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Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
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Frontmatter
[More information](#)

CONTENTS

Dedication..... xxiii

Preface xxv

Acknowledgments xxvii

Materials Research Society Symposium Proceedings..... xxviii

ADVANCES IN GROWTH

* The Chemistry of GaN Growth G1.1
T.F. Kuech, Shulin Gu, Ramchandra Wate, Ling Zhang,
Jingxi Sun, J.A. Dumesic, and J.M. Redwing

Drastic Reduction of Threading Dislocation Density of AlGa_N on
SiC Wafer by Using Highly-Si-Incorporated AlGa_N Superlattice G1.3
Hideki Hirayama, Makoto Aino, Atsuhiko Kinoshita,
Akira Hirata, and Yoshinobu Aoyagi

Growth of Self-Seeded Aluminum Nitride by Sublimation-
Recondensation and Substrate Preparation G1.10
J. Carlos Rojo, Glen A. Slack, Kenneth Morgan,
Leo J. Schowalter, and Michael Dudley

ADVANCED ALLOYS AND
CHARACTERIZATION

Nitride-Rich Hexagonal GaNP Growth Using Metalorganic
Chemical Vapor Deposition G2.2
Seikoh Yoshida, Yoshiteru Itoh, and Junjiro Kikawa

Comprehensive Study of Anomalous Conduction Band Structure
of In_{1-x}Ga_{1-x}As_{1-y}N_y G2.5
C. Skierbiszewski, P. Perlin, P. Wisniewski, A. Presz,
T. Suski, J. Geisz, W. Jantsch, and D. Mars

Indium Incorporation and Surface Segregation During InGa_N
Growth by Molecular Beam Epitaxy G2.6
Huajie Chen, R.M. Feenstra, J.E. Northrup, J. Neugebauer,
and D.W. Greve

*Invited Paper

**In Segregation Effects on Optical and Doping Properties of
InAlGa_N Quaternary for UV Emitting Devices G2.8**
Hideki Hirayama, Atsuhiko Kinoshita, Takuya Yamanaka,
Akira Hirata, and Yoshinobu Aoyagi

GROWTH AND CHARACTERIZATION

**Localized Vibrational Modes of Carbon-Hydrogen Complexes in
MOCVD Grown GaN and AlGa_N Thin Films G3.1**
J. Chen, Q. Zhou, Y. Berhane, M.O. Manasreh, C.A. Tran,
M. Pophristic, and I.T. Ferguson

A New Mechanism in the Growth Process of GaN by HVPE G3.2
A. Trassoudaine, E. Aujol, R. Cadoret, T. Paskova,
and B. Monemar

**A Comparison of Magnesium and Beryllium Acceptors in GaN
Grown by rf-Plasma Assisted Molecular Beam Epitaxy G3.3**
A.J. Ptak, T.H. Myers, Lijun Wang, N.C. Giles,
M. Moldovan, C.R. Da Cunha, L.A. Hornak, C. Tian,
R.A. Hockett, S. Mitha, and P. Van Lierde

**Optical Study of GaN Doped with Mn Grown by Metal Organic
Vapor Phase Epitaxy G3.7**
R.Y. Korotkov, J.M. Gregie, and B.W. Wessels

**Optimization of the GaN Epilayer Quality Using In-Situ
Reflectance Measurements..... G3.8**
Sandra Ruffenach-Clur, Matthieu Moret, Olivier Briot,
Nathanaël Moreaud, Joseph Calas, and Roger L. Aulombard

Microstructure of GaN Grown on (11 $\bar{2}$ 0) Sapphire G3.9
P. Ruterana, A.E. Wickenden, M.E. Twigg, D.D. Koleske,
R.L. Henry, and O. Tottereau

Chemical Ordering in AlGa_N Layers Grown by MOCVD G3.10
P. Ruterana and F. Omnes

**Surface Morphology and Composition Characterization at the
Initial Stages of AlN Crystal Growth..... G3.13**
B. Liu, Y. Shi, L. Liu, J.H. Edgar, and D.N. Braski

**Highly Selective Photoenhanced Wet Etching of GaN for Defect
Investigation and Device Fabrication..... G3.14**
P. Visconti, M.A. Reshchikov, K.M. Jones, F. Yun,
D.F. Wang, R. Cingolani, H. Morkoç, C.W. Litton,
and R.J. Molnar

Simulation of Stress Generation During GaN Lateral Epitaxial Overgrowth	G3.15
Zhaohua Feng, Edward G. Lovell, Roxann L. Engelstad, Thomas F. Kuech, and Susan E. Babcock	
Effect of N₂ Plasma Treatments on Dry Etch Damage in n- and p-Type GaN	G3.16
D.G. Kent, K.P. Lee, A.P. Zhang, B. Luo, M.E. Overberg, C.R. Abernathy, F. Ren, K.D. Mackenzie, S.J. Pearton, and Y. Nakagawa	
Investigation of Buffer Layers for GaN Grown by MBE	G3.17
Feng Yun, Michael A. Reshchikov, Paolo Visconti, Keith M. Jones, Dongfeng Wang, Marc Redmond, Jie Cui, Cole W. Litton, and Hadis Morkoç	
Surface Segregation and Composition Fluctuations in Ammonia MBE and MOVPE of InGaN	G3.18
Sergey Yu. Karpov, Roman A. Talalaev, Eugene V. Yakovlev, and Yuri N. Makarov	
Surface Modification of Cubic GaN Buffer Layer Grown by Metalorganic Vapor Phase Epitaxy	G3.20
Akira Nagayama, Ryuji Katayama, Jun Wu, Kentaro Onabe, Hidetaka Sawada, Eliko Takuma, Hideki Ichinose, and Yasuhiro Shiraki	
The Effect of Buffer Layers in MOCVD Growth of GaN Film on 3C-SiC/Si Substrate	G3.25
C.I. Park, J.H. Kang, K.C. Kim, K.Y. Lim, E.-K. Suh, and K.S. Nahm	
Atomic Force Microscopy Study of GaN Grown on Al₂O₃ (0001) by LP-MOVPE	G3.28
K. Xu, D.H. Lim, B.L. Liu, X.L. Du, G.H. Yu, A.W. Jia, A. Yoshikawa, and K. Takahashi	
Vapor Phase Synthesis and Characterization of Gallium Nitride Powders	G3.31
Kazuhiko Hara, Yoshinori Matsuo, and Yuuki Matsuno	
Step Flow Surface Morphology in Plasma Assisted Molecular Beam Epitaxy Grown GaN	G3.33
Kazuhide Kusakabe, Akihiko Kikuchi, and Katsumi Kishino	
Growth Mode and Defects in Aluminum Nitride Sublimated on (0001) 6H-SiC Substrates	G3.40
Lianghong Liu, Bei Liu, Ying Shi, and J.H. Edgar	

Nucleation of GaN on (0001) Sapphire During MOCVD Growth: An Atomic Force and High Resolution Electron Microscopy Study	G3.41
F. Degave, P. Ruterana, G. Nouet, J.H. Je, and C.C. Kim	
Interaction Between Basal Stacking Faults and Prismatic Inversion Domain Boundaries in GaN	G3.44
Philomela Komninou, Joseph Kioseoglou, Eirini Sarigiannidou, George P. Dimitrakopoulos, Thomas Kehagias, Alexandros Georgakilas, Gerard Nouet, Pierre Ruterana, and Theodoros Karakostas	
Growth of Quaternary AlInGaN/GaN Heterostructures by Plasma Induced Molecular Beam Epitaxy with High In Concentration	G3.45
A.P. Lima, C.R. Miskys, L. Görgens, O. Ambacher, A. Wenzel, B. Rauschenbach, and M. Stutzmann	
A Study on the Growth of Cubic GaN Films Using an AlGaAs Buffer Layer Grown on GaAs (100) by Plasma-Assisted Molecular Beam Epitaxy	G3.46
Ryuhei Kimura, Kiyoshi Takahashi, and H.T. Grahn	
Microstructure of GaN Films Grown by RF-Plasma Assisted Molecular Beam Epitaxy	G3.47
Philomela Komninou, Thomas Kehagias, Joseph Kioseoglou, Eirini Sarigiannidou, Theodoros Karakostas, Gerard Nouet, Pierre Ruterana, Khalid Amimer, Spyros Mikroulis, and Alexandros Georgakilas	
Structural and Elasticity-Based Properties of SiC-Based Interfaces: Their Relevance to the Heteroepitaxy of III-V Nitrides	G3.49
P. Mastri, M. Rouhani Laridjani, Th. Stauden, J. Pezoldt, and M. Averous	
Strain and Compositional Analysis of InGaN/GaN Layers	G3.52
Sérgio Pereira, Maria. R. Correia, Estela Pereira, C. Trager-Cowan, F. Sweeney, P.R. Edwards, K.P. O'Donnell, E. Alves, A.D. Sequeira, and N. Franco	
Novel Cubic Zn_xMg_{1-x}O Epitaxial Heterostructures on Si (100) Substrates	G3.53
A. Kvit, J. Narayan, A.K. Sharma, C. Jin, J.F. Muth, C.W. Teng, and O.W. Holland	
Growth and Characterization of GaN Bulk Crystals via Vapor Phase Transport	G3.54
H. Shin, D.B. Thomson, P.Q. Miraglia, S.D. Wolter, R. Schlessler, Z. Sitar, and R.F. Davis	

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 Frontmatter
[More information](#)

Observation of Dislocation Etch Pits in Epitaxial Lateral Overgrowth GaN by Wet Chemical Etching.....	G3.56
T.C. Wen, S.C. Lee, H.S. Chuang, C.H. Chiou, and W.I. Lee	

Direct Observation of Bulk and Interface States in GaN on Sapphire Grown by Hydride Vapor Phase Epitaxy.....	G3.59
S.H. Goss, A.P. Young, L.J. Brillson, D.C. Look, and R.J. Molnar	

DOPANTS AND PROCESSING

Stability, Diffusion, and Complex Formation of Beryllium in Wurtzite GaN.....	G4.3
Sukit Limpijumnong, Chris G. Van de Walle, and Jörg Neugebauer	

Low Resistance Optically Transparent Contacts to p-Type GaN Using Oxidized Ni/Au and ITO for LED Application	G4.8
C.H. Lin, D.L. Hibbard, A. Au, H.P. Lee, Z.J. Dong, F.J. Szalkowski, J. Chen, and C. Chen	

LATERAL EPITAXY AND GROWTH

* Approaches for Reduction of the Defect Density in Group III Nitride Based Heterostructures.....	G5.1
T.S. Zheleva, F. Karoui, K. Kirchner, M. Derenge, K.A. Jones, R.D. Vispute, and T. Venkatesan	

Can Laterally Overgrown GaN Layers be Free of Structural Defects?.....	G5.2
D. Cherns and Z. Liliental-Weber	

Fabrication of GaN Layer with Low Dislocation Density Using Facet Controlled ELO Technique	G5.3
H. Miyake, H. Mizutani, K. Hiramatsu, Y. Iyechika, Y. Honda, and T. Maeda	

* Characteristics of FIELO-GaN Grown by Hydride Vapor Phase Epitaxy.....	G5.6
Akira Usui, Haruo Sunakawa, Kenji Kobayashi, Heiji Watanabe, and Masashi Mizuta	

*Invited Paper

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Frontmatter[More information](#)

Heteroepitaxy and Characterization of Low-Dislocation-Density GaN on Periodically Grooved Substrates	G5.7
T. Detchprohm, M. Yano, R. Nakamura, S. Sano, S. Mochiduki, T. Nakamura, H. Amano, and I. Akasaki	

Optical Properties of MBE Grown Cubic AlGaIn Epilayers and AlGaIn/GaN Quantum Well Structures	G5.9
D.J. As, T. Frey, M. Bartels, A. Khartchenko, D. Schikora, K. Lischka, R. Goldhahn, and S. Shokhovets	

OPTICAL PROPERTIES AND LIGHT EMITTERS

Effect of Thermal Annealing on the Photoluminescence Properties of a GaInNAs/GaAs Single Quantum Well.....	G6.3
Laurent Grenouillet, Catherine Bru-Chevallier, G��rard Guillot, Philippe Gilet, Philippe Ballet, Philippe Duvaut, Andr�� Chenevas-Paule, and Alain Million	

Comparative Study of HVPE- and MOCVD-Grown Nitride Structures for UV Lasing Application	G6.4
J.B. Lam, G.H. Gainer, S. Bidnyk, Amal Elgawadi, G.H. Park, J. Krasinski, J.J. Song, D.V. Tsvetkov, and V.A. Dmitriev	

Luminescence Properties of Amorphous AlN Thin Film Phosphors Incorporated with Mixtures of Tb, Cu or Cu, Cr	G6.5
Andrea L. Martin, Meghan L. Caldwell, Martin E. Kordesch, Chance M. Spalding, Paul G. Van Patten, and Hugh H. Richardson	

Visible Emission from Thin-Film Phosphors of Amorphous AlN:Cu, Mn, and Cr	G6.6
M.L. Caldwell, A.L. Martin, C.M. Spalding, P.G. Van Patten, M.E. Kordesch, and H.H. Richardson	

Photoluminescence Study of Defects in GaN Grown by Molecular Beam Epitaxy	G6.7
Michael A. Reshchikov, Manhong H. Zhang, Jie Cui, Paolo Visconti, Feng Yun, and Hadis Morko��	

Raman Spectroscopy Studies in InGaIn/GaN Wurtzite Epitaxial Films	G6.10
Maria R. Correia, S��rgio Pereira, Teresa Monteiro, Estela Pereira, and Eduardo Alves	

Photo- and Cathodoluminescence Investigations of Piezoelectric GaN/AlGa_N Quantum Wells	G6.12
E.M. Goldys, M. Godlewski, M.R. Phillips, and A.A. Toropov	
IR-VUV Dielectric Function of Al_{1-x}In_xN Determined by Spectroscopic Ellipsometry	G6.13
A. Kasic, M. Schubert, B. Rheinländer, J. Off, F. Scholz, and C.M. Herzinger	
Influence of Er Depth Profiles on Luminescence Properties of Er-Doped GaN	G6.15
Shin-ichiro Uekusa and Tomoaki Hirano	
Cross-Sectional Cathodoluminescence Study in Ga-Polar and N-Polar GaN Epilayers.....	G6.16
X.L. Du, D.H. Lim, K. Xu, B.L. Liu, A.W. Jia, K. Takahashi, and A. Yoshikawa	
Observation of Band Gap Energy Fluctuation of Microcrystalline InGa_N:Zn	G6.18
Hisashi Kanie, Kosei Sugimoto, and Hiroaki Okado	
Cathodoluminescence and Micro-Structure of Polycrystalline GaN Grown on ZnO/Si.....	G6.20
Tsutomu Araki, Hidetaka Kagatsume, Hiroaki Aono, and Yasushi Nanishi	
Optical Characterization of AlGa_N/Ga_N MQW's	G6.21
Ricardo A. Rocha, Teresa Monteiro, Estela Pereira, and Eduardo Alves	
Characterization of the Mechanism of Activation for Visible Luminescence in Tb-Doped Crystalline and Amorphous AlN Thin Films	G6.22
C.M. Spalding, M.L. Caldwell, A.L. Martin, V.I. Dimitrova, M.E. Kordesch, H.H. Richardson, and P.G. Van Patten	
Shallow-Impurity-Related Photoluminescence in Homoepitaxial GaN	G6.23
V. Kirilyuk, M. Zielinski, P.C.M. Christianen, A.R.A. Zauner, J.L. Weyher, P.R. Hageman, and P.K. Larsen	
Comparison of Er³⁺ Photoluminescence and Photoluminescence Excitation Spectroscopy in <i>In-Situ</i>-Doped GaN:Er and Er-Implanted GaN	G6.26
Andrea M. Mitofsky, George C. Papen, Stephen G. Bishop, Dong-Seon Lee, and Andrew J. Steckl	

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Frontmatter[More information](#)

Degradation of Luminescence from GaN During Electron Bombardment: Effects of Beam Voltage, Current and Scanned Area.....	G6.27
E.M. Campo, G.S. Cargill III, J. Ramer, M. Schurman, and I.T. Ferguson	
Optical and Electrical Properties of $\text{Al}_{1-x}\text{In}_x\text{N}$ Films Grown on Sapphire (0001) by Plasma Source Molecular Beam Epitaxy.....	G6.29
Y.V. Danylyuk, M.J. Lukitsch, C. Huang, G.W. Auner, R. Naik, and V.M. Naik	
Development of an AlN Deep UV Detector for Space Application.....	G6.33
Feng Zhong, Changhe Huang, Yuri V. Danylyuk, and Gregory W. Auner	
Optical Constants, Critical Points, and Phonon Modes of GaAsN Single Layers	G6.35
G. Leibiger, V. Gottschalch, A. Kasik, B. Rheinländer, J. Sik, and M. Schubert	
Optical Properties of a Quantum Well of $\text{Al}_{1-x}\text{B}_x$ Alloy Semiconductor in the Coherent Potential Approximation.....	G6.36
Yuzo Shinozuka, Hirotsugu Kida, and Masanori Watarikawa	
Raman Analysis of Single Crystalline Bulk Aluminum Nitride: Temperature Dependence of the Phonon Frequencies	G6.38
Jonathan M. Hayes, Martin Kuball, Ying Shi, and James H. Edgar	
Photoluminescence Studies of p-Type GaN:Mg Co-Doped with Oxygen	G6.39
R.Y. Korotkov, J.M. Gregie, and B.W. Wessels	
X-ray Reciprocal Space Mapping Studies of Strained GaN/AlGaN Quantum Wells	G6.40
Olivier Briot, Sandra Ruffenach-Chur, Matthieu Moret, and Roger-Louis Aulombard	
Group III-Nitride Based VCSEL for Applications at the Wavelength of 400nm	G6.42
M. Linnik and A. Christou	
Relationship Between Microscopic Structure and Optical Property of Polycrystalline GaN on Silica Glass.....	G6.43
Hidetaka Kagatsume, Hiroaki Aono, Tsutomu Araki, and Yasushi Nanishi	

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 Frontmatter
[More information](#)

A Generalized Roosbroeck-Schockley Relation for III-Nitrides in Far-From-Equilibrium Conditions	G6.44
A.R. Vasconcellos, R. Luzzi, C.G. Rodríguez, V.N. Freire, and A.P. da Costa	
The Influence of Defects and Piezoelectric Fields on the Luminescence from InGaN/GaN Single Quantum Wells	G6.45
S.J. Henley and D. Cherns	
Phase Separation in Multiple ZnO/Cubic- $Mg_xZn_{1-x}O$ Superlattice Heterostructures Observed via High Resolution Transmission Electron Microscopy.....	G6.50
A. Kvit, G. Dusher, A.K. Sharma, C. Jin, J. Narayan, J. Muth, and C.W. Teng	
Preparation of 30x30 mm² Free-Standing GaN Wafer by Mechanical Liftoff and Optical Properties in the Backside of the Free GaN by Cathodoluminescence	G6.51
Hwa-Mok Kim, Jae-Eung Oh, and Tae-Won Kang	
Growth and Characterization of Epitaxial $Al_{1-x}In_xN$ Films Grown on Sapphire (0001) by Plasma Source Molecular Beam Epitaxy	G6.54
M.J. Lukitsch, G.W. Auner, R. Naik, and V.M. Naik	
MBE Growth of GaN Using NH_3 and Plasma Sources.....	G6.56
A.V. Sampath, A. Bhattacharyya, I. Sandeep, H.M. Ng, E. Iliopoulos, and T.D. Moustakas	
<i>In Situ</i> Pyrometric Interferometry for Molecular Beam Epitaxy of $Al_xGa_{1-x}N$ on Si (111).....	G6.57
S.A. Nikishin, S. Francoeur, and H. Temkin	
Planar Force-Constant Method for Lattice Dynamics of Cubic InN	G6.58
H.W. Leite Alves, J.L.A. Alves, L.M.R. Scolfaro, and J.R. Leite	
High Density Plasma Etching Damage Effects on Contacts to <i>n</i>-GaN	G6.61
Rajwinder Singh, C.R. Eddy, Jr., T.D. Moustakas, and H.M. Ng	

***ELECTRONIC TRANSPORT
AND QUANTUM DOTS***

High Electron Mobility in Free-Standing GaN Substrates	G7.2
A. Saxler, D.C. Look, S. Elhamri, J. Sizelove, D. Cull, W.C. Mitchel, M. Callahan, D. Bliss, L. Bouthillette, Sheng-Qi Wang, C.M. Sung, S.S. Park, and K.Y. Lee	

*Invited Paper

* High Magnetic Field Studies of AlGa_{0.3}N/GaN Heterostructures Grown on Bulk GaN, SiC, and Sapphire Substrates	G7.3
W. Knap, E. Borovitskaya, M.S. Shur, R. Gaska, G. Karczewski, B. Brandt, D. Maude, E. Frayssinet, P. Lorenzini, N. Grandjean, J. Massies, J.W. Yang, X. Hu, G. Simin, M. Asif Khan, C. Skierbiszewski, P. Prystawko, I. Grzegory, and S. Porowski	
Two-Dimensional Electron Gas Scattering Mechanisms in AlGa_{0.3}N/GaN Heterostructures	G7.5
E. Borovitskaya, W. Knap, M.S. Shur, R. Gaska, E. Frayssinet, P. Lorenzini, N. Grandjean, B. Baumont, J. Massies, C. Skierbiszewski, P. Prystawko, M. Leszczynski, I. Grzegory, and S. Porowski	
Persistent Photoconductivity in a High Mobility Two Dimensional Electron Gas in an AlGa_{0.3}N/GaN Heterostructure	G7.6
S. Elhamri, A. Saxler, D. Cull, W.C. Mitchel, C.R. Elsass, I.P. Smorchkova, B. Heying, C. Poblenz, P. Fini, S. Keller, P.M. Petroff, S.P. DenBaars, U.K. Mishra, and J.S. Speck	
Phonon Lifetimes and Phonon Decay Channels in Single Crystalline Bulk Aluminum Nitride.....	G7.7
M. Kuball, J.M. Hayes, Ying Shi, and J.H. Edgar	
Surface Structure and Polarization Effects in GaN Thin Films as Studied by Electric Force Microscopy	G7.9
K.M. Jones, P. Visconti, F. Yun, M.A. Reshchikov, A.A. Baski, and H. Morkoç	

***SPECIAL SESSION IN HONOR OF
PROFESSOR AKASAKI***

* Renaissance and Progress in Nitride Semiconductors — My Personal History of Nitride Research	G8.1
Isamu Akasaki	
* Microwave Al_{0.3}Ga_{0.7}N/GaN Power HEMT's	G8.2
Lester F. Eastman	
* Review of Facet Controlled Epitaxial Lateral Overgrowth (FACELO) of GaN via Low Pressure Vapor Phase Epitaxy.....	G8.4
Kazumasa Hiramatsu and Hideto Miyake	

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Frontmatter[More information](#)**CHARACTERIZATION AND
BANDSTRUCTURE**

- * Growth and Characterization of GaN Underlying Layer Used in
Blue-Violet GaN-Based Laser Diodes on Sapphire..... G9.1**
Kenji Funato, Tomonori Hino, Shigetaka Tomiya,
Takao Miyajima, Takeharu Asano, Tsyuyoshi Tojyo,
Shigeki Hashimoto, Katsunori Yanashima, Shiro Uchida,
Koshi Tmamura, Toshimasa Kobayashi, and Masao Ikeda
- Role of Localized Quantum Well Excitons in InGaN Quantum
Well Structure Correlated with Microstructural Analysis G9.3**
S.F. Chichibu, T. Sota, and S. Nakamura
- UV Raman Study of $A_1(\text{Lo})$ and E_2 Phonons in InGaN Alloys
Grown by Metal-Organic Chemical Vapor Deposition on (0001)
Sapphire Substrates..... G9.7**
Dimitri Alexson, Leah Bergman, Robert J. Nemanich,
Mitra Dutta, Michael A. Stroscio, C.A. Parker, S.M. Bedair,
N.A. El-Masry, and Fran Adar
- Universal Behavior of the Pressure Coefficient of the Light
Absorption and Emission in InGaN Structures G9.8**
P. Perlin, T. Suski, P. Wisniewski, I. Gorczyca,
S. Lepkowski, M. Hansen, S.P. DenBaars, B. Damilano,
N. Grandjean, and J. Massie
- Propagation and Scattering of Exciton-Polaritons in Nitride-Based
Multiple Quantum Wells..... G9.9**
Guillaume Malpuech, Marian Zamfirescu, Alexey Kavokin,
and Aldo Di Carlo
- Time-Resolved Photoluminescence Measurements of
 $\text{In}_{0.15}\text{Ga}_{0.85}\text{N}/\text{In}_{0.015}\text{Ga}_{0.985}\text{N}$ Quantum Wells with Si-Doped Barriers G9.10**
Mee-Yi Ryu, Young Jun Yu, Phil Won Yu, Eun-joo Shin,
Eunsoon Oh, Chul Soo Sone, Ok Hyun Nam,
and Yong Jo Park
- Luminescence and Structural Properties of InGaN Epilayer,
Quantum Well and Quantum Dot Samples Using Synchrotron
Excitation..... G9.11**
K.P. O'Donnell, R.W. Martin, M.E. White, M.J. Tobin,
J.F.W. Mosselmans, I.M. Watson, B. Damilano,
and N. Grandjean

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 Proceedings: Volume 639
 Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
 Frontmatter
[More information](#)

**QUANTUM DOTS AND
 PHOTO DETECTORS**

* Recombination Dynamics in Nitride Quantum Boxes and Quantum Wells for Colors Ranging from the UV to the Red	G10.1
P. Lefebvre, A. Morel, M. Gallart, T. Taliercio, B. Gil, J. Allègre, H. Mathieu, N. Grandjean, B. Damilano, and J. Massies	
AC Operation of GaN:Er Thin Film Electroluminescent Display Devices	G10.4
J. Heikenfeld and A.J. Steckl	
* Performance Characteristics of cw InGaN Multiple-Quantum-Well Laser Diodes	G10.6
Michael Kneissl, William S. Wong, Chris G. Van de Walle, John E. Northrup, David W. Treat, Mark Teepe, Naoko Miyashita, Peter Kiesel, and Noble M. Johnson	
Fabrication and Characterization of In_xAl_yGa_{1-x-y}N Ultraviolet Detectors	G10.7
Tom N. Oder, Jing Li, Jingyu Lin, and Hongxing Jiang	
AlGaIn p-i-n Photodiode Arrays for Solar-Blind Applications	G10.9
P. Lamarre, A. Hairston, S. Tobin, K.K. Wong, M.F. Taylor, A.K. Sood, M.B. Reine, M.J. Schurman, I.T. Ferguson, R. Singh, and C.R. Eddy, Jr.	

**ELECTRONIC PROPERTIES
 AND TRANSPORT**

Polarization Effects in Al_xGa_{1-x}N/GaN Superlattices	G11.1
Erik L. Waldron, E. Fred Schubert, John W. Graff, Andrei Osinsky, Michael J. Murphy, and William F. Schaff	
Growth and Investigation of GaN/AlN Quantum Dots	G11.2
Hadis Morkoç, Michael A. Reshchikov, Keith M. Jones, Feng Yun, Paolo Visconti, Marshall I. Nathan, and Richard J. Molnar	
Impact of the Growth Polar Direction on the Optical Properties of GaN Films Grown by Metalorganic Vapor Phase Epitaxy	G11.6
A. Setoguchi, K. Yoshimura, M. Sumiya, A. Uedono, and S.F. Chichibu	

*Invited Paper

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978-1-107-41293-4 - GaN and Related Alloys—2000: Materials Research Society Symposium
Proceedings: Volume 639Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter[More information](#)

Structural Evolution of Ni/Au Contact on GaN(0001)	G11.7
Chong Cook Kim, Jong Kyu Kim, Jong-Lam Lee, Min-Su Yi, Jin-Woo Kim, Do Young Noh, Yeukuang Hwu, Pierre Ruterana, and Jung Ho Je	
Polarity of Hexagonal GaN Grown on GaAs (111)A and (111)B Surfaces by HVPE and MOVPE	G11.8
O. Takahashi, M. Namerikawa, H. Tanaka, R. Souda, T. Suemasu, and F. Hasegawa	
AlGaIn/InGaIn Heterostructure Field Effect Transistors Grown on Sapphire by Metal-Organic Chemical Vapor Deposition	G11.11
Chang-Cheng Chuo, Chia-Min Kan, Jen-Inn Chyi, Tzer-En Nee, Chia-Ming Lee, and Chin-Kun Peng	
Emission Characteristics of GaN-Based EL Device with AC Operation.....	G11.13
Tohru Honda and Hideo Kawanishi	
High-Temperature Electron Transport Properties in AlGaIn/GaN Heterostructure Field Effect Transistors.....	G11.14
Narihiko Maeda, Tadashi Saitoh, Kotaro Tsubaki, Toshio Nishida, and Naoki Kobayashi	
Electrical Properties of InN Grown by RF-MBE.....	G11.18
Yoshiki Saito, Nobuaki Teraguchi, Akira Suzuki, Tomohiro Yamaguchi, Tsutomu Araki, and Yasushi Nanishi	
Comparison of 500nm InGaIn/GaN QW Emission Properties Induced by Piezoelectric Field Effect and Phase Separation	G11.19
Bong Kee, J.M. Koh, and Euijoon Yoon	
Profiling Electric Fields in GaIn/InGaIn/GaN Single Quantum Wells by Electron Holography.....	G11.20
Juan Cai, M.R. McCartney, and F.A. Ponce	
Investigation of Sidewall Recombination in GaN Using a Quantum Well Probe.....	G11.21
E.D. Haberer, M. Woods, A. Stonas, C.-H. Chen, S. Keller, M. Hansen, U. Mishra, S. DenBaars, J. Bowers, and E.L. Hu	
High-Frequency Capacitance-Voltage Characteristics of PECVD- Grown SiO₂ MIS Structure on GaN and GaN/Al_{0.4}Ga_{0.6}N/GaN Heterostructure.....	G11.24
P. Chen, Y.G. Zhou, H.M. Bu, W.P. Li, Z.Z. Chen, B. Shen, R. Zhang, and Y.D. Zheng	

Cambridge University Press

978-1-107-41293-4 - GaN and Related Alloys—2000: Materials Research Society Symposium
Proceedings: Volume 639Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter[More information](#)

Electronic Structure of GaN Quantum Dots with an Adjacent Threading Dislocation	G11.25
A.D. Andreev, J.R. Downes, and E.P. O'Reilly	
Non-Stationary Photoconductivity of GaN Nanocomposites in Artificial Opal Matrix	G11.26
M. Niehus, S. Koynov, R. Schwarz, N.A. Feoktistov, V.G. Golubev, D.A. Kurdyukov, and A.B. Pevtsov	
Low-Noise, Low-Dark-Current GaN Diodes for UV Detectors	G11.27
Peter W. Deelman, Robert N. Bicknell-Tassius, Sergey Nikishin, and Henryk Temkin	
AlN Acoustic Wave Sensors Using Excimer Laser Micromachining Techniques	G11.28
Feng Zhong, Changhe Huang, and Gregory W. Auner	
High Resistivity GaN Formed by Ion Implantation.....	G11.30
Jun Kudo, Yuji Hishida, Masanori Watanabe, Tomoaki Hatayama, and Takashi Fuyuki	
Self-Aligned Process for Emitter- and Base-Regrowth GaN HBTs and BJTs.....	G11.32
K.P. Lee, A.P. Zhang, G. Dang, F. Ren, J. Han, S.N.G. Chu, W.S. Hobson, J. Lopata, C.R. Abernathy, S.J. Pearton, and J.W. Lee	
Hot Electron Transport in AlN	G11.33
Ramón Collazo, Raoul Schlessner, Amy Roskowsky, Robert F. Davis, and Z. Sitar	
Electric Fields at the SiC/AlN and SiC/GaN Polar Interfaces	G11.34
Morad Rouhani Laridjani, Pierre Masri, and Jacek A. Majewski	
Polarization Induced 2D Hole Gas in GaN/AlGaIn Heterostructures	G11.35
S. Hackenbuchner, J.A. Majewski, G. Zandler, O. Ambacher, and P. Vogl	
Synthesis, Structure, and Luminescence of A²B⁴C⁵ Nitrides	G11.36
Vyacheslav Bondar, Lev Axelrud, Vladimir Davydov, and Tom Felter	
Gas Source Molecular Beam Epitaxy of High Quality AlGaIn on Si and Sapphire	G11.37
S. Nikishin, G. Kipshidze, V. Kuryatkov, A. Zubrilov, K. Choi, Iu. Gherasoiu, L. Grave de Peralta, T. Prokofyeva, M. Holtz, R. Asomoza, Yu. Kudryavtsev, and H. Temkin	

Cambridge University Press

978-1-107-41293-4 - GaN and Related Alloys—2000: Materials Research Society Symposium
Proceedings: Volume 639Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter[More information](#)

Characterization of Ion Implanted GaN.....	G11.39
B.J. Skromme, G.L. Martinez, L. Krasnobaev, and D.B. Poker	
Preliminary Characterization of GaN MBE Epitaxial Layers Grown on Nanoporous 6H-SiC Substrates.....	G11.41
J.T. Wolan, A. Gopalkrishna, S.E. Saddow, M. Mynbaev, H. Morkoç, M. Reshchikov, F. Yun, V. Dmitriev, and C.E.C. Wood	
Characterization of GaN MOS Structures Using Photoanodically Grown Oxides with Respect to FET Devices.....	G11.42
D. Mistele, T. Rotter, R. Ferretti, F. Fedler, H. Klausning, O.K. Semchinova, J. Stemmer, J. Aderhold, and J. Graul	
A Comparative Study of the Influence of the Local Density Approximation and the Generalized Gradient Approximation on the Calculated Properties of the III-Nitride (110) Surfaces.....	G11.46
H.W. Leite Alves, J.L.A. Alves, R.A. Nogueira, and J.R. Leite	
Surface Elevation and Strain in Ion Implanted GaN.....	G11.53
B. Molnar, S.B. Qadri, S. Schiestel, R.M. Stroud, and C.A. Carosella	
Analysis of Strain in Sub-Grains with Variable Misorientation in GaN Epilayers by Digital Processing of HRTEM Images.....	G11.54
S. Kret, P. Ruterana, J. Chen, and G. Nouet	
Deep Level Formation in Undoped and Oxygen-Doped GaN.....	G11.56
J.M. Gregie, R.Y. Korotkov, and B.W. Wessels	
Plasma-Induced Effects on the Thermal Conductivity of Hydride Vapor Phase Epitaxy Grown n-GaN/Sapphire (0001).....	G11.57
D.I. Florescu, Fred H. Pollak, William B. Lanford, Farid Khan, I. Adesida, and R.J. Molnar	
Effect of Externally-Imposed Radial Strain on the Piezoelectric Response of MOCVD-Grown Gallium Nitride.....	G11.58
Jennifer A. Himes, James R. Willis, and Daniel A. Gulino	
TEM Analysis of Threading Dislocations in ELO-GaN Grown with Controlled Facet Planes.....	G11.59
Noriyuki Kuwano, Kayo Horibuchi, Hideto Miyake, and Kazumasa Hiramatsu	

**LIGHT EMITTERS AND
STRAIN CONTROL**

* Group-III Nitride Quantum Heterostructures Emitting in the Whole Visible Range.....	G12.1
Nicolas Grandjean, Benjamin Damilano, and Jean Massies	
Integration of In_xGa_{1-x}N Laser Diodes with Dissimilar Substrates by Laser Lift-Off.....	G12.2
William S. Wong, Michael Kneissl, Ping Mei, David W. Treat, Mark Teepe, and Noble M. Johnson	
High Efficiency UV Emitter Using High Quality GaN/Al_xGa_{1-x}N Multi-Quantum Well Active Layer.....	G12.3
M. Iwaya, S. Terao, T. Ukai, R. Nakamura, S. Kamiyama, H. Amano, and I. Akasaki	
Current Injection UV-Emission from InAlGa_n Multi-Quantum-Well Light-Emitting Diodes.....	G12.6
A. Kinoshita, H. Hirayama, M. Ainoya, J.S. Kim, A. Hirata, and Y. Aoyagi	
* Defect and Stress Control of AlGa_n and Fabrication of High-Efficiency UV-LED.....	G12.7
H. Amano, M. Iwaya, S. Nitta, S. Terao, R. Nakamura, T. Ukai, S. Saitoh, S. Kamiyama, C. Wetzel, and I. Akasaki	
Improved Optical Quality of BAIGa_n/AlN MQW Structure Grown on 6H-SiC Substrate by Controlling Residual Strain Using Multi-Buffer Layer	G12.9
Takayoshi Takano, Hideo Kawanishi, Makoto Kurimoto, Yoshiyuki Ishihara, Masato Horie, and Jun Yamamoto	

**LIGHT EMITTERS AND
ELECTRONIC DEVICES**

The Investigation of InGa_n MQW Electroabsorption Modulator Using the LED/Modulator/Detector Monolithically Integrated Structure.....	G13.3
S.W. Chung, Y.S. Zhao, C.H. Lin, and H.P. Lee	
Fabrication of a High Power Ga_n Metal Semiconductor Field-Effect Transistor.....	G13.4
Seikoh Yoshida and Hirotatsu Ishii	

*Invited Paper

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978-1-107-41293-4 - GaN and Related Alloys—2000: Materials Research Society Symposium
Proceedings: Volume 639
Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter
[More information](#)

**Metal-Semiconductor Contacts and CPW MMIC Issues for
AlGaIn/GaN FETs..... G13.9**
Bart Jacobs, Mark Kramer, Bram van Straaten,
Thieu Kwaspen, Fouad Karouta, Peter de Hek,
Raymond van Dijk, and Frank van Vliet

*** p-InGaIn/n-GaN Heterojunction Diodes and Their Application to
Heterojunction Bipolar Transistors..... G13.10**
Toshiki Makimoto, Kazuhide Kumakura, Toshio Nishida,
and Naoki Kobayashi

Author Index

Subject Index

*Invited Paper

Cambridge University Press

978-1-107-41293-4 - GaN and Related Alloys—2000: Materials Research Society Symposium
Proceedings: Volume 639

Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter

[More information](#)

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Proceedings: Volume 639

Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter

[More information](#)

DEDICATION



Isamu Akasaki

These proceedings and a Special Session of the symposium on Gallium Nitride and Related Alloys at the 2000 MRS Fall Meeting are dedicated to Professor Isamu Akasaki for his pioneering achievements in the field of group-III nitride semiconductors. Due to Professor Akasaki's insight, perseverance and ingenuity, group-III nitrides have become a major player in wide band gap semiconductor physics and devices. During the Special Session and a banquet in his honor, the nitride community took the opportunity to thank Professor Akasaki for his work and its impact on science and technology. The banquet at the John F. Kennedy library was attended by over 150 colleagues, and numerous speeches were given in tribute to Professor Akasaki.

Isamu Akasaki received his B.S. degree from Kyoto University in 1952 and his Ph.D. from Nagoya University in 1964. He then joined Kobe Kogyo Corporation, which now is Fujitsu Ltd., as a member of the research staff. He worked on electronic materials, electroluminescence, and developed scintillators. Then in 1959 he returned to Nagoya University progressing in the positions of research associate, assistant professor, and associate professor. His work there centered around the vapor phase epitaxy (VPE) of Ge.

From 1964 through 1981, Dr. Akasaki headed the Fundamental Research Laboratory at the newly established Matsushita Research Institute Inc., Tokyo. Among the highlights of his research in optoelectronics were the world's purest GaAs at the time by VPE (1968), and the brightest GaP red LED (1970). His research on the nitrides started in 1966 with VPE and the optical properties of AlN. Then in 1974 he grew the very first GaN single crystal by MBE, and later his group developed the first flip-chip GaN blue LED.

In 1981, Dr. Akasaki was appointed as a full professor at Nagoya University where he conducted research on compound semiconductor materials and devices, with special emphasis on group-III nitrides. He found significant improvement of crystalline quality of nitrides by pioneering the low-temperature deposited buffer layer technique (1986). He and his group realized p-type conduction in nitrides (1989) and then the GaN p-n junction LED (1989). Conductivity control of n-type nitrides followed in 1989, and room temperature stimulated emission from the nitrides in 1990.

Beginning in 1992 Professor Akasaki has been working at Meijo University, Nagoya, where since 1996 he has directed a High Tech Research Center focusing specifically on group-III nitrides, and the list of firsts continues to the present day.

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Proceedings: Volume 639

Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter

[More information](#)

For his outstanding achievements, Professor Akasaki has received a long list of awards and prizes. Special tribute must be paid to Professor Akasaki for persevering in the nitrides, when in the light of the material's problems, almost everyone else had left the field. He kept working and finally by developing the low-temperature deposited buffer layer and p-type conduction, he succeeded and initiated the breakthrough of the nitrides. It is because of his achievements that this field has since seen revolutionary development.

Thank you, doumo arigatou, Professor Akasaki!

S. P. DenBaars and C. Wetzel

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Proceedings: Volume 639

Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter

[More information](#)

PREFACE

Symposium G, "Gallium Nitride and Related Alloys—2000" was held November 27–December 1 at the 2000 MRS Fall Meeting in Boston, Massachusetts. During 10 half-day oral sessions, 21 invited talks and 75 contributed talks were given. In 3 poster sessions, 181 posters were presented. This nitride symposium had the largest abstract submission of the conference.

In a Special Session and a well-attended banquet, the nitride community honored Professor Akasaki for his achievements in this field.

This year's nitride symposium provided an integrated view of advances in both the basic sciences and the technology of group-III nitride electronic and optoelectronic devices. The devices discussed at the conference included high frequency, high power, and high temperature devices as well as light-emitting diodes, laser diodes, and UV photodetectors. Topical challenges and future goals for the advancement of this rapidly progressing field included the further optimization and stabilization of growth processes, and growth of GaInN, AlGaIn, AlInN, and quaternary layers. Also covered were advanced dislocation control, models of the growth kinetics, implications of piezoelectric polarization, the roles of defects, dopants, and contaminants, optimization of light emission and electron transport mechanisms, layer lift-off techniques, ohmic and Schottky contacts, as well as general GaN-based device processing.

The proceedings of this symposium capture the most exciting developments of this rapidly progressing and commercializing field. This volume will be useful for both established researchers working on nitrides and for the students of this novel science and technology.

Christian Wetzel
Michael S. Shur
Umesh K. Mishra
Bernard Gil
Katsumi Kishino

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Proceedings: Volume 639

Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter

[More information](#)

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Proceedings: Volume 639

Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino
Frontmatter

[More information](#)

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We would like to thank the invited speakers

I. Akasaki	P. Lefebvre
H. Amano	T. Makimoto
L. F. Eastman	B. K. Meyer
K. Funato	B. Monemar
N. Grandjean	K. Onabe
V. Härle	T. Sands
K. Hiramatsu	S. A. Stockman
W. Knap	A. Usui
M. Kneissl	C. G. Van de Walle
T. F. Kuech	T. S. Zheleva

and their co-authors for their talks and papers submitted to this volume. Their contributions were essential to the success of this symposium.

We are most grateful to the following organizations for their generous financial support of this symposium and the banquet.

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Frontmatter[More information](#)**MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS**

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Editors: Christian Wetzel, Michael S. Shur, Umesh K. Mishra, Bernard Gil and Katsumi Kishino

Frontmatter

[More information](#)

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