Sidney Perkowitz
Curriculum vitae

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PERSONAL

Born: Brooklyn, New York. Married, one child.

EDUCATION

University of Pennsylvania, Philadelphia, Pennsylvania
Ph. D. in solid state physics, June, 1967 (Frazier Fellowship)
Thesis adviser: Elias Burstein
M. S. in physics, June, 1962
Polytechnic University, New York
B. S. in physics, summa cum laude, June, 1960

PROFESSIONAL INTERESTS

Research: optical properties of condensed matter including semiconductors and superconductors, and biological materials; infrared, Raman, synchrotron, and picosecond spectroscopy; characterization of technological materials.
Writing, teaching, and lecturing: physics and science for nonscientists; science writing and science journalism; science and art; science in film and the theater.

PROFESSIONAL EXPERIENCE

2011 – date: Charles Howard Candler Professor Emeritus of Physics, Emory University

1987 - 2011: Charles Howard Candler Professor of Physics, Emory University (1979, Professor; 1974, Associate Professor; 1969, Assistant Professor),

1990 - 1991: Visiting Senior Scientist, Southeastern Universities Research Association, Washington, DC

1989 - 2000: Adjunct Professor of Liberal Arts, Atlanta College of Art

1983 - 84: Visiting Professor of Physics, University of California at Santa Barbara

1966 - 69: Solid State Physicist, GT&E Laboratories, Bayside, NY

ADMINISTRATIVE EXPERIENCE

Director, Emory University Raman Scattering Facility, 1984 - 1999
Chairman, Emory University Physics Department, 1980 - 83
Codirector, Emory University Center for Instructional Computing, 1979 - 82
President, Society for Literature, Science and the Arts, 1997 - 1998

RESEARCH, TEACHING AND PROFESSIONAL DEVELOPMENT SUPPORT

Grants and contracts: Alfred P. Sloan Foundation, Atomic Energy Commission, Department of Defense/TRW Corp., DoE, Ford Foundation, Korea Institute of Science and Technology, Lockheed Corporation, NSF, National Synchrotron Light Source, NIH Biomedical Sciences Program, North Atlanta Treaty Organization, Oak Ridge National Laboratory, Office of Naval Research, Research Corporation, Sandia Laboratories, and others.

Internal support: Emory Research Committee; Emory Teaching Fund.

CONSULTING AND PROFESSIONAL ACTIVITIES

Consultant, Encyclopedia Britannica, American Physical Society, NIST, NRL, Lockheed Corp., NRC Canada, Georgia Tech Research Institute, Santa Barbara Research Center, National Geographic Magazine, Fernbank and SciTrek Museums. AIP Science Writing Award Committee; President, Society for Literature, Science and the Arts; Program Committee, International Conference Series on Infrared and Millimeter Waves; Editorial panel, Int. J. Infrared Millimeter Waves; Advisory Boards, Smithsonian Institution, NAS Science and Entertainment Exchange, Imagine Science Film Festival. Member, AAAS CoSTEP Committee; Chair, APS CIP Committee; Advisory Board, Journal of Science and Popular Culture.

Referee, NSF, DoE, ARO, NIST, Sciences and Engineering Research Council of Canada, Research Corporation, International Science Foundation, MacArthur Foundation, Princeton University Press, Cambridge University Press, *Leonardo, Phys. Rev., Phys. Rev. Lett., J. Opt. Soc. America, Chem. Phys., Optics Lett., J. Vac. Sci. Technol., Appl. Optics, J. Phys. Chem. Solids, J. Appl. Phys., Appl. Phys. Lett., Opt. Engineering, J. Luminescence, Nature, Mod. Phys. Lett.*

TEACHING EXPERIENCE

Undergraduate: introductory physics, mechanics, mathematical physics, quantum mechanics, applied solid state physics: science writing; physics for artists; astronomy; freshman seminar; science in film and in the theater; senior honors theses.

Graduate: solid state physics and applied solid state physics; special topics in condensed matter physics; master's theses; doctoral dissertations.

HONORS, PROFESSIONAL SOCIETIES, AND LISTINGS

Fellow, American Association for the Advancement of Science; Phi Beta Kappa.

Member, American Association for the Advancement of Science, American Physical Society, Society for Literature, Science and the Arts, National Association of Science Writers, American Society of Journalists and Authors, Northwest Science Writers Association. Listed, *Who's Who in America; American Men and Women of Science; Who's Who in Technology and in Science and Engineering; Optical Science and Engineering*; *Frontiers of Science and Technology; Outstanding Scientists of the 20th Century; Dictionary of International Biography; Contemporary Authors.*

LECTURES, SEMINARS, AND MEDIA APPEARANCES

Selected items from over 550 presentations.

Public talk, "Celebrating Light," Atlanta Science Festival, Atlanta, GA March 25, 2015

Interview, The Russell Scott Show. May 4, 2014.

Public talk, "Science and Art: Closer than you Think," Oglethorpe University Museum of Art, https://www.youtube.com/watch?v=DtnslPY9-5M, April 16, 2014.

Presentation, "String Theory," with the Vega Quartet, Highlands-Cashiers Music Festival, Highlands, NC, July 20, 2013

Invited talk, "Quantum Entanglement: Real but Mysterious," Gathering for Gardner 10, Atlanta, GA, March 31, 2012.

Presenter, "Hollywood Science: How Can We Make it Better for Science?" MINTiFF Workshop, Technical University of Berlin, Germany, Sept. 7, 2011.

Invited talk, "Science in Film," CUNY Graduate Center Conference on Science and the Performing Arts, New York, NY, Oct 29 – 30, 2010.

Interview, "Newshour: Artificial Life and Sci Fi," BBC World Service, May 21, 2010.
Invited speaker, "Hollywood Science: Good for Hollywood, Bad for Science?" AAAS annual meeting, San Diego, CA, Feb. 19, 2010.

Invited speaker, "Scared Silly: Mad Scientists in the Movies," Chicago Humanities Festival, Nov. 15, 2009.

Interview, "Big Screen Science," NPR/Living on Earth, week of Jan. 25, 2008.

Panel moderator, "Prodigies, Nobelists and Penguins: Science and Stereotypes in the Movies." Tribeca Film Festival, New York, May 5, 2007.
http://www.tribecafilminstitute.org/index.php?c=Panels&s=sloan

Appearances: CNN, NPR, BBC, Microsoft Corp.; American Museum of Natural History; Los Alamos, Oak Ridge, Lawrence Livermore Labs.; Goddard Space Flight Ctr.; U. S. and foreign universities (Canada, Germany, China, Korea); and others.

PUBLISHED RESEARCH WORKS

MONOGRAPHS

Optical Characterization of Semiconductors: Infrared, Raman, and Photoluminescence Spectroscopy (Academic Press, London, 1993).

Optical Characterization in Microelectronics Manufacturing, with D. G. Seiler and W. M. Duncan (Diane Publishing, 1994).

Survey of optical characterization methods for materials, processing, and manufacturing in the semiconductor industry, with W. Murray Bullis and D.G. Seiler (Gaithersburg, MD: U.S. Dept. of Commerce, Technology Administration, National Institute of Standards and Technology, 1995).

EDITED WORKS

Digest of the Second International Conference on Submillimeter Waves, San Juan, 1976 (IEEE, New York, 1976).

Digest of the Fourth International Conference on Infrared and Millimeter Waves, Miami Beach, 1979 (IEEE, New York, 1979).

Digest of the 1996 Conference of the Society for Literature and Science, Atlanta, Georgia.

RESEARCH AND REVIEW PAPERS

1. E. Burstein, S. Perkowitz, and M. H. Brodsky, "The Dielectric Properties of the Cubic IV-VI Compound Semiconductors," J. Phys. Radium **29**, (Supp. 11-12), C4-8 (1968).

2. S. Perkowitz, "Mobility and Infrared Absorption in n-Type GaAs," J. Appl. Phys. **40**, 3751 (1969).

3. S. Perkowitz, "Local and Nonlocal Magnetoplasma Effects in n-Type PbTe," Phys. Rev. **182**, 828 (1969).

4. J. F. Black, E. Lanning, and S. Perkowitz, "Infrared Techniques for Semiconductor Characterization," Infrared Phys. **10**, 125 (1970).

5. S. Perkowitz, "Far Infrared Free-Carrier Absorption in n-Type GaAs," J. Phys. Chem. Solids **32**, 2267 (1971).

6. S. Perkowitz, R. K. Murty-Gutta, and A. K. Garrison, "Far Infrared Absorption in ZnO," Solid State Commun. **9**, 2251 (1971).

7. S. Perkowitz and J. Breecher, "Characterization of GaAs by Far Infrared Reflectivity," Infrared Phys. **13**, 321 (1973).

8. S. Perkowitz and R. H. Thorland, "Far Infrared Study of Free Carriers and the Plasmon-Phonon Interaction in CdTe," Phys. Rev. B **9**, 545 (1974).

9. S. Perkowitz and J. Breecher, "Far Infrared Reflectivity and Electron Scattering in GaAs," in *Digest of the First International Conference on Submillimeter Waves, Atlanta, 1974* (IEEE Pub. No. 74 CH 0856-5 (MTT)), p. 193.

10. S. Perkowitz and R. H. Thorland, "Generalized Dielectric Function and the Plasmon-Phonon Coupling in GaAs and CdTe," Solid State Commun. **16**, 1093 (1975).

11. S. Perkowitz, "Free Carriers, Coupled Modes and the Generalized Dielectric Function in PbTe," Phys. Rev. B **12**, 3210 (1975).

12. S. Perkowitz, M. Merlin, and L. R. Testardi, "Far Infrared Reflectivity of V_3Si," Solid State Commun. **18**, 1059 (1976).

13. B. L. Bean and S. Perkowitz, "Far Infrared Transmission Measurements with an Optically Pumped FIR Laser," Appl. Optics **15**, 2617 (1976).

14. J. J. Gallagher, M. D. Blue, B. L. Bean, and S. Perkowitz, "Tabulation of FIR Lines Available from Optically Pumped Lasers and Application to Atmospheric Transmission," Infrared Phys. **17**, 43 (1977).

15. S. Perkowitz and B. L. Bean, "Far Infrared Absorption of Chlorophyll in Solution," J. Chem. Phys. **66**, 2231 (1977).

16. S. W. McKnight, R. H. Thorland, and S. Perkowitz, "Far Infrared Behavior of Thin Film High Temperature Superconductors," Thin Solid Films **41**, L61 (1977).

17. M. D. Blue and S. Perkowitz, "Reflectivity of Common Materials in the Submillimeter Region," IEEE Trans. Microwave Theory and Tech. **MTT-25**, 491 (1977).

18. B. L. Bean and S. Perkowitz, "Submillimeter-Far Infrared Spectroscopy in the Liquid and Solid States with a Tunable Optically Pumped Laser," J. Opt. Soc. Am. **67**, 911 (1977).

19. P. M. Amirtharaj, B. L. Bean, and S. Perkowitz, "Far Infrared Studies in Epitaxial Films of III-V and IV-VI Semiconductors," J. Opt. Soc. Am. **67**, 939 (1977).

20. B. L. Bean and S. Perkowitz, "Complete Frequency Coverage for Submillimeter Laser Spectroscopy with Optically Pumped CH_3OH, CH_3OD, CD_3OD, and CH_2CF_2," Optics Lett. **1**, 202 (1977).

21. S. W. McKnight, P. M. Amirtharaj, and S. Perkowitz, "Far Infrared Studies of Lattice and Free Carrier Effects in $Hg_{1-x}Mn_xTe$," Solid State Commun. **25**, 357 (1978).

22. S. W. McKnight, P. M. Amirtharaj, and S. Perkowitz, "Far Infrared Interband Absorption in $Hg_{1-x}Mn_xTe$," Infrared Phys. **18**, 919 (1978).

23. J. R. Grammer, W. H. Alff, M. D. Blue, and S. Perkowitz, "Far-Infrared Properties of Baffle Coating Materials," in *Thermophysics and Thermal Control* (Volume 66 of *Progress in Astronautics and Aeronautics)*, R. Voskanta, Ed. (American Institute of Aeronautics and Astronautics, New York, 1978 (c. 1979)], 39-46.) (Reprinted, *Cryogenic Optical Systems,* G. R. Pruitt, Ed. (SPIE Optical Engineering Press, Bellingham, 1994)).

24. J. R. Grammer, L. J. Bailin, M. D. Blue, and S. Perkowitz, "Absorbing Coatings for the Far Infrared," in *Radiation Scattering in Optical Systems* (Proceedings SPIE 257, Bellingham, WA, 1980), 192-195. (Reprinted, *Cryogenic Optical Systems,* G. R. Pruitt, Ed. (SPIE Optical Engineering Press, Bellingham, 1994)).

25. S. W. McKnight, B. L. Bean, and S. Perkowitz, "Far Infrared Laser Spectroscopy of V_3Si," Phys. Rev. B **19**, 1437 (1979).

26. S. W. McKnight, S. Perkowitz, D. B. Tanner, and L. R. Testardi, "Far Infrared Measurements of Holstein Processes and Low Energy $\alpha^2F(\omega)$ Structure in V_3Si," Phys. Rev. B **19**, 5689 (1979).

27. S. Perkowitz, R. L. Henry, and D. B. Tanner, "Comparison of Fourier and Laser Spectroscopy in the Far-Infrared-Submillimeter Range," Applied Opt. **18**, 2349 (1979).

28. O. A. Simpson, B. L. Bean, and S. Perkowitz, "Far Infrared Optical Constants of Liquid Water Measured with an Optically Pumped Laser," J. Opt. Soc. Am. **69**, 1723 (1979).

29. P. M. Amirtharaj and S. Perkowitz, "Far Infrared Spatial Probe of Heteroepitaxial Indium Arsenide," Thin Solid Films **62**, 357 (1979).

30. B. L. Bean and S. Perkowitz, "Far Infrared/Submillimeter Spectroscopy with an Optically Pumped Laser," in *Infrared and Millimeter Waves: Volume 2*, K. J. Button, Editor, (Academic Press, New York, 1979), 273-298.

31. G. Busse and S. Perkowitz, "Piezoelectric Transducers as Monitors for Optically Pumped FIR Lasers," Int. J. Infrared and Mm. Waves **1**, 139 (1980).

32. O. A. Simpson, R. A. Bohlander, J. J. Gallagher, and S. Perkowitz, "Measurements of Far-Infrared Water Vapor Absorption between Lines with an Optically Pumped Laser," J. Phys. Chem. **84**, 1753 (1980).

33. P. M. Amirtharaj, G. D. Holah, and S. Perkowitz, "Far Infrared Spectroscopic Study of $In_{1-x}Ga_xAs_yP_{1-y}$," Phys. Rev. B **21**, 5656 (1980).

34. S. Perkowitz and G. Busse, "Far Infrared Optoacoustic Material Probing and Imaging," Optics Lett. **5**, 228 (1980).

35. R. C. DuVarney and S. Perkowitz, "Microcomputer Control and Data Analysis for a Far Infrared Fourier Spectrometer," Int. J. IR Mm. Waves **2**, 587 (1981).

36. G. D. Holah and S. Perkowitz, "Far Infrared Laser Thermal Spectroscopy of Superconductors," Int. J. IR Mm. Waves **2**, 581 (1981).

37. R. A. Bohlander, R. J. Emery, D. T. Llewellyn-Jones, G. G. Gimmestad, H. A. Gebbie, O. A. Simpson, J. J. Gallagher, and S. Perkowitz, "Excess Absorption by Water Vapor and Comparison with Theoretical Dimer Absorption," in *Atmospheric Water Vapor*, A. Deepak, T. D. Wilkerson, and L. H. Ruhuke, Editors (Academic Press, New York, 1981), 241-253.

38. G. D. Holah, A. A. Schenk, S. Perkowitz, and R. D. Tomlinson, "Infrared Reflectivity of p-type $CuInTe_2$," Phys. Rev. B **23**, 6288 (1981).

39. D. Karecki, R. E. Pena, and S. Perkowitz, "Far Infrared Transmission of Superconducting Homogeneous NbN Films: Scattering Time Effects," Phys. Rev. B **25**, 1565 (1982).

40. S. Perkowitz, "Laser Thermal Spectroscopy of Highly Granular NbN," Phys. Rev. B (Rapid Communications) **25**, 3420 (1982).

41. D. R. Karecki, G. L. Carr, S. Perkowitz, D. U. Gubser, and S. A. Wolf, "Far Infrared Conductivity and Anomalous Below-gap Absorption in Superconducting Granular NbN," Phys. Rev. B **27**, 5460 (1983).

42. S. Perkowitz, "Submillimeter Solid State Physics," in *Infrared and Millimeter Waves: Vol. 8*, K. J. Button, Editor (Academic Press, New York, 1983), 71-125.

43. G. L. Carr, D. R. Karecki, and S. Perkowitz, "Submillimeter Detector Operation of Granular Superconducting NbN Films," J. Appl. Phys. **55**, 3892 (1984).

44. S. Perkowitz, Comments on "Effect of Polar Vibrations of the Crystal Lattice on the Plasma Frequency of Heavily-Doped Semiconductors and Correction for Calculation of Carrier Concentration," Infrared Physics **24**, 423 (1984).

45. B. Mitrovic and S. Perkowitz, "Role of Varying Electronic Density of States in the Far Infrared Behavior of V_3Si," Phys. Rev. B **30**, 6749 (1984).

46. B. Subramaniam and S. Perkowitz, "Low Frequency Multiphonon Absorption in InP:Fe," Solid State Commun. **53**, 473 (1985).

47. S. Perkowitz, G. L. Carr, B. Subramaniam, and B. Mitrovic, "Far Infrared Determination of Scattering Behavior and Plasma Frequency in V_3Si, Nb_3Ge and Nb," Phys. Rev. B **32**, 153 (1985).

48. C. E. Jones, T. N. Casselman, J. P. Faurie, S. Perkowitz, and J. Schulman, "Infrared Properties and Bandgaps of HgTe/CdTe Superlattices," Appl. Phys. Lett. **47**, 140 (1985).

49. W. B. Cook and S. Perkowitz, "Temperature Dependence of the Far Infrared Ordinary-Ray Optical Constants of Sapphire," Appl. Optics **24**, 1773 (1985).

50. S. Perkowitz, "Far Infrared Characterization of $Hg_{1-x}Cd_xTe$ and Related Electronic Materials," J. Electronic Materials **14**, 551 (1985).

51. G. L. Carr, S. Perkowitz, and D. B. Tanner, "Far Infrared Properties of Inhomogeneous Materials," in *Infrared and Millimeter Waves: Vol. 13*, K. J. Button, Editor (Academic Press, New York, 1985), 171 - 263.

52. S. Perkowitz and G. Busse, "Infrared Optoacoustics," in *Infrared and Millimeter Waves: Vol. 16*, K. J. Button, Editor (Academic Press, New York, 1986), 1 - 33.

53. W. H. Cook and S. Perkowitz, "Far Infrared Properties and Characterization of Superconducting Nb_3Ge," Phys. Rev. B **33**, 4557 (1986).

54. C. E. Jones, M. E. Boyd, W. H. Konkel, S. Perkowitz and R. Braunstein, "Noncontact Electrical Characterization of Epitaxial $Hg_{1-x}Cd_xTe$," J. Vac. Sci. Technol. A **4**, 2056 (1986).

55. S. Perkowitz, D. Rajavel, I. K. Sou, J. Reno, J. P. Faurie, C. E. Jones, T. Casselman, K. A. Harris, J. W. Cook, and J. F. Schetzina, "Far Infrared Study of Alloying in HgTe-CdTe Superlattices," Appl. Phys. Lett. **49**, 806 (1986).

56. S. Perkowitz, "Far Infrared Spectroscopy of $Hg_{1-x}Cd_xTe$ and Related Materials," in *Far-Infrared Science and Technology*, J. R. Izatt, Editor (Proceedings SPIE 666, Bellingham, 1986), 120-125.

57. S. Perkowitz, R. Sudharsanan, and S. S. Yom, "Far Infrared Analysis of Alloy Structure in HgTe-CdTe Superlattices," J. Vac. Sci. Technol. A **5**, 3157 (1987).

58. S. Perkowitz, R. Sudharsanan, S. S. Yom and T. J. Drummond, "AlAs Phonon Parameters and Heterostructure Characterization," Solid State Commun. **62**, 645 (1987).

59. S. Perkowitz, S. S. Yom, R. N. Bicknell, and J. F. Schetzina, "Ultraviolet-Excited Photoluminescence and Raman Scattering in $Cd_{1-x}Mn_xTe$-CdTe Microstructures," Appl. Phys. Lett. **50**, 1001 (1987).

60. S. Perkowitz, G. L. Carr, B. Lou, S. S. Yom, R. Sudharsanan, and D. S. Ginley, "Phonon, Plasmon, and Gap Behavior in Superconducting $Y_1Ba_2Cu_3O_7$ and $Gd_{1.5}Ba_{1.5}Cu_3O_7$," Solid State Commun. **64**, 721 (1987).

61. S. Perkowitz, R. Sudharsanan, K. A. Harris, J. W. Cook, Jr., J. F. Schetzina and J. N. Schulman, "Effective Mass in an n-Type HgTe-CdTe Superlattice," Phys. Rev. B **36**, 9290 (1987).

62. R. Sudharsanan, S. Perkowitz, S. S. Yom and T. J. Drummond, "Far Infrared Reflectance Spectroscopy of AlAs-GaAs Microstructures," in *Modern Optical Characterization Techniques for Semiconductors and Semiconductor Devices*, O. H. Glembocki, F. H. Pollak and J. J. Soong, Editors (Proceedings SPIE 794, Bellingham, 1987), 197-201.

63. I. Bozovic, D. Mitzi, M. Beasley, A. Kapitulnik, T. Geballe, S. Perkowitz, G. L. Carr, B. Lou, R. Sudharsanan, and S. S. Yom, "Vibrational Spectra and lattice Instabilities in the High-T_c Superconductors $YBa_2Cu_3O_7$ and $GdBa_2Cu_3O_7$," Phys. Rev. B (Rapid Communications) **36**, 4000 (1987).

64. S. S. Yom and S. Perkowitz, "Picosecond Time-Resolved Photoluminescence from $Cd_{1-x}Mn_xTe$-CdTe Microstructures," in *Ultrafast Lasers Probe Phenomena in Bulk and Microstructure Semiconductors*, R. A. Alfano, Editor (Proceedings SPIE 793, Bellingham, 1987), 25-28.

65. D. Rajavel and S. Perkowitz, "Compositional Dependence of Infrared Phonon Parameters for $Hg_{1-x}Cd_xTe$," J. Electronic Materials **17**, 25 (1988).

66. S. S. Yom, S. Perkowitz, P. M. Amirtharaj and J. J. Kennedy, "Picosecond Photoluminescence from Bound Excitons in $Cd_{1-x}Zn_xTe$," Solid State Commun. **65**, 1055 (1988).

67. R. Sudharsanan, S. Perkowitz, B. Lou, B. R. Caldwell and G. L. Carr, "Infrared Reflectance of Rare Earth-Barium-Copper Oxide Superconductors," in *High-Temperature Superconducting Materials*, W. H. Hatfield and J. H. Miller, Editors (Marcel Dekker, New York, 1988), 283-288.

68. J. M. Wrobel, B. P. Clayman, P. Becla, R. Sudharsanan, and S. Perkowitz, "Lattice Vibrations of Cadmium Manganese Telluride Alloys," J. Appl. Phys. **64**, 310 (1988).

69. B. Lou, S. Perkowitz, and R. Sudharsanan, "Anisotropy and Infrared Response of the AlAs-GaAs Superlattice," Phys. Rev. B (Rapid Communications) **38**, 2212 (1988). (Erratum: Phys. Rev. **39**, 1387 (1989)).

70. S. Perkowitz, R. Sudharsanan, J. M. Wrobel, B. P. Clayman, and P. Becla, "Effective Charge and Ionicity in $Cd_{1-x}Mn_xTe$," Phys. Rev. B **38**, 5565 (1988).

71. R. Sudharsanan, S. Perkowitz, B. Lou, T. J. Drummond, and B. L. Doyle, "Far-Infrared Characterization of AlAs-GaAs Superlattice Structure," Superlattices and Microstructures **4**, 657 (1988).

72. S. Perkowitz and S. S. Yom, "Picosecond Single-Photon Counting Spectroscopy of $Cd_{1-x}Zn_xTe$ and $Cd_{1-x}Mn_xTe$-CdTe," in *Ultrafast Lasers Probe Phenomena in Bulk and Microstructure Semiconductors II*, R. A. Alfano, Editor (Proceedings SPIE 942, Bellingham, 1988), 246.

73. Z.-C. Feng, R. Sudharsanan, S. Perkowitz, A. Erbil, K. T. Pollard, and A. Rohatgi, "Raman Scattering Characterization of High-Quality $Cd_{1-x}Mn_xTe$ Films Grown by Metalorganic Chemical Vapor Deposition," J. Appl. Phys. **64**, 686 (1988).

74. Z.-C. Feng, S. Perkowitz, J. M. Wrobel, and J. J. Dubowski, "Outgoing Multiphonon Resonant Raman Scattering and Luminescence Near the $E_o + \Delta_o$ Gap in Epitaxial CdTe Films," Physical Review (Rapid Communications) **39**, 12997 (1989).

75. R. Sudharsanan, Z. C. Feng, S. Perkowitz, A. Rohatgi, K. T. Pollard, and A. Erbil, "Characterization of MOCVD-Grown CdMnTe Films by Infrared Spectroscopy," J. Electronic Materials **18**, 455 (1989).

76. Z. C. Feng, S. Perkowitz, R. Sudharsanan, A. Erbil, K. T. Pollard, A. Rohatgi, J. L. Bradshaw and W. J. Choyke, "Photoluminescence of $Cd_{1-x}Mn_xTe$ Films Grown by Metalorganic Chemical Vapor Deposition," J. Appl. Phys. **66**, 1711 (1989).

77. S. Perkowitz, B. Lou, L. S. Kim, O. K. Wu, and J. N. Schulman, "Far-Infrared Determination of Effective Mass and Valence-Band Offset in the HgTe-CdTe Superlattice," Phys. Rev. B **40**, 5613 (1989).

78. S. Perkowitz, L. S. Kim, O. K. Wu, and J. N. Schulman, "Far Infrared Analysis of the HgTe-CdTe Superlattice," in *Future Infrared Detector Materials*, J. W. Baars and R. E. Longshore, editors (Proceedings SPIE 1106, Bellingham, 1989), 190.

79. T. R. Yang, S. Perkowitz, G. L. Carr, R. C. Budhani, G. P. Williams, and C. J. Hirschmugl, "Infrared Properties of Single Crystal MgO, a Substrate for High Temperature Superconducting Films," Applied Optics **29**, 332 (1990).

80. L. S. Kim, S. Perkowitz, O. K. Wu, and J. N. Schulman, "Far-Infrared Band and Characterisation Measurements in the HgTe-CdTe Superlattice," Semicond. Sci. Technol. **5**, S107 (1990).

81. G. P. Williams, R. Budhani, C. J. Hirschmugl, G. L. Carr, S. Perkowitz, B. Lou, and T. R. Yang, "Infrared Synchrotron Radiation Transmission Spectroscopy of $YBa_2Cu_3O_{7-d}$ in the Gap and Supercurrent Regions," Physical Review B **41**, 4752 (1990).

82. Z. C. Feng, S. Perkowitz, and O. Wu, "Raman and Resonant Raman Scattering from the HgTe/CdTe Superlattice," Phys. Rev. B **41**, 6057 (1990).

83. S. Perkowitz, L. Kim, Z. Feng, and P. Becla, "Optical Phonons in $Cd_{1-x}Zn_xTe$", Phys. Rev. **42**, 1455 (1990).

84. Z. C. Feng, S. Perkowitz, T. S. Rao, and J. B. Webb, "Raman Characterization of InSb/GaAs Grown by Metalorganic Magnetron Sputtering," in Materials Research Society Symposium Proceedings Vol. 160: Layered Structures: Heteroepitaxy, Superlattices, Strain, and Metastability, 739 (1990).

85. U. Strom, J. C. Culbertson, S. A. Wolf, S. Perkowitz, and G. L. Carr, "Far Infrared Photoresponse of Quasi-Two-Dimensional Granular NbN/BN Films", Phys. Rev. B **42**, 4059 (1990).

86. Z. C. Feng, S. Perkowitz, T. S. Rao, and J. B. Webb, "Resonance Raman Scattering from Epitaxial InSb Films Grown by Metalorganic Magnetron Sputtering," J. Appl. Phys. **68**, 5363 (1990).

87. S. Perkowitz, L. S. Kim, and P. Becla, "Infrared Bond Ionicity in Ternary II-VI Alloys," Solid State Commun. **77**, 471 (1991).

88. S. Perkowitz, L. S. Kim, and P. Becla, "Infrared Analysis of Clustering in the II-VI-VI Compound $CdSe_xTe_{1-x}$," Phys. Rev. B **43**, 6598 (1991).

89. Z. C. Feng, S. Perkowitz, R. Rousina, and J. B. Webb, "Raman and Infrared Spectroscopy of $In_{1-x}Ga_xSb$ Films Grown on GaAs by Metalorganic Magnetron Sputtering", Canadian J. Phys. **69**, 386 (1991).

90. Z. C. Feng, S. Perkowitz, and P. Becla, "Multiple Phonon Overtones in ZnTe", Solid State Commun. **78**, 1011 (1991).

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