

OMVPE-11 Final Program

Monday Morning, July 21, 2003
Joint Plenary Session, ACCGE15/OMVPE11
Session Chairs: Robert Biefeld, Sandia; Debra Kaiser, NIST
Room: Grey's Peak I,II,III

8:15	Welcome
8:30	Plenary Speaker –Nanocrystals and Nanocrystal Assemblies: Building with Artificial Atoms, <i>C. Murray; T. J. Watson Research Center, IBM Corporation</i>
9:15	Plenary Speaker –The Spin on Electronics! <i>Stuart Parkin, IBM Almaden Research Center; San Jose, CA</i>
10:00	Break

OMVPE Regular Sessions
Monday Morning, July 21, 2003
Session: Growth Mechanisms
Session Chair: Mike Tischler, M. Tischler & Associates
Room: Red Cloud

10:20	638 Gas Phase Nano-particle Formation during InP and GaAs Organometallic Chemical Vapor Deposition <i>Rajaram Bhat* (a), Benjamin Hall (a); (a)Sullivan Park, Corning, Inc.</i>
10:40	1009 Ordering in GaInP: the role of steps, dimers and Sb <i>J Olson* (a), W McMahon (a), I Batyrev (a), S Zhang (a), A Norman (a), R Reedy (a); (a), NREL</i>
11:00	788 Polycrystals growth on dielectric masks during InP/GaAs selective area MOVPE <i>Masakazu Sugiyama* (a), Ho-jin Oh (b), Yoshiaki Nakano (c), Yukihiro Shimogaki (b); (a)Dept. of Electronic Engineering, Univ. of Tokyo; (b)Dept. of Materials Engineering, Univ. of Tokyo; (c)RCAST, Univ. of Tokyo</i>
11:20	891 The Effect of Reactor Pressure on Selective Area Epitaxy of GaAs in a Close-Coupled Showerhead (CCS) Reactor <i>David Forbes* (a), Patrick Corbett (a), Ling Zhang (a), Darren Hansen (a), Troy Goodnough (a); (a), Alfalight, Inc.</i>
11:40	687 A new approach to performing equilibrium surface reaction calculations and its application to predicting growth of gallium nitride <i>Sandip Mazumder* (a), Debasis Sengupta (a); (a), CFD Research Corporation</i>
12:00	960 Modeling tool for MOVPE in commercial reactors <i>Roman Talalaev* (a), Alexey Kondratyev (a), Yuri Shpolyanskiy (a), Alexander Galyukov (b), Yuri Makarov (b); (a), Soft-Impact Ltd.; (b), STR, Inc.</i>
12:20	Vendor Exhibit opens No technical Sessions until 19:30

Monday Afternoon, July 21, 2003

17:30	Vendor Reception
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OMVPE-11
Monday Evening, July 21, 2003
Session: Nitrides I
Session Chair: Sarah Kurtz, National Renewable Energy Laboratory
Room: Red Cloud

19:30	773 GaN NUCLEATION LAYER EVOLUTION ON SAPPHIRE BEFORE HIGH TEMPERATURE GROWTH <i>Daniel Koleske* (a), Michael Coltrin (a), Karen Cross (a), Christine Mitchell (a), Andrew Allerman (a), Jeffrey Figiel (a); (a)Org. 1126, Sandia National Laboratories</i>
19:50	627 Effect of Sapphire Substrate Nitridation on Structural Properties of AlN Films <i>David Weyburne* (a), Qing Paduano (a), Zuzanna Liliental-Weber (b), Jacek Jasinski (b); (a)SNHC, AFRL; (b)Materials Science, Lawrence Berkeley National Lab</i>

20:10	883 Structural and morphological evolution of GaN on SiC substrates <i>Brendan Moran* (a), Feng Wu (b), James Speck (b), Umesh Mishra (c), Steven DenBaars (b) ; (a)Materials, University of California - Santa Barbara; (b)Materials, University of California - Santa Barbara; (c)Electrical and Computer Engineering, University of California - Santa Barbara</i>
20:30	615 Benefits of optical in-situ measurements for the MOCVD of III-Nitrides <i>Thomas Zettler* (a), John Mullins (b), Andre Strittmatter (c), Roland Schmidt (d), Hilde Hardtdegen (d), Menno Kappers (e), Kolja Haberland (a) ; (a), LayTec GmbH; (b), Thomas-Swan Sci. Equ.. Ltd.; (c), TU Berlin; (d), FZ Juelich; (e), Cambridge Univ.</i>
20:50	753 In-situ measurements during the MOCVD growth of AlN buffer layers on (111) Si substrates <i>Srinivasan Raghavan* (a), Joan Redwing (b) ; (a)Materials Science and Engineering, The Pennsylvania State University; (b)Materials Science and Engineering, The Pennsylvania State University</i>
21:10	867 Influence of substrate miscut on the AlN Growth on Si(111) by MOVPE <i>Hongfei Tang* (a), Ling Zhang (a), Akitaka Kimura (a), Zhiyan Liu (a), Thomas Kuech (a), Mike Tischler (b) ; (a)Chemical Engineering Department, University of Wisconsin-Madison; (b), Ocis Technology</i>
21:30	729 Growth and optimization of AlN/GaN DBR on Si(111) <i>M. Heuken* (b), Y. Dikme (a), H.M. Chern (b), H. Kalisch (a), A. Szymakowski (a), R.H. Jansen (a) ; (a)Institut für Theoretische Elektrotechnik, RWTH Aachen; (b), AIXTRON AG</i>

OMVPE-11

Tuesday Morning, July 22, 2003

Session: Future Directions (Joint OMVPE/ACCGE)

Session Chair: Simon Watkins, Simon Fraser University

Room: Red Cloud

8:30	Future MOCVD Manufacturing and Research Requirements For III-V Device Technologies (INVITED) <i>J. Nelson* ; Uniroyal Optoelectronics</i>
9:15	GaN crystal growth and light emitting devices (INVITED) <i>Shuji Nakamura; Materials Department, College of Engineering, University of California Santa Barbara</i>
10:00	Break

OMVPE-11

Tuesday Morning, July 22, 2003

Session: Dilute Nitrides

Session Chair: Andrew Allerman, Sandia

Room: Red Cloud

10:20	636 Growth experiments of the novel material system (GaIn)(NP)/GaP <i>Bernardette Kunert* (a), Jörg Koch (a), Torsten Torunski (a), Kerstin Volz (a), Wolfgang Stolz (a) ; (a)Materials Sciences Center, University Marburg</i>
10:40	764 Unintentional impurity incorporation into GaNP grown by metal-organic chemical vapor deposition <i>John Geisz* (a), Robert Reedy (a), Brian Keyes (a), Wyatt Metzger (a) ; (a), National Renewable Energy Laboratory</i>
11:00	606 OMVPE of GaAsSbN on GaAs for 1300 to 1550 nm emitters <i>Gregory Peake* (a), Andrew Allerman (b), Terry Hargett (c), John Klem (c), Norman Modine (d), Karen Waldrip (b), Darwin Serkland (c), Michael Cich (c) ; (a)RF Microsystems Technology, Sandia National Laboratories; (b)Chemical Processing Science, Sandia National Laboratories; (c)RF Microsystems Technologies, Sandia National Laboratories; (d), Sandia National Laboratories</i>
11:20	628 Annealing-induced type conversion of GaInNAs <i>Sarah Kurtz* (a), John Geisz, Daniel Friedman, Wyatt Metzger, Richard King, Nasser Karam ; (a)National Center for Photovoltaics, National Renewable Energy Laboratory</i>
11:40	859 Trap-dominated minority-carrier recombination in GaInNAs pn junctions <i>Daniel Friedman (a), John Geisz (a), Wyatt Metzger (a), Steven Johnston (a) ; (a), National Renewable Energy Laboratory</i>

OMVPE-11

Tuesday Afternoon, July 22, 2003

Session: Devices

Session Chair: Daniel Koleske, Sandia

Room: Red Cloud

13:40	629 The MOVPE growth and operation of strain balanced MQW pin solar cells <i>John Roberts* (a), Robert Airey (b), Geof Hill (c), Ned Ekins-Daulkes (d), Keith Barnham (d), David Bushnell (d); (a)Dept. of Electronic Engineering,</i>
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	<i>University of Sheffield, UK., EPSRC Nation Centre for III-V Technologies; (b)Dept. of Electronic Engineering, University of Sheffield, UK, EPSRC National Centre for III-V Technologies; (c)Dept. of Electronic Engineering, University of Sheffield, UK, EPSRC National Centre for III-V Technologies; (d)Blackett Laboratory Imperial College London, UK, Experimental Solid State Physics;</i>
14:00	907 Growth and Characterization of InAsSb/GaInAsSb/AlGaAsSb Heterostructures for Monolithically Interconnected Thermophotovoltaic Devices on Wafer-Bonded Substrates <i>Christine Wang (a), Daniel Shiao (a), Peter Murphy (b), Peter O'Brien (c), Alfredo Anderson (b), Gregory Nichols (d) ; (a)Electro-Optical Materials and Devices, MIT Lincoln Laboratory; (b)Analog Device Technology, MIT Lincoln Laboratory; (c)Quantum Electronics, MIT Lincoln Laboratory; (d), Lockheed Martin Corporation</i>
14:20	977 MOVPE of High Efficiency Metamorphic GaInP/GaInAs/Ge Solar Cells <i>Chris Fetzer* (a), Richard King (i), Peter Colter (i), Kenneth Edmondson (i), Daniel Law (i), Alex Stavrides (i), Hojun Yoon (i), James Ermer (i), Nasser Karam (i) ; (a)Engineering Dept., Spectrolab, Inc.; (i), Spectrolab, Inc.</i>
14:40	996 MOVPE growth and characterization of carbon-doped InAlAs/InGaAs avalanche photodiode structures <i>R Sudharsanan* (a), T Isshiki, D McAlister, G Kinsey, J Boisvert, N Karam ; (a), Spectrolab Inc.</i>
15:00	838 New DFB Grating Structure using Dopant-Induced Refractive Index Step <i>Richard Glew* (a), Karin Hinzer (b), J White (b), Darren Goodchild (b), Gordon Knight (b), Anthony SpringThorpe (c), St. John Dixon-Warren (b) ; (a), Bookham Technologies, 2500 Carling Avenue, Ottawa, K2h 8E9, Ontario, Canada; (b), Bookham Technologies, 3500 Carling Avenue, Ottawa, Ontario, Canada, K2H 8E9.; (c), Compound Semiconductor Solutions, PO Box 96, Richmond, Ontario, Canada, K0A 2Z0.</i>
15:20	899 In-Situ Strain Control During MOCVD Growth of High Quality InP Based Long Wavelength Distributed Bragg Reflectors <i>Richard Hoffman* (a), Michael Murphy (a), Jonathan Cruel (a), Michael Belousov (a), Boris Volf (a), Chris Murray (a), Eric Armour (a) ; (a), Emcore Corporation</i>
15:40	925 MOCVD Growth of high performance InGaAsP/InGaP Strain-Compensated VCSELs with 850 nm emission wavelength <i>Hao-chung Kuo* (a), Y. H. Chang, T. C. Lu, G. F. Lin, W. C. Lin, S. C. Wang ; (a)Institute of Electro-optical Engineering, National Chiao-Tung University</i>

OMVPE-11
Tuesday Afternoon, July 22, 2003
Poster session, 16:00-18:00
Session Chair, Dr. Chris Ebert, Triquint Optoelectronics
Room: Shavano

OM 1	594 Growth of nitrides and phosphides epitaxial layers by Rapid Thermal MOCVD process <i>Oleg Kreinin* (a), Gad Bahir (a) ; (a)Solid State Institute, Technion</i>
OM 2	670 GaInNAs quantum structures for 1.55 μm emission on GaAs <i>Teppo Hakkarainen* (a), Juha Toivonen (a), Markku Sopanen (a), Harri Lipsanen (a) ; (a)Optoelectronics laboratory, Helsinki University of Technology</i>
OM 3	702 Growth of GaN films on porous 4H-SiC substrate by metal-organic chemical vapor deposition <i>Jae Kyeong Jeong* (a), Hyun Jin Kim (a), Hui-Chan Seo (a), Euijoon Yoon (a), Cheol Seong Hwang (a), Hyeong Joon Kim (a) ; (a)School of Materials Science and Engineering and Inter-university Semiconductor Research Center, Seoul National University</i>
OM 4	719 Simulation of GaN and InGaN p-i-n and n-i-n photo-devices <i>Kunakorn Poochinda* (a), Tai-Chang Chen (b), Thomas Stoebe (c), N. Ricker (a) ; (a)Chemical Engineering, University of Washington; (b)Electrical Engineering, University of Washington; (c)Materials Science and Engineering, University of Washington</i>
OM 5	727 Nature of inhomogeneity in In_xGa_{1-x}N epitaxial layers <i>Olga Elyukhina* (a) ; (a)Physico-Technical Department, Saint-Petersburg State Politechnical University</i>
OM 6	772 Optical and Structural Properties of GaInNAs/GaAs Quantum Wells Grown by MOCVD <i>Abdel-Rahman El-Emawy* (a), Noppadon Nuntawong (a), Hongjun Cao (a), Marek Osinski (a) ; (a)Center for high technology materials, University of New Mexico</i>
OM 7	799 Characterization of optical and electrical quality in Mg doped In_xGa_{1-x}N grown by MOCVD <i>Sung-Nam Lee* (a), Tan Sakong (a), Wonseok Lee (a), Hosun Paek (a), Okhyun Nam (a), Yongjo Park (a), Euijoon Yoon (b) ; (a)Photonics Lab., Samsung Advanced Institute of Technology, P.O. Box 111, Suwon 440-600, South Korea; (b)Compound Semiconductor Epitaxy Laboratory, School of Materials Science and Engineering, Seoul National University, Shinlim Dong, Kwan-Ak Ku, Seoul 151-742, South Korea</i>
OM 8	809 Structure and properties of GaN_xO_y films grown by nitridation of GaAs (100) substrates <i>Marco Sacilotti* (b), Carmen Marco de Lucas (a), François Fabreguette (b), Michel Linsavanh (c), Valerie Potin (a), Olivier Heintz (a), Luc Imhoff (a), Sylvie Bourgeois (a) ; (a)Laboratoire des Recherches sur la Réactivité des</i>

	<i>Solides, Université de Bourgogne; (b) Couches Minces et Nanostructures, LPUB, Université de Bourgogne; (c) Laboratoire des Recherches sur la Réactivité des Solides, Université de Bourgogne</i>
OM 9	815 Modeling and experimental analysis of AlGaIn MOVPE in commercial vertical high-speed rotating disk reactors Yuri Makarov* (a), Eugene Yakovlev (a), Anna Lobanova (a), Kirill Mazaev (a), Roman Talalaev (a), Alexander Galyukov (a), David Gotthold (b), Lev Kadinski (b), Boris Peres (b); (a), STR, Inc.; (b), EMCORE Corporation
OM 10	841 Growth of HEMT structures on 4 inch in multiwafer MOCVD reactors Assadullah Alam (a), Oliver Schoen (a), Markus Luenenbuerger (a), Bernd Schineller (a), Christof Sommerhalter (a), Michael Heuken (a); (a), AIXTRON AG
OM 11	861 Computational Analysis of GaN/InGaIn Deposition in MOCVD Vertical Rotating Disk Reactors L. Kadinski* (a), V. Merai (a), A. Parekh (a), J. Ramer (a), E. Armour (a), R. Stall (a), A. Gurary (a), A. Galyukov (b), Yu. Makarov (b); (a), EMCORE; (b), STR Inc
OM 12	901 Performance of Single Use Purifiers vs. Regenerable Purifiers for Growth of High Brightness GaN LEDs Robert Torres* (a), Tadaharu Watanabe (a), Joseph Vininski (b), David Lawrence (b), Wen Wang (e), John Garcia (e), C. Yan (e); (a) Research and Development, Matheson Trigas; (b), Matheson Trigas; (c), AXT Optoelectronics; (d), AXT Optoelectronics; (e), AXT Optoelectronics
OM 13	926 MOVPE growth of single-crystalline GaN on a 3c-SiC/Si(111) structure formed by C-ion implantation into Si(111) substrate Akio Yamamoto* (a), Tomonori Yamauchi (a), Tohru Tanikawa (a), Masato Sasase (b), Bablu Ghosh (c), Akihiro Hashimoto (c), Yoshifumi Ito (b); (a) Dept. of Electrical & Electronics Eng., Fukui University; (b), Wakasa-wan Energy Research Center; (c) Dept. of Electrical and Electronics Eng., Fukui University
OM 14	931 Correlations between electrical and optical properties for MOVPE-grown InN Ken-ichi Sugita* (a), Hirofumi Takatsuka (a), Akihiro Hashimoto (a), Akio Yamamoto (b); (a) Dept. of Electrical & Electronics Eng., Fukui University; (b) Dept of Electrical & Electronics Eng., Fukui University
OM 15	935 Employment of a GaN buffer in the MOVPE growth of InN on sapphire substrates Akio Yamamoto* (a), Naoaki Imai (a), Ken-ichi Sugita (b), Akihiro Hashimoto (a); (a) Dept. of Electrical & Electronics Eng., Fukui University; (b) Dept. of Electrical and Electronics Eng., Fukui University
OM 16	937 Deposition behavior of GaN in AIX 200 horizontal reactor Roman Talalaev* (a), Eugene Yakovlev (a), Yuri Makarov (b), Boris Yavich (c), W. Wang (c); (a), Soft-Impact Ltd.; (b), STR, Inc.; (c), University of Bath
OM 17	616 Hydrogen and carbon complexes in GaSb and GaAsSb S. Watkins* (a), M. Ziaei (a), C. Wang (a), B. Clayman (a); (a) Physics, Simon Fraser University
OM 18	618 Optical Characterisation of Al_xGa_{1-x}Sb Grown by Metalorganic Chemical Vapour Deposition Ari Ramelan* (a), Ewa Goldys (b); (a) Physics Department, Faculty of Mathematics and Natural Sciences, Universitas Sebelas Maret, Jl. Ir. Sutami No. 36A, Surakarta 57126, Indonesia.; (b) Physics Department, Division of Information and Communication Sciences, Macquarie University, NSW 2109 Australia.
OM 19	784 Surface modifications induced by bismuth on (001) GaAs and GaAsSb surfaces S. Watkins* (a), W. Jiang (a); (a) Physics, Simon Fraser University
OM 20	906 Tellurium doping of GaSb and GaInAsSb Christine Wang* (a), Daniel Shiau (a), Robin Huang (a), Michael Connors (a), Christopher Harris (a); (a) Electro-Optical Materials and Devices, MIT Lincoln Laboratory
OM 21	920 Effect of interface grading on optical properties of GaSb/GaAs heterostructures Oliver Pitts* (a), Chengxin Wang, Simon Watkins, James Stotz, Thomas Meyer, Michael Thewalt; (a) Physics, Simon Fraser University
OM 22	728 Fundamental kinetics of determining growth rate profiles of InP and GaAs in MOVPE with horizontal reactor Ik-Tae Im* (a), Ho Jin Oh (a), Masakazu Sugiyama (b), Yoshiyuki Nakano (b), Yukihiro Shimogaki (a); (a) Materials Engineering, University of Tokyo; (b) Electronics Engineering, University of Tokyo
OM 23	733 In(x)Ga(1-x)As Epitaxial Nano-Layers Wlodek Strupinski* (a), Marek Wesolowski (b), Elzbieta Jezierska (c), Agata Jasik (d), Jarek Gaca (e), Marek Wojcik (e), Krystyna Mazur (e); (a) III-V Epitaxy dept., Institute of Electronic Materials Technology; (b) III-V Epitaxy, Institute of Electronic Materials Technology; (c) Materials Science, Warsaw Technical University; (d) III-V Epitaxy, Institute of Electronic Materials Technology; (e) X-ray, Institute of Electronic Materials Technology
OM 24	739 Clusters Formation in Mn-incorporated (GaIn)As / InP Layers Grown by MOVPE Shinjiro Hara* (a), Michael Lampalzer (a), Werner Treutmann (a), Wolfgang Stolz (a); (a) Materials Sciences Center, Philipps-University Marburg
OM 25	763 Chemical Vapor Deposition of InP and Related Alloys Using Tertiarybutylphosphine and Tertiarybutylarsine Ravi Kanjolia* (a), Gangyi Chen (b), Dick Cheng (b), David Tobin (b), Robert Hicks (b); (a), Epichem, Inc. 1429 Hailldale Avenue, Haverhill, MA 01832; (b) Chemical Engineering Department, University of California, Los Angeles, CA 90095
OM 26	787 The effect of group V precursor on selective area MOVPE of InP/GaAs related materials Masakazu

	<i>Sugiyama</i> [*] (b), <i>Ho-jin Oh</i> (a), <i>Yoshiaki Nakano</i> (c), <i>Yukihiro Shimogaki</i> (a); (a)Dept. of Materials Engineering, Univ. of Tokyo; (b)Dept. of Electronic Engineering, Univ. of Tokyo; (c)RCAST, Univ. of Tokyo
OM 27	826 Mask interference effect in a densely arrayed waveguide fabricated by using narrow-stripe selective MOVPE <i>Shinya Sudo</i> [*] (a), <i>Kazuo Mori</i> (b), <i>Tatsuya Sasaki</i> (a); (a)Photonic and Wireless Devices Research labs., NEC Corporation; (b)Photonic and Wireless Devices Research Labs., NEC Corporation
OM 28	856 A multiscale study of the MOCVD of GaAs and AlGaAs <i>Carlo Cavallotti</i> [*] (a), <i>Alessandro Veneroni</i> (a), <i>Maurizio Masi</i> (a), <i>Sergio Carra</i> ' (a); (a)Chimica, Materiali e Ing. Chimica, Politecnico di Milano
OM 29	863 Study of Incorporation Factor (K) and its Application to Laser Diode Production <i>Darren Hansen</i> [*] (a), <i>Troy Goodnough</i> (a), <i>Ling Zhang</i> (a), <i>Patrick Corbett</i> (a), <i>David Forbes</i> (a); (a)Epitaxy, Alfalight, Inc
OM 30	908 Performance of Sub-Atmospheric Pressure Hydride Gas Source and Delivery System for MOCVD <i>Mark Raynor</i> [*] (a), <i>Russell Frye</i> (b), <i>Steve Griffing</i> (c), <i>Andrew Clark</i> (d), <i>Bob Walteson</i> (d); (a)Advanced Technology Center, Matheson Tri-Gas, Inc.; (b), ATMI, Inc; (c), ATMI, Inc.; (d), Honeywell
OM 31	939 Routine use of optical in-situ sensor for true wafer temperature and reflectance measurement in multiwafer MOVPE reactors <i>Markus Weyers</i> [*] (a), <i>Thomas Bergunde</i> (a), <i>Kolja Haberland</i> (b), <i>Bernd Henninger</i> (b), <i>Thomas Zettler</i> (b); (a), Ferdinand-Braun-Institut; (b), LayTec GmbH

	Tuesday Evening, July 22, 2003
18:00	Banquet Reception
19:00	Banquet

OMVPE-11

Wednesday Morning, July 23, 2003

Session: Narrow gap materials

Session Chair: Raj Bhat, Corning, Inc.

Room: Red Cloud

8:20	775 Suppression of Hydrogen Passivation in Carbon-doped GaAsSb Grown by MOCVD <i>Yasuhiro Oda</i> [*] (a), <i>Noriyuki Watanabe</i> (b), <i>Masahiro Uchida</i> (b), <i>Hiroki Sugiyama</i> (a), <i>Haruki Yokoyama</i> (a), <i>Michio Sato</i> (a), <i>Takashi Kobayashi</i> (a); (a), NTT Photonics Laboratories, NTT Corporation; (b), NTT Advanced Technology Corporation
8:40	904 Influence of GaSb Substrate Surface on GaSb and GaInAsSb Epilayers Grown by Organometallic Vapor Phase Epitaxy <i>Christine Wang</i> [*] (a), <i>Daniel Shiau</i> (a), <i>Angie Lin</i> (a); (a)Electro-Optical Materials and Devices, MIT Lincoln Laboratory
9:00	913 Optical and Structural Properties of InAs, InAsSb, and InGaAs Quantum Dot Active Regions Grown by MOCVD <i>Jeff Cederberg</i> [*] (a), <i>Forrest Kaatz</i> (a), <i>Mark Phillips</i> (a), <i>Steven Kurtz</i> (a), <i>Robert Biefeld</i> (a); (a), Sandia National Laboratories
9:20	966 Characterization and Structural Analysis of MOCVD-grown InAs Thin Films on (100) GaAs <i>A Khandekar</i> [*] (a), <i>G. Suryanarayanan</i> (b), <i>S Babcock</i> (c), <i>T Kuech</i> (a); (a)Chemical Engineering, University of Wisconsin-Madison; (b)Materials Science Program, University of Wisconsin-Madison; (c)Materials Science and Engineering, University of Wisconsin-Madison
9:40	Break

OMVPE-11

Wednesday Morning, July 23, 2003

Session: Nitrides II

Session Chair: Joan Redwing, Pennsylvania State University

Room: Red Cloud

10:00	868 Nature of the parasitic chemical reactions occurring during AlGaInN OMVPE <i>Randall Creighton</i> [*] (a), <i>George Wang</i> (b), <i>Michael Coltrin</i> (a), <i>William Breiland</i> (a); (a), Sandia National Laboratories; (b), Sandia National Labs
10:20	677 Adduct Formation Chemistry between Magnesocene (MgCp₂) and NH₃: Origin of the "Memory Effect" <i>George Wang</i> [*] (a), <i>J. Randall Creighton</i> (a); (a), Sandia National Laboratories

10:40	596 Morphological Evolution Studies of InGaN/GaN Quantum-Well Heterostructures Grown by Metal-Organic Chemical Vapor Deposition on (0001) Sapphire <i>V Merai* (a), S Ting (b), J Ramer (a), D Florescu (a), A Parekh (a), D Lee (a), D Lu (a), E Armour (a)</i> ; (a), EMCORE Corporation; (b), United Microelectronics Corporation
11:00	837 GaN-based Resonant Cavity Light-Emitting Diodes with AlN/GaN Distributed Bragg Reflectors Grown By Metal-Organic Chemical Vapor Deposition <i>Chia-Feng Lin* (a), H. H. Yao, J. W. Lu, Y. L. Hsieh, H. C. Kuo, S. C. Wang</i> ; (a)Institute of Electro-Optical Engineering, National Chiao Tung University
11:20	767 MOCVD growth of AlGaIn films for solar blind photodetectors <i>Stacia Keller* (a), Pablo Cantu (b), Ting Li (c), Michael Craven (d), Feng Wu (e), Patrick Waltereit (e), Umesh Mishra (f), James Speck (e), Steven DenBaars (g)</i> ; (a)Electrical & Computer Engineering Dept., University of California Santa Barbara; (b)Electrical & Computer Engineering Department, University of California Santa Barbara; (c), Cree Lighting Company; (d)Materials Department, University of California; (e)Materials Department, University of California Santa Barbara; (f)Electrical & Computer Engineering Department, University of California Santa Barbara; (g)Materials and Electrical & Computer engineering Departments, University of California Santa Barbara
11:40	915 Growth of UV LEDs Utilizing AlN Interlayers for Strain Reduction <i>Thomas Katona* (a), Matthew Schmidt (b), Craig Moe (b), Tal Margalith (b), Robert Underwood (c), Shuji Nakamura (b), James Speck (b), Steven DenBaars (d)</i> ; (a)Electrical and Computer Engineering, University of California at Santa Barbara; (b)Materials Science, University of California at Santa Barbara; (c), Cree Lighting Company; (d)Electrical and Computer Engineering & Materials Science, University of California at Santa Barbara
12:00	991 Growth and Characterization of AlGaIn alloys for 290-300nm Light Emitting Diodes <i>Andrew Allerman* (a), Art Fischer (b), Mary Crawford (b), Kate Bogart (a), Randy Shul (c), Dan Koleske (a), Steve Lee (b), Steven Kurtz (b)</i> ; (a)1126, Sandia National Laboratories; (b)1123, Sandia National Laboratories; (c), Sandia National Laboratories
12:00	Free Time (until 19:00)

OMVPE-11
Wednesday Evening, July 23, 2003
Panel Discussion: Current Trends in the Industrial Application of OMVPE
19:00-???
Session Chair: Egbert Woelk, Shipley Company
Room: Red Cloud

In this informal but lively session, various trends in the application of OMVPE technology will be discussed in a panel discussion format. The discussion will primarily focus on the following areas:

Trends in Monitoring and Feedback Control of Epitaxial Growth:

- *Randall Geels, Filmetrics: "In-Situ Crystal Growth Monitoring in the Future"*
- *Thomas Zettler, Laytec: "Optical Real-Time Sensors for MOCVD"*
- *Jim Dixon, EMF Ltd: "Control Systems of the Future"*

Trends in Gas Purity Monitoring and Control

- *Jeffrey J. Spiegelman, Aeronex Inc: "The Gas Plant in a Box"*
- *Tim Johnson, SAES Getters*
- *Stuart Bestrom, Johnson-Matthey: "Hydrogen Carrier Gas Supply and Purification Methods for MOCVD Processes"*
- *Virginia Houlding and Bill Kroll, Matheson Tri-Gas: "Issues in Hydride Gas Purity"*

Trends in OMVPE Reactors

- *B. Schulte, AIXTRON AG: "MOCVD - The Enabling Technology"*
- *Tom Mieke, Emcore*
- *Koh Matsumoto, Nippon Sanso Corporation: "High Quality Epitaxy for Next Generation GaN Based Devices"*

Trends in OMVPE Precursors

- *Joseph Reiser, Shipley Company: "Metalorganics' Focus on Improving Productivity"*
- *Barry Cottrell, Akzo*
- *Mark Fine, President, Epichem Inc.: "OMVPE Precursors in 2008!"*

Industrial representatives from each category will give brief presentations on their view of important current and future issues in OMVPE technology, in order to stimulate lively discussion with the audience. Conference participants with strong views on future trends and challenges are encouraged to bring summary viewgraphs to the meeting for presentation at this session.

OMVPE-11
Thursday Morning, July 24, 2003
Session: Novel Materials
Session Chair: Leslie Smith, Epichem Ltd.
Room: Red Cloud

8:20	933 Deposition and Characterization of Zirconium Tin Titanate Thin Films as a High-k Material for Electronic Devices <i>Ebony Mays* (a), William Rees (b), Dennis Hess (c); (a)Materials Science and Engineering, Georgia Institute of Technology; (b)Materials Science and Engineering, School of Chemistry and Biochemistry, Georgia Institute of Technology; (c)Chemical Engineering, Georgia Institute of Technology</i>
8:40	833 MOCVD OXIDE FILMS FOR OPTICAL APPLICATIONS <i>Joseph Cuchiaro* (a), Catherine Rice (a), Gary Tompa (a), Nick Sbrockey (a), Gary Provost (a); (a), Structured Materials Industries, Inc.;</i>
9:00	1006 Metalorganic Chemical Vapor Growth and Characterizations of Epitaxial $Mg_xZn_{1-x}O$ ($0 < x < 0.33$) Films on (01-12) r-Sapphire Substrates <i>Sriram Muthukumar* (a), Frederic Cosandey (a), Theo Siegrist (b), Yimin Chen (c), Jian Zhong (c), Yicheng Lu (c); (a)Ceramics and Materials Engineering, Rutgers University; (b)Bell Laboratories, Lucent Technologies; (c)Electrical and Computer Engineering, Rutgers University</i>
9:20	912 Tungsten Nitride Thin Films Deposited by MOCVD: Sources of Carbon and Effects on Film Structure and Stoichiometry <i>Omar Bchir* (a), Kelly Green (a), Mark Hlad (a), Timothy Anderson (a), Benjamin Brooks (b), Corey Wilder (b), David Powell (b), Lisa McElwee-White (b); (a)Department of Chemical Engineering, University of Florida; (b)Department of Chemistry, University of Florida</i>
9:40	802 Structure and magnetic properties of MOVPE grown (MnGa)As clusters in GaAs <i>Kerstin Volz* (a), Michael Lampalzer (a), Werner Treutmann (a), Wolfgang Stolz (a); (a)Materials Sciences Center, Philipps University Marburg</i>
10:00	Break

OMVPE-11
Thursday Morning, July 24, 2003
Session: Characterization and Production Issues
Session Chair: Christine Wang, MIT Lincoln Labs.
Room: Red Cloud

10:20	695 Reconstructions of the InP (111)A Surface <i>Robert Hicks* (a), Yan Sun (a), Connie Li (a), Daniel Law (a), Sven Visbeck (a); (a)Chemical Engineering, UCLA</i>
10:40	696 Kinetics of Phosphine Adsorption and Phosphorus Desorption from InP and GaP (001) Surfaces <i>Yan Sun* (a), Daniel Law (b), Robert Hicks (a); (a)Chemical Engineering, UCLA; (b)Chemical Engineering, UCLA</i>
11:00	902 Real-Time Monitoring Of Sub-ppm Levels Of Water In Phosphine Using Cavity Ring-Down Spectroscopy <i>Kris Bertness* (a), Susan Lehman (a), Joseph Hodges (b); (a)Optoelectronics Division, National Institute of Standards and Technology; (b)Process Measurements Division, National Institute of Standards and Technology</i>
11:20	940 Accurate continuous level indication for precursor bubblers <i>Ravi Kanjolia, Lesley Smith, Raj Odedra, Megan Ravetz, Lindsay Smith, Graham Williams, Hugh Cunning, Steve Travis, William Monk; Epichem</i>
11:40	938 Safe Treatment of GaN MOCVD Exhausts <i>Michael Czerniak* (a), Vic Chidgopkar (c), Ian Kilgarriff (c), Andrew Seeley (a), Shahid Hussain (a); (a)EGM, BOC Edwards; (b), BOC Edwards; (c), BOC Edwards</i>
12:00	Closing Remarks