Dr. Warren J. Wiscombe

Senior Scientist
Climate and Radiation Branch, Laboratory for Atmospheres
NASA Goddard Space Flight Center

and

ARM Chief Scientist
DOE Atmospheric Radiation Measurements Program
Brookhaven National Laboratory

RESEARCH EXPERIENCE: Radiative transfer, remote sensing, light scattering, cloud radiation, climate theory, scientific data systems

EDUCATION:

1964	B.S.	Physics, M.I.T., Cambridge, MA
1966	M.S.	Physics, Caltech, Pasadena, CA
1970	Ph.D.	Applied Mathematics, Caltech

PREVIOUS POSITIONS:

2005 – present	Chief Scientist, DOE ARM Program (0.5 time) Brookhaven National Laboratory
2005 – present	Senior Research Scientist (0.5 time) Climate and Radiation Branch NASA Goddard Space Flight Center
2003 – present	Adjunct Full Professor, ESSIC University of Maryland
1984 - 2005	Senior Research Scientist Climate and Radiation Branch NASA Goddard Space Flight Center
1991 – 1998	Goddard DAAC Project Scientist
1983 – 1984	NAS-NRC Senior Research Associate NASA Goddard Space Flight Center Laboratory for Atmospheric Sciences
1981 – 1984	Associate Professor Dept. of Applied Science New York University
1974 – 1981	Staff Scientist Climate Section National Center for Atmospheric Research
1969 – 1974	Research Scientist Systems, Science & Software, Inc. La Jolla, CA

PROFESSIONAL SOCIETIES:

Fellow, American Meteorological Society (since 1989)
President, Atmospheric Sciences Section,
American Geophysical Union

COURSES TAUGHT:

Meto 401, University of Maryland (several times, 2003-6, with Z. Li)

The Carbon Dioxide Problem (NYU, 1981)

Atmospheres and Oceans (NYU, 1982)

Climate Modeling (NYU, 1983)

Summer School: Radiation as it Relates to Climate (Boulder, 1986)

Principles of Numerical Modeling (Italy, 1987; EPA, 1990; UC Santa Barbara, 1992)

Chaos and Fractals in Atmospheric Sciences (Italy, 1993)

Writing Scientific Software, several times at Goddard (1991–96)

Global Warming, Federal University of Rio de Janeiro, Brazil (1998)

Clouds and Radiation, University of Alaska, Fairbanks (1999)

Single and Multiple Scattering, International Center for Theoretical Physics (Trieste, Italy, 1999)

VISITING POSTS:
(typically one month)

1980	Institut fur Meteorologie, Johann-Gutenberg University, Mainz, West Germany
1982, 87, 93	CNR Istituo di Fisica dell'Atmosfera, Rome and Frascati, Italy
1985	Geophysical Institute, University of Alaska, Fairbanks
1989	NASA Ames Research Center, Moffett Field, CA
1996	Dept. of Atmospheric Science, University of Washington, Seattle
1997	Dept. of Meteorology, Penn State University, State College, PA
1998	Program in Atmos. & Oceanic Science, University of Colorado, Boulder, CO
1998	Dept. of Physics, Federal University of Rio de Janeiro, Brazil
1999	Scripps Institute of Oceanography, University of California at San Diego, La Jolla, CA
2001	University of California at Berkeley
2003–4	One-year sabbatical, ESSIC, University of Maryland, College Park, MD

HONORS & AWARDS:

1964	Sigma Xi (MIT)
1964 – 66	NSF Fellow (Caltech)
1989	Elected an AMS Fellow
1995	NASA EOSDIS V0 Award
1990, 98	Laboratory Peer Awards
1992, 97	FIRE Group Achievement Awards
1988, 90, 94, 95, 96, 98, 99, 04	NASA Performance Awards
1990, 99	NASA Special Act Awards
1998	Founder and Chairman, Gordon Conference on Radiation and Climate
2004	Elected President, AGU Atmos. Sciences Section

LEADERSHIP ROLES:

ICRCCM (Intercomparison of Radiation Codes in Climate Models), 1981–91

SPECTRE (Spectral Radiance Experiment), 1989-96 (field phase 1991)

ARM (DOE Atmospheric Radiation Measurements Program), 1990–now
* Executive Committee (1995–1998, 2005–present)
* Oklahoma Site Advisory Committee (1995–1999)
* ARM Infrastructure Review Committee (1999)
* Chairman, Shortwave Special Interest Group (1995–2000)

Developed and set standards for scientific programs including those for Mie scattering and DISORT radiative transfer which have thousands of users worldwide.

At Goddard:
Earth Science Vision Team (1998–2004)
Project Scientist, Goddard DAAC (data center), 1991–98
Instrument Incubator Program: PI on revolutionary spectrometer
SBIR/STTR: caused development of several new cloud instruments

SCIENCE TEAMS:

Triana/DSCOVR (1998–2004)
Landsat–7 (1996–2000)
EOS MODIS (1996–present)
IceSat (2006–present)
FIRE (1985–95)
ARM (1990–present)
IceSat (2006-present)

EDITORSHIPS:

Journal of the Atmospheric Sciences (1978–84)
Journal of Geophysical Research (1989–92)
J. Quant. Spectrosc. Radiat. Transfer (1992–present)
Transport Theory and Statistical Physics (1981–1999).

GRANT SUPPORT

1. ARM Chief Scientist, 3-yr grant from DOE starting Oct 2005: $760K/yr (supports 0.6 of my NASA salary through an IPA agreement; plus a "Chief Scientist Team" consisting of one full-time postdoc, fractions of three scientists at Brookhaven National Lab, a retired DOE lab person on a consulting contract to manage our interactions with IPCC climate modelling centers, and half of a graduate student at UMCP)

2. Studies on 3D clouds and radiation, 3-yr grant from DOE starting Oct 2005: $192K/yr (supports one postdoc at NASA plus part of one professor at Boston University)

3. Sunglint studies in a wave tank, 3-yr grant from NASA starting Oct 2004: $250K/yr (supports parts of professors at Stevens Institute and Hampton University, plus two graduate students, plus some salary support for civil servants Alexander Marshak and myself)

4. IceSat Science Team member, 3-yr grant from NASA starting Oct 2006: $250K/yr (supports one postdoc at NASA plus some salary support for civil servants Alexander Marshak and myself)

ISI CITATION RECORD (as of Feb 2007)

4955 citations
average citations per year: 138
Most cited papers:

- #31 (Stamnes, Tsay, Wiscombe, Jayaweera): 907 citations
- #4 (Joseph, Wiscombe, Weinman): 437 citations
- #14 (Wiscombe): 386 citations
- #17 (Wiscombe and Warren): 356 citations

Hirsh number: 32

REFEREED PUBLICATIONS

1. Wiscombe, W., 1975: Solar Radiation Calculations for Arctic Summer Stratus Conditions. Climate of the Arctic, Weller and Bowling, Eds., University of Alaska Press, Fairbanks, Alaska.

2. Wiscombe, W., 1976: Extension of the doubling method to inhomogeneous sources. J. Quant. Spectrosc. Radiat. Transfer, 16, 477-489.

3. Wiscombe, W., 1976: On initialization, error, and flux conservation in the doubling method. J. Quant. Spectrosc. Radiat. Transfer, 16, 637-658.

4. Joseph, J., W. Wiscombe, and J. Weinman, 1976: The Delta-Eddington approximation for radiative flux transfer. J. Atmos. Sci., 33, 2452-2459.

5. Wiscombe,W., and G. Grams, 1976: The backscattered fraction in two-stream approximations. J. Atmos. Sci., 33, 2440-2451.

6. Wiscombe, W., 1977: Doubling initialization revisited. J. Quant. Spectrosc. Radiat. Transfer, 18, 245-248.

7. Wiscombe, W., 1977: Author's Reply. J. Quant. Spectrosc. Radiat. Transfer, 18, 251.

8. Wiscombe, W., and P. Chylek, 1977: Mie scattering between any two angles. J. Opt. Soc. Amer., 67, 572-573.

9. Wiscombe, W., and J. Evans, 1977: Exponential-sum fitting of radiative transmission functions. J. Comp. Phys., 24, 416-444.

10. Wiscombe, W., 1977: The Delta-M method: Rapid yet accurate radiative flux calculations for strongly asymmetric phase functions. J. Atmos. Sci., 34, 1408-1422.

11. Wiscombe, W., and J. Joseph, 1977: The range of validity of the Eddington approximation. Icarus, 32, 362-377.

12. Wiscombe, W., and A. Mugnai, 1980: Exact Calculations of Scattering from Moderately-Nonspherical Tn-Particles: Comparisons with Equivalent Spheres. Proc.Workshop Light Scattering by Irregularly Shaped Particles, D. W. Schuerman, Ed., Plenum Publishing Corp., NY.

13. Mugnai, A., and W. Wiscombe, 1980: Scattering of radiation by moderately nonspherical particles. J. Atmos. Sci., 37, 1291-1307.

14. Wiscombe, W., 1980: Improved Mie scattering algorithms. Appl. Opt., 19, 1505-1509.

15. Nussenzveig, H., and W. Wiscombe, 1980: Forward optical glory. Optics Lett., 5, 455-457.

16. Nussenzveig, H., and W. Wiscombe, 1980: Efficiency factors in Mie scattering. Phys. Rev. Lett., 45, 1490-1494.

17. Wiscombe, W., and S. Warren, 1980: A model for the spectral albedo of snow I. Pure snow. J. Atmos. Sci., 37, 2712-2733.

18. Wiscombe, W., and S. Warren, 1980: A model for the spectral albedo of snow II. Snow containing atmospheric aerosols. J. Atmos. Sci., 37, 2734-2745.

19. Wiscombe, W., and S. Warren, 1981: Comment on 'Radiative Properties of Snow for Clear Sky Solar Radiation. Cold Reg. Sci. Tech., 5, 177-180.

20. Wiscombe, W., 1983: Atmospheric Radiation: 1975-1983. Rev. Geophys. Space Phys., 21, 997-1021.

21. Hoffert, M., B. Flannery, A. Callegari, C. Hsieh, and W. Wiscombe, 1983: Evaporation-limited tropical temperatures as a constraint on climate sensitivity. J. Atmos. Sci., 40, 1659-1668.

22. Wiscombe, W., R. Welch, and W. Hall, 1984: The effect of very large drops on cloud absorption I. Parcel models. J. Atmos. Sci., 41, 1336-1355.

23. Warren, S., and W. Wiscombe, 1985: Dirty snow after nuclear war. Nature, 313, 467-470.

24. Wiscombe, W., and V. Ramanathan, 1985: The role of radiation and other renascent subfields in atmospheric science. Bull. Amer. Met. Soc., 66, 1278-1287.

25. Wiscombe, W., and R. Welch, 1986: Further comments on the effects of large drops in clouds. J. Atmos. Sci., 43, 401-407.

26. Mugnai, A., and W. Wiscombe, 1986: Scattering from nonspherical Chebyshev particles. I: Cross sections, single-scattering albedo, asymmetry factor, and backscattered fraction. Appl. Opt., 25, 1235-1244.

27. Prabhakara, C., D. Short, W. Wiscombe, R. Fraser, and B. Vollmer, 1986: Rainfall over oceans inferred from Nimbus 7 SMMR: Application to 1982-83 El Nino. J. Clim. Appl. Met., 25, 1464-1474.

28. Nussenzveig, H., and W. Wiscombe, 1987: Diffraction as tunneling. Phys. Rev. Lett., 59, 1667-1671.

29. Luther, F., R. Ellingson, Y. Fouquart, S. Fels, N. Scott, and W. Wiscombe, 1988: Intercomparison of Radiation Codes in Climate Models (ICRCCM): Longwave clear sky results. Bull. Amer. Met. Soc., 69, 40-48.

30. Wiscombe, W., and A. Mugnai, 1988: Scattering from nonspherical Chebyshev particles II: Means of angular scattering patterns. Appl. Opt., 27, 2405-2421.

31. Stamnes, K., S. Tsay, W. Wiscombe, and K. Jayaweera, 1988: Numerically stable algorithm for discrete-ordinate-method radiative transfer in multiple scattering and emitting layered media. Appl. Opt., 27, 2502-2509.

32. Mugnai, A., and W. Wiscombe, 1989: Scattering from nonspherical Chebyshev particles III: Variability of angular scattering patterns. Appl. Opt., 28, 3061-3073.

33. Wiscombe, W., 1990: Principles of Numerical Modeling with Applications to Atmospheric Radiation. Course on Radiation as It Relates to Climate, Westview Press, Boulder, Colorado.

34. Warren, S., W. Wiscombe, and J. Firestone, 1990: Spectral albedo and emissivity of CO2 in Martian polar caps: Model results. J. Geophys. Res. 95, B9, 14717-14741.

35. Fiedler-Ferrari, N., H. Nussenzveig, and W. Wiscombe, 1991: Theory of near-critical angle scattering from a curved interface. Phys. Rev. A, 43, 1005-1038.

36. Nussenzveig, H., and W. Wiscombe, 1991: Complex Angular Momentum approximation to hard-core scattering. Phys. Rev. A, 43, 2093-2112.

37. Gao, B.-C., A. Goetz, and W. Wiscombe, 1993: Cirrus cloud detection from airborne imaging spectrometer data using the 1.38 micron water vapor band. Geophys. Res. Lett., 20, 301-304.

38. Cahalan, R. F., and W. Wiscombe, 1993: Impact of Cloud Structure on Climate. Current Problems in Atmospheric Radiation, A. Deepak Publishing, 120-124.

39. Marshak, A., A. Davis, R. F. Cahalan, and W. Wiscombe, 1993: Multi-singular and multi-affine properties of bounded cascade clouds. Fractals 1, 702-710.

40. Davis, A., A. Marshak, and W. Wiscombe, 1993: Bi-multifractal analysis and multi-affine modeling of non-stationary geophysical processes, application to turbulence and clouds. Fractals, 3, 560-567.

41. Marshak, A., A. Davis, R. F. Cahalan, and W. Wiscombe, 1994: Bounded cascade models as non-stationary multifractals. Phys. Rev., E49, 55-69.

42. Davis, A., A. Marshak, W. Wiscombe, and R. F. Cahalan, 1994: Multifractal characterizations of non-stationarity and intermittency in geophysical fields, observed, retrieved, or simulated. J. Geophys. Res., 99, 8055-8072.

43. Gao, B.-C., and W. Wiscombe, 1994: Surface-induced brightness temperature variations and their effects on detecting thin cirrus clouds using IR emission channels in the 8-12 micron region. J. Appl. Meteor., 33, 568-570.

44. Davis, A., A. Marshak, and W. Wiscombe, 1994: Wavelet-Based Multifractal Analysis of Non-Stationary and/or Intermittent Geophysical Signals. Wavelets in Geophysics., E. Foufoula-Georgiou and P. Kumar, Eds., Academic Press, 249-298.

45. Cahalan, R. F., W. Ridgway, W. Wiscombe, T. L. Bell, and J. B. Snider, 1994: The albedo of fractal stratocumulus clouds. J. Atmos. Sci., 51, 2434-2455.

46. Cahalan, R. F., W. Ridgway, W. Wiscombe, Harshvardhan, and S. Gollmer, 1994: Independent pixel and Monte Carlo estimates of stratocumulus albedo. J. Atmos. Sci., 51, 3776-3790

47. Marshak, A., A. Davis, W. Wiscombe, and G. Titov, 1995: The verisimilitude of the independent pixel approximation used in cloud remote sensing. Remote Sens. Env., 52, 72-78.

48. Marshak, A., A. Davis, W. Wiscombe, and R. F. Cahalan, 1995: Radiative smoothing in fractal clouds. J. Geophys. Res.-Atmos., 100, 26247-26261.

49. Wiscombe, W., 1995: An Absorbing Mystery. Nature, 376, 466-467.

50. Davis, A., A. Marshak, W. Wiscombe, and R. F. Cahalan, 1996: Scale-invariance of Liquid Water Distributions in Marine Stratocumulus. I. Spectral Properties and Stationarity Issues. J. Atmos. Sci., 53, 1538-1558.

51. Davis, A., A. Marshak, W. Wiscombe, and R. F. Cahalan, 1996: Multifractal Characterizations of Intermittency in Nonstionary Geophysical Signals and Fields. Nonstationary Random Processes and Their Applications, G. Trevino, Ed., World Scientific, 97-158.

52. Ellingson,R., and W. Wiscombe, 1996: The Spectral Radiance Experiment (SPECTRE): Project Description and Sample Results. Bull. Amer. Meteor. Soc., 77, 1967-1985.

53. Davis, A., A. Marshak, R. Cahalan, and W. Wiscombe, 1997: Horizontal Radiative Fluxes in Stratocumulus and the Landsat Scale-Break. J. Atmos. Sci., 54, 241-260.

54. Davis, A., Marshak, R. F. Cahalan, and W. Wiscombe, 1997: The Landsat Scale Break in Stratocumulus as a Three-Dimensional Radiative Transfer Effect: Implications for Cloud Remote Sensing. J. Atmos. Sci., 54, 241-260.

55. Marshak, A., A. Davis, W. Wiscombe, and R. F. Cahalan, 1997: Scale-invariance of Liquid Water Distributions in Marine Stratocumulus. II. Multifractal Properties and Intermittency Issues. J. Atmos. Sci., 54, 1423-1444.

56. Marshak, A., A. Davis, R. Cahalan, and W. Wiscombe, 1997: Physical Simulation of High-resolution Satellite Images for Fractal Cloud Model. Fractal Frontiers, 301-310.

57. Marshak, A., A. Davis, W. Wiscombe, and R. Cahalan, 1997: Inhomogeneity Effects on Cloud Shortwave Absorption Measurements: Two-aircraft Simulations. J. Geophys. Res., 102, 16619-16637.

58. Davis, A., A. Marshak, R. F. Cahalan, and W. Wiscombe, 1997: Interactions: Solar and Laser Beams in Stratus Clouds. Fractals, 5, 129-166.

59. Marshak, A., A. Davis, R. Cahalan, and W. Wiscombe, 1998: Nonlocal Independent Pixel Approximation: Direct and Inverse Problems. IEEE Trans. Geosci. and Rem. Sens., 36, 192-205.

60. Marshak, A., A. Davis, W. Wiscombe W. Ridgway, and R. Cahalan, 1998: Biases in Shortwave Column Absorption in the Presence of Fractal Clouds. J. Climate, 11, 431-446.

61. Marshak, A., A. Davis, W. Wiscombe, and R. Cahalan, 1998: Radiative Effects of Sub-Mean-Free-Path Liquid Water Variability observed in Stratiform Clouds. J. Geophys. Res., 103, 19557-19567.

62. Gao, B.- C., Y. Kaufman, W. Han, and W. Wiscombe, 1998: Correction of thin Cirrus Path Radiances in the 0.4-1 Micron Spectral Region using the Sensitive 1.375 Micron Cirrus Detecting Channel. J. Geophys. Res., 103, 32,169-32,176.

63. Davis, A., A. Marshak, H. Gerber and W. Wiscombe, 1999: Horizontal Structure of Marine Boundary-Layer Clouds from Cm-to Km Scales. J. Geophys. Res., 104, 6123-6144.

64. Marshak, A., W. Wiscombe, A. Davis, L. Oraiopoulos, and R. Cahalan, 1999: On the Removal of the Effect of Horizontal Fluxes in Two-aircraft Measurements of Cloud Absorption. Quart. J. Roy. Meteor. Soc., 558, 2153-2170.

65. Marshak, A., L. Oreopoulos, A. Davis, W. Wiscombe, and R. Cahalan, 1999: Horizontal Radiative Fluxes in Clouds and Accuracy of the Independent Pixel Approximation at Absorbing Wavelengths. Geoph. Res. Lett., 11, 1585-1588.

66. Marshak, A., Y. Knyazikhin, A. Davis, W. Wiscombe, and P. Pilewskie, 2000: Cloud-Vegetation Interaction: Use of Normalized Difference Cloud Index for Estimation of Cloud Optical Thickness. Geophys. Res. Lett., 27, No. 12, 1695-1698.

67. Esper, J., P. Panetta, M. Ryschkewitsch, W. Wiscombe, and S. Neeck, 2000: NASA/GSFC Nano-Satellite Technology for Earth Science Missions. Acta Astronautica , 46, 287-296.

68. Yang, P., B. C. Gao, B. Baum, Y. Hu, W. Wiscombe, M. Mishchenko. D. M. Winker, S. Nasiri, 2001: Asymptotic Solutions for Optical Properties of Large Particles with Strong Absorption. Appl. Optics, 40, No. 9, 1532-1547.

69. Gerber, H., J. Jensen, A. Davis, A. Marshak, and W. Wiscombe, 2001: Spectral Density of Cloud Liquid Water Content at High Frequencies. J. Atmos. Sci, 58, 497-503.

70. Yang, P., B.-C. Gao, B. Baum, Y. Hu, W. Wiscombe, S.-C. Tsay, D. Winker, S. Nasiri, 2001: Radiative Properties of Cirrus Clouds in the Infrared (8-13 m. . J. Quant. Spectros. Rad. Transfer, 70, 473-504.

71. Yang, P., B.- C. Gao, B. A. Baum, W. Wiscombe, Y. X. Hu, S. Nasiri, A. Heymsfield, G. McFarquhar, and L. Miloshevich, 2001: Sensitivity of Cirrus Bidirectional Reflectance to Vertical Inhomogeneity of Ice Crystal Habits and Size Distributions. J. Geophys. Res., 106, 17267-17291.

72. Yang, P., B.-C. Gao, W. Wiscombe, M. Mishchenko, S. Platnick, H.-L. Huang, B. Baum, Y. Hu, D. Winker, S.-C. Tsay, and S. Park, 2002: Inherent and Apparent Scattering Properties of Coated or Uncoated Spheres Embedded in an Absorbing Host Medium. Applied Optics, 41, 2740-2759.

73. Gao, B.-C., P. Yang, W. Han, R.-R. Li, and W. Wiscombe, 2002: An algorithm using visible and 1.38-μm channels to retriev cirrus cloud reflectances from aircraft and satellite data. IEEE Trans. Geosci. Remote Sens., 40, 1659-1668.

74. Knyazikhin, Y., A. Marshak, W. Wiscombe, J. Martonchick, and R. Myneni, 2002: Missing Solution to the Transport Equation and its Effect on Estimation of Cloud Absorptive Properties", J. Atmos. Sci. 59, 3572-3585.

75. Lee, Y., P. Yang, M. Mishchenko, B. Baum, Y. Hu, H.-L. Huang, W. Wiscombe, and A. Baran, 2002: On the use of circular cylinders as surrogates for hexagonal pristine ice crystals in scattering calculations at infrared wavelengths. Appl. Opt., 42, 2653-2664.

76. Knyazikhin, Y., A. Marshak, W. Wiscombe, J. Martonchick, and R. Myneni, 2002: A missing solution to the transport equation and its effect on estimation of cloud absorptive properties. J. Atmos. Sci., 59, 3572-3585.

77. Gao, B.-C., P. Yang, W. Han, R.-R. Li, and W. Wiscombe,2002: An algorithm using visible and 1.38-m channels to retrieve cirrus cloud reflectance from aircraft and satellite data. IEEE Trans. Geosci. Remote Sens., 40, 1659-1668.

78. Yang, P., M. Mlynczak, H.L. Wei, D. Kratz, B.A. Baum, Y. Hu, H.-L. Huang, W. Wiscombe, A. Heldinger, and M. Mishchenko, 2003: Spectral signature of ice clouds in the far-infrared region: Single-scattering calculation and radiative sensitivity study. J. Geophys. Res., 108 (D18) 4569, doi:10.1029/2002JD003291.

79. Lee, Y.K., P. Yang, M.I. Mischenko, B.A. Baum, Y.Hu, H.L. Huang, W. Wiscombe, and A.J. Baran, 2003: On the use of circular cylinders as surrogates for hexagonal pristine ice crystals in scattering calculations at infrared wavelengths. Appl. Opt., 42, 4653-2664.

80. Gao, B.-C. P. Yang, G. Guo, S.K. Parks, W. Wiscombe, and B.D. Chen, 2003: Measurements of water vapor and high clouds over the Tibetan Plateau with the Terra MODIS instrument. IEEE Trans. Geosci. Remote Sens., 41, 895-900.

81. Evans, K.F., R. Lawson, P. Zmarzly, D. O'Connor, and W. Wiscombe, 2003: In situ cloud sensing with multiple scattering lidar: Simulations and demonstration. J. Atmos. Oceanic Tech., 20, 1505-1522.

82. Chiu, J.-Y. C., A. Marshak, and W. Wiscombe, 2004: The effect of surface heterogeneity on cloud absorption estimates. Geophys. Res. Lett., 31 (L15105), doi:10.1029/2004GL020104.

83. Marshak, A., Y. Knyazikhin, K. Evans, and W. Wiscombe, 2004: The "RED versus NIR" plane to retrieve broken-cloud optical depth from ground-based measurements. J. Atmos. Sci., 61, 1911-1925.

84. Yang, P., G.W. Kattawar and W. Wiscombe, 2004: Effect of particle asphericity on single-scattering parameters: comparison between Platonic solids and spheres, Appl. Opt. 43, 4427-4435.

85. Evans, K.F. and W. Wiscombe, 2004: An algorithm for generating stochastic cloud fields from radar profile statistics, Atmos. Res. 72, 263–289.

86. Halthore, R., (23 authors)… and W. Wiscombe, 2005: Intercomparison of shortwave radiative transfer codes and measurements, J. Geophys. Res., 110, D11206, doi: 10.1029/2004JD00529

87. Marshak, A., Yu. Knyazikhin, M. L. Larsen, and W. Wiscombe, 2005: Small-scale drop size variability: Empirical models for drop-size-dependent clustering in clouds. J. Atmos. Sci., 62, 551-558.

88. Knyazikhin, Y., A. Marshak, M. Larsen, W. Wiscombe, J. Martonchik, and R. Myneni, 2005: Small-scale drop size variability: Impact on estimation of cloud optical properties. J. Atmos. Sci., 62, 2555-2567.

89. Chiu, J.-C., A. Marshak, Y. Knyazikhin, W. Wiscombe, H. Barker, J. Barnard, Y. Luo, 2006: Remote sensing of cloud properties using ground-based measurements of zenith radiance, J. Geophys. Res., 111, D16201, doi:10.1029/2005JD006843.

90. Turner, D., A. Vogelmann, R. Austin, J. C. Barnard, K. Cady-Pereira, J.-C. Chiu, S. A. Clough, C. Flynn, M. Khaiyer, J. Liljegren, K. Johnson, B. Lin, C. Long, A. Marshak, S. Matrosov, S. McFarlane, M. Miller, Q. Min, P. Minnis, W. O'Hirok, Z. Wang, and W. Wiscombe, 2007. Thin liquid water clouds: Their importance and our challenge. Bulletin Amer. Meteor. Soc. (BAMS), 88, 177-190.

91. Wiscombe, W., 2006: "Scales, Tools and Reminiscences", in **Three-Dimensional Radiative Transfer in Cloudy Atmospheres**, A. Marshak and A. B. Davis, Editors, Springer-Verlag, 790 pp.

92. Chiu, J.-C., A. Marshak, W. Wiscombe, E. J. Welton, and S. Valencia, 2007. Cloud optical depth retrievals from solar background "signal" of micropulse lidars. Geosci. Remote Sens. Lett., 4, 456-460.

93. Zhang, Z., P. Yang, G. Kattawar & W. Wiscombe, 2007: Single-scattering properties of Platonic solids in geometrical-optics regime, JQSRT 106, 595-603.

94. Su, W., E. Dutton, T. Charlock, and W. Wiscombe, 2007: Performance of standard radiometers in very low temperature and pressure environment, J. Atmos. Oceanic. Tech (accepted)

95. Huang, D., Y. Liu and W. Wiscombe, 2008a: Determination of cloud liquid water distribution with 3D cloud tomography, J. Geophys. Res. (accepted)

96. Huang, D., Y. Liu and W. Wiscombe, 2008b: Cloud tomography: role of constraints and a new algorithm, J. Geophys. Res. (accepted)

97. Ottaviani, M., K. Stamnes, J. Koskulics, H. Eide, S. Long, W. Su and W. Wiscombe, 2008: Light reflection from water waves: a polarimetric investigation under controlled laboratory conditions, J. Atmos. Oceanic Tech. (in press)

98. Ottaviani, M., C. Merck, S. Long, J. Koskulics, K. Stamnes, W. Su and W. Wiscombe, 2008: Time-resolved polarimetry over water waves: relating glints and surface statistics, Appl. Opt. (in press)

99. Ottaviani, M., R. Spurr, K. Stamnes, W. Li, W. Su and W. Wiscombe, 2008: Improving the description of sunglint for accurate prediction of remotely-sensed radiances, JQSRT (submitted)

100. Yang Y., A. Marshak, J.-C. Chiu, W. Wiscombe, S.P. Palm, A.B. Davis, D. Spangenberg, L. Nguyen, J. Spinhirne, and P. Minnis, 2008. Retrievals of cloud optical depth from the Geoscience Laser Altimeter System (GLAS) by calibration of solar background signal. J. Atmos. Sci., (accepted Apr 2008).

101. Pankine, A., Z. Li, D. Parsons, M. Purucker, E. Weinstock, W. Wiscombe, and K. Nock, 2008: Stratospheric satellites for Earth observations, Bulletin Amer. Meteor. Soc. (BAMS), (submitted)

102. Chiu, J. -C., A. Marshak, Y. Knyazikhin, P. Pilewskie, and W. Wiscombe, 2008. Physical interpretation of the spectral radiative signature in the transition zone between cloud-free and cloudy regions. ACPD 8, 17549-17580.

MAJOR REPORTS (that continue to be cited):

1. "The Delta-Eddington Approximation for a Vertically Inhomogeneous Atmosphere," W. Wiscombe, NCAR Technical Note TN-121+STR, 1977.

2. "Mie Scattering Calculations: Advances in Techniques and Fast, Vector-Speed Computer Codes," W. Wiscombe, NCAR Technical Note TN-140+STR, 1979 (revised and reissued Aug 1996).

3. "Single Scattering from Nonspherical Chebyshev Particles: A Compendium of Calculations," W. Wiscombe and A. Mugnai, NASA RP-1157, 1986.

4. “DISORT, a General-Purpose Fortran Program for Discrete-Ordinate-Method Radiative Transfer in Scattering and Emitting Layered Media**:** Documentation of Methodology “, K. Stamnes, S.-C. Tsay, W. Wiscombe, and I. Laszlo, electronic publication, Mar 2000.