

## R. Beresford

1. Position                    Professor of Engineering

2. Home Address

3. Education

BS    Engineering and Applied Science, Yale University, 1979

MS    Engineering and Applied Science, Yale University, 1981

PhD   Electrical Engineering, Columbia University, 1990

Dissertation: *Band Structure Engineering for Electron Tunneling Devices*

4. Professional Appointments

1978:            Summer Student, Exploratory Magnetics, IBM T.J. Watson Research Center, Yorktown Heights NY

1979-1980:     Engineer, Exploratory Bipolar Devices and Circuits, IBM T.J. Watson Research Center, Yorktown Heights NY

1981-1983:     Solid State Editor, *Electronics*, McGraw-Hill, New York NY

1983-1987:     Editor-in-Chief, Senior Editor; *VLSI Design*, CMP Publications, Manhasset NY.

1987-1990:     Research and Teaching Assistant, Department of Electrical Engineering, Columbia University

1990-1996     Assistant Professor, Division of Engineering, Brown University

1996-2006     Associate Professor, Division of Engineering, Brown University

2006-            Professor, Division of Engineering, Brown University

5. Completed Publications

a. Books/monographs

1. Papers from the 15th North American Conference on Molecular Beam Epitaxy (R. Beresford, ed.), *J. Vac Sci. Technol. B*, **14** (1996).
2. *Quantum Theory of Light Solutions Manual* (for *The Quantum Theory of Light*, 3/e, by Rodney Loudon), Oxford University Press: 2008 ([oup.com/uk/](http://oup.com/uk/), web distribution only).

c. Refereed journal articles

1. High-Speed Split-Emitter I<sup>2</sup>L/MTL Memory Cell, S.K. Wiedmann, D.D. Tang, and R. Beresford, *IEEE J. Solid State Circuits* **16**, 429 (1981).
2. Resonant Tunneling in AlSb/InAs/AlSb Double-Barrier Heterostructures, L.F. Luo, R. Beresford, and W.I. Wang, *Appl. Phys. Lett.* **53**, 2320 (1988).

3. Negative Differential Resistance in AlGaSb/InAs Single-Barrier Heterostructures at Room Temperature, R. Beresford, L.F. Luo, and W.I. Wang, *Appl. Phys. Lett.* **54**, 1899 (1989).
4. Inelastic Tunneling in (111) Oriented AlAs/GaAs/AlAs Double-Barrier Heterostructures, L.F. Luo, R. Beresford, W.I. Wang, and E.E. Mendez, *Appl. Phys. Lett.* **54**, 2133 (1989).
5. Resonant Tunneling of Holes in AlSb/GaSb/AlSb Double-Barrier Heterostructures, R. Beresford, L.F. Luo, and W.L. Wang, *Appl. Phys. Lett.* **55**, 694 (1989).
6. Heterojunction Field-Effect Transistors Based on AlGaSb/InAs, L.F. Luo, R. Beresford, W.I. Wang, and H. Munekata, *Appl. Phys. Lett.* **55**, 789 (1989).
7. Resonant Tunneling through X-Valley States in GaAs/AlAs/GaAs Single-Barrier Heterostructures, R. Beresford, L.F. Luo, W.I. Wang, and E.E. Mendez, *Appl. Phys. Lett.* **55**, 1555 (1989).
8. Band Structure Engineering for Electron Tunneling in Heterostructures, R. Beresford, L.F. Luo, and W.I. Wang, *IEEE Trans. on Electron Devices* **36**, 2618 (1989).
9. Interband Tunneling in Polytype Heterostructures, L.F. Luo, R. Beresford, and W.I. Wang, *Appl. Phys. Lett.* **55**, 2023 (1989).
10. Polytype Heterostructures for Electron Tunneling Devices, R. Beresford, L.F. Luo, K. Longenbach, and W.I. Wang, *Digest of Technical Papers, 1989 International Electron Devices Meeting*, Washington D.C., December 3-6, 1989.
11. Magnetoresistance Measurements of Doping Symmetry and Strain Effects in GaSb/AlSb Quantum Wells, W. Hansen, T.P. Smith III, J. Piao, R. Beresford, and W.I. Wang, *Appl. Phys. Lett.* **56**, 81 (1990).
12. Interband Resonant Tunneling through a 110-mn InAs Quantum Well, R. Beresford, L.F. Luo, and W.I. Wang, *Appl. Phys. Lett.* **56**, 551 (1990).
13. Resonant Interband Tunneling Device with Multiple Negative Differential Resistance Regions, R. Beresford, L.F. Luo, K.F. Longenbach, and W.I. Wang, *Electron Device Lett.* **11**, 110 (1990).
14. Interband Tunneling through Single-Barrier InAs/AlSb/GaSb Heterostructures, R. Beresford, L.F. Luo, K.F. Longenbach, and W.I. Wang, *Appl. Phys. Lett.* **56**, 952 (1990).
15. MBE Growth of Metastable Ge-Sn Alloys, J. Piao, R. Beresford, W.I. Wang, and H. Homma, *J. Vac. Sci. Technol. B* **8**, 221 (1990).

16. Surface Structures of the (Al, Ga)Sb System, J. Piao, R. Beresford, and W.I. Wang, *J. Vac. Sci. Technol. B* **8**, 276 (1990).
17. Narrow Gap InAs for Heterostructure Tunneling, R. Beresford, L.F. Luo, and W.I. Wang, *Semiconductor Science and Technology* **5**, 195 (1990).
18. Application of Dual-Gate and Split-Gate Field-Effect Transistor Designs to InAs Field Effect Transistors, K.F. Longenbach, R. Beresford, and W.I. Wang, *Solid State Electronics* **33**, 1211 (1990).
19. Optically Induced Variability of the Strain Induced Electric Fields in (111) GaSb/AlSb Quantum Wells, B.V. Shanabrook, D. Gammon, R. Beresford, W.I. Wang, R.P. Leavitt, and D.A. Broido, *Superlatt. Microstruct.* **7**, 363 (1990).
20. A Complementary Heterostructure Field-Effect Transistor Technology Based on InAs/AlSb/GaSb, K.F. Longenbach, R. Beresford, and W.I. Wang, *IEEE Trans. on Electron Devices* **37**, 2265 (1990).
21. Resonant Interband Coupling in Single-Barrier Heterostructures of InAs/GaSb/InAs and GaSb/InAs/GaSb, L.F. Luo, R. Beresford, and W.I. Wang, *J. Appl. Phys.* **68**, 2854 (1990).
22. Analytical Approximations for the Fermi Energy of an Ideal Fermi Gas Obeying a Nonparabolic Dispersion Relation, R. Beresford, *J. Appl. Phys.* **70**, 5156 (1991).
23. Statistical Properties of an Ideal Nonparabolic: Fermi Gas, R. Beresford, *J. Appl. Phys.* **70**, 6834 (1991).
24. Effects of Nonparabolicity on Collective Intersubband Excitations, G. Brozak, B.V. Shanabrook, D. Gammon, D.A. Broido, R. Beresford, and W.I. Wang, *Phys. Rev. B* **45**, 11399 (1992).
25. Intersubband Transitions in Piezoelectric Superlattices, G. Brozak, B.V. Shanabrook, D. Gammon, D.A. Broido, R. Beresford, and W.I. Wang, *Surf. Sci.* **267**, 120 (1992).
26. Exact Eigenfunctions of a Two-Band Semiconductor in a Uniform Electric Field, R. Beresford, *Semiconductor Sci. and Technol.* **8**, 1957 (1993).
27. Growing GaN by Plasma-Assisted Molecular Beam Epitaxy, R. Beresford, *Minerals, Metals, and Materials Soc.* **46**, 54 (1994).
28. Growth of Group III Nitrides on Si (111) by Plasma-Assisted Molecular Beam Epitaxy, K.S. Stevens, A. Ohtani, A.F. Schwartzman, and R. Beresford, *J. Vac. Sci. Technol. B* **12**, 1186 (1994).

29. Growth and Characterization of GaN on Si (111), A. Ohtani, K.S. Stevens, and R. Beresford, *Proc. Mater. Res. Soc.* **339**, 471 (1994).
30. Envelope Functions for a Three-Band Semiconductor in a Uniform Electric Field, R. Beresford, *Phys. Rev. B* **49**, 13663 (1994).
31. Microstructure and Photoluminescence of GaN Grown on Si (111) by Plasma-Assisted Molecular Beam Epitaxy, A. Ohtani, K.S. Stevens, and R. Beresford, *Appl. Phys. Lett.* **65**, 61 (1994).
32. Microstructure of AlN on Si (111) Grown by Plasma-Assisted Molecular Beam Epitaxy, K.S. Stevens, A. Ohtani, M. Kinniburgh, and R. Beresford, *Appl. Phys. Lett.* **65**, 321 (1994).
33. Analysis and Optimization of the Electron Cyclotron Resonance Plasma for Nitride Epitaxy, A. Ohtani, K.S. Stevens, M. Kinniburgh, and R. Beresford, *J. Cryst. Growth.* **150**, 902 (1995).
34. Influence of Substrate Electrical Bias on the Growth of GaN in Plasma-Assisted Epitaxy, R. Beresford, A. Ohtani, K.S. Stevens, and M. Kinniburgh, *J. Vac. Sci. Technol. B* **13**, 792 (1995).
35. Demonstration of a Silicon Field-Effect Transistor Using AlN as the Gate Dielectric, K.S. Stevens, M. Kinniburgh, A. Ohtani, A.F. Schwartzman, and R. Beresford, *Appl. Phys. Lett.* **66**, 3179 (1995).
36. Photoconductive Ultraviolet Sensor Using Mg-Doped GaN on Si(111), K.S. Stevens, M. Kinniburgh, and R. Beresford, *Appl. Phys. Lett.* **66**, 3518 (1995).
37. Optical and Electrical Characterization of GaN Layers Grown on Silicon and Sapphire Substrates, M.A. Sanchez-Garcia, F.J. Sanchez, F. Calle, E. Munoz, E. Calleja, K.S. Stevens, M. Kinniburgh, R. Beresford, and P. Gibart, *Solid State Electronics* **40**, 81 (1996).
38. Downstream Ion Drift in an Electron Cyclotron Resonance Plasma Process, R. Beresford, *J. Appl. Phys.* **79**, 1292 (1996).
39. Problems and Prospects in the Analysis of Epitaxial Growth of the Wide Bandgap Group III Nitrides, R. Beresford, *Computational Mater. Sci.* **6**, 113 (1996).
40. Epitaxial Growth of GaN on Lattice-Matched Hafnium. Substrates, R. Beresford, K.S. Stevens, C. Briant, R. Bai, and D.C. Paine, *Proc. Mater. Res. Soc.* **395**, 55 (1996).
41. Group IV-B Refractory Metal Crystals as Lattice-Matched Substrates for Growth of the Group III Nitrides by Plasma-Source Molecular Beam Epitaxy, R. Beresford, D.C. Paine, and C.L. Briant, *J. Cryst. Growth* **178**, 189 (1997).

42. Feasibility of the Synthesis of AlAsN and GaAsN Films by Plasma-Source Molecular Beam Epitaxy, G. Mendoza-Diaz, K.S. Stevens, A.F. Schwartzman, and R. Beresford, *J. Cryst. Growth* **178**, 45 (1997).
43. High Growth Rate (0.8  $\mu\text{m/hr}$ ) of GaN in Plasma-Source Molecular Beam Epitaxy, R. Beresford, K.S. Stevens, Q. Cui, and H. Cheng, *Proc. Mater. Res. Soc.* 449, 361 (1997).
44. Exciton and Donor-Acceptor Recombination in Undoped GaN on Si(111), F. Calle, F.J. Sanchez, J.M.G. Tijero, M.A. Sanchez-Garcia, E. Calleja, and R. Beresford, *Semicond. Sci. Technol.* **12**, 1396 (1997).
45. The Effect of the III/V Ratio and Substrate Temperature on the Morphology and Properties of GaN- and AlN-Layers Grown by Molecular Beam Epitaxy on Si(111), M.A. Sanchez-Garcia, E. Calleja, E. Monroy, F.J. Sanchez, F. Calle, E. Munoz, and R. Beresford, *J. Cryst. Growth* **183**, 23 (1998).
46. Investigation of the Annealing Texture Evolution in Hafnium, R. Bai, C.L. Briant, D.C. Paine, and J.R. Beresford, *Metallurgical and Mat. Trans. A* **29**, 757 (1998).
47. Microstructure and Composition of InAsN Alloys Grown by Plasma-Source Molecular Beam Epitaxy, R. Beresford, K.S. Stevens, and A.F. Schwartzman, *J. Vac. Sci. Technol. B* **16**, 1293 (1998).
48. A Study of Low Temperature Crystallization of Amorphous Thin Film Indium Tin Oxide, D.C. Paine, T. Whitson, D. Janiac, R. Beresford, C. Ow-Yang, and B. Lewis, *J. Appl. Phys.* **85**, 8445 (1999).
49. Real-Time Measurements of Stress Relaxation in InGaAs/GaAs, R. Beresford, J. Yin, K. Tetz, and E. Chason, *J. Vac. Sci. Technol. B* **18**, 1431 (2000).
50. Metastability of InGaAs/GaAs Probed by *In Situ* Optical Stress Sensor, R. Beresford, K. Tetz, J. Yin, E. Chason, and M.U. González, *J. Vac. Sci. Technol. B* **19**, 1572 (2001).
51. Intrinsic Stress Evolution in Aluminum Nitride Thin Films and the Influence of Multistep Processing, A. Rajamani, R. Beresford, and B.W. Sheldon, *Appl. Phys. Lett.* **79**, 3776 (2001).
52. Dislocation Structure and Relaxation Kinetics in InGaAs/GaAs Heteroepitaxy, C. Lynch, E. Chason, R. Beresford, E.B. Chen, and D.C. Paine, *J. Vac. Sci. Technol. B* **20**, 1247 (2002).
53. Kinetics of Dislocation-Mediated Strain Relaxation in InGaAs/GaAs Heteroepitaxy, R. Beresford, C. Lynch, and E. Chason, *J. Crystal Growth* **251**, 106 (2003).

54. Intrinsic Compressive Stress in Polycrystalline Films with Negligible Grain Boundary Diffusion, B.W. Sheldon, A. Ditkowski, R. Beresford, E. Chason, and J. Rankin, *J. Appl. Phys.* **94**, 948 (2003).
55. Nanoheteroepitaxy of GaN on a Nanopore Array Si Surface, J. Liang, S.-K. Hong, N. Kouklin, R. Beresford, and J. M. Xu, *Appl. Phys. Lett.* **83**, 1752 (2003).
56. Analysis of the Thin-Oxide Growth Kinetic Equation, R. Beresford, *Semicond. Sci. Technol.* **18**, 973 (2003).
57. Influence of Growth Flux and Surface Superaturation on InGaAs/GaAs Strain Relaxation, C. Lynch, E. Chason, R. Beresford, and S.K. Hong, *Appl. Phys. Lett.* **84** 1085 (2004).
58. Real-Time Stress Evolution during Growth of In<sub>x</sub>Al<sub>1-x</sub>As/GaAs Metamorphic Buffer Layers, C. Lynch, R. Beresford, and E. Chason, *J. Vac. Sci. Technol. B* **22**, 1539 (2004).
59. Full-Zone *kp* Method of Band Structure Calculation for Wurtzite Semiconductors, R. Beresford, *J. Appl. Phys.* **95**, 6216 (2004).
60. A Growth Pathway for Highly Ordered Quantum Dot Arrays, J. Liang, H. Luo, R. Beresford, and J.M. Xu, *Appl. Phys. Lett.* **85**, 5974 (2004).
61. Competition Between Tensile and Compressive Stress Mechanisms during Volmer-Weber Growth of Aluminum Nitride Films, B.W. Sheldon, A. Rajamani, A. Bhandari, E. Chason, S.K. Hong, and R. Beresford, *J. Appl. Phys.* **98**, 043509 (2005).
62. Enhanced Strain Relaxation Rate of InGaAs by Adatom-Assisted Dislocation Kink Nucleation, C. Lynch, E. Chason, and R. Beresford, *J. Vac. Sci. Technol. B* **23**, 1166 (2005).
63. Response to "Comment on 'A growth pathway for highly ordered quantum dot arrays' " [*Appl. Phys. Lett.* **86**, 206101 (2005)] , R. Beresford and J. M. Xu, *Appl. Phys. Lett.* **86**, 206102 (2005).
64. Limits of Strain Relaxation in InGaAs/GaAs Probed in Real Time by In Situ Wafer Curvature Measurement, C. Lynch, E. Chason, R. Beresford, L.B. Freund, K. Tetz, and K.W. Schwarz, *J. Appl. Phys.* **98**, 073532 (2005).
65. Carbon Nanotube Gated Lateral Resonant Tunneling Field-Effect Transistors, D.P. Wang, B.R. Perkins, A.J. Yin, A. Zaslavsky, J.M. Xu, R. Beresford, and G. L. Snider, *Appl. Phys. Lett.* **87**, 152102 (2005).

66. Growth of Highly Ordered Relaxed InAs/GaAs Quantum Dots on Non-lithographically Patterned Substrates by Molecular Beam Epitaxy, W. Guo, R.S. Guico, R. Beresford, and J.M. Xu, *J. Crystal Growth* **287**, 509 (2006).
67. Mobile Dislocation Density and Strain Relaxation Rate Evolution During  $\text{In}_x\text{Ga}_{1-x}\text{As}/\text{GaAs}$  Heteroepitaxy, C. Lynch, E. Chason, and R. Beresford, *J. Appl. Phys.* **100**, 013525 (2006).
68. Microfluidic Three-Electrode Cell Array for Low-Current Electrochemical Detection, N. Triroj, M.A. Lapierre-Devlin, S.O. Kelley, and R. Beresford, *IEEE Sensors Journal* **6**, 1395 (2006).
69. High-Mobility Amorphous  $\text{In}_2\text{O}_3$ -10 wt % ZnO Thin Film Transistors, B. Yaglioglu, H. Y. Yeom, R. Beresford, and D. C. Paine, *Appl. Phys. Lett.* **89**, 062103 (2006).
70. Conserved Flux in Interband Tunneling, R. Beresford, *Solid State Electronics* **51**, 136 (2007).
71. Characterization of Metamorphic  $\text{In}_x\text{Al}_{1-x}\text{As}/\text{GaAs}$  Buffer Layers Using Reciprocal Space Mapping, D. Lee, M.S. Park, Z. Tang, H. Luo, R. Beresford, and C.R. Wie, *J. Appl. Phys.* **101**, 063523 (2007).
72. Kinetic Monte Carlo Simulation of InAs Quantum Dot Growth on Nonlithographically Patterned Substrates, W. Guo, R. S. Guico, J. M. Xu, and R. Beresford, *J. Vac. Sci. Technol. B* **25**, 1072 (2007).
73. Fabrication and optical characterization of highly ordered InAs/GaAs quantum dots on nonlithographically patterned substrates, R.S. Guico, M. Tzolov, W. Guo, S.G. Cloutier, R. Beresford, and J. Xu, *J. Vac. Sci. Technol. B* **25**, 1093 (2007).

g. Invited lectures

Texas Instruments, November 1989  
 Rockwell International Science Center, December 1989  
 IBM T.J. Watson Research Center, December 1989  
 Phillips Laboratories, December 1989

Brown University, February 1990  
 Boston University, March 1990

Conference on Crystal Growth and Epitaxy, June 1995  
 Lawrence Berkeley Laboratory, June 1995  
 Xerox Palo Alto Research Center, June 1995  
 University of California at Santa Barbara, June 1995

Hughes Electronics Research Laboratories, June 1995  
Massachusetts Institute of Technology, November 1995

Purdue University, January 1996  
Polytechnic University of Madrid, November 1996

Future Trends in Microelectronics Workshop, Les Embiez, France, June 1998

U.S. Army Research Laboratory, February 2000

International Symposium on Compound Semiconductors, August 2003  
State University of New York, Buffalo, October 2003

Brown University, Showcase of Nanomedicine, June 2006

Brown University, Sarah Doyle Women's Center "Cliff Notes," March 2007

#### h. Papers read

International Conference on Narrow-Gap Semiconductors, June 1989  
Device Research Conference, June 1989  
International Electron Devices Meeting, December 1989

Scottish Universities Summer School in Physics, August 1991

New England MBE Workshop, May 1993  
North American Molecular-Beam Epitaxy Conference, September 1993

Workshop on Compound Semiconductor Materials and Devices, February 1994  
Connecticut Microelectronics and Optoelectronics Symposium, March 1994  
Materials Research Society Spring Meeting, April 1994  
Device Research Conference, June 1994  
International Conference on Molecular Beam Epitaxy, August 1994  
North American Conference on Molecular Beam Epitaxy, October 1994  
Workshop on Wide Bandgap Nitrides, October 1994  
Materials Research Society Fall Meeting, November 1994

Connecticut Microelectronics and Optoelectronics Symposium, March 1995  
European Workshop on Molecular Beam Epitaxy, March 1995  
Electronic Materials Conference, June 1995  
International Conference on Modulated Semiconductor Structures, July 1995  
Workshop on III-V Nitrides, September 1995  
North American Conference on Molecular Beam Epitaxy, September 1995  
Materials Research Society Fall Meeting, November 1995

New England MBE Workshop, May 1996  
Materials Research Society Fall Meeting, November 1996

North American Conference on Molecular Beam Epitaxy, October 1997

North American Conference on Molecular Beam Epitaxy, October 1999  
Materials Research Society Fall Meeting, November 1999

North American Conference on Molecular Beam Epitaxy, October 2000

North American Conference on Molecular Beam Epitaxy, October 2001

International Conference on Molecular Beam Epitaxy, September 2002

IEEE Nano, August 2003  
North American Conference on Molecular Beam Epitaxy, September 2003  
Materials Research Society Fall Meeting, November 2003

Gordon Research Conference — Nanostructure Fabrication, July 2004  
North American Conference on Molecular Beam Epitaxy, October 2004  
Materials Research Society Fall Meeting, November 2004

Materials Research Society Spring Meeting, March 2005  
American Conference on Crystal Growth and Epitaxy, July 2005  
Materials Research Society Fall Meeting, November 2005

Gordon Research Conference — MEMS Technology and Biomedical Applications,  
June 2006  
North American Conference on Molecular Beam Epitaxy, October 2006

International Conference on Crystal Growth, August 2007  
North American Conference on Molecular Beam Epitaxy, September 2007  
NSF Grantees Conference, Nanoscale Interdisciplinary Research Teams, December  
2007

## 6. Research grants

### a. Current grants

AFOSR MURI, “Direct Nanoscale Conversion of Biomolecular Signals into Electronic Information” (2003– ), co-PI, total award \$5,609,969

NSF MRSEC, “Micro- and Nano-Mechanics of Electronic and Structural Materials” (2005– ), co-PI, total award \$9,360,000.

NSF, “NER: Nanoscale Sensing and Control of Biological Processes” (2006–2007), \$128,300.

b. Completed grants

NSF Research Equipment Grant, "Electron Beam Lithography" (1992), PI, \$40,000.

NSF, "Ultrafast Spectroscopy of Nanostructures" (1992-93), co-PI portion \$51,840.

NSF Academic Infrastructures Program, "Renovation and Enhancement of the Microelectronics Facility" (1992-94), PI, \$320,872.

NSF Research Equipment Grant, "Epitaxial Regrowth" (1995), co-PI, total award \$125,000.

Texas Instruments Research Contract, "Group III Arsenide/Nitride Alloys" (1995-96), PI, \$122,373.

NSF MRSEC "Micro- and Nano-Mechanics of Materials" (1996-2001), co-PI, total award \$5,376,000.

NSF MRSEC, "Micro- and Nano-Mechanics of Electronic and Structural Materials" (2000-2005), co-PI, total award \$7,100,000.

c. Proposals submitted

NSF, "Multiplexed Array Nanoelectronic Imaging of Redox Enzymes in Biological Systems," (submitted 2007), \$346,490.

NSF MRI: "Acquisition of a Dual Focused Ion/electron Beam (FIB) imaging and Nano-fabrication Tool," co-PI (submitted 2008).

7. Service

(i) to the University

Engineering Progress Review Committee, 1990-1995, 1997-98

Departmental Liaison to Sciences Library, 1991-92

IEEE Student Chapter Faculty Advisor, 1991-1996

Freshman / Sophomore Advisor, 1992-93, 1994-1996, 1997-98, 1999-2001, 2002-03, 2004-2007

Electrical Engineering Concentration Advisor, 1992-1997, 2007-08

Tau Beta Pi Faculty Advisor, 1991-1996

Laboratory Safety Committee, 1995-2000

Engineering Laboratory Safety Subcommittee, 1997-2000

Advisory Committee on Summer Studies, 1995-1998

Faculty Assistant to the Dean of the Faculty, 1997

College Curriculum Council, 1998-2001

Director of Undergraduate Programs in Engineering, 1998-2001

Electrical Sciences Representative to Engineering Executive Committee, 1998-2001

Division of Engineering ABET Coordinator, 2001-2003

Division of Engineering Affirmative Action Representative, 2004-2007

(ii) to the profession

Member, American Physical Society, 1990

Proceedings Editor, 15th North American Conference on Molecular-Beam Epitaxy

Reviewer, *J. Appl. Phys.*, *J. Vac. Sci. Technol. B*, *Mater. Res. Soc.*, *Appl. Phys. Lett.*,  
*Electron Device Lett.*, *J. Crystal Growth*, *Solid State Electronics*, *J. Phys. Chem.*  
Organizer, 1996 New England MBE Workshop  
NSF Review Panel, Research Equipment Grants, 1997  
NSF Review Panel, Electronic and Photonic Devices and Technology, 2006, 2007  
NSF Undergraduate Faculty Enhancement Program, 2000  
Chair, 20th North American Conference on Molecular Beam Epitaxy, 2001  
Advisory Board, North American Conference on Molecular Beam Epitaxy, 2001–2007  
Program Committee, International MBE Conference, 2002, 2008  
Program Committee, North American Conference on Molecular Beam Epitaxy, 2003  
NSF Workshop, Control and System Integration of Micro- and Nano-Scale Systems,  
2004  
Session Organizer, American Conference on Crystal Growth and Epitaxy, 2005

(iii) to the community

Nayatt Elementary School Strategic Planning Committee, 1996  
Science Advisor to the East Bay Educational Collaborative, 1996-2000  
RI Diabetes 100K Bike-a-Thon, 1998  
MRSEC Teacher Training Institute, 2001, 2005  
MRSEC Research Experience for Teachers, 2004  
Providence Tree Tally volunteer, 2005  
Rhode Island Blood Center donor, 2006-2008

## 8. Honors and awards

Tau Beta Pi (1978)  
Sheffield Fellowship (Yale University, 1980–81)  
Office of Naval Research Fellowship (Columbia University, 1987–90)  
Sigma Xi (1991)  
BBV Foundation Chair (Visiting Professor, Polytechnic University of Madrid, 1996)  
Institute of Electrical and Electronics Engineers, Senior Member (2002)

## 9. Teaching

Prior to 2004: PhD and ScM graduates

Kevin Scott Stevens, Akira Ohtani, Miguel Angel Sanchez-Garcia,  
Morgan John Kinniburgh, Guadalupe Mendoza-Diaz, Jingjiang Yin

ScB projects

Valerie Fowler, Pete Carpenter, Ben Dodge, Scott Johnston, Lili Kudo,  
Dan Goldwater, Matt Silvia, Sam Blackman, David Goldberg, Jaya  
Kanajan, Kevin Tetz, Emily Nelson, Shelley Vanderweil, James  
Hayward, Joniqua Howard, Kom Promsuttikul, Landon Haywood, Rob  
Broesler

2004-2005    EN51 Electricity and Magnetism (69)

- EN168 Design of Semiconductor Devices (9)  
2 graduate independent study projects
- 2005-2006 EN51 Electricity and Magnetism (83)  
EN292S29 Nanoelectronics (7)  
2 graduate independent study projects  
2 undergraduate independent study projects (Newton Ikhariale, David Meisner)
- 2006-2007 EN51 Electricity and Magnetism (78)  
EN168 Design of Semiconductor Devices (7)  
EN260 Electronic Processes in Semiconductors (5)  
2 graduate independent study projects  
1 undergraduate research project (Michael Mak, 2 semesters)
- Summer 2007 REU and UTRA supervisor (Ryan Mott, Andres Jaramillo)
- 2007-2008 ENGN1590 (11)  
ENGN2610  
2 graduate independent study projects  
1 undergraduate independent study project (Ryan Mott)

Date of Preparation: January 17, 2008