Roberto Daniel Merlin

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PERSONAL DATA

Born August 12, 1950 in Buenos Aires, Argentina.

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ACADEMIC QUALIFICATIONS

1978	Doktor der Naturwissenschaften (Dr. rer. nat.), Universität Stuttgart, Germany.
1973	Licenciado en Ciencias Físicas, University of Buenos Aires, Argentina.

HONORS

2009	Peter A. Franken Collegiate Professor of Physics
2008	Outstanding Referee, American Physical Society
2007	Fellow, John Simon Guggenheim Memorial Foundation
2006	Frank Isakson Prize, American Physical Society
2002	Lannin Lecturer, Department of Physics, Pennsylvania State University
2000	Fellow, Optical Society of America
1997	Dean's Faculty Award, College of Literature, Science and the Arts, University of Michigan
1997	Iberdrola Visiting Professor Chair, Universidad Autónoma de Madrid, Spain
1996	Fellow, American Physical Society
1987	Fellow, Alexander Von Humboldt Foundation (Germany)
1975-78	MPI (Max-Planck-Institut FKF, Stuttgart, Germany) Fellowship
1974-75	CONICET (Consejo Nacional de Investigaciones Científicas y Técnicas, Argentina) Fellowship

PROFESSIONAL SOCIETIES

1997	Member, Optical Society of America
1997	Member, American Association for the Advancement of Science
1972	Member, Asociación Física Argentina
1979	Member, American Physical Society

TEACHING AND RESEARCH EXPERIENCE

2000-present	Professor, Electrical Engineering and Computer Science, University of Michigan, Ann Arbor, MI
1989-present	Professor of Physics, University of Michigan, Ann Arbor, MI
1985-89	Associate Professor, Department of Physics, University of Michigan, Ann Arbor, MI
1980-85	Assistant Professor, Department of Physics, University of Michigan, Ann Arbor, MI
1978-80	Research Associate, Materials Research Laboratory and Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL
1975-78	Research Assistant, Max-Planck-Institut für Festkörperforschung, Stuttgart, Germany
1974-75	Research Assistant, Comisión Nacional de Energía Atómica, Buenos Aires, Argentina
1973-74	Instructor, Mathematics Department, Universidad de Buenos Aires, Argentina
1971-74	Instructor, Physics Department, Universidad de Buenos Aires, Argentina

ADMINISTRATIVE POSITIONS

2006-	Director, AFOSR MURI Center on Negative Index Materials
2004-07	Director, Optics Physics Interdisciplinary Laboratory, University of Michigan
2001-05	Director, AFOSR MURI Center: Phonon Control for Enhanced Device Performance
1993-96	Associate Chair for Research and Facilities, Department of Physics, University of Michigan

VISITING APPOINTMENTS

2007	Visiting Professor at the Université Pierre et Marie Curie, Paris, France
1997	Visiting Professor at the Universidad Autónoma de Madrid, Spain
1996	Visiting Professor at the Hong Kong University of Science & Technology
1987	Visiting Professor at Max-Planck-Institut für Festkörperforschung, Stuttgart, Germany

NATIONAL/PROFESSIONAL SERVICE AND OTHER ACTIVITIES

2010	Member, OSA Plasmonics and Metamaterials (META 2010) Program Committee
2009	Member, External Review Committee, Department of Physics, Hunter College, CUNY
2009	Member, Technical Programme Committee, 3rd International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials), London, UK
2008	Member, OSA Plasmonics and Metamaterials (META 2009) Program Committee
2007	Member, Frank Isakson Prize Selection Committee, American Physical Society
2006-07	Member, AIP PACS Working group
2006	General Co-Chair, QELS 2006, Long Beach, CA
2006	Member, Advisory Committee, XII International Conference on Vibrations at Surfaces (VAS-12), Erice, Italy
2006-08	Member, Arthur L. Schawlow Prize Selection Committee, American Physical Society
2005	Member, International Committee of CLACSA XII, Angra dos Reis, Rio de Janeiro, Brazil.
2004	Member, Scientific Advisory Committee, International Conference on Spontaneous Coherence in Excitonic Systems, Seven Springs Mountain, PA
2004	Member, Program Committee, XXVII International Conference on the Physics of Semiconductors (ICPS-27), Flagstaff, AZ
2004	Program Committee Co-Chair, International Quantum Electronics Conference, San Francisco, CA
2003	Member (ex-officio) Joint Council on Quantum Electronics
2003	Co-Organizer, Symposium on Frontiers in Optical Control of Complex Systems, March Meeting, The American Physical Society
2002-present	Editor, Solid State Communications
2002-04	Member, APS Committee on International Freedom of Scientists
2001	Member, Transport Through Nanointerfaces Panel, Department of Energy
2001-02	Chair, Program Subcommittee for Ultrafast Dynamics, QELS 2002
2001-03	Member and Chair (2002), Ellis R. Lippincott Award Committee, Optical Society of America
2000-01	Member, IMR and MRI Proposal Review Panel, National Science Foundation
1999-00	Member, Program Subcommittee for Ultrafast Dynamics, QELS 2000
1999	Member, International Advisory Committee, XV Latinamerican Symposium on Solid State Physics
1998-present	Editor, Springer Series in Solid State Sciences
1997	Chair, Symposium on Spectroscopy of Individual Excitons in Quantum Wells, March Meeting, The American Physical Society
1997	Member, Program Committee, March Meeting, American Physical Society
1996	Member, Program Committee, April Meeting, American Physical Society
1994-97	Vice-Chair (94-95), Chair-Elect (95-96) and Chair (96-97), Forum on International Physics, The American Physical Society
1995	Member, Advisory Panel, Condensed Matter Physics Proposals, National Science Foundation
1995	Member, External Review Committee, Department of Physics, University of Concepción, Concepción, Chile
1994-95	Member, International Advisory Committee, Seventh International Conference on Modulated Semiconductor Structures, Madrid, Spain

1993	Member, U. S. Army Research Office, Condensed Matter Advisory Group
1985-86	Consultant, Battelle Columbus Laboratories, Columbus, OH
1988-89	Chairman, Organizing Committee, Fourth International Conference on Modulated Semiconductor Structures, Ann Arbor, MI
1988-89	Member, Technical Program Committee of the Topical Meeting on Quantum Wells for Optics and Optoelectronics, Salt Lake City, UT
1984	Member, Advisory Committee of the International Conference on the Physics of Superlattices, Interfaces and Microdevices, Urbana, IL
1981	Consultant, AT&T Bell Laboratories, Holmdel, NJ

PATENTS

1. **Quasiperiodic Layered Structures** - U. S. Patent Certificate No. 4,955,692; with R. Clarke (Issue Date: September 11, 1990).
2. **Data Storage Using Pulsed Optical Domain Reversal** - U. S. Patent Certificate No. 5,477,519; with S. Fahy (Issue Date: December 19, 1995).
3. **Apparatus for Subwavelength Near Field Focusing of Electromagnetic Waves** – U. S. Patent Application No. 60/938,858 (pending); with Anthony Grbic.

RESEARCH SUMMARY

Merlin's research specialty is experimental condensed matter physics. His areas of expertise include various conventional optical techniques and, in particular, spontaneous and impulsive Raman spectroscopy. In the past several years, he has used light scattering to study a wide range of systems such as rare-earth magnetic semiconductors, mixed-valence compounds, transition-metal oxides, A15 superconductors, intercalated graphite and GaAs-AlAs artificial structures. His current interests focus on the generation and control of coherent vibrational and electronic fields using ultrafast laser and x-ray pulses, and negative refraction. Among major accomplishments, Merlin and his collaborators pioneered experimental work on quasiperiodic (e.g., Fibonacci) superlattices, squeezed phonons and near-field plates, discovered the quantum-well Pockels effect and developed the technique of magneto-Raman scattering. Other significant contributions include the earliest light scattering studies of folded acoustic and interface phonons, shallow impurities and coupled intersubband Landau-level excitations in GaAs-AlAs heterostructures.

PUBLICATIONS

1. "Raman scattering from soft E(TO) phonons of the $Pb(Ti_{1-x},Zr_x)O_3$ system." R. Merlin and A. Pinczuk, *Ferroelectrics* **7**, 275-277 (1974); presented at the 3rd International Meeting on Ferroelectricity, 1973, Edinburgh, U. K.
2. "Coupled mode behavior of the soft E(TO) phonon of $Pb(Ti_{1-x},Zr_x)O_3$ and $(Pb_{1-3x/2},La_x)TiO_3$." R. Merlin, J. A. Sanjurjo and A. Pinczuk, *Solid State Commun.* **16**, 931-935 (1975).
3. "Raman scattering from soft phonons of $Pb(Ti_{1-x},Zr_x)O_3$ and $(Pb_{1-3x/2},La_x)TiO_3$." R. Merlin, J. A. Sanjurjo and A. Pinczuk, in *Light Scattering in Solids*, ed. by M. Balkansky, R. C. C. Leite and S. P. S. Porto (Flammarion, Paris, 1975), pp. 895-899; presented at the 3rd International Conference on Light Scattering in Solids, 1975, Campinas, Brazil.
4. "Phase diagram, optical and phononic properties of the valence instabilities of SmS." G. Güntherodt, R. Keller, P. Grünberg, A. Frey, W. Kress, R. Merlin, W. B. Holzapfel and F. Holtzberg, *in Valence Instabilities and Related Narrow Band Phenomena* (Plenum Press, NY 1976), pp. 321-336; presented at the International Conference on Valence Instabilities and Related Narrow Band Phenomena, 1976, Rochester, NY.
5. "Resonant two-magnon Raman scattering in α-Fe_2O_3." T. P. Martin, R. Merlin, D. R. Huffman and M. Cardona, *Solid State Commun.* **22**, 565-567 (1977).
6. "Anti-Stokes luminescence in europium monochalcogenides." R. Merlin, R. Tsu, G. Güntherodt, G. Abstreiter and M. W. Shafer, *Solid State Commun.* **22**, 609-613 (1977).
7. "Spin-disorder induced Raman scattering in europium chalcogenides." R. Merlin, R. Zeyher and G. Güntherodt, *Phys. Rev. Lett.* **39**, 1215-1218 (1977).
8. "f-d hybridization, valence fluctuation and phonon spectrum of SmS." G. Güntherodt, R. Merlin, A. Frey and F. Holtzberg, in *Lattice Dynamics*, ed. by M. Balkansky, (Flammarion, Paris, 1977), pp. 130-133; presented at the International Conference on Lattice Dynamics, 1977, Paris, France.
9. "Spin-disorder induced phonon Raman scattering in europium chalcogenides." R. Merlin, G. Güntherodt, R. Zeyher, W. Kress, P. Grünberg and F. Canal, in *Lattice Dynamics*, ed. by M. Balkansky (Flammarion, Paris, 1977), pp. 87-89; presented at the International Conference on Lattice Dynamics, 1977, Paris, France.
10. "Multiphonon processes in YbS." R. Merlin, G. Güntherodt, R. Humphreys, M. Cardona, R. Suryanarayanan and F. Holtzberg, *Phys. Rev.* B **17**, 4951-4958 (1978).
11. "Reply to Comments on the paper anti-Stokes luminescence in europium monochalcogenides." R. Merlin and G. Güntherodt, *Solid State Commun.* **26**, 145-146 (1978).
12. "Two magnon resonant Raman scattering in transition metal oxides." R. Merlin, T. P. Martin, A. Polian, M. Cardona, D. Tannhauser and B. Andlauer, *J. Magn. Magn. Mater.* **9**, 83-85 (1978).
13. "Optic phonon anomalies and f-d hybridization in SmS and SmB_6." G. Güntherodt, R. Merlin, A. Frey and M. Cardona, *Solid State Commun.* **27**, 551-556 (1978).
14. "Spin-dependent Raman scattering of Europium chalcogenides." R. Merlin, R. Zeyher and G. Güntherodt, in *Physics of Semiconductors, 1978*, ed. by B.L.H. Wilson (The Institute of Physics, Bristol and London, 1978), pp. 145-148; presented at the 14th International Conference on the Physics of Semiconductors, 1978, Edinburgh, U.K.
15. "Multiphonon processes and exciton-LO phonon interaction in YbS." R. Merlin, G. Güntherodt and R. Humphreys, in *Physics of Semiconductors, 1978*, ed. by B.L.H. Wilson (The Institute of Physics, Bristol and London, 1978), pp. 875-878; presented at the 14th International Conference on the Physics of Semiconductors, 1978, Edinburgh, U. K.
16. "Spin-disorder induced Raman scattering from phonons in europium chalcogenides, I. Experiment." G. Güntherodt, R. Merlin and P. Grünberg, *Phys. Rev.* B **20**, 2834-2849 (1979).
17. "Phonon Raman scattering from spin superstructures: magnetic Bragg scattering." G. Güntherodt, R. Merlin, W. Bauhofer and G. Abstreiter, *J. Magn. Magn. Mater*. **13**, 187-188 (1979).
18. "Raman scattering in superlattices: anisotropy of polar phonons." R. Merlin, C. Colvard, M. V. Klein, H. Morkoç, A. Y. Cho and A. C. Gossard, *Appl. Phys. Lett.* **36**, 43-45 (1980).
19. "Raman scattering in a magnetic semiconductor." G. Güntherodt, R. Merlin and G. Abstreiter, *J. Magn. Magn. Mater.* **15-18**, 821-822 (1980); presented at the International Conference on Magnetism, 1979, Munich, F.R. Germany.

20. "Observation of folded acoustic phonons in a semiconductor superlattice." C. Colvard, R. Merlin, M. V. Klein and A. C. Gossard, *Phys. Rev. Lett.* **45**, 298-301 (1980).
21. "Phonon folding and anisotropy in GaAs-AlAs superlattices." R. Merlin, C. Colvard, M. V. Klein, H. Morkoç, A. C. Gossard and A. Y. Cho, *J. Phys. Soc. Japan* **49** Suppl. A, 1021-1023 (1980); presented at the 15th International Conference on the Physics of Semiconductors, 1980, Kyoto, Japan.
22. "Resonant Light Scattering from Magnetic Excitations." R. Merlin, *J. Phys. (Paris)* C**5**, 233-239 (1980); invited paper at the International Meeting on Magnetic Semiconductors, 1979, Montpellier, France.
23. "Light scattering from phonons in GaAs-AlAs superlattices." C. Colvard, R. Merlin, M. V. Klein and A. C. Gossard, *J. Phys. (Paris)* C**6**, 631-633 (1981); presented at the International Conference on Phonon Physics, 1981, Bloomington, Indiana.
24. "Raman scattering in V_3Si, V_3Ge, Nb_3Sb, and Cr_3Si: correlation of E_g optical phonon line width with magnetic susceptibility." R. Merlin, S. B. Dierker, M. V. Klein, J. Jorgensen, S. R. Rasmussen, Z. Fisk and G. W. Webb, *J. Phys. (Paris)* C**6**, 392-394 (1981); presented at the International Conference on Phonon Physics, 1981, Bloomington, Indiana.
25. "Light scattering study of electrons confined at Ge/GaAs interfaces." R. Merlin, A. Pinczuk, W. T. Beard and C. E. E. Wood, *J. Vac. Sci. Technol*. **21**, 516-518 (1982); presented at the Ninth Annual PCSI Conference, 1982, Pacific Grove, California.
26. "The water-collecting mechanism of moloch horridus re-examined." C. Gans R. Merlin and W. F. C. Blumer, *Amphibia-Rept*ilia **3**, 57-64 (1982).
27. "Raman scattering and phonon density of states in proton irradiated V_3Si." S. B. Dierker, R. Merlin, M. V. Klein, B. S. Chandrasekhar and J. W. Blue, *Phys. Rev.* B **27**, 3571-3576 (1983).
28. "Raman scattering in V_3Si, V_3Ge, Nb_3Sn, and Nb_3Sb: damping of the E_g optical phonon by interband electronic excitations." S. B. Dierker, R. Merlin, M. V. Klein, G. W. Webb and Z. Fisk, *Phys. Rev.* B **27**, 3577-3591 (1983).
29. "Roughness-induced Raman scattering from surface carbon on PbTe." J. E. Potts, R. Merlin and D. L. Partin, *Phys. Rev.* B (Rapid Communications) **27**, 3905-3908 (1983).
30. "Raman scattering from phonons and magnons in antiferromagnetic Fe_3BO_6." H. Navarro, J. E. Potts and R. Merlin, *Solid State Commun.* **50**, 331-333 (1984).
31. "Raman scattering in rare earth chalcogenides." G. Güntherodt and R. Merlin, *in Light Scattering in Solids IV*, ed. by M. Cardona and G. Güntherodt, Topics in Applied Physics, Vol. **54** (Springer, Berlin, 1984) Ch. 5, pp. 243-283 [Russian translation: MIR, Moscow, 1986].
32. "Raman scattering from electrons bound to shallow donors in GaAs-$Al_xGa_{1-x}As$ quantum well structures." B. V. Shanabrook, J. Comas, T. A. Perry and R. Merlin, *Phys. Rev.* B (Rapid Communications) **29**, 7096-7098 (1984).
33. "Photoexcited two-dimensional electron system at the surface of semi-insulating GaAs." T. A. Perry, J. E. Potts, R. Merlin, G. A. Prinz and E. M. Swiggard, *Phys. Rev.* B (Rapid Communications) **30**, 1106-1108 (1984).
34. "Growth of amorphous Ti_20_3 layers by laser-induced oxidation." R. Merlin and T. A. Perry, *Appl. Phys. Lett.* **45**, 852-853 (1984).
35. "Comment on enhanced Raman scattering from adsorbates on semiconductor surfaces." J. E. Potts and R. Merlin, *Surf. Sci.* **147**, 617-618 (1984).
36. "Raman scattering and photoluminescence studies of two-dimensional electron systems in Ge/GaAs Heterostructures." D. Gammon, R. Merlin, W. T. Beard and C. E. E. Wood, *Superlattices and Microstructures* **1**, 161-164 (1985); invited paper at the International Conference on Superlattices, Microstructures, and Microdevices, 1984, Urbana, IL.
37. "Folded acoustic and quantized optic phonons in semiconductor superlattices." C. Colvard, T. A. Gant, M. V. Klein, R. Merlin, R. Fischer, H. Morkoç and A. C. Gossard, *Phys. Rev.* B **31**, 2080-2091 (1985).
38. "Phonon freedom and confinement in GaAs-$Al_xGa_{1-x}As$ superlattices." C. Colvard, R. Fischer, T. A. Gant, M. V. Klein, R. Merlin and H. Morkoç, *Superlattices and Microstructures* **1**, 81-86 (1985); presented at the International Conference on Superlattices, Microstructures, and Microdevices, 1984, Urbana, IL.

39. "Space-charge layers in semi-insulating GaAs: photoexcited two-dimensional electron systems." T. A. Perry, J. E. Potts, R. Merlin, G. A. Prinz and E. M. Swiggard, *Superlattices and Micro*structures **1**, 97-99 (1985); presented at the International Conference on Superlattices, Microstructures, and Microdevices, l984, Urbana, IL.
40. "Raman scattering studies of donor transitions in semiconductor quantum well structures." T. A. Perry, R. Merlin, B. V. Shanabrook and J. Comas, *J. Vac. Sci. Technol*. B **3**, 636-638 (1985); presented at the International Conference on Molecular Beam Epitaxy, 1984, San Francisco, CA.
41. "Observation of resonant impurity states in semiconductor quantum-well structures." T. A. Perry, R. Merlin, B. V. Shanabrook and J. Comas, *Phys. Rev. Lett.* **54**, 2623-2626 (1985).
42. "Electronic structure of NiO." R. Merlin, *Phys. Rev. Lett.* (C) **54**, 2727 (1985).
43. "Quasiperiodic GaAs-AlAs heterostructures." R. Merlin, K. Bajema, R. Clarke, F. –Y. Juang and P. K. Bhattacharya, *Phys. Rev. Lett.* **55**, 1768-1770 (1985).
44. "Fibonacci GaAs-AlAs superlattices." R. Merlin, K. Bajema, R. Clarke, F. -Y. Juang and P. K. Bhattacharya, in *Phonon Physics*, ed. by J. Kollár, N. Kroó, N. Menyhárd and T. Siklós (World Scientific Publishing Co., Singapore, 1985), pp. 541-545; presented at the Second International Conference on Phonon Physics, 1985, Budapest, Hungary.
45. "Evidence of a high-temperature dipole-glass phase in K_2CrO_4." S. D. Russell and R. Merlin, *Phys. Rev.* B **33**, 1871-1874 (1986).
46. "Raman spectra of shallow acceptors in quantum-well structures." D. Gammon, R. Merlin, W. T. Masselink and H. Morkoç, *Phys. Rev.* B (Rapid Communications) **33**, 2919-2922 (1986).
47. "Inelastic light scattering by electronic excitations in semiconductor heterostructures." G. Abstreiter, R. Merlin and A. Pinczuk, *IEEE J. Quantum Electron*. QE-**22**, 1771-1784 (1986); invited paper in a special issue on Quantum Well Structures: Physics and Applications, ed. by D. S. Chemla and A. Pinczuk.
48. "Field-dependent linewidths and photoluminescence energies in GaAs-AlGaAs multiquantum well modulators." F. -Y. Juang, J. Singh, P. K. Bhattacharya, K. Bajema and R. Merlin, *Appl. Phys. Lett.* **48**, 1246-1248 (1986).
49. "Synchrotron x-ray study of a Fibonacci superlattice." J. Todd, R. Merlin, R. Clarke, K. M. Mohanty and J. D. Axe, *Phys. Rev. Lett.* **57**,1157-1160 (1986).
50. "Artificially structured incommensurate materials." R. Clarke and R. Merlin, *in Incommensurate Crystals, Liquid Crystals and Quasicrystals*, ed. by J. F. Scott and N. A. Clark (Plenum Press, New York, 1987), pp. 359-365; invited paper at the NATO Advanced Research Workshop on Incommensurate Materials, 1986, Bolder, CO.
51. "Quasiperiodic semiconductor superlattices." R. Merlin, K. Bajema, R. Clarke and J. Todd, *in 18th International Conference on the Physics of Semiconductors*, ed. by O. Engstrom (World Scientific Publishing Co., Singapore, 1987), pp 675-678; presented at the 18th International Conference on the Physics of Semiconductors, 1986, Stockholm, Sweden.
52. "Acceptor Raman scattering in GaAs-$Al_xGa_{1-x}As$ quantum-well structures." D. Gammon, R. Merlin, D. Huang and H. Morkoç, *J. Crystal Growth* **81**, 149-152 (1987); presented at the Fourth International Conference on Molecular Beam Epitaxy, 1986, York, U. K.
53. "Growth and properties of quasiperiodic heterostructures." R. Clarke, J. Todd, R. Merlin, K. Bajema, P. K. Bhattacharya and F. -Y. Juang, *J. Crystal Growth* **81**, 116-119 (1987); presented at the Fourth International Conference on Molecular Beam Epitaxy, 1986, York, U. K.
54. "Magnetic-field-enhanced Raman scattering by confined and interface phonons in semiconductor superlattices." D. Gammon, R. Merlin and H. Morkoç, *Phys. Rev.* B (Rapid Communications) **35**, 2552-2555 (1987).
55. "Stark effect in GaAs-$Al_xGa_{1-x}As$ quantum wells: light scattering by intersubband transitions." K. Bajema, R. Merlin, F. -Y. Juang, S. -C. Hong, J. Singh and P. K. Bhattacharya, *Phys. Rev.* B (Rapid Communications) **36**, 1300-1302 (1987).
56. "Raman scattering by acoustic phonons in Fibonacci GaAs-AlAs superlattices." K. Bajema and R. Merlin, *Phys. Rev.* B (Rapid Communications) **36**, 4555-4557 (1987).
57. "Subband-Landau-level coupling in tilted magnetic fields: exact results for parabolic wells." R. Merlin, *Solid State Commun.* **64**, 99-101 (1987).

58. "Resonant Raman scattering by phonons in a strong magnetic field: GaAs." G.Ambrazevicius, M. Cardona and R. Merlin, *Phys. Rev. Lett.* **59**, 700-703 (1987).
59. "Raman scattering in the high T_C superconductors $MBa_2Cu_30_{7-x}$." L. Ran, R. Merlin, M. Cardona, H. J. Mattausch, A. Simon, F. Garcia-Alvarado, E. Moran, M. Vallet, J. M. Gonzalez-Calbet and M. A. Alario, *Solid State Commun.* **63**, 839-841 (1987).
60. "Reply to 'Comment on synchrotron x-ray study of a Fibonacci superlattice' - Clarke and Merlin reply." R. Clarke and R. Merlin, *Phys. Rev. Lett.* **59**, 2237 (1987).
61. "Stark effect in quantum wells: Raman scattering by intersubband transitions." K. Bajema, R Merlin, F. -Y. Juang, S. -C. Hong, J. Singh and P. K. Bhattacharya, *J. Phys. (Paris)* **48 C-5**, 179-182 (1987); presented at the Third International Conference on Modulated Semiconductor Structures, 1987, Montpellier, France.
62. "Raman scattering by acoustic phonons and structural properties of Fibonacci, Thue-Morse and random superlattices." R. Merlin, K. Bajema, J. Nagle and K. Ploog, *J. Phys. (Paris)* **48 C-5**, 503-506 (1987); presented at the Third International Conference on Modulated Semiconductor Structures, 1987, Montpellier, France.
63. "Phonon anomaly in $K_{1-x}Rb_xC_8$." D. Medjahed, R. Merlin and R. Clarke, *Phys. Rev.* B (Rapid Communications) **36**, 9345-9347 (1987).
64. "Raman spectroscopy of acoustic phonons in Fibonacci superlattices." K. Bajema and R. Merlin, *Superlattices and Microstructures* **3**, 477-479 (1987); presented at the Third International Conference on Superlattices, Microstructures, and Microdevices, 1987, Chicago, IL.
65. "Electronic Raman scattering in quantum wells: coupled levels in tilted magnetic fields." R. Boroff, R. Merlin, R. L. Greene and J. Comas, *Superlattices and Microstructures* **3**, 493-496 (1987); presented at the Third International Conference on Superlattices, Microstructures, and Microdevices, 1987, Chicago, IL.
66. "Electric field effects on intersubband transitions in quantum-well structures." K. Bajema, R. Merlin, F. -Y. Juang, S. -C. Hong, J. Singh and P. K. Bhattacharya, *Superlattices and Microstructures* **3**, 685-687 (1987); presented at the Third International Conference on Superlattices, Microstructures, and Microdevices, 1987, Chicago, IL.
67. "Structural fluctuations and randomness in GaAs-$Al_xGa_{1-x}As$ Superlattices." R. Clarke, T. Moustakas, K. Bajema, D. Grier, W. Dos Passos and R. Merlin, *Superlattices and Microstructures* **4**, 371-374 (1988); presented at the Third International Conference on Superlattices, Microstructures, and Microdevices, 1987, Chicago, IL.
68. "Enhanced and quenched Raman scattering by interface phonons in semiconductor superlattices: what are the defects?" D. Gammon, L. Shi, R. Merlin, G. Ambrazevicius, K. Ploog and H. Morkoç, *Superlattices and Microstructures* **4**, 405-407 (1988); presented at the Third International Conference on Superlattices, Microstructures, and Microdevices, 1987, Chicago, IL.
69. "Observation of coupled quasi two-dimensional electronic excitations in tilted magnetic fields." R. Borroff, R. Merlin, R. L. Greene and J. Comas, *Surface Sci.* **196**, 626-631 (1988); presented at the 7th International Conference on Electronic Properties of Two-Dimensional Systems, 1987, Santa Fe, NM.
70. "Structure and electronic properties of Thue-Morse lattices." Z. Cheng, R. Savit and R. Merlin, *Phys. Rev.* B **37**, 4375-4382 (1988).
71. "Structural and electronic properties of non-periodic superlattices." R. Merlin, *IEEE J. Quantum Electron.* **24**, 1791-1798 (1988); invited paper in a special issue on Quantum Well Heterostructures and Superlattices, ed. by J. J. Coleman.
72. "Suppression of Raman scattering by interface phonons in quantum wells under high photoexcitation." G. Ambrazevicius, M. Cardona, R. Merlin and K. Ploog, *Solid State Commun.* **65**, 1035-1038 (1988).
73. "Effective mass and impurity states of quasiperiodic systems." K. W. -K. Shung, L. Sander and R. Merlin, *Phys. Rev. Lett.* **61**, 455-458 (1988).
74. "Raman studies of acoustic phonons in periodic and non-periodic semiconductor superlattices." R. Merlin, in *Proceedings of the Eleventh International Conference on Raman Spectroscopy*, ed. by R. J. H. Clark and D. A. Long (Wiley, Chichester, 1988) pp. 15-18; plenary talk at the XIth International Conference on Raman Spectroscopy, 1988, London, U. K.
75. "Raman scattering by optical phonons in $In_{1-y-z}Al_yGa_zAs$ lattice-matched to InP." R. Borroff, R. Merlin, A. Chin and P. K. Bhattacharya, *Appl. Phys. Lett.* **53**, 1652-1653 (1988).

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168. "Generation and Remote Detection of Coherent Folded Acoustic Phonons." M. Trigo, T. A. Eckhause, J. K. Wahlstrand, R. Merlin, M. Reason and R. S. Goldman, in *Physics of Semiconductors*, ed. by J. Menéndez and C. G. Van de Walle, AIP Conference Proceedings **772** (2005), pp. 1190-1191; presented at the 27th International Conference on the Physics of Semiconductors, 2004, Flagstaff, AZ, USA.

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171. "Simulations of the phonon Bragg switch in GaAs." J. M. H. Sheppard, P. Sondhauss, R. Merlin, P. Bucksbaum, R. W. Lee and J. S. Wark, *Solid State Commun.* **136**, 181-185 (2005).
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179. "Introduction to Light Scattering in Solids IX." M. Cardona and R. Merlin, in *Light Scattering in Solids IX*, ed. by M. Cardona and R. Merlin, Topics in Applied Physics, Vol. **108** (Springer, Berlin, 2007) Ch. 1, pp. 1-15.
180. "Ultrafast magneto-optical Kerr study of standing spin waves in ferromagnetic GaMnAs thin films." D. M. Wang, Y. H. Ren, X. Liu, Y. J. Cho, J. K. Furdyna, M. Grimsditch and R. Merlin, in *Physics of Semiconductors*, ed. by W. Jantsch and F. Schäffler, AIP Conference Proceedings **893** (2007), pp. 1175-1176; presented at the 28th International Conference on the Physics of Semiconductors, 2006, Vienna, Austria.
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187. "Probing Unfolded Acoustic Phonons with X Rays." M. Trigo, Y. M. Sheu, D. A. Arms, J. Chen, S. Ghimire, R. S. Goldman, E. Landahl, R. Merlin, E. Peterson, M. Reason and D. A. Reis, *Phys. Rev. Lett.* **101**, 025505 (2008).

188. "Coherent Control of Bound Entangled Electrons in a CdMnTe Quantum Well." P. W. Jacobs, J. K. Furdyna and R. Merlin, *Phys. Status Solidi* (*c*) **5**, 2889-2892 (2008); invited talk at the 34th International Symposium on Compound Semiconductors, 2007, Kyoto, Japan.
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190. "Spin Flip Wave Generation in Semimagnetic Doped Quantum Wells." P. Jacobs, F. Perez, C. Aku-Leh, R. Merlin and G. Karczewski, in *Physics of Semiconductors*, ed. by, AIP Conference Proceedings (2009), pp.; presented at the 29th International Conference on the Physics of Semiconductors, 2008, Rio de Janeiro, Brazil.
191. "Metamaterials and the Landau-Lifshitz Permeability Argument: Large Permittivity Begets High-Frequency Magnetism." R. Merlin, *Proc. Nat. Acad. Sci.* **106**, 1693-1698 (2009). Published online 2 February 2009; DOI:10.1073/pnas.0808478106.
192. "Observation of Insulating Nano-Islands in Ferromagnetic GaMnAs." D. M. Wang, Y. H. Ren, P. W. Jacobs, S. Fahy, X. Liu, J. K. Furdyna, V. F. Sapega, and R. Merlin, *Phys. Rev. Lett.* **102**, 256401 (2009).

BOOKS: EDITOR

1. "Proceedings of the Fourth International Conference on Modulated Semiconductor Structures." *Surface Sci.* **228**, Nos. 1-3, April (I) 1990. Edited by L. L. Chang, R. Merlin and D. C. Tsui.
2. "Proceedings of the Fifteenth Latinamerican Symposium on Solid State Physics (SLAFES XV)." *Phys. Stat. Solidi (b)* **220**, No. 1, 2000. Edited by J. Giraldo, L. Quiroga, R. Merlin and J. R. Leite.
3. "Raman Scattering in Materials Science." Springer Series in Materials Science **42** (Springer, Berlin, 2000). Edited by W. H. Weber and R. Merlin.
4. "Light Scattering in Solids IX." Topics in Applied Physics Vol. **108** (Springer, Berlin, 2007). Edited by M. Cardona and R. Merlin.

INVITED PRESENTATIONS AT MEETINGS

1. "Resonant Light Scattering from Magnetic Excitations," invited paper at the International Meeting on Magnetic Semiconductors, **1979**, Montpellier, France. Publication No. 22.
2. "Raman Scattering and Photoluminescence Studies of Two-dimensional Electron Systems in Ge/GaAs Heterostructures," invited paper at the International Conference on Superlattices, Microstructures, and Microdevices, **1984**, Urbana, IL. Publication No. 36, with D. Gammon, W. T. Beard and C.E.E. Wood.
3. "Quasiperiodic (Fibonacci) GaAs-(Al,Ga)As Heterostructures," invited talk at the March Meeting of the American Physical Society, **1986**, Las Vegas, NV. *Bull. Amer. Phys. Soc.* **31**, 347 (1986).
4. "Artificially Structured Incommensurate Materials," invited paper at the NATO Advanced Research Workshop on Incommensurate Materials, **1986**, Bolder, CO. Publication No. 50.
5. "Novel Properties of Fibonacci Sequence Superlattices," invited talk at the Workshop on Frontiers in Superlattices and Microstructures, **1986**, La Jolla, CA.
6. "Fibonacci, Random and Other Non-Periodic Structures," invited talk at the Workshop on Chemical Concepts for Ultrasmall Electronic Devices, **1987**, Cambridge, MA.
7. "Raman Studies of Acoustic Phonons in Periodic and Non-periodic Semiconductor Superlattices," plenary talk at the XIth International Conference on Raman Spectroscopy, **1988**, London, U. K. Publication No. 74.
8. "Artificial Layered Systems: Fractal Aspects," invited talk at the **1988** Fall Meeting of the Materials Research Society, Boston, MA. Publication No. 76.
9. "Superredes Semiconductoras y Pozos Cuánticos," series of lectures at the II. Encuentro de Física del Sólido, **1989**, Santiago, Chile.
10. "Electronic Raman Scattering in Photoexcited Quantum Wells: Field Effects and Charge-Density Domains," invited paper at the NATO Advanced Research Workshop on Spectroscopy of Semiconductor Microstructures, **1989**, Venice, Italy. Publication No. 79.
11. "Raman Spectroscopy of Shallow Impurities in Semiconductor Quantum Well Structures," invited paper at the SPIE's **1990** International Symposium on Optical and Optoelectronic Applied Science and Engineering, Conference 1336, 1990, San Diego, CA. Publication No. 87.
12. "Sequential Resonant Tunneling in Superlattices: Light Scattering by Intersubband Transitions," invited paper at the NATO Advanced Research Workshop on Light Scattering in Semiconductor Structures and Superlattices, **1990**, Mont Tremblant, Quebec, Canada. Publication No. 89.
13. "Difusión Inelástica de Fotones, Neutrones y Electrones en Sólidos," series of lectures at the III. Encuentro de Física del Sólido, **1991**, Santiago, Chile.
14. "Enhanced Linear Electro-optic Anisotropy in GaAs Quantum Wells," invited paper at the NATO Advanced Research Workshop on Frontiers of Optical Phenomena in Semiconductor Structures of Reduced Dimensions, **1992**, Yountville, CA. Publication No.100.
15. "Raman Scattering by Phonons in GaN," invited talk at the International Meeting on Wide Bandgap Nitrides, **1994**, St. Louis, MO; with S. Murugkar, A. Salvador and H. Morkoç.
16. "Electric Field Effects in Quantum Well Structures," invited talk at the Adriatic Research Conference on Lower Dimensionality Semiconductor Systems, **1995**, Campinas, Brazil.
17. "Acoustic Phonons in Superlattices - Recent Developments," invited talk at the International Summer School on Phonons in Crystalline Structures, **1995**, Kiev, Ukraine.
18. "Impulsive Raman Scattering in $LaAlO_3$: Seeking Domain Reversal." invited lecture at the XVth International Conference on Raman Spectroscopy, **1996**, Pittsburgh, PA. Publication No. 124.
19. "Electric Field Domains, Pockels Effect and Coherent Acoustic Phonons in Superlattices," invited lectures at the NATO Advanced Study Institute on Optical Spectroscopy of Low-Dimensional Semiconductors, **1996**, Ankara, Turkey. Publication No. 129.
20. "Dominios Eléctricos, Efecto Pockels y Fonones Coherentes en Superredes," invited lectures at the Segunda Escuela Nacional de Física de la Materia Condensada, **1996**, Santafé de Bogotá, Colombia.
21. "Efecto Pockels, Dominios Eléctricos y Fonones Coherentes en Superredes," invited lectures at the II Taller de Física, Sistemas de Baja Dimensionalidad, **1997**, Valparaíso, Chile.
22. "Coherent and Squeezed Phonon Generation with Ultrafast Optical Pulses," invited talk at the ARO Workshop on Manipulation of Coherent Quantum Phenomena, **1997**, Princeton, NJ.

23. "Vacuum-Squeezed Solids: Two-Phonon Coherent States in $KTaO_3$," invited paper at the **1997** Quantum Electronics and Laser Science Conference, Baltimore, MD, in *QELS'1997, OSA Technical Digest* **12** (Optical Society of America, Washington DC, 1997) p.51, with G. A. Garrett, A. G. Rojo, A. K. Sood and J. F. Whitaker.
24. "Phonon-Squeezing in $KTaO_3$: Macroscopic Quantum States Driven by Light Pulses," invited paper at the Fifth International Conference on Squeezed States and Uncertainty Relations, **1997**, Balatonfüred, Hungary, with G. A. Garrett, A. G. Rojo, A. K. Sood and J. F. Whitaker.
25. "Controlling Lattice Motion with Ultrafast Light Pulses: Generation of Coherent and Squeezed Phonons," invited talk at the symposium on Recent Developments in Photon-Matter Interactions, **1997**, Philadelphia, PA.
26. "Control de Vibraciones de Red con Pulsos Ultrarápidos de Luz: Fonones Coherentes y Squeezed," invited talk at the XIV Simposio Latinoamericano de Física del Estado Sólido, **1998**, Oaxaca, Mexico.
27. "Coherent and Squeezed Phonons: Control of Lattice Vibrations with Ultrafast Light Pulses, " invited talk at the International Workshop on Current Topics of Laser Technology, **1998**, Kobe, Japan.
28. "Squeezed Phonon Fields: Control of Lattice Fluctuations with Ultrafast Optical Pulses," invited talk at the March Meeting of the American Physical Society, **1998**, Los Angeles, CA. *Bull. Amer. Phys. Soc.* **43**, 602 (1998).
29. "Squeezed Phonon Fields: Controlling Quantum Lattice Fluctuations with Light Pulses," invited talk at the Topical Meeting on Nonlinear Optics: Materials, Fundamentals and Applications, **1998**, Princeville, Hawaii, with G. A. Garrett and J. F. Whitaker.
30. "Interferences and Coherent Control of Excitons in GaAs Quantum Wells, " invited paper at the International Workshop on Nanophysics and Electronics (NPE-98), **1998**, Lecce, Italy, with J. Fernández-Rossier and C. Tejedor. Publication No. 137.
31. "Resonant Impulsive Raman Scattering: Coherent Production and Control of Intense Phonon Fields," invited talk at the XV Simposio Latinoamericano de Física del Estado Sólido, **1999**, Cartagena, Colombia.
32. "Femtosecond X-ray Diffraction: Experiments and Limits." invited paper at the SPIE's International Symposium on Optical Science and Technology, Conference 4143, **2000**, San Diego, CA, with J. S. Wark, A. M. Allen, P.C. Ansbro, P. H. Bucksbaum, Z. Chang, M. DeCamp, R. W. Falcone, P.A. Heimann, S. L. Johnson, I. Kang, H. C. Kapteyn, J. Larsson, R. W. Lee, A. M. Lindenberg, T. Missalla, G. Naylor, H. A. Padmore, D. A. Reis, K. Scheidt, A. Sjoegren, P.C. Sondhauss and M. Wulff. Publication No. 144.
33. "Resonant Impulsive Raman Scattering: Coherent Production of Intense Phonon Fields," plenary talk at the XVIIth International Conference on Raman Spectroscopy, **2000**, Beijing, China. Publication No. 145.
34. "Impulsive Generation of Phonon Polaritons: Cherenkov Emission at Subluminal Speeds," invited talk at the 17th International Conference on Coherent and Nonlinear Optics (ICONO 2001), **2001**, Minsk, Belarus, with T. E. Stevens, J. K. Wahlstrand and J. Kuhl.
35. "Impulsive Generation of Polaritons: Light Emitting Light at Subluminal Speeds," invited talk at the X Latin American Congress on Surface Science and Applications (CLACSA-10), **2001**, San José, Costa Rica, with T. E. Stevens, J. K. Wahlstrand and J. Kuhl.
36. "Coherent Phonon-Polaritons and Subluminal Cerenkov Radiation, " invited talk at the Tenth International Conference on Phonon Scattering in Condensed Matter, **2001**, Hanover, NH, with J. K. Wahlstrand, T. E. Stevens and J. Kuhl. Publication No. 150.
37. "Coherent and Squeezed Phonons: Controlling Lattice Motion with Ultrafast Light Pulses," invited talk at the Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), **2001**, Detroit, MI.
38. "Picosecond time-resolved x-ray diffraction probe of coherent lattice dynamics," invited talk at the Twelve Synchrotron Radiation Instrumentation Conference (SRI), **2001**, Madison, WI, Rev. Sci. Instrum. **73**, 1361 (2002), with D. A. Reis, M. F. DeCamp, P. H. Bucksbaum, R. Clarke and E. Dufresne.
39. "Time-resolved Pendellösung oscillations from impulsively strained crystals," invited talk at the **2002** Quantum Electronics and Laser Science Conference, Long Beach, CA, in *QELS'2002*, *OSA Technical Digest* (Optical Society of America, Washington DC, 2002), p. 124, with D. A. Reis, M. F. DeCamp. P. H. Bucksbaum, R. Clarke, E. M. Dufresne, R. Merlin, J. Wahlstrand, B. Adams and J. S. Wark.
40. "Generation of Entangled Multi-Spin States in a Semiconductor Quantum Well," invited talk at the Euroconference Nano-Phase, **2002**, Erice, Italy, with J. Bao, A. Bragas and J. Furdyna.
41. "Optically-Induced Multi-Spin Entanglement in a Semiconductor Quantum Well," invited talk at the XXXIII Winter Colloquium on The Physics of Quantum Electronics (PQE), **2003**, Snowbird, Utah.

42. "The Dark Side of the Cherenkov Effect: Light Emitting Light at Subluminal Speeds (and at the Nanometer

Scale)," invited talk at the Pan American Advanced Studies Institute (PASI) on Physics at the Nanometer Scale, **2003**, Bariloche, Argentina.

43. "Optical Generation of Many-Spin Entangled States in a Quantum Well," invited talk at the Pan American Advanced Studies Institute (PASI) on Physics at the Nanometer Scale, **2003**, Bariloche, Argentina.
44. "Optical generation of many-spin entangled states in a quantum well," keynote paper at the SPIE's Second International Symposium on Fluctuations and Noise, Conference 5472, **2004**, Gran Canaria, Spain, with J. M. Bao, A. V. Bragas and J. K. Furdyna. Publication No. 160.
45. "Low Energy Excitations in Quantum Wells: Coherent Density Fluctuations and Entangled Spins," invited talk at the Colorado Meeting on Fundamental Optical Processes in Semiconductors (FOPS), **2004**, Estes Park, CO.
46. "Generating Coherent Excitations with Laser Pulses," invited talk at the Advanced Photon Source Workshop on Time Domain Science Using X-ray Techniques, **2004**, Lake Geneva, WI.
47. "Optical Generation of Many-Spin Entangled States in a Quantum Well," invited talk at the XVII Latin American Symposium on Solid State Physics, **2004**, La Habana, Cuba.
48. "Ultrafast generation of optical and acoustic phonons in nanocrystallites," invited talk at Photonics West 2005, Symposium on Optoelectronic Materials and Devices, Conference 5725 (Ultrafast Phenomena in Semiconductor and Nanostructure Materials IX), **2005**, San Jose, CA, with A. V. Bragas and C. Aku-Leh. Publication No. 167.
49. "Magnon squeezing in an antiferromagnet: reducing the spin noise below the standard quantum limit," invited talk at the SPIE's Third International Symposium on Fluctuations, Conference: Fluctuations and Noise in Materials II , **2005**, Austin, TX, with J. Zhao, A. V. Bragas and D. J. Lockwood.
50. "Mechanisms for ultrafast generation of coherent phonons and spin excitations," invited talk at the 355th Wilhelm und Else Heraeus Seminar: Ultrafast Dynamics of Collective Excitations in Solids, **2005**, Vitte, Hiddensee Island, Germany.
51. "Mechanisms for generating coherent phonons, spin and charge excitations," invited talk at the Gordon Research Conference on Ultrafast Phenomena in Cooperative Systems, **2006**, Buellton, CA.
52. "Generating Coherent Phonons and Spin Excitations with Ultrafast Light Pulses," Frank Isakson Prize talk at the March Meeting of the American Physical Society, **2006**, Baltimore, MD. *Bull. Amer. Phys. Soc.* **51**, 147 (2006).
53. "Mechanisms for ultrafast generation of coherent phonons, polaritons and spin excitations," invited talk at the Cornell Workshop on the Scientific Potential of a High Repetition-Rate, Ultra-short Pulse ERL X-ray Source, **2006**, Ithaca, NY.
54. "Multi-spin entanglement generated by optical pulses in CdTe quantum wells with dilute concentrations of Mn^{++} ions," invited talk at the VI International Conference on the Physics of Light-Matter Coupling in Nanostructures (PLMCN6), **2006**, Magdeburg, Germany, with J. K. Furdyna, J. M. Bao and A. V. Bragas.
55. "Light-induced Generation of Coherent Vibrational and Spin Fields," invited talk at the school Son et Lumière: from Microphotonics to Nanophononics, **2006**, Cargèse, France.
56. "Surface-Avoidance-Induced Mirrorless Cavities," invited talk at the Montana Meeting on Fundamental Optical Processes in Semiconductors (FOPS 2007), **2007**, Big Sky, MO.
57. "Multi-spin entanglement in magnetic-semiconductor nanostructures," invited talk at the 34th International Symposium on Compound Semiconductors (ISCS 2007), **2007**, Kyoto, Japan. Publication No. 191.
58. "From Negative Refraction to Radiationless Interference: A New Road to Subwavelength Photolithography," invited lecturer at the Winter School: 'Beyond Moore's Law,' **2008**, Kenting, Taiwan.
59. "Near-Field Focusing Plates: Theory and Experiments," invited talk at the 2008 International Conference on Computational & Experimental Engineering and Sciences (ICCES08), **2008**, Honolulu, Hawaii, with A. Grbic and L. Jiang.
60. "Near field plates, subwavelength focusing and radiationless interference," invited talk at the 2008 SPIE Optics and Photonics Symposium, Conference OP201 – Metamaterials: New Horizons, Fundamentals and Applications, **2008**, San Diego, CA.
61. "Near-Field Focusing Plates," invited talk at the 2008 Metamaterials Summit, Wright-Patterson Air Force Base, **2008**, Dayton, OH.
62. "Near-Field Plates: Subwavelength Focusing and Radiationless Interference," invited talk at the 2nd International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials), **2008**, Pamplona, Spain, with A. Grbic and L. Jiang.
63. "Negative Refraction and the Quest for the Superlens," invited talk at the JASON Fall Meeting, **2008**, MITRE Corporation, McLean, VA.

64. "Optical Magnetism and the Landau-Lifshitz Permeability Argument," invited talk at the workshop Research Frontiers and Capability Gaps for Controlling and Designing Functional Materials, Los Alamos National Laboratory, **2009**, Los Alamos, NM.
65. "High-Frequency Magnetism: Where is the Limit?" invited talk at the International Workshop on Electromagnetic Metamaterials: Toward Real World Applications (IWEMIII), **2009**, LANL, Los Alamos, NM.
66. "Generating Coherent Phonons and Spin Excitations with Ultrafast Light Pulses," invited lecture at the 2009 Ultrafast X-ray Summer School (UXSS), **2009**, SLAC National Accelerator Laboratory, Menlo Park, CA.
67. "Magnetic Plasmon Resonances at Optical Frequencies: Too Weak to Matter?," invited talk at the 4th International Conference on Surface Plasmon Photonics (SPP4), **2009**, Amsterdam, The Netherlands.
68. "Optical Magnetism and the Landau-Lifshitz Permeability Argument," invited talk at the 2009 SPIE Optics and Photonics Symposium, Conference OP103 – Plasmonics: Metallic Nanostructures and Their Optical Properties, **2009**, San Diego, CA.
69. "Metamaterials, Optical Magnetism and the Landau-Lifshitz Permeability Argument," invited talk at the Fourth 'Rio de la Plata' Workshop on Lasers Dynamics and Nonlinear Photonics, **2009**, Piriápolis, Uruguay.

OTHER INVITED CONTRIBUTIONS

1. "Raman Scattering in Rare Earth Chalcogenides," in Light Scattering in Solids, Topics in Applied Physics, Vol. **54** (Springer, Heidelberg, 1984) Ch. 5 [Russian translation: MIR, Moscow, 1986]. Publication No. 31, with G. Güntherodt.
2. "Inelastic Light Scattering by Electronic Excitations in Semiconductor Heterostructures," invited paper in *IEEE Journal of Quantum Electronics*, special issue on Quantum Well Structures: Physics and Applications. Publication No. 47 (1986), with G. Abstreiter and A. Pinczuk.
3. "Structural and Electronic Properties of Non-periodic Superlattices," invited paper *in IEEE J. Quantum Electronics*, special issue on Quantum Well Heterostructures and Superlattices. Publication No. 71 (1988).
4. "Raman Studies of Fibonacci, Thue-Morse and Random Superlattices," in *Light Scattering in Solids V*, Topics in Applied Physics, Vol. **66** (Springer, Berlin, 1989) Ch. 5. Publication No. 78 (1989).
5. "Coupled Intersubband-Cyclotron Resonances in Quantum-Well Structures," in *Festschrift in Honor of Rogerio Cerqueira Leite's 60th Birthday*. Publication No. 92 (1991).
6. "Der Quantentrog-Pockels-Effeckt," invited paper in *Phys. Bl.* Publication No. 101 (1993), with S. H. Kwok, H. T. Grahn and K. Ploog.
7. "Raman Spectra of $In_xGa_{1-x}As$," in *Properties of Lattice-Matched and Strained InGaAs* (Electronic Materials Information Service, London, 1993). Publication No. 104 (1993).
8. "Raman Scattering by Plasmons in Fibonacci Superlattices," *in A Festschrift Issue to Pay Tribute to Professor Elias Burstein* (1992). Publication No. 96, with J. P. Valladares, A. Pinczuk, A. C. Gossard and J. H. English.
9. "Near-Field Optics: Chemical Sensors, Photon Supertips and Subwavelength Spectroscopy," *in Microchemistry, Spectroscopy and Chemistry in Small Domain*. Publication No. 109, with W. Tan, D. Birnbaum, C. Harris, B. Orr, Z. Shi, S. Smith, B. A. Thorsrud and R. Kopelman.
10. "Raman Scattering by Surface-Avoiding Acoustic Phonons in Semi-Infinite Superlattices," in *Festschrift in honor of Manuel Cardona's 60th birthday, Phil. Mag*. B (1994). Publication No. 113.
11. "Raman Spectroscopy of Quantum Wells and Superlattices," *in Properties of III-V Superlattices and Quantum Wells* (Electronic Materials Information Service, London, 1996). Publication No. 125 (1996), with D. Gammon.
12. "Generating Coherent THz Phonons with Light Pulses," invited paper in *Solid State Commun.*, special issue on *Highlights of Condensed Matter Physics and Materials Science*. Publication No. 127 (1997).
13. "The Sound of a Quantum Loudspeaker," invited paper in *Physics World*. Publication No. 130 (1997).
14. "Squeezed States: Controlling Quantum Noise in a Solid," invited paper in *LEOS (IEEE Lasers and Electro-Optics Society) Newsletter*. Publication No. 131 (1997), with G. A. Garrett.
15. "Ultrafast Optical excitation of a Combined Coherent-Squeezed Phonon Field in $SrTiO_3$," invited paper in *Optics Express, Focus Issue: Coherent Phenomena in Solids*. Publication No. 132 (1997), with G. A. Garrett, J. F. Whitaker and A. K. Sood**.**
16. "Overview of Phonon Raman Scattering in Solids," in *Raman Scattering in Materials Science*, Springer Series

in Mater. Science **42** (Springer, Berlin, 2000). Publication No. 143 (2000), with A. Pinczuk and W. H. Weber.

17. "Impulsive Stimulated Raman Scattering by Phonon Polaritons and the Cherenkov Effect," invited paper in *Indian J. Phys*., special issue on the 75th Anniversary of the Discovery of the Raman Effect. Publication No. 155 (2003), with J. K. Wahlstrand.
18. "Optical Implementation of Entangled Multi-Spin States in a CdTe Quantum Well," invited paper in *Solid State Commun.*, special issue on *Advances in Studies of Electrons in Low Dimensional Structures*. Publication No. 157 (2003), with J. Bao, A. V. Bragas and J. K. Furdyna.
19. "Squeezed Phonons in Solids," in *Encyclopedia of Modern Optics* (Academic Press, London, 2005). Publication No. 164, with A. V. Bragas.
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