

Presentations by Sandia Scientists

Presentations made by Sandia scientists in the area of solid-state lighting from 2000 through July 2003 are shown here. The citations are organized by year, beginning with the most recent year. Within years, publications are ordered alphabetically by title. To skip directly to a particular year, click on the link, below.

2003	2002	2001	2000
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2003

- "[The Effect of Film-Thickness Nonuniformity on In-Situ Wafer-Curvature Measurements of Thin-Film Stress](#)", by S. R. Lee, W. G. Breiland, and D. D. Koleske, *2003 APS March Meeting, Austin, TX* (2003).
- "[Influence of Coupling between Localized and Continuum States in Quantum-Dot Systems](#)", by H. C. Schneider, W. W. Chow, and S. W. Koch, *Nonlinear Optics and Excitation Kinetics in Semiconductors (NOEKS), Karlsruhe, Germany* (2003).
- "[Low Defect Density Epitaxy as a Substrate for 390 nm InGaN/GaN Multiple Quantum Well LEDs](#)", by D. D. Koleske, A. J. Fischer, A. A. Allerman, C. C. Mitchell, K. H. A. Bogart, R. J. Shul, J. J. Figiel, K. W. Fullmer, and K. C. Cross, *SPIE Photonics West, San Jose, CA* (2003).
- "[MOCVD Growth and Performance of Light Emitting Diodes for 300 nm Emission](#)", by A. A. Allerman, A. Fischer, D. D. Koleske, K. H. A. Bogart, R. Shul, S. Kurtz, J. Figiel, K. Cross, and K. Fullmer, *Photonics West, San Jose, CA* (2003).
- "[The Next Generation Lighting Initiative](#)", by J. A. Simmons, *Phosphor Global Summit 2003, Scottsdale, AZ (invited)* (2003).
- "[Optical Properties of II-VI and VI Semiconductor Nanoclusters for Use as Phosphors](#)", by J. P. Wilcoxon, L. S. Rohwer, and P. Provencio, *203rd Electrochemical Society Meeting, Paris, France (invited)* (2003).
- "[Progress and Challenges in the Development of AlGaN-Based Deep-UV Light Emitters](#)", by M. H. Crawford, A. A. Allerman, A. J. Fischer, K. H. A. Bogart, D. D. Koleske, W. W. Chow, S. R. Kurtz, and S. R. Lee, *Impurity Based Electroluminescence in Wide Bandgap Semiconductors Workshop, Santa Fe, NM (invited)* (2003).
- "[The Role of GaN Semiconductors in the Solid-State Lighting Revolution and Synergisms with National Security](#)", by J. M. Gee, J. Y. Tsao, and J. A. Simmons, *2003 Military Sensing Symposium, Materials Specialty Group, Tucson, AZ* (2003).
- "[Science and Technology Challenges in Solid-State Lighting](#)", by J. Y. Tsao, *Workshop on Selective, Patterned and Self-Assembled Growth in Nanostructures, Hong Kong, China (invited)* (2003).
- "[Semiconductor Quantum Dots for White Light Generation](#)", by L. S. Rohwer, J. P. Wilcoxon, B. L. Abrams, S. M. Woessner, and S. G. Thoma, *203rd Electrochemical Society Meeting, Paris, France* (2003).
- "[Solid-State Lighting Research at Sandia National Laboratories](#)", by J. M. Gee, J. Y. Tsao, and J. A. Simmons, *Workshop on Solid-State Lighting, Georgia Institute of Technology, Atlanta, GA* (2003).
- "[Solid State Lighting Research at Sandia National Laboratories](#)", by J. A. Simmons, *203rd Electrochemical Society Meeting, Paris, France (invited)* (2003).
- "[Sources of the Parasitic Chemical Reactions during AlGaN OMVPE](#)", by J. R. Creighton, W.

- G. Breiland, and M. E. Coltrin, *LumiLeds Lighting, San Jose, CA* (2003).
- "What the PV Specialists Might Like to Know About Solid-State Lighting", by J. M. Gee, *National Center for Photovoltaics and DOE Solar Program Review Meeting, Denver, CO* (2003).

2002

- "Activation and Passivation of Mg Acceptor in GaN:Mg", by D. Matlock, M. E. Zvanut, J. R. DiMaio, R. F. Davis, J. E. Van Nostrand, R. L. Henry, D. D. Koleske, and A. E. Wickenden, *Symposium L: GaN and Related Alloys, 2002 Fall MRS Meeting, Boston, MA* (2002).
- "Aspects of Hydrogen Behavior in GaN: Mg-Acceptor Passivation/Compensation and Interaction with Point Defects", by A. F. Wright and S. M. Myers, *Wake Forest University, Winston-Salem, NC (invited)* (2002).
- "Brittle/Ductile Stress Relaxation During MOCVD Growth Of AlGaN/GaN Heterostructures", by J. A. Floro, D. M. Follstaedt, P. P. Provencio, S. J. Hearne, and K. E. Waldrip, *March Meeting of the American Physical Society, Indianapolis, IN* (2002).
- "Cantilever Epitaxy of GaN on Sapphire: Further Reduction in Dislocation Density", by D. M. Follstaedt, P. P. Provencio, D. D. Koleske, N. A. Missett, C. C. Mitchell, C. I. Ashby, and A. A. Allerman, *2002 Fall MRS Meeting, Boston, MA* (2002).
- "Cantilever Epitaxy with Facet Controlled Growth for Low Dislocation Density GaN", by C. C. Mitchell, D. D. Koleske, A. A. Allerman, A. J. Fischer, D. M. Follstaedt, P. P. Provencio, N. A. Missett, and C. I. H. Ashby, *14th American Conference on Crystal Growth Epitaxy, Seattle, WA* (2002).
- "Characterization of II-VI Semiconductor Nanocrystals for Solid State Lighting Applications", by L. S. Rohwer and J. P. Wilcoxon, *Nanomaterials for Aerospace Symposium, Corpus Christi, TX (invited)* (2002).
- "Defects Observed in Semi-Insulating GaN and SiC Through Optically-Detected Magnetic Resonance", by E. R. Glaser, J. A. Freitas Jr., W. E. Carlos, B. V. Shanabrook, A. E. Wickenden, D. D. Koleske, R. L. Henry, M. W. Bayerl, and M. S. Brandt, *ONR Workshop on Challenges in Semi-Insulating Nitrides and SiC, Laugarvatn, Iceland* (2002).
- "Dislocation Density and Electrical Compensation in GaN Films", by M. E. Twigg, D. D. Koleske, R. L. Henry, and A. E. Wickenden, *44th Meeting of the EMC, Santa Barbara, CA* (2002).
- "Effects of LED Processing Steps on the Surface of GaN Epilayers", by K. H. A. Bogart, D. D. Koleske, A. A. Allerman, A. J. Fischer, K. W. Fullmer, K. Cross, and C. C. Mitchell, *AVS International Symposium, Denver, CO* (2002).
- "Facet Controlled Growth in Cantilever Epitaxy for Improved LED Performance", by A. A. Allerman, D. D. Koleske, C. C. Mitchell, A. J. Fischer, D. M. Follstaedt, P. P. Provencio, N. A. Missett, and C. I. H. Ashby, *Electronic Materials Conference, Santa Barbara, CA* (2002).
- "Facet Controlled Growth In Cantilever Epitaxy For Low Dislocation Density GaN", by A. A. Allerman, D. D. Koleske, C. C. Mitchell, A. J. Fischer, D. M. Follstaedt, P. P. Provencio, N. A. Missett, and C. I. H. Ashby, *7th Wide Bandgap III-Nitride Workshop, Richmond, VA* (2002).
- "Fundamental Science Needs for Solid State Lighting", by J. A. Simmons, *Basic Energy Sciences on "Basic Research Needs to Assure a Secure Energy Future", Gaithersburg, MD (invited,)* (2002).
- "Gas-Phase Nanoparticle Formation During AlGaN MOCVD", by J. R. Creighton, W. G. Breiland, and M. E. Coltrin, *AVS 49th Intl. Symposium, Denver, CO* (2002).

- "HighTemperature Illumination-Induced Metastability in Undoped Semi-Insulating GaN Growth by Metalorganic Vapor Phase Epitaxy", by Z. Q. Fang, B. B. Claflin, D. C. Look, T. H. Myers, D. D. Koleske, A. E. Wickenden, and R. L. Henry, *Symposium L: GaN and Related*

- Alloys, 2002 Fall MRS Meeting, Boston, MA* (2002).
- "Influence of Ambient on Surface-Inhibited H Release from P-GaN", by S. M. Myers, W. R. Wampler, C. H. Seager, B. L. Vaandrager , D. D. Koleske, and A. A. Allerman, *2002 Fall Meeting of the MRS, Boston, MA* (2002).
 - "InGaN/GaN Multiple Quantum Well LEDs Grown by MOCVD using Cantilever Epitaxy", by A. J. Fischer, D. D. Koleske, A. A. Allerman, C. C. Mitchell, K. H. A. Bogart, R. J. Shul, J. J. Figiel, and K. W. Fullmer, *2002 Fall MRS Meeting, Boston, MA* (2002).
 - "Mass Transport and Kinetic Limitations in GaN Epitaxial Lateral Overgrowth", by M. E. Coltrin and C. C. Mitchell, *2002 Fall MRS Meeting, Boston, MA* (2002).
 - "Measurements and Modeling of H Diffusion in p-type GaN", by C. H. Seager, S. M. Myers, A. F. Wright, D. D. Koleske, and A. A. Allerman, *2002 Fall MRS Meeting, Boston, MA* (2002).
 - "MOCVD Growth of AlGaN Alloys for 300 nm LEDs", by A. A. Allerman, A. Fischer, D. D. Koleske, K. H. A. Bogart, R. Shul, and S. Kurtz, *2002 Fall MRS Meeting, Boston, MA* (2002).
 - "MOCVD Growth of GaN Based UV Light Emitters", by D. D. Koleske, *Dept. of Materials Science & Engineering-Arizona State University, Tempe, AZ* (2002).
 - "Optical Reflectance Measurements of the 3D to 2D Delayed Recovery of GaN on Sapphire with Correlation to Improved 380 nm LED Brightness", by D. D. Koleske, A. J. Fischer, A. A. Allerman, C. C. Mitchell, S. R. Kurtz, J. J. Figiel, K. W. Fullmer, and W. G. Breiland, *Symposium L: GaN and Related Alloys, 2002 Fall MRS Meeting, Boston, MA* (2002).
 - "Parasitic Reactions and Particulate Formation during AlGaN MOCVD", by J. R. Creighton, W. G. Breiland, and M. E. Coltrin, *National Meeting of the American Institute of Chemical Engineers, Indianapolis, IN* (2002).
 - "Phosphor Synthesis Techniques of the Last Century", by L. S. Rohwer, *Centennial Meeting of the Electrochemical Society, Philadelphia, PA* (2002).
 - "Reducing Threading Dislocation in Laterally Grown GaN: Further Approaches", by D. M. Follstaedt, P. P. Provencio, C. C. Mitchell, N. A. Misset, C. I. H. Ashby, D. D. Koleske, and A. A. Allerman, *Electronic Materials Conference, Santa Barbara, CA* (2002).
 - "Research at Sandia in Solid State Lighting Technologies", by J. A. Simmons, *Seminar at General Electric Corporate Research and Development, Schenectady, NY (invited)* (2002).
 - "Role of Carbon in Silicon-doped GaN Grown by Metalorganic Chemical Vapor Deposition", by W. Götz, T. Mihopoulos, J. Yu, C. H. Seager, and A. F. Wright, *4th Symposium on Non-Stoichiometric III-V Semiconductors, Monterey, CA* (2002).
 - "Significantly Reduced Threading Dislocations in GaN Grown by Cantilever Epitaxy", by P. P. Provencio, D. M. Follstaedt, C. C. Mitchell, D. D. Koleske, N. A. Misset, A. A. Allerman, and C. I. H. Ashby, *38th Annual Symposium, New Mexico Chapter of the American Vacuum Society, Albuquerque, NM* (2002).
 - "Sources of the Parasitic Chemical Reactions during AlGaN OMVPE", by J. R. Creighton, W. G. Breiland, and M. E. Coltrin, *201st Meeting of the Electrochemical Society* (2002).
 - "Synthesis and Characterization of Cathodoluminescent Phosphors", by L. S. Rohwer, *Seminar at GE Global Research Center, Niskayuna, NY (invited)* (2002).
 - "Toward Quantification of GaN Film Evolution of Sapphire", by D. D. Koleske, M. E. Coltrin, S. R. Lee, K. C. Cross, C. C. Mitchell, A. A. Allerman, and J. J. Figiel, *2002 Fall Meeting of the MRS, Boston, MA* (2002).
 - "The U.S. Solid-State Lighting Roadmap: Targets and Technical Challenges", by J. Y. Tsao, *University of Michigan, Ann Arbor, MI (invited)* (2002).

 - "The U.S. Solid-State Lighting Roadmap: Targets and Technical Challenges", by J. Y. Tsao, *2002 OIDA Annual Forum, Washington, DC (invited)* (2002).
 - "Using Density Functional Theory to Help Understand the Behavior of Defects in Wurtzite

- "GaN", by A. F. Wright, *Texas Tech University (invited)*, (2002).
- "Vertical Composition Modulations in AlGaN Epitaxial Layers", by A. N. Westmeyer, S. Mahajan, D. D. Koleske, A. A. Allerman, and R. M. Biefeld, *Symposium L: GaN and Related Alloys, 2002 Fall MRS Meeting, Boston, MA* (2002).
- "Wide-Bandgap Group-III Nitride Semiconductor Lasers", by W. W. Chow, *OSEP Optics Seminar, University of Colorado, Boulder, CO (invited)* (2002).

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- "Cantilever Epitaxy and its Development to Produce GaN Substrates with Reduced Threading Dislocation Densities", by C. C. Mitchell, C. I. H. Ashby, D. M. Follstaedt, P. P. Provencio, N. A. Misset, and A. A. Allerman, *American Conference on Crystal Growth and Epitaxy, Burlington, VT* (2001).
- "Cantilever Epitaxy and its Potential for GaN Substrates with Whole-wafer Dislocation Densities Below 10^7 cm^{-2} ", by C. I. Ashby et al., *43rd Electronic Materials Conference, South Bend, IN* (2001).
- "Control and Elimination of Cracking of AlGaN Films Using Low-temperature AlGaN Interlayers", by K. E. Waldrip, J. Han, S. J. Hearne, and J. J. Figiel, *Fall 2000 Meeting of the Material Research Society, Boston, MA* (2001).
- "Emissivity-Correcting Pyrometry for OMVPE Applications", by W. G. Breiland, L. A. Bruskas, A. A. Allerman, and T. W. Hargett, *Tenth Biennial Workshop on Organometallic Vapor Phase Epitaxy, San Diego, CA* (2001).
- "GaN/AlGaN Epitaxial DBRs for Use in Blue and UV Light Emitters", by A. J. Fischer, K. E. Waldrip, G. M. Peake, J. J. Figiel, and A. A. Allerman, *2001 OSA Annual Meeting/ILS XVII, Long Beach, CA* (2001).
- "Gas-Phase Studies of the MOVPE of AlN from Trimethylaluminum and Ammonia", by R. P. Pawlowski, R. J. Creighton, and M. E. Coltrin, *National Meeting of the AIChE, Reno, NV* (2001).
- "Growth and Characterization of AlGaN/GaN DBR Mirrors for UV Surface-Emitting Devices", by J. Han, K. E. Waldrip, and J. J. Figiel, *Fall 2000 Meeting of the Material Research Society, Boston, MA* (2001).
- "Identification Of Misfit Dislocations Producing Relaxation Of AlGaN/GaN Heterostructures", by D. M. Follstaedt, R. P. Provencio, J. A. Floro, and S. J. Hearne, *2001 Fall MRS Meeting, Boston, MA* (2001).
- "Interaction of Hydrogen with Gallium Vacancies and Nitrogen Interstitials in Wurtzite Gallium Nitride", by A. F. Wright, *2001 Fall MRS Meeting, Boston, MA* (2001).
- "Issues for GaN HEMTs Grown on MOCVD", by A. G. Baca, C. Monier, J. R. Wendt, S. R. Shul, A. A. Allerman, D. D. Koleske, C. C. Mitchell, C. I. Ashby, M. G. Armendariz, and C. Sandoval, *ONR Workshop on Physical Effect and Device/Circuit Interactions in Solid State Devices, Bar Harbor, ME* (2001).
- "Kinetics and Transport in Gallium Nitride Epitaxial Lateral Overgrowth", by M. E. Coltrin, C. C. Mitchell, and J. Han, *199th Meeting of the Electrochemical Society, Washington, D.C.* (2001).
- "LED Solid-state Lighting for Illumination: Status Report", by E. D. Jones, *SPIE Conference, 2001 SPIE Conference, San Jose, CA* (2001).
- "Low Temperature Nitride Precursor Reactions", by J. R. Creighton, *Tenth Biennial Workshop on Organometallic Vapor Phase Epitaxy, San Diego, CA* (2001).
- "Mechanism Of Catastrophic Stress Relief In AlGaN/GaN", by K. E. Waldrip, J. A. Floro, D. M. Follstaedt, S. R. Lee, J. A. Hunter, S. J. Hearne, D. D. Koleske, A. A. Allerman, J. J. Figiel,

- and T. M. Kerley, *2001 Fall MRS Meeting, Boston, MA* (2001).
- "MOCVD Growth and Characterization of AlGaN/GaN/GaInN Vertical Cavity Surface Emitting Laser", by J. Han, K. E. Waldrip, and J. J. Figiel, *10th Biennial Workshop on MOVPE, San Diego, CA* (2001).
 - "Modelling of Hydrogen Behavior in Wurtzite GaN", by A. F. Wright and S. M. Myers Jr., *New Mexico American Vacuum Society Meeting, Albuquerque, NM* (2001).
 - "National Security Implications of Solid-State Lighting", by J. M. Gee, *OIDA Workshop on Solid-State Lighting, CS-MAX Conference, Boston, MA*. (2001).
 - "National White Lighting Initiative: What's it all about?", by E. D. Jones, *31st Winter Colloquium on Physics of Quantum Electronics Conference, Snowbird, UT* (2001).
 - "Search for the Missing Group-III Flux during AlGaN OMVPE", by J. R. Creighton, M. E. Coltrin, R. P. Pawlowski, and W. G. Breiland, *AVS 48th International Symposium, San Francisco, CA* (2001).
 - "Solid-State Lighting Initiative and Synergisms with National Security", by J. M. Gee, J. A. Simmons, and T. E. Drennen, *Optical Society of America, 2001 Annual Meeting, Long Beach, CA* (2001).
 - "The Solid-State Lighting Initiative: Synergisms with Office of Science Materials Science Programs", by J. A. Simmons, *Energy Materials Coordinating Committee, Washington, DC* (2001).
 - "Theoretical Consideration of Hydrogen-Related Atomic Processes in Gallium Nitride", by S. M. Myers and A. F. Wright, *4th International Conference on Nitride Semiconductors, Denver, CO* (2001).
 - "Theoretical Investigation of Hydrogen in Wurtzite GaN", by A. F. Wright, *March APS Meeting, Seattle, WA (invited)* (2001).
 - "UV LEDSs with AlInGaN/InGaN and AlGaN/InGaN Active Regions Grown by OMVPE", by G. M. Peake, A. J. Fischer, J. Han, J. J. Figiel, C. C. Mitchell, and R. M. Biefeld, *Tenth Biennial Workshop on Organometallic Vapor Phase Epitaxy, San Diego, CA* (2001).

2000

- "Cantilever Epitaxy: A Simple Lateral Growth Technique for Reducing Dislocation Densities in GaN and other Nitrides", by C. I. Ashby, *198th Meeting of the Electrochemical Society, (invited)* (2000).
- "Crystal Growth Kinetics and Transport in GaN Epitaxial Overgrowth", by M. E. Coltrin, C. C. Willan, and M. E. Bartram, *47th Annual Meeting of the American Vacuum Society, Boston, MA* (2000).
- "GaN Epitaxial Lateral Overgrowth Kinetics", by M. E. Coltrin, C. C. Willan, and M. E. Bartram, *American Institute of Chemical Engineers, Los Angeles, CA* (2000).
- "Mass Transport Processes in the Epitaxial Lateral Overgrowth of Gallium Nitride", by C. C. Willan, M. E. Coltrin, and J. Han, *Fall 2000 Meeting of the Material Research Society, Boston, MA* (2000).
- "Reversible Hydrogen Release and Dopant Activation in Gallium Nitride: Experiment and Theory", by S. M. Myers, A. F. Wright , G. A. Petersen, W. R. Wampler, C. H. Seager, M. H. Crawford, and J. Han, *Fall 2000 Meeting of the Material Research Society, Boston, MA* (2000).