpes, CEA, LETI, MINATEC Campus, F-38054 Grenoble, France, 2 Université Côte d'Azur, CRHEA-CNRS, rue B. Grégoire, F-06560 Valbonne, France, 3 C2N-CNRS, Route de Nozay, F-91460 Marcoussis, France

- 14:00 **Dislocation reduction and strain relaxation of AlN film with new interface formation by high temperature annealing under N₂** A 12.2

Mingxing Wang, Fujun Xu, Zhixin Qin, Lisheng Zhang, Yuanhao Sun, Na Xie, Zhaoying Chen, Bo Shen

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China

- 14:15 **Influence of Al_yGa_{1-y}N quantum dots design on the optical properties for ultraviolet emission** A 12.3

S. Matta^{1,2*}, J. Brault¹, T.-H. Ngo², B. Damilano¹, M. Korytov¹, P. Vennégùès¹, M. Nemoz¹, J. Massies¹, M. Leroux² and B. Gil²

1. CNRS-CRHEA, Rue B. Gregory, 06560 Valbonne, France 2. L2C, UMR 5221, Case courrier 074-34095 Montpellier Cedex 5, France

- 14:30 **Controlling UV Absorption in Two-inch AlN Single Crystal Growth** A 12.4

Robert Bondokov, Jianfeng (Jeff) Chen, Murugesu Yoganathan, Takashi Suzuki, Shailaja P. Rao, Toru Kimura, Keisuke Yamaoka, and Leo J. Schowalter

Crystal IS, Inc., 70 Cohoes Av, Green Island, USA, and Asahi Kasei Corp, 2-1 Samejima, Fuji-shi, Shizuoka, 416-8501, Japan

- 14:45 **p-n junction visualization and quantitative characterization on single Al_xGa_{1-x}N nanowires** A 12.5

A.M. Siladie [1,2], M. Belloeil [1,2], Z. Fang [3], L. Tizei [4], M. Kociak [4], A. Cros [5], N. Garro [5], B. Gayral [1,2], J. Pernot [1,3] and B. Daudin [1,2]

[1] Univ. Grenoble Alpes, 38000 Grenoble, France, [2] CEA, INAC-PHELIQS «Nanophysics and semiconductors» group, F-38000 Grenoble, France, [3] CNRS, Inst. NEEL, F-38042 Grenoble, France, [4] Laboratoire de Physique des Solides, Université Paris-Sud, 91405, Orsay, France, [5] Materials Science Institute (ICMUV), University of Valencia, P. O. Box 22085, E46071, Valencia, Spain.

- 15:00 **Improvement of AlN crystalline quality and AlGaN-based 281-nm MQWs IQE through Small-Coalescence-Area Lateral Growth on NPSS** A 12.6

Lisheng Zhang, Fujun Xu*, Mingxing Wang, Yuanhao Sun, Nan Xie, Zhixin Qin, and Bo Shen*

State Key Laboratory of Artificial Microstructure and Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, China

- 15:15 **Characterization of Nonradiative Recombination Processes in AlGaN-Based Multi-Quantum-Well Structures for Deep Ultraviolet LEDs** A 12.7

M. Tollabi Mazraehno^{1,2}, M. P. Hoffmann², C. Reich¹, S. Englisch², C. Brandl², M. Binder², B. Galler², T. Wernicke¹, M. Kneissl¹, and H.-J. Lugauer²

Institute of Solid State Physics, Technische Universität Berlin, Hardenbergstr. 36, 10623 Berlin, Germany OSRAM Opto Semiconductors GmbH, Leibnizstr. 4, 93055 Regensburg, Germany

15:30 **MOVPE growth of AlN on thermally roughened sapphire** A 12.8

Sylvia Hagedorn, Arne Knauer, Ute Zeimer, and Markus Weyers

Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, Gustav-Kirchhoff-Str. 4, D-12489 Berlin, Germany

Optics and physics : Yoichi Kawakami

13:45 **Ultrafast spectroscopy of III nitride heterostructures under high injection: from fundamental properties to device** B 13.1

Gwénolé Jacopin

Institute of Physics, École Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland

14:15 **Suppression of the quantum confined Stark effect in polar III-nitride heterostructures for efficient UV emitters** B 13.2

M. R. Wagner¹, S. Schlichting¹, J. Müßener²⁺³, P. Hille²⁺³, J. Teubert², J. Schörmann², M. Eickhoff²⁺³, A. Hoffmann¹, G. Callsen¹⁺⁴, G. M. O. Hönig⁵

¹Institute of solid state physics, Technical University Berlin, Hardenbergstr. 36, 10623 Berlin, Germany, ²1. Physikalisches Institut, Justus-Liebig-Universität Giessen, Heinrich-Buff-Ring 16, 35392 Giessen, Germany, ³Institute of Solid State Physics, University of Bremen, Otto-Hahn-Allee 1, 28359 Bremen, Germany, ⁴Institute of Physics, École Polytechnique Fédérale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland, ⁵Bundesanstalt für Materialforschung und -prüfung (BAM), Unter den Eichen 87, 12205 Berlin, Germany

14:30 **Luminescence and conductivity studies of chevrons in semi-polar (11-22) InGaN/GaN multiple quantum well structures** B 13.3

C. Brasser (1), J. Bruckbauer (1), Z. Li (2), L. Jiu (2), J. Bai (2), P. R. Edwards (1), T. Wang (2) and R. W. Martin (1)

(1) Department of Physics, SUPA, University of Strathclyde, Glasgow, United Kingdom (2) Department of Electronic and Electrical Engineering, University of Sheffield, Sheffield, United Kingdom

14:45 **Absence of quantum-confined Stark effect in GaN/(Al,Ga)N nanowires grown by molecular beam epitaxy** B 13.4

Chiara Sinito, Pierre Corfdir, Timur Flissikowski, Carsten Pfüller, Javier Bartolomé Vilchez, Uwe Jahn, Thomas Auzelle, Johannes K. Zettler, Sergio Fernández-Garrido, Holger T. Grahn, and Oliver Brandt

Paul-Drude-Institut für Festkörperelektronik, Leibniz-Institut im Forschungsverbund Berlin e.V., Hausvogteiplatz 5–7, 10117 Berlin, Germany

15:00 **Influence of electric field variation on optical properties of semipolar InGaN/GaN light emitting diodes** B 13.5

Stefan Freytag^{1*}, Michael Winkler¹, Tim Wernicke², Luca Sulmoni¹, Ingrid Koslow², Duc V. Dinh³, Brian Corbett³, Peter J. Parbrook³, Martin Feneberg¹, Michael Kneissl¹, and Rüdiger Goldhahn¹

*Corresponding author: stefan.freytag@ovgu.de

¹Institut für Experimentelle Physik, Otto-von-Guericke-Universität, Magdeburg, Germany, ²Technische Universität Berlin, Institute of Solid State Physics, Berlin, Germany, ³Tyndall National Institute, University College Cork, Cork, Ireland

15:15 **Estimation of the anisotropic deformation potential D5 for GaN and InN by control of anisotropic strain in m-plane GaInN/GaN QWs** B 13.6

Fedor Alexej Ketzer, Philipp Horenburg, Heiko Bremers, Uwe Rossow, and Andreas Hangleiter

Institute of Applied Physics, Braunschweig University of Technology, Germany

15:30 **Is the built-in electric field fully screened at the threshold of nitride lasers?** B 13.7

A. Kafar (1), S. Stanczyk (1,2) K. Pieniak (1), T. Suski (1), P. Perlin (1,2)

(1) Institute of High Pressure Physics PAS, Sokolowska 29/37, 01-142 Warsaw, Poland, (2) TopGaN Ltd., Sokolowska 29/37, 01-142 Warsaw, Poland

Two terminal devices : Yvon Cordier

- 13:45 **Resonant Tunneling Diodes (RTDs): an elusive III-Nitride device** C 10.1

Jimy Encmendero¹, S.M. Islam¹, Vladimir Protasenko, Debdeep Jena^{1,2} and Huili Grace Xing^{1,2,*}

School of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853 Department of Materials Science and Engineering, Cornell University, Ithaca, NY 14853

- 14:15 **Record High Peak Current Density of Over 180 kA/cm² in GaN/AlN Resonant Tunneling Diodes** C 10.2

Jimy Encmendero¹, SM Islam¹, Sergei Rouvimov², Patrick Fay², Debdeep Jena^{1,3}, and Huili Grace Xing^{1,3}.

1-School of Electrical and Computer Engineering, Cornell University, 2-Department of Electrical Engineering, University of Notre Dame, 3-Department of Materials Science and Engineering, Cornell University

- 14:30 **High-Quality N-polar GaN p-n Diodes on Bulk N-Polar GaN Substrates by MBE** C 10.3

YongJin Cho, Zongyang Hu, Kazuki Nomoto, Huili (Grace) Xing, Debdeep Jena

School of Electrical and Computer Engineering, Cornell University, Ithaca, New York 14853, USA

- 14:45 **Defect-free Ni Schottky diodes on GaN with high temperature stability** C 10.4

Ramon Collazo [1], Pramod Reddy [1], Biplab Sardar [1], Felix Kaess [1], Erhard Kohn [1], and Zlatko Sitar [1]

[1] Department of Materials Science and Engineering, North Carolina State University, Raleigh, NC 27695-7919, USA.

- 15:00 **Development of vertical GaN JBS Diode fabricated by selective area p-GaN regrowth** C 10.5

Ryo Tanaka, Stacia Keller, Umesh Mishra

Fuji Electric Co., Ltd. , Department of Electrical and Computer Engineering, University of California, Santa Barbara, Department of Electrical and Computer Engineering, University of California, Santa Barbara

- 15:15 **Temperature dependence of Schottky barrier height of Ni/n-GaN consistently obtained by C-V and forward I-V measurements** C 10.6

Takuya Maeda, Masaya Okada, Masaki Ueno, Yoshiyuki Yamamoto, Tsunenobu Kimoto, Masahiro Horita, and Jun Suda

Kyoto University, Takuya Maeda, Tsunenobu Kimoto, Masahiro Horita, and Jun Suda, Sumitomo Electric Industries, Ltd., Masaya Okada, Masaki Ueno, and Yoshiyuki Yamamoto, Nagoya University, Jun Suda

- 15:30 **Single Crystal AlN Films with Improved Elastic and Piezoelectric Properties for Bulk Acoustic Wave Filters** C 10.7

Shawn R. Gibb, Ramakrishna Vetur, Michael D. Hodge, Pinal Patel, Alexander Yu. Feldman, and Jeffrey B. Shealy

Akoustis, Inc. 9805-H Northcross Center Ct. Huntersville, NC 28078, USA

Conference dinner

A conference dinner is being arranged on Thursday evening, starting at 19:00. All conference attendees are invited to this reception as a chance to meet and renew relationships with colleagues. The price is 50 EUR per attendee. Preregistration is mandatory.



12th International Conference
on Nitride Semiconductors (ICNS12)
24th-28th July 2017, Strasbourg, France

Friday Program

Friday

Plenary 2

Friday - July 28

Session chair: B. Daudin

09:00 - 09:45: **Plenary talk 4**

A path toward electrically injected AlGaN-based deep UV laser diodes

R. Kirste, S. Mita, P. Reddy, Q. Guo,¹ B. Sarkar, F. Kaess, J. Tweedie, R. Collazo, Z. Sitar*

North Carolina State University, Materials Science and Engineering, Raleigh, NC 27695, USA; Adroit Materials, Inc., 2054 Kildaire Farm Rd, Cary, NC 27518, USA

Despite the rapid progress in III-nitride-based laser diodes, sub-300 nm UV semiconductors lasers have not been realized. UV optoelectronic devices have a variety of applications such as sterilization, water purification, spectroscopy, and biological sensing. AlGaN-based technology developed on single crystalline AlN substrates and impurity control in the active region offers a pathway to address all these challenges. In addition to low dislocation density, reduction in non-radiative centers and compensating point defects in the active region are required to achieve high IQE. In order to understand the influence of point defects on radiative lifetime and ultimately achieve high IQE, we have carried out an extensive study of vacancy and carbon control via Fermi level and supersaturation management for various MQW structures grown on bulk AlN substrates. The use of bulk AlN substrates enabled us to undoubtedly distinguish the effect of growth parameters on optical quality from the influence of dislocations and achieve record high IQE of >95% at 260 nm. Using this technology, we achieved lasing at room temperature in optically pumped AlGaN-based MQW structures with a threshold as low as 6 kW/cm² and lasing wavelengths from 237 to 281 nm, and for the first time demonstrated population inversion in electrically injected lasers.

09:45 - 10:00: **Break**

10:00 - 10:45: **Plenary talk 5**

Laser light source for projection devices

Guillaume Arthuis

BBright, France

Laser Light sources, the future of video projection. Even if high brightness laser projection is still in its early stages, the latest improvements in GaN laser should trigger an acceleration of laser projection market adoption in digital cinema and other large venue projection applications. Laser laser projection provides multiple advantages : scalable light power, native primary colors, longer life cycles. BBright develops high power laser light sources and packaging technologies for red, green, and blue color. This presentation will cover the following items: - General review on video projection devices, how it works, and what are the main markets - Laser light sources in video projection, pro and cons - Other applications of laser light sources (medical, illumination)

10:45 - 11:15: **Coffee break**

11:15 - 12:00: **Plenary talk 6**

GaN Power Devices: Development, Manufacturing, and Application

Thomas Detzel

Infineon Technologies Austria AG

Compact devices with unique switching performance, this has been the promise of GaN power devices since several years. And now we are experiencing the exciting time when this is becoming reality. Advanced GaN technologies will be a decisive step towards energy efficiency and size & weight reduction in a variety of applications which today are still dominated by silicon devices. This plenary talk will provide a technology performance comparison between GaN and Si power devices and will try to answer the question where GaN will succeed. The development and implementation of benchmark GaN-on-Si enhancement mode power technology in a high-volume Si manufacturing line leading to Europe's most comprehensive power device fab will be presented. A key success factor is an outstanding R&D eco-system which will be highlighted by sharing our contribution to the European funding project PowerBase in which 39 partners throughout the entire value chain, ranging from base-material to final application, teamed up to pioneer the path for a wide adoption of GaN power technology in a broad application spectrum. First successful uses of 600V enhancement mode GaN products in high performance applications will be shown. Examples will include highest efficiency high power switched mode power supplies for server and telecom applications as well as high frequency DCDC stages resulting in unique increase of power density and reduction of form factor.

12:00 - 12:15: **Closing ceremony - J.Y. Duboz - B. Gil**

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