

16th International Conference on Microscopy of Semiconducting Materials 2009

Journal of Physics: Conference Series Volume 209

**Oxford, United Kingdom
17-20 March 2009**

ISBN: 978-1-61738-268-0

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2009) by the Institute of Physics
All rights reserved.

Printed by Curran Associates, Inc. (2010)

For permission requests, please contact the Institute of Physics
at the address below.

Institute of Physics
Dirac House, Temple Back
Bristol BS1 6BE UK

Phone: 44 1 17 929 7481
Fax: 44 1 17 920 0979

techtracking@iop.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

INVITED PAPERS

Gan Devices Based on Nanorods	1
<i>D Cherns, L Meshi, I Griffiths, S Khongphetsak, S V Novikov, R P Campion, C T Foxon, C Liu, P Shields, W N Wang</i>	
Growth, Structure and Phase Transitions of Epitaxial Nanowires of III-V Semiconductors	11
<i>F Glas, G Patriarche, J C Harmand</i>	
Bridging the Length Scales Between Lithographic Patterning and Self Assembly Mechanisms in Fabrication of Semiconductor Nanostructure Arrays	23
<i>R Hull, J A Floro, M Gherasimova, J F Graham, J L Gray, A Portavoce, F M Ross, J Thorp</i>	
Exploring Semiconductor Quantum Dots and Wires by High Resolution Electron Microscopy	33
<i>S I Molina, P L Galindo, L Gonzalez, J M Ripalda, M Varela, S J Pennycook</i>	
Quantitative Z-contrast Atomic Resolution Studies of Semiconductor Nanostructured Materials	43
<i>E Carlino</i>	
On the Incorporation of Indium in InAs-based Quantum Structures	53
<i>D Gerthsen, H Blank, D Litvinov, R Schneider, A Rosenauer, T Passow, A Grau, P Feinäugle, H Kalt, C Klingshirn, M Hetterich</i>	
STEM-EELS Investigations of High-k Dielectrics	63
<i>A J Craven, M MacKenzie, P Longo, S McFadzean</i>	
Strain Distribution Analysis in Si/SiGe Line Structures for CMOS Technology Using Raman Spectroscopy	73
<i>M Hecker, M Roelke, P Hermann, E Zschech, V Vartanian</i>	

SESSION A & B

Measurement of Composition Profiles in III-nitrides by Quantitative Scanning Transmission Electron Microscopy	83
<i>A Rosenauer, K Gries, K Müller, M Schowalter, A Pretorius, A Avramescu, K Engl, S Lutgen</i>	
Structural Properties of GaN Nanowires and GaN/AlN Insertions Grown by Molecular Beam Epitaxy	87
<i>C Bougerol, R Songmuang, D Camacho, Y M Niquet, B Daudin</i>	
GaN, AlGa_N, HfO₂ Based Radial Heterostructure Nanowires	91
<i>L Lari, T Walther, K Black, R T Murray, T J Bullough, P R Chalker, C Chêze, L Geelhaar, H Riechert</i>	
Basal-plane Stacking Faults in Non-polar GaN Studied by Off-axis Electron Holography	95
<i>Lewis Z-Y Liu, D V Sridhara Rao, M J Kappers, C J Humphreys, D Geiger</i>	
Atomic Resolution Imaging of in Situ InAs Nanowire Dissolution at Elevated Temperature	99
<i>R S Pennington, J R Jinschek, J B Wagner, C B Boothroyd, R E Dunin-Borkowski</i>	
Mg Dopant Distribution in an AlGa_N/GaN P-type Superlattice Assessed Using Atom Probe Tomography, TEM and SIMS	103
<i>S E Bennett, P H Clifton, R M Ulfing, M J Kappers, J S Barnard, C J Humphreys, R A Oliver</i>	
Investigation of Optimum Growth Conditions of InAlN for Application in Distributed Bragg Reflectors	107
<i>T C Sadler, M J Kappers, R A Oliver</i>	
Microstructural Characterisation of a Prototype Layer Structure for a GaN-based Photonic Crystal Cavity	111
<i>H. W. A. R. El-Ella, T. C. Sadler, M. J. Kappers, R. A. Oliver</i>	
Dislocation Reduction in MOVPE Grown GaN Layers on (111)Si Using SiN_x and AlGa_N Layers	115
<i>M Haeberlen, D Zhu, C McAleese, M J Kappers, C J Humphreys</i>	
Simulation Supported Analysis of the Effect of SiN_x Interlayers in AlGa_N on the Dislocation Density Reduction	119
<i>O Klein, J Biskupek, U Kaiser, K Forghani, S B Thapa, F Scholz</i>	
The Role of Rough Surfaces in Quantitative ADF Imaging of Gallium Nitride-based Materials	125
<i>J S Barnard, S E Bennett, R A Oliver, M J Kappers, C J Humphreys</i>	
TEM Characterization of Catalyst- and Mask-free Grown GaN Nanorods	129
<i>M Schowalter, T Aschenbrenner, C Kruse, D Hommel, A Rosenauer</i>	
Scanning Probe Microscopy Studies on the Growth of Palladium and Nickel on GaN(0001)	133
<i>C Nörenberg, S Myhra, P J Dobson</i>	

Lattice Distortions in GaN Thin Films on (0001) Sapphire	137
<i>D V Sridhara Rao, R Beanland, M J Kappers, D Zhu, C J Humphreys</i>	
Atomic Ordering in Intermetallic CoAl Alloys Epitaxially Grown on GaAs (001)	141
<i>Q Wan, R Hey, A Trampert</i>	
Existence Or Absence of Bandgap Bowing in II-VI Ternary Alloys: Comparison Between Common-anion and Common-cation Cases	145
<i>Nacir Tit, I M Obaidat, A H Reshak, H Alawadhi</i>	

SESSION C & D

Refinement of Chemically Sensitive Structure Factors Using Parallel and Convergent Beam Electron Nanodiffraction	149
<i>K Müller, M Schowalter, A Rosenauer, J Jansen, K Tsuda, J Titantah, D Lamoen</i>	
Nanoscale Characterization of Compound Semiconductors Using Laser-pulsed Atom Probe Tomography	153
<i>M Müller, D W Saxey, A Cerezo, G D W Smith</i>	
Off Axis Holography of Doped and Intrinsic Silicon Nanowires: Interpretation and Influence of Fields in the Vacuum	157
<i>M I den Hertog, J L Rouviere, H Schmid, D Cooper, M T Björk, H Riel, F Dhalluin, P Gentile, P Ferret, F Oehler, T Baron, P Rivallin, S Karg, W Riess</i>	
Observation of Carrier Distribution in GaAs Semiconductors Using Phase-shifting Electron Holography	161
<i>H Sasaki, K Yamamoto, T Hirayama</i>	
Comparison of Experimental and Theoretical X-ray Intensities from (In)GaAs Specimens Investigated by Energy-dispersive X-ray Spectroscopy in a Transmission Electron Microscope	165
<i>T Walther</i>	
Theoretical and Experimental Factors Affecting Measurements of Semiconductor Mean Inner Potentials	169
<i>R S Pennington, J J Mortensen, T Kasama, C B Boothroyd, R E Dunin-Borkowski</i>	
Advantages of Low Beam Energies in a TEM for Valence EELS	173
<i>M Stöger-Pollach, P Pongratz</i>	
Through-focal HAADF-STEM of Buried Nanostructures	177
<i>M P Guerrero-Lebrero, J Pizarro, E Guerrero, P L Galindo, A Yáñez, S I Molina</i>	
Characterization of Core-shell GaAs/AlGaAs Nanowire Heterostructures Using Advanced Electron Microscopy	181
<i>M J Tambe, L F Allard, S Gradežak</i>	
MOCVD Growth Mechanisms of ZnO Nanorods	185
<i>G Perillat-Merceroz, P H Jouneau, G Feuillet, R Thierry, M Rosina, P Ferret</i>	
Quantitative Investigation of the Onset of Islanding in Strained Layer Epitaxy of InAs/GaAs by X-ray Mapping in STEM	189
<i>T Walther, M Hopkinson</i>	
Study of Annealed InAs/GaAs Quantum Dot Structures	193
<i>Y Qiu, Z Y Zhang, R A Hogg, A G Cullis, T Walther</i>	
TEM Studies of Multilayered In_{0.33}Ga_{0.67}As Quantum Dots	199
<i>D V Sridhara Rao, K Muraleedharan, R Balamuralikrishnan, R Muralidharan, T Srinivasan, D Banerjee</i>	
Study of InGaN/GaN Quantum Dot Systems by TEM Techniques and Photoluminescence Spectroscopy	203
<i>R J Kashtiban, U Bangert, B Sherliker, M P Halsall, A J Harvey</i>	
Structure and Luminescence of Sol-gel Synthesized Anatase Nanoparticles	207
<i>U Hörmann, U Kaiser, M Albrecht, J Geserick, N Hüsing</i>	
Ab Initio Based Atomic Scattering Amplitudes and {002} Electron Structure Factors of In_xGa_{1-x}As/GaAs Quantum Wells	213
<i>J T Titantah, D Lamoen, M Schowalter, A Rosenauer</i>	
Structure of an Incommensurate 90° Si Grain Boundary Resolved with the Help of a Cs-corrector for Illumination	219
<i>J L Rouviere, F Lançon, K Rousseau, D Caliste, P H Jouneau, F Fournel</i>	

SESSION E TO H

Structural Properties of Annealed SiO_x	223
<i>G Nicotra, C Bongiorno, M Miritello, F Priolo, C Spinella</i>	
Structural and Compositional Study of Erbium-doped Silicon Nanocrystals by HAADF, EELS and HRTEM Techniques in an Aberration Corrected STEM	229
<i>R J Kashtiban, U Bangert, I Crowe, M P Halsall, B Sherliker, A J Harvey, J Eccles, A P Knights, R Gwilliam, M Gass</i>	
STEM EDX Applications for Arsenic Dopant Mapping in Nanometer Scale Silicon Devices	233
<i>G Servanton, R Pantel, M Juhel, F Bertin</i>	
Ion Implantation Enhanced Formation of 3C-SiC Grains at the SiO₂/Si Interface After Annealing in CO Gas	237
<i>B Pécz, J Stoemenos, M Voelskow, W Skorupa, L Dobos, A Pongrácz, G Battistig</i>	
Electron Tomography of Gate-all-around Nanowire Transistors	241
<i>P D Cherns, F Lorut, C Dupré, K Tachi, D Cooper, A Chabli, T Ernst</i>	
Characterization of a FinFET 6T-SRAM Cell by Tomography	245
<i>O Richard, S Demuyck, A Veloso, P Van Marcke, H Bender</i>	
InAs/GaAs(001) Molecular Beam Epitaxial Growth in a Scanning Tunnelling Microscope	249
<i>F Bastiman, A G Cullis, M Hopkinson</i>	
Scanning Capacitance Microscopy Studies of GaN Grown by Epitaxial Layer Overgrowth	257
<i>R A Oliver, S E Bennett, J Sumner, M J Kappers, C J Humphreys</i>	
Observation of Dopant Profile of Transistors Using Scanning Nonlinear Dielectric Microscopy	261
<i>K Honda, K Ishikawa, Y Cho</i>	
Specimen Preparation for Off-axis Electron Holography Using Focused Ions, Energy Filters and Laser Beams	265
<i>D Cooper, B Aventurier, F Templier, A Chabli, P H Salles, G Benassayag</i>	
Focused Ion Beam Patterning to Dielectrophoretically Assemble Single Nanowire Based Devices	269
<i>V La Ferrara, B Alfano, E Massera, G Di Francia</i>	
Energy Filtered Scanning Electron Microscopy: Applications to Dopant Contrast	273
<i>C Rodenburg, M A E Jepson, B J Inkson, E Bosch, A K W Chee, C J Humphreys</i>	
Progress Towards Quantitative Dopant Profiling in the SEM	277
<i>K W A Chee, E G T Bosch, C J Humphreys</i>	
The Chemisorption of Oxygen and Its Effect on the Secondary Electron Emission from Doped Semiconductors	281
<i>F N Zaggout, C G H Walker, M M El Gomati</i>	
Characterization of Ytterbium Silicide Formed in Ultra High Vacuum	285
<i>A ?aszcz, J Ratajczak, A Czerwinski, J K?tcki, V Srot, F Phillipp, P A van Aken, D Yarekha, N Reckinger, G Larrieu, E Dubois</i>	
Chemical Analysis of Nickel Silicides with High Spatial Resolution by Combined EDS, EELS and ELNES	289
<i>E Verleysen, H Bender, D Schryvers, W Vandervorst</i>	
Evolution of the Interface Structure of Bonded Si Wafers After High Temperature Annealing	293
<i>N D Zakharov, E Pippel, P Werner, U Gösele, V Vdovin, M Milvidskii, M Ries, M Seacrist, R Falster</i>	
Evolution of Porous Silicon Crystal Structure During Storage in Ambient Air	297
<i>L M Sorokin, V V Ratnikov, A E Kalmykov, V I Sokolov</i>	
Ge Nanocrystals in Alumina Matrix: A Structural Study	301
<i>R J Kashtiban, S R C Pinto, U Bangert, A G Rolo, A Chahboun, M J M Gomes, A J Harvey</i>	
TEM Analysis of Ge-on-Si MOSFET Structures with HfO₂ Dielectric for High Performance PMOS Device Technology	305
<i>D J Norris, T Walther, A G Cullis, M Myronov, A Dobbie, T Whall, E H C Parker, D R Leadley, B De Jaeger, W Lee, M Meuris, J Watling, A Asenov</i>	
Off-axis Electron Holography of Si Semiconductors Prepared Using FIB Milling	309
<i>D Cooper, J-P Barnes, J-M Hartmann, F Bertin</i>	
Improved Accuracy in Nano Beam Electron Diffraction	313
<i>A Béché, L Clément, J-L Rouvière</i>	
Interpretation of Electron Beam Induced Charging of Oxide Layers in a Transistor Studied Using Electron Holography	317
<i>F Ubaldi, G Pozzi, T Kasama, M R McCartney, S B Newcomb, R E Dunin-Borkowski</i>	
Reliability Study on Green InGaN/GaN Light Emitting Diodes	321
<i>Z L Li, P T Lai, H W Choi</i>	
Temperature Dependence of Ga-assisted Oxide Desorption on GaAs(001)	325
<i>F Bastiman, R Hogg, M Skolnick, A G Cullis, M Hopkinson</i>	

The Impact of ScO_xN_y Interlayers on Unintentional Doping and Threading Dislocations in GaN	331
<i>T Zhu, M A Moram, D V Sridhara Rao, H Li, M J Kappers, R A Oliver</i>	
Progress Towards Site-specific Dopant Profiling in the Scanning Electron Microscope.....	335
<i>M A E Jepson, B J Inkson, R Beanland, A K W Chee, C J Humphreys, C Rodenburg</i>	
Site-selective Dopant Profiling of P-n Junction Specimens in the Dual-beam FIB/SEM System.....	339
<i>K W A Chee, R Beanland, P A Midgley, C J Humphreys</i>	
Monte Carlo Modelling of the Low-loss Electron Signal in Scanning Electron Microscopy and Comparison with the BSE Signal	343
<i>C Bonet, M M El-Gomati, J A D Matthew, S P Tear</i>	

Author Index