

James Robert Anderson

Professor of Physics

I. Education:

Ph.D. Iowa State University, 1965

II. Experience in Higher Education:

Jan. 2002,      Visiting Professor, National Institute for Materials Science (Formerly  
2000, & 98      National Research Institute for Metals) Tsukuba, Japan  
Feb. 1999      Visiting Professor, Kuwait University

2002 - 1996    Visiting Professor, Institute of Physics, Polish Academy of Sciences, Warsaw,  
Poland  
& 92  
(Summers)

Jan. 1999      Visiting Professor, Institute for Materials Research, Sendai, Japan  
1994-1995      Visiting Professor, Research Institute for Scientific Measurements, Tohoku  
University, Sendai, Japan

1994            Visiting Professor, Institute for Materials Research, Tohoku University, Sendai,  
Japan

1990            Visiting Professor, Institute of High Pressure Physics, Moscow, USSR  
(Summer)

1988            Visiting Professor, Institute for Materials Research, Tohoku University, Sendai,  
Japan

1984            Visiting Professor, Institute of Physics, Polish Academy of Sciences, Warsaw,  
Poland

1977-present    Professor, University of Maryland

1971-1977      Associate Professor, University of Maryland

III. Honors and Awards since 1984:

National Academy of Sciences Exchange Fellowship, 1984

IREX Exchange Fellowship, 1984-1985

University of Maryland General Research Board Grant, Fall 1986

University of Maryland International Travel Grant, 1990 and 1994

Invited Lecturer at Brazilian Summer School on Semiconductor Physics, July 1993

Invited Lecturer at Polish Summer School on Condensed Matter Physics, July 1997, 1998, & 1999

Invited Lecturer at National Research Institute for Metals, Tsukuba, Japan, January 1998 & 2000

IV. Professional Service activities from 1994:

Chairman of the Symposium on Cluster and Nanoscale Interfaces, 24-26 October 2001.  
 Member of the Evaluation Panel for the American Society for Engineering Education  
 Evaluator of the Physics Department of Kuwait University, February 1999  
 Advisory Board of the International Consortium for Nanoscale Materials, 1992 to the present.  
 Director of the International Consortium for Nanoscale Materials, 2000 to the present.  
 Organizing Committee for International Symposium on Science and Technology of Atomically  
 Engineered Materials, held in Richmond, Virginia, from 30 October to 4 November 1995.  
 International Advisory Board for the International Conference on Nano-Clusters and Granular  
 Materials, Sendai, Japan, Sept. 95.  
 Organizing Committee for the International Symposium on Cluster and Nanostructure Interfaces,  
 25-28 October 1999.  
 Member of the Advisory Committee for the International Conference on the "Science and  
 Technology of Nanostructured Materials", Puri, India, 4-8 January 2001.

Editorial Advisory Board of **Materials Science Forum**

General Judge of Prince George's County Science Fair, 1992-1994, 1997-2002.

#### V. Papers Published - Physics Research since 1992:

1. Photoreflectance Characterization of the Internal Electric Fields across the n-Type GaAs/Substrate Homojunction and across the GaAs/Al<sub>0.3</sub>Ga<sub>0.7</sub>As Heterojunctions in MBE-Grown Materials, with C.R. Lu, *Key Engineering Materials* **65**, 177-182 (1992).
2. Anomalous Temperature Dependence of Excitons in the Diluted Magnetic Semiconductor Cd<sub>1-x</sub>Mn<sub>x</sub>Se under High Magnetic Fields, with I. Mogi, T. Kokubun, G. Kido, Y. Nakagawa, M. Górska, and W. Girit, *Physica* **B177**, 457 (1992).
3. Far Infrared Electron spin Resonance of Cd<sub>1-x</sub>Co<sub>x</sub>Se in High Magnetic Fields, with N. Adachi, G. Kido, Y. Nakagawa, Y. Oka, M. Górska, and W. Girit, *Physica* **B177**, 453 (1992).
4. Exchange Interaction in Rare-Earth-Doped IV-VI Diluted Magnetic Semiconductors, with M. Górska, G. Kido, S.M. Green, and Z. Golacki, *Phys. Rev.* **B45**, 11702 (1992).
5. Influence of Localization on the Hall Effect in Narrow-Gap Bulk Semiconductors, with R. G. Mani, *Springer Series in Solid State Sciences*, Vol. **101**; *High Magnetic Fields in Semiconductor Physics III*, (Ed. G. Landwehr, Springer-Verlag, Berlin-Heidelberg), 1992.
6. Magnetization and Susceptibility of Cd<sub>1-x</sub>Co<sub>x</sub>Se, with M. Górska, S.M. Green, G. Kido, and W. Girit, *Acta Physica Polonica* **A92**, 753 (1992).
7. High Field Magneto-Luminescence in Cd<sub>0.9</sub>Mn<sub>0.1</sub>Se under High Pressures at 4.2 K, with Yasuhiro Matsuda, Noritka Kuroda, and Iwao Mogi, *Jpn. J. Appl. Phys.* **32**, Suppl. 32-1, 270-272 (1993).
8. High-Field Magnetization Processes in Diluted Magnetic Semiconductors, with M. Górska, G. Kido, N. Adachi, and W. Girit, *Sci. Rep. RITU*, **A-vol. 38**, 257-260 (1993)-(invited).
9. Magnetic Susceptibility of Sn<sub>1-x</sub>Eu<sub>x</sub>Te, with M. Górska, J.L. Peng, and Z. Golacki, *Acta Phys. Pol.* **A84**, 665-668 (1993).
10. Spatial Correlations and Quasi-Periodicity of Charged Impurities, *Braz. Jour. Phys.* **24**, 355-362 (1994)-(invited).
11. High-Field Magneto-optics of Diluted Magnetic Semiconductors, with I. Mogi, N. Adachi, T. Kokubun, and G. Kido, *Sci. Rep. RITU* **A-vol. 38-2**, 261-266 (1994).
12. Magnetization and Susceptibility of Sn<sub>1-x</sub>Eu<sub>x</sub>Te:EuTe, with M. Górska, J.L. Peng, and Z. Golacki, *Jour. Phys. Chem. Solids* **56**, 1253-1258 (1995).

13. High-field Magnetization of  $\text{Sn}_{1-x}\text{Eu}_x\text{Te}$ , with M. Górska, Y. Oka, J.Y. Jen, I. Mogi, and Z. Golacki, *Solid State Comm.* **96**, 11-15 (1995).
14. Effect of Simultaneous Electric and Magnetic Fields on a GaAs/AlGaAs Superlattice Miniband Probed by Intersubband Electron Transitions, with A.C. Goldberg, J.W. Little, and W.A. Beck, *Physica B* **216**, 372-375 (1996).
15. Magnetization Studies of  $\text{Sn}_{1-x}\text{Eu}_x\text{Te}$ . with M. Górska, Y. Oka, J. Y. Jen, I. Mogi, and Z. Golacki, *Physica* **B216**, 307-309 (1996).
16. Study of the Internal Electric Fields across the Interfaces in the GaAs/(Al,Ga)As Microstructures, with C.R. Lu, C.L. Chang, C.H. Liou, D.R. Stone, and R.A. Wilson, *Appl. Surf. Sci.* **92**, 404 (1996).
17. Photoreflectance Study of GaAs/Al<sub>0.3</sub>Ga<sub>0.7</sub>As Resonant Asymmetric Double Quantum Wells with Si  $\delta$ -doping in Side Barriers, *Appl. Surf. Sci.* **92**, 543 (1996).
18. Stimulated Blue Emission Processes in  $\text{Zn}_{1-x}\text{Cd}_x\text{Se}/\text{ZnSe}$  Multi-Quantum Wells, *Appl. Surf. Sci.* **92**, 547 (1996).
19. Photoluminescence of Heavily Doped GaAs/AlGaAs Quantum Wells in High Magnetic Fields, with M. Górska, Y. Oka, J.Y. Jen, I. Mogi, and C.E.C. Wood, *Materials Science and Engineering A* **217-218**, 184-188 (1996).
20. Magnetization Studies of  $\text{Sn}_{1-x}\text{Eu}_x\text{Te}$ , with M. Górska, *Physica* **B21**, 307 (1996).
21. Concentration Dependence of the Exchange Interaction in  $\text{Pb}_{1-x}\text{Eu}_x\text{Te}$ , with M. Górska, J.L. Peng, Y. Oka, J. Y-Jen, I. Mogi, D. Ravot, and Z. Golacki, *Phys. Rev.* **B 55**, 4400 (1997).
22. Magnetic Field Induced Exciton Confinement in Heavily Doped GaAs/Al<sub>x</sub>Ga<sub>1-x</sub>As Quantum Wells, with Jen-Y Jen, Yasuo Oka, Malgorzata Górska, and Iwao Mogi, in **High Magnetic Fields in the Physics of Semiconductors II**, vol. 2 (Ed. by G. Landwehr and W. Ossau, World Scientific, Singapore), p. 553 (1997).
23. Exciton Confinement in III-V Quantum Well Structures: Role of Magnetic Fields", with M. Górska, J. Kossut, J. Jen, I. Mogi, and Y. Oka, in **Novel Materials Design and Properties**, (Ed. B.K. Rao and S.N. Behera, Nova Science Publishers, Inc., New York), p. 261 (1998).
24. High-Field Magnetization of  $\text{Sn}_{1-x}\text{Gd}_x\text{Te}$ , with M. Górska, C. Wolters, and A. Lusakowski, *Acta Phys. Pol.* **A94**, 347 (1998).
25. Magnetization of  $\text{Sn}_{1-x}\text{Gd}_x\text{Te}$  at mK Temperatures, with M. Górska, C. Wolters, A. Lusakowski, and T. Story, *Physical Phenomena at High Magnetic Fields III*, (Ed. By Zachary Fisk, Lev Gor'kov, and Robert Schrieffer, World Scientific, Singapore), p. 507 (1999).
26. Anisotropic Magnetization Process in  $\text{Cd}_{1-x}\text{Co}_x\text{Se}$  in High Magnetic Fields, with N. Kuroda, G. Kido, and W. Girit, *Jour. Magnetism and Magnetic Mat.* - to be published.
27. Photoreflectance and Electroreflectance Characterization of Surface Fermi Levels in n- and p-type InP, with A. Niwa, T. Kurayama, and M. Sakai, *Jour. Phys. Soc. Japan* - to be published.
28. High Field Magnetization of  $\text{Sn}_{1-x}\text{Gd}_x\text{Te}$ , with M. Górska, C. Wolters, A. Lusakowski, T. Story, and Z. Golacki, *Physical Phenomena at High Magnetic Fields III*, (Ed. By Zachary Fisk, Lev Gor'kov, and Robert Schrieffer, World Scientific, Singapore), p. 541 (1999).
29. Beyond Moore's Law: Quantum Computing with rf SQUIDS, with A. J. Dragt, C. Lobb, F. C. Wellstood, M. Gubrud, M. Ejrnaes, M. Gorska, and T. Rusin, in **Clusters and Nanostructure Interfaces**, Edited by P. Jena, S. N. Khanna, and B. K. Rao, World Scientific Publishing Co. Pte. Ltd., Singapore, p. 241 (2000).
30. Design for Effective Thermalization of Junctions for Quantum Coherence, with R. C. Ramos, M. A. Gubrud, A. J. Berkley, C. J. Lobb, and F. C. Wellstood, *IEEE Trans. Appl. Supercon.* **11**, 998-

- 1001 (2001).
31. Sub-Gap Leakage in Nb/AlO<sub>x</sub>/Nb and Al/AlO<sub>x</sub>/Al Josephson Junctions, with M. A. Gubrud, M. Ejrnaes, A. J. Berkley, R. C. Ramos, Jr., I. Jin, A. J. Dragt, C. J. Lobb, and F. C. Wellstood, *IEEE Trans. Appl. Supercon.* **11**, 1001 1005 (2001).
  32. Magnetization of Sn<sub>1-x</sub>Gd<sub>x</sub>Te, with M. Gorska, C. Wolters, A. Lusakowski, T. Story, and Z. Golacki, *Phys. Rev.* **B64**, 115210 (2001).
  33. Study of Covalent Spin Interactions in Cd<sub>1-x</sub>Mn<sub>x</sub>Se by Cryobaric Magnetophoto Luminescence, with N. Kuroda, Y. H. Matsuda, G. Kido, i. Mogi, and W. Girit, in *Materials Science in Static High Magnetic Fields* (K. Watanabe and m. Motokawa, eds., *Advances in Materials Research Series*, Springer-Verlag, Berlin heidelberg New York, p. 149 (2001).
  34. "Single and Double Bit Quantum Gates by Manipulating Four-fold Degeneracy", T. Hakioglu, J. R. Anderson, and F. C. Wellstood, *Phys. Rev. B* **66**, 115324 (2002).
  35. "Spectroscopy of Capacitively Coupled Josephson-Junction Qubits", Philip R. Johnson, Frederick W. Strauch, Alex J. Dragt, Roberto C. Ramos, C. J. Lobb, J. R. Anderson, and F. C. Wellstood, *Phys. Rev. B* **67**, 020509 (2003).
  36. "Characterization of an LC-Isolated Josephson-Junction Qubit", A. J. Berkley, H. Xu, M. A. Gubrud, R. C. Ramos, Jr., J. R. Anderson, C. J. Lobb, and F. C. Wellstood, *IEEE Trans. Appl. Supercon.* – to be published.
  37. "Capacitively Coupled Josephson Junctions: a Two-Qubit System", R. C. Ramos, F. W. Strauch, P. R. Johnson, A. J. Berkley, H. Xu, M. A. Gubrud, J. R. Anderson, C. J. Lobb, A. J. Dragt, and F. C. Wellstood, *IEEE Trans. Appl. Supercon.* – to be published.
  38. "Analysis of Energy Level Quantization and tunneling from the Zero-Voltage State of a Current-Biased Josephson Junction", H. Xu, A. J. Berkley, M. A. Gubrud, R. C. Ramos, J. R. Anderson, C. J. Lobb, and F. C. Wellstood, *IEEE Trans. Appl. Supercon.* – to be published.

## VI. Invited Talks (Since 1994)

1. "Modulated Reflectance from GaAs-Based Quantum-Well Structures", International Conference on Optical Properties of Nanostructures, Sendai, Japan, Sept. 19-22 1994 (40 minutes).
2. "Spatial Correlations of Charged Impurity Scatterers", Lecture given at NEC Laboratories, Tsukuba, Japan, 22 Nov. 1994 (75 minutes).
3. "Long Wavelength Intraband Photoconducting Detectors". Lecture given at the Research Institute for Scientific Measurements, Tohoku University, Sendai, Japan, 2 Dec. 1994 (50 minutes).
4. "Photoreflectance and Photoluminescence in Heavily Doped GaAs/AlGaAs Single Quantum-Well Structures, Meeting of Japan Physical Society, Yokohama, Japan, 27-31 March 1995 (30 minutes).
5. "Influence of Landau Level Splitting and Fermi Distribution on Photoluminescence from Doped GaAs/AlGaAs Quantum Wells", Invited lecture at the International Workshop on Cluster Science and Atomic Engineering, Sept. 11-14, 1995, at Nan Daihe, China (50 minutes).
6. "Magnetic Field Dependence of Photoluminescence from Heavily Doped Quantum Wells", International Symposium on the Science and Technology of Atomically Engineered Materials, Richmond, Virginia, 30 October-4 November 1995 (25 minutes).
7. "Review of Modulated Optical Properties of III-V Heterostructures", XXIV International

School on Physics of Semiconducting Compounds, Jaszowiec, Poland, 29 May-2 June 1995 (25 minutes).

8. "Superlattices and Heterostructures: Real-Life Quantum Mechanics", Colloquium given at Mathematics Dept. of UMCP, 27 October 1995 (50 minutes).
9. "High-Field Magnetization of Eu-Based Diluted Magnetic Semiconductors", International Workshop on Advances in High Magnetic Fields, National Research Institute for Metals, Tsukuba, Japan, 20-22 February 1995 (30 minutes).
10. "Modulated Reflectance and Time-Resolved Luminescence Studies in III-V Heterostructures", Colloquium given at Electrical Engineering Dept. of Tsing Hua University, Taiwan, 6 February 1995 (50 minutes).
11. "Influence of Magnetic Fields on Optical Spectra and Exciton Confinement in GaAs-Based Quantum Wells", Fifth Annual Workshop on Nanostructured Materials, Vanderbilt University, Nashville, Tennessee, 17-20 October 1996 (30 minutes).
12. "Exchange Interactions in Wide-Gap Diluted Magnetic Semiconductors", Workshop on Diluted Magnetic Semiconductors, I.V.I.C., Caracas, Venezuela, 28 Oct. - 1 Nov. (1996), 45 minutes.
13. "Exciton Confinement in III-V Quantum-Well Structures: Role of Magnetic Fields", International Symposium on Novel Materials, Institute of Physics, Bhubaneswar (Puri), India, 3 - 7 March (1997), 30 minutes.
14. "Modulation Spectroscopy: Techniques and Examples", Eleventh International School of Condensed Matter Physics - Physics and Chemistry of Modern Materials, Bia?owieza, Poland, 10-20 July 1997, 3 hours.
15. "Influence of Magnetic Fields on Optical Spectra and Exciton Confinement in GaAs-Based Quantum Wells", Sixth Annual Workshop of the Consortium on Nano-Structured Materials", University of Kentucky, Lexington, Kentucky, 23-25 October 1997.
16. "Exchange Interactions in Rare-Earth-Doped IV-VI Diluted Magnetic Semiconductors", Colloquium given at the Institute of Physics, Polish Academy of Sciences, Warsaw, 15 July 1997.
17. "Photoluminescence in GaAs/AlGaAs Doped Quantum Wells at High Magnetic Fields", Talk given at the Conference on Applications of High Magnetic Fields, Tokyo, Japan, 19 January 1998.
18. "Influence of Carrier Density and  $x$ -Value on the Exchange Interaction in  $\text{Sn}_{1-x}\text{Gd}_x\text{Te}$ ", Lecture given at the National Research Institute for Metals, Tsukuba, Japan, 22 January 1998.
19. "Magnetic Properties of IV-VI Diluted Magnetic Semiconductors", Lectures Given at the Twelfth International Summer School of Condensed Matter Physics - Physics and Chemistry of Modern Materials, Supracl, Poland, 22 June - 2 July 1998.
20. "High Magnetic Field Investigations of  $\text{Sn}_{1-x}\text{Gd}_x\text{Te}$ ", Talk given at the Physical Phenomena at High Magnetic Fields Conference III, Tallahassee, Florida, 24 October 1998.
21. "Optical Properties of III-V Quantum Wells Prepared by MBE", Talk given at the Consortium for Nanoscale Materials, Richmond, Virginia, 30 October 1998, 30 minutes.
22. "Quantum Computing or Why you Might Not Want to 'Bank' on the Internet", Colloquium at Virginia Commonwealth University, 6 November 1998, 50 minutes.
23. "Semiconductor Optical detectors I: GaAs-based Intersubband Devices", Colloquium given at Kuwait University, 10 February 1999, 90 minutes.
24. "Semiconductor Optical Detectors II: Avalanche Photodiodes", Seminar given at Kuwait University, 15 February 1999, 60 minutes.
25. "Diluted Magnetic Semiconductors for Thermoelectric Devices", Seminar given at Kuwait

- University, 16 February 1999, 60 minutes.
26. "Introduction to Quantum Computing: Confidentiality of Future Electronic Communications", 3 lectures given at the 11<sup>th</sup> International Summer School on the Physics and Chemistry of Modern Materials, Bialowieza, 5-12 July 1999, 150 minutes.
  27. "Diluted Magnetic Semiconductor Heterostructures for Thermoelectric Power", Seminar given at the Institute of Physics, Warsaw, 16 July 1999, 50 minutes.
  28. "Quantum Computing with Josephson Junctions", Seminar given at the Institute of Physics, Warsaw, 27 July 1999, 50 minutes.
  29. "Introduction to Quantum Computing II: The Superconductivity Approach", Colloquium given at Virginia Commonwealth University, 28 September 1999, 50 minutes.
  30. "DMS Heterostructures for Thermoelectric Generators", Seminar at the Institute of Physics, Warsaw, 20 July 2000, 50 minutes.
  31. "Quantum Computing with rf SQUIDS", Seminar at the National Research Institute for Metals, Tsukuba, Japan, 18 January 2000, 75 minutes.
  32. "Model for the Exchange Interaction in IV-VI Diluted Magnetic Semiconductors", Colloquium presented at the Institute for Materials Research, Tohoku University, Sendai, Japan, 25 January 2000, 60 minutes.
  34. "Development of a Quantum Computer Based on Superconducting Qubits", Conference on Nanoscale Clusters and Interfaces, Richmond, Virginia, 16 September 2000, 30 minutes.
  35. "IV-VI and II-VI Diluted Magnetic Semiconductors: Thermal and Magnetic Properties", Colloquium presented at Cambridge University, 10 January 2001, 1 hour.
  36. "Quantum Computing with Superconducting Elements: Recent Results", Colloquium at Virginia Commonwealth University, 21 September 2001, 50 min.
  37. "Quantum Computing with Josephson-Junction Devices", Presented at the Second Annual Conference on Atomic and Nanoscale Systems, Tamkang University, Tansui, Taiwan, 13 December 2001, 40 min.
  38. "Josephson-Junction Approach to Quantum Computing", Presented at the International Symposium on Novel Materials: from Clusters to Nano-Structures", Jekyll Island, Georgia, 6 June 2002, 35 min.
  39. "Introduction to III-V Diluted Magnetic Semiconductors", Presented at the XXX Conference on Advanced Electronic Materials, Unipress, Warsaw, Poland, 6 July 2002, 25 min.
  40. "Josephson-Junction Qubits: Entanglement and Coherence", Presented at The Eleventh Annual Southeast Consortium for Nanostructured Material, Georgia Institute of Technology, Atlanta, Georgia, 18 October 2002, 30 min.
  41. "Josephson-Junction Qubits: Microwave Spectroscopy", Colloquium at Syracuse University, Syracuse, New York, 26 November 2002, 50 min.

#### VI. Contributed Talks (Since 1994)

1. "Temperature Dependence of Photo-Reflectance in GaAs/AlGaAs Quantum Wells", with M. Sakai, W.T. Beard, and C.C. Wood, Bull. APS, vol. 39, March 1994, p.325.
2. "Deviations from Curie-Weiss Behavior in  $\text{Sn}_{1-x}\text{Eu}_x\text{Te}$ ", with M. Górska, J.L. Peng, and Z. Golacki, Bull. APS, vol. 39, March 1994, p. 855.
3. "Effect of Simultaneous Electric and Magnetic Fields on a GaAs/AlGaAs Superlattice Miniband

- Probed by Intersubband Electron Transitions", Bull. APS, vol. 39, March 1994, p. 893.
4. "Study of the Internal Electric Fields across the Interfaces in the GaAs/(Al,Ga)As Microstructures", with C.R. Lu, C.L. Chang, C.H. Liou, and R.A. Wilson, (Given by C.R. Lu) Seventh International Conference on Solid Films and Surfaces, National Tsing Hua University, Hsinchu, Taiwan, R.O.C., Dec. 12-16, 1994.
  5. "Photo-reflectance Study of a GaAs/Al<sub>0.3</sub>Ga<sub>0.7</sub>As Resonant Asymmetric Double Quantum Well with Si  $\delta$ -Doping in Side Barriers", with C.R. Lu, S.K. Du, and R.A. Wilson (given by C.R. Lu) Seventh International Conference on Solid Films and Surfaces, National Tsing Hua University, Hsinchu, Taiwan, R.O.C., Dec. 12-16, 1994.
  6. "Stimulated Blue Emission Processes in Zn<sub>1-x</sub>Cd<sub>x</sub>Se/ZnSe Multi-Quantum Wells", with J.Y. Jen, Y. Oka, I. Souma (Given by J.Y. Jen), Seventh International Conference on Solid Films and Surfaces, National Tsing Hua University, Hsinchu, Taiwan, R.O.C., Dec. 12-16, 1994.
  7. "Influence of Magnetic Fields on the Photoluminescence of Heavily Doped GaAs/AlGaAs Single Quantum Wells", with M. Górska, Y. Oka, J.Y. Jen, I. Mogi, and C.E.C. Wood (Given by C.E.C. Wood), Fifteenth Annual North Conference on Molecular-Beam Epitaxy, 17-20 September 1995.
  8. "Photoluminescence of Heavily Doped GaAs/AlGaAs Quantum Wells in High Magnetic Fields", with M. Górska, Y. Oka, J.Y. Jen, and C.E.C. Wood, International Conference on Nano-Clusters and Granular Materials, Sendai, Japan, 19-22 September 1995.
  9. "Susceptibility and High-Field Magnetization of Pb<sub>0.9</sub>Eu<sub>0.1</sub>Te", with M. Górska, J.L. Peng, Y. Oka, I. Mogi, and J.Y. Jen, Bulletin of the American Physical Society, vol. 41, 101 (1996).
  10. "Magnetoluminescence in Strongly Doped GaAs/GaAlAs Quantum Wells", with M. Górska, J. Kossut, J.Y. Jen, and Y. Oka, Bulletin of the American Physical Society, vol. 41, 154 (1996).
  11. "Transport Properties of Superlattice Minibands Determined Using a Miniband Transport Quantum Well Infrared Photodetectors", with A.C. Goldberg, J.W. Little, and W.A. Beck (Given by A.C. Goldberg), Bulletin of the American Physical Society, vol. 41, 692 (1996).
  12. "Observation of Multistability and Hysteresis in Electron Transport Through Multiple Quantum Well/Superlattices Subjected to Electric and Magnetic Fields", with A.C. Goldberg and J.W. Little (Given by A. C. Goldberg), Bulletin of the American Physical Society, Vol. 42, No. 1, p.219 (1997).
  13. "Beyond Moore's Law: Quantum Computing", Talk given at the International Symposium on cluster and Nanostructure Interfaces, 25-18 October 1999.
  14. "Magnetization of Sn<sub>1-x</sub>Gd<sub>x</sub>Te", Presented at the American Physical Society Meeting, 23 March 2000, Bulletin of the APS, Vol. 45, No. 1, p. 906.
  15. "Effective Thermalization of Junctions for Quantum Coherence", Presented at the American Physical Society Meeting, March 2001 (given by R. Ramos).
  16. "Quantum Dynamics of Josephson Junctions in a High-Q Experiment" Presented at the American Physical Society Meeting, March 2001 (given by M. Gubrud).
  17. "Effect of Current Noise on Resonant Activation in the Josephson-Junction Qubit", Presented at the American Physical Society Meeting, March 2003 (given by Hui Zhong Xu).
  18. "Decoherence in a Josephson-Junction Phase Qubit", Presented at the American Physical Society Meeting, March 2003 (given by Andrew Berkley).
  19. "Entanglement and Quantum Correlations in Capacitively Coupled Junction Qubits", Presented at the American Physical Society Meeting, March 2003 (given by Roberto Ramos).

## VI. Research Grants

### a) Contracts and grants:

1. “Quantum Computing with Superconducting Devices” – DOD grant held jointly with Professors Dragt, Lobb, and Wellstood for 4 years at a total of about \$2,00,000.
2. “Growth and Physical Properties of Diluted Magnetic Semiconductors” – This is a DOD grant for approximately \$70,000 per year primarily for research at the University of Maryland Eastern Shore by Professor Mohammad Fotouhi.

## VII. Advisory Groups (1994-2001)

1. Member of Organizing Committee for the Third Annual Workshop of the Consortium for Nanostructured Materials. The Workshop on Atomically Engineered and Nanoscale Materials was held in Oak Ridge, Tennessee, on Oct. 14-15, 1994. There were about 70 participants from many parts of the U.S. as well as Puerto Rico, Japan, and France.
2. Member of the Organizing Committee for the International Symposium on the Science and Technology of Atomically Engineered Materials held in Richmond, Virginia, from 30 October to 4 November 1995.
3. Member of the Advisory Board for the International Consortium for Nanoscale Materials.
4. Member of the Organizing Committee for the Fifth Annual Workshop of the Consortium for Nanostructured Materials held in Lexington, Kentucky, 23-25 October 1997.
5. Member of the Editorial Board of Materials Science Forum.
6. Member of the Organizing Committee for the Sixth Annual Workshop of the Consortium for Nanostructured Materials held in Richmond, Virginia, 29-31 Oct. 1998.
7. Member of the Local Organizing Committee for the International Symposium on Cluster and Nanostructure Interfaces, 25-28 October 1999.
8. Member of the Advisory Committee for the International Conference on "Science and Technology of Nanostructured Materials, Puri, India, 4-8 January 2001.

## VIII. Service (1996-2000)

- a. Departmental service (departmental committees, grading comprehensive exam questions, etc.)

Fall 1996-Fall 1997

Appointments, Promotions, and Tenure Committee

Spring 1998-Fall 1998

Appointments, Promotions, and Tenure Committee  
Salary Committee

Spring 1999-Fall 1999

Salary Committee

Spring 2000-Fall 2000

Salary Committee  
Lab Course Committee  
Expanded Qualifying Exam Committee

Spring 2001 – Fall 2001

Appoints, Promotions, and Tenure Committee  
Expanded Qualifying Exam Committee  
Laboratory Committee

Spring 2002 – Fall 2002

APT Committee  
Expanded Qualifying Exam Committee  
Laboratory Committee

b. University service (campus senate, university or college committees, etc.) (2000-2002)

General Committee on Programs, Curricula, and Courses  
China Committee  
International Affairs Committee  
Japan Council  
International Travel Committee (Chairman)  
Senate Core Committee (Arts & Sciences)  
Core Mathematics and Sciences Working Group  
Graduate Research Board Committee  
Academic Procedures and Standards Committee  
Fulbright Committee

c. Professional service (reviewing articles, officer of professional society, professional committees, etc.)

Reviewed articles for Physical Review, Physical Review Letters, Review of Scientific Instruments, Solid State Communications, Journal of Applied Physics, Canadian

Journal of Physics, and Physica  
Two Organizing Committees and two International Advisory Boards  
Evaluation Panel for the American Society for Engineering Education