ABBREVIATED CURRICULUM VITA

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EDUCATION:

Ph.D. (1980)	Atmospheric Science (concentration: Atmospheric Dynamics), Colorado State University, Fort Collins, CO
M.S. (1977)	Atmospheric Science (concentration: Atmospheric Dynamics), Colorado State University, Fort Collins, CO
B.S. (1974)	Meteorology (concentration: Physics, Mathematics) with honors, Lyndon State College, Lyndonville, VT

PROFESSIONAL RECORD:

12/07 - *present*	*Director*, National Center for Computational Sciences, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6008
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9/09 – 10/13	*Director,* Oak Ridge Climate Change Science Institute, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831
9/84 – 3/10	*Scientist* (Scientist I, 1984-1987; Scientist II, 1987-1990; Scientist III, 1990-1999; Senior Scientist 1999-2010; Climate Modeling Section Head, 3/01-12/07; Deputy Division Director 7/04-12/07; 1/08-3/10 Leave of Absence), National Center for Atmospheric Research, Climate and Global Dynamics Division, P.O. Box 3000, Boulder, CO 80307
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PUBLICATIONS

Reviewed Publications (Web of Science: 9829 citations [average 142], h-index 39; 1 March 2019)
(Google Scholar: 17022 citations, h-index 52, i10-index 77; 1 March 2019)
(ResearchGate: 12707 citations, h-index 47; 1 March 2019)

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15. Kiehl, J. T., C. S. Bretherton, P. Chang, J. J. Hack, W. Large, M. Blackmon, C. Bitz, D. McKenna, S. Doney, J. Fein, S. J. Reid, D. Bader, 2003: Community Climate System Model Science Plan (2004-2008), 76 pp. (http://www.ccsm.ucar.edu/management/sciplan2004-2008.pdf)

16. Collins, W. D., P. J. Rasch, B. A. Boville, J. J. Hack, J. R. McCaa, D. L. Williamson, J. T. Kiehl, B. Briegleb, C. Bitz, S.-J. Lin, M. Zhang, and Y. Dai, 2004: Description of the CCSM Community Atmosphere Model (CAM3). *NCAR Technical Note TN-464+STR*, 266 pp, see http://www.ccsm.ucar.edu/models/atm-cam/docs/description/description.pdf.

17. Hack, J., J., and colleagues, Exascale Requirements Review Series. Office of Science Review Sponsored Jointly by Advanced Scientific Computing Research and Companion Program Offices, June 10-12, 2015 through March 9–10, 2017, doi10.2172/1341722, doi:10.2172/1341721, doi:10.2172/1375639, doi:10.2172/1375720, doi:10.2172/1369223, doi:10.2172/1375638, doi:10.2172/1417653; http://exascaleage.org/.

Selected Conference Papers (refereed/published)

1. Hack, J. J., 1977: Experiments with an Axisymmetric Primitive Equation Tropical Cyclone Model Incorporating a Spectral Cumulus Parameterization. Conference Papers, 11th Technical Conference on Hurricanes and Tropical Meteorology (Miami Beach), AMS, Boston, pp. 512–517.

2. Hack, J. J. and W. H. Schubert, 1981: Numerical Simulation of the Tropical Cyclone Life Cycle using a Spectral Cumulus Parameterization. Conference Papers, Fifth Conference on Numerical Weather Prediction (Monterey, CA), AMS, Boston, 203–208.

3. Schubert, W. H. and J. J. Hack, 1981: Inertial Stability and Tropical Cyclone Development. Conference Papers, Fifth Conference on Numerical Weather Prediction (Monterey, CA), AMS, Boston, 246–251.

4. Schubert, W. H., P. Ciesielski, and J. J. Hack, 1984: Response of the Tropical Atmosphere to Convective Cloud Clusters. Proc. ECMWF Workshop on Convection in Large–Scale Models, ECMWF, Reading, 377–390.
5. Hack, J. J., 1985: On the Relationship of Peak to Sustained Performance in Highly Concurrent Vector Machine Organizations. Invited Paper, Proceedings of the Cray Users Group, May 7–9, Stockholm, 76–85.
6. Hack, J. J., 1988: Supercomputer Directions and Large–Scale Atmospheric Simulation. Proceedings of the 12th IMACS World Congress on Scientific Computation, July 18-22, 1988, Paris, France, Vol. 5, 146–149.
7. Hack, J. J., W. H. Schubert, D. E. Stevens, H.-C. Kuo, 1989: On the Response of the Hadley Circulation to Diabatic Heating. Conference Papers, 18th Technical Conference on Hurricanes and Tropical Meteorology (San Diego), AMS, Boston, pp. 5–6.
8. Williamson, D. L., and J. J. Hack, 1992: Simulated Precipitation in the NCAR CCM2. GEWEX/WGNE Workshop on Global Observations, Analyses, and Simulation of Precipitation, October 27-30, 1992, Camp Springs, MD.
9. Kiehl, J.T., M. W. Moncrieff, J. J. Hack, W. Grabowski, and V. Ramaswamy, 1993: A hierarchical approach to improved cloud radiation parameterization for climate models through the Atmospheric Radiation Measurement Program. Proceedings of the Third Atmospheric Radiation Measurement (ARM) Science Team Meeting, DOE Office of Energy Research, Washington, DC, 379 p, 1-5 Mar 1993; pp. 179-182.
10. Hack, J. J., 1993: Parameterized Sub-grid Transports in the NCAR CCM2. Invited lecture, WCRP Workshop on the Parameterization of Sub-grid Scale Tracer Transport, November 30 – December 3, 1993, Virginia Beach, VA, Vol. 823., pp 63–67.
11. Drake, J., R. Flanery, I. Foster, J. Hack, J. Michalakes, R. Stevens, D. Walker, D. Williamson, and P. Worley, 1993: The message passing version of the parallel community climate model. *Parallel Supercomputing in Atmospheric Sciences*, World Scientific, Singapore, pp 500-513.
12. Hack, J. J., 1994: Future Directions for the NCAR Community Climate Model. Proceedings from the U.S. Global Change Research Program Workshop on Earth System Modeling, May 1–4, 1994, Washington, DC.
13. Drake, J., I. Foster, J. Hack, J. Michalakes, D. Semeraro, B. Toonen, D. Williamson, and P. Worley, 1994: A GCM Adapted for Scalable Parallel Computers. *Proc. 1994 AMS Annual Meeting*, American Meteorological Society, 91-98.
14. Drake, J. B., R. E. Flanery, I. T. Foster, J. J. Hack, J. G. Michalakes, R. L. Stevens, D. W. Walker, D. L. Williamson, and P. H. Worley, 1994: Global Climate Modeling in Parallel: CCM on the Intel Touchstone Delta. *Concurrent Supercomputing Consortium Newsletter*, Vol. 13, No. 6, pp 5–7.
15. Zhang, M. H., R. D. Cess, J. T. Kiehl, and J. J. Hack, 1995: Surface Energy Budget Over the Oceans: Convection-Wind-Evaporation Feedback and Impact of Anomalous Absorption in Clouds. AMS Symposium on the Regulation of Sea Surface Temperature and Warming of the Tropical Ocean-Atmosphere System, January 1995, Dallas, Texas, 62-65.
16. Hack, J. J., and J. T. Kiehl, 1995: Reduction of Systematic Errors in the NCAR CCM2. Proceedings of the First International AMIP Scientific Conference (Monterey, CA, USA, May 15–19, 1995), WCRP-92, WMO/TD-No.732, pp 313-318.
17. Ferreira, RN, W. H. Schubert, J. J. Hack, 1995: Twin tropical cyclones and the Madden-Julian Oscillation. American Meteorological Society Proceedings of the 21st Conference on Hurricanes and Tropical Meteorology, Miami, 24-28 April 1995, Pages: 410-412.

18. Hack, J. J., J. W. Hurrell, and J. T. Kiehl, 1997: Climate characteristics of the NCAR Community Climate Model (CCM3). AMS Annual Meeting, Seventh Conference on Climate Variations, February 2–7, 1997, Long Beach, pp 1–3.
19. Hack, J. J., 1998: Climate modeling requirements for high-speed computers. Conference on High Speed Computing (proceedings published by Los Alamos National Laboratory, LA-13474-C), April 20–23, 1998, Gleneden Beach, Oregon.
20. Hack, J. J., 2000: The Scientific and Technical Challenges of Global Climate Modeling, Invited Presentation, Proceedings of the Supercomputing in Nuclear Applications (SNA 2000), 5 September 2000, Tokyo, 9 pp.
21. Muszala, SP; G. Alaghband, G; D.A. Connors, J. J. Hack, 2004: A VFSA scheduler for radiative transfer data in climate models. 17th International Conference on Parallel and Distributed Computing Systems, San Francisco, Sept 15-17, 2004, Parallel, and Distributed Computing Systems, 64-71.
22. Rasmussen, R., J. Hack, P. LeMone, M. Moncrieff, D. Parsons, K. Trenberth, T. Warner, J. Wilson, 2003: The Water Cycle Across Scales: An NCAR Initiative. Joint Session 7 U. S. Global Change Research Program water cycle initiative (with Symposium on Observing and Understanding the Variability of Water in Weather and Climate, the 14th Symposium on Global Change and Climate Variation and the 17th Conference on Hydrology), J7.11, 12 pp, Long Beach, 12 February 2003 https://ams.confex.com/ams/pdfpapers/57789.pdf.
23. Gleckler, P., M. Miller, J. Hack, D. Bader, K. Sperber and K. Taylor, 2008: Summary of the 3rd WGNE Workshop on Systematic Errors in Climate and NWP Models, Lawrence Livermore National Report Series, UCRL LLNL-TR-403078, April 2008, 10 pp.
24. Taylor MA, K. Evans, J. Hack, and P. Worley, 2010: Subcycled Dynamics in the Spectral Community Atmosphere Model, Version 4. Proceedings of 2010 Scientific Discovery through Advanced Computing (SciDAC) Conference, Chattanooga, TN, July 11–15 2010.

Selected Conference/Meeting Presentations

1. Hack, J. J., 1980: On the Role of Convective-Scale Processes in Tropical Cyclone Development. Presented at the Thirteenth Technical Conference on Hurricanes and Tropical Meteorology of the AMS, December 1–5, 1980, Miami Beach, FL.
2. Hack, J. J., 1982: The Linear and Nonlinear Response of Atmospheric Vortices to Prescribed Heating. Presented at the Fourteenth Technical Conference on Hurricanes and Tropical Meteorology of the AMS, June 7–11, 1982, San Diego, CA.
3. Hack, J. J. and W. H. Schubert, 1985: The Linear vs. Nonlinear Response of Atmospheric Vortices to Heating by Organized Cumulus Convection. Presented at the Joint Assembly of the IAMAP/IAPSO, August 5–16, 1985, Honolulu, HI.
4. Hack, J. J., 1987: Supercomputers and Large–Scale Atmospheric Simulation. Invited Paper, Second International Conference on Supercomputing, May 4–8, 1987, Santa Clara, CA.
5. Hack, J. J., 1988: On the Promise of General–Purpose, Massively–Parallel Computing. Invited paper, Salishan Conference on High–Speed Computing sponsored by Los Alamos and Lawrence Livermore National Laboratories, March 17, 1988, Gleneden Beach, OR.
6. Hack, J. J., 1988: Large-Scale Atmospheric Modeling, Invited Presentation, 12th International Mathematics and Computer Simulation (IMACS) World Congress on Scientific Computation, Paris, July 18-22,1988.
7. Hack, J. J., 1988: Supercomputer Directions and Large–Scale Atmospheric Simulation. Invited paper, IBM Europe Institute on Parallel Computing, July 25-29, 1988, Oberlech, Austria.

8. Hack, J. J., 1988: Algorithmic Considerations for the Parallel Implementation of Atmospheric Simulation Models, IFIP Working Group on Numerical Software, Working Conference on Aspects of Computation on Asynchronous Parallel Processors, Stanford University, August 22-26, 1988.
9. Hack, J. J., 1991: A Stability-Dependent, Mass Flux Representation of Moist Convection in the NCAR Community Climate Model. Presented at the IAMAP Symposia, Twentieth IUGG General Assembly, August 11-24, 1991, Vienna, Austria.
10. Hack, J. J., 1992: Modeling and Validation of the Atmospheric Hydrologic Cycle, Invited presentation at the University of Minnesota, Institute for Mathematics and its Applications (IMA), July 28, 1992, Minneapolis, MN.
11. Hack, J. J., 1992: Sensitivity of the NCAR CCM2 to a Low Wind Surface Energy Exchange Formulation. Presented at the Second International Conference on Modeling of Global Climate Change and Variability, September 7-11, 1992, Hamburg, Germany.
12. Hack, J. J., R. Jakob, and D. L. Williamson, 1993: Solutions to Date for the Standard Test Set for Numerical Approximations to the Shallow Water Equations in Spherical Geometry, 1993 SIAM Annual Meeting, July 12-16, 1993, Philadelphia, PA.
13. Hack, J. J., 1993: Scientific and Computational Challenges of Atmospheric General Circulation Modeling. Invited presentation, DOE Computational Science Graduate Fellowship Conference, August 5-7, 1993, Minneapolis, MN.
14. Hack, J. J., 1994: Parameterization of Moist Convection in the NCAR CCM2. Presented at the Workshop on Cumulus Parameterization, Center for Clouds, Chemistry and Climate, February 17, 1994, La Jolla, CA.
15. Hack, J. J., 1994: Validation Opportunities for Atmospheric General Circulation Modeling Under the ARM Program. Invited talk at the ARM Science Team Meeting, February 28, 1994, Charleston, SC.
16. Hack, J. J., J. T. Kiehl, M. Zhang, and R. D. Cess, 1994: Sensitivity of the Simulated Climate to Enhanced Shortwave Cloud Absorption. NATO Advanced Research Workshop on Climate Sensitivity to Radiative Perturbations: Physical Mechanisms and Validation, July 11, 1994, Paris.
17. Hack, J. J., and J. T. Kiehl, 1994: Sensitivity of the CCM2 Climate to Improvements in Cloud Optical Properties. DOE FANGIO Intercomparison Workshop, July 12, 1994, Paris.
18. Hack, J. J., and J. T. Kiehl, 1994: The Effect of Cloud Optical Properties on the Simulated Precipitation Distribution in the NCAR CCM2. European Conference on the Global Energy and Water Cycle, July 17–23, 1995, London.
19. Hack, J. J., 1995: The Simulated Climate from the NCAR CSM Atmospheric Component Model. Third International Conference on Modeling of Global Climate Change and Variability, September 4–8, 1995, Hamburg.
20. Hack, J. J., 1996: Simulation of the Earth's hydrologic cycle in atmospheric general circulation models. Invited presentation, American Physical Society Meeting, Indianapolis, Indiana, May 3, 1996.
21. Hack, J. J., 1998: The Utility of Single-Column Modeling Frameworks, ECMWF Workshop on Cloud Processes and Cloud Feedbacks in Large-Scale Models, November 9–13, 1998, Reading, UK.
22. Hack, J. J., 1999: Systematic Biases in the Representation of Clouds in Atmospheric General Circulation Models. Invited talk, Workshop on Parameterizations of Clouds and Surface Processes, Aspen Lodge, Estes Park, CO, 14 September 1999.
23. Hack, J. J., 1999: Calibrating Parameterized Physics Using Cloud Resolving Models, 4th GCSS WG 4 Workshop, Princeton, 6 October 1999.
24. Hack, J. J., 2001: The mystery, science, and art of simulating Earth's hydrological cycle. Invited Plenary Presentation, NCAR Climate System Modeling Workshop, 26 June 2001, Breckenridge, CO.

25. Hack, J. J., 2001: The science, art, and technical challenge of simulating Earth's climate system. Invited Keynote Presentation, DOE Computational Science Graduate Fellowship Conference, 18 July 2001, Washington, DC.
26. Hack, J. J., 2002: GS40 Earth Simulator Project: Background, Scientific Opportunities, and Risks, Invited Presentation, Earth Simulator Rapid Response Workshop, 15 May 2002, Washington, DC.
27. Hack, J. J., 2002: Understanding the Maintenance of the Global Hydrological Cycle with the Aid of Cloud Resolving Models, First GPM Coupled Cloud-Radiation Modeling Workshop, 20 July 2002, Honolulu, HI.
28. Hack, J. J., 2002: GS40 Earth Simulator Initiative: Background Science Oportunities and Risks, Invited Presentation, DOE Advanced Scientific Computing Advisory Committee (ASCAC), 17 October 2002, Washington, DC.
29. Hack, J. J., 2003: Physical Parameterization Techniques Used in Global Atmospheric Models, Invited Lecture, SAMSI Multiscale Workshop, 2 February 2003, Research Triangle Park, NC.
30. Hack, J. J., 2003: Idealized Frameworks for the Diagnosis and Evaluation of Parameterized Physics, Future of Cloud Parameterization Workshop, 8 May 2003, Kauai, HI.
31. Hack, J. J., 2004: Cloud Processes and Their Role in Regulating CAM3 Climate Sensitivity, Climate Sensitivity and Feedbacks Workshop, Invited Talk, 20 April 2004, Exeter, UK.
32. Hack, J. J., 2004: Metrics for Global Change Research: A Modeling Perspective (invited), NRC Metrics for Global Change Research, 9 June 2004, Irvine, CA.
33. Hack, J. J, 2005: What's So Hard About Simulating Earth's Climate System? (invited), NCAR Image Theme of the Year Workshop, 31 October 2005, Boulder, CO.
34. Hack, J. J., 2005: Parameterization and Resolved-Scale Motions (invited). CMOS 39th Annual Congress, Norman McFarlane Session, 31 May 2005, Vancouver, BC.
35. Hack, James J., 2006: Modeling the Climate System Across Scales. CSU Distinguished Lecture (Invited), Colorado State University, Fort Collins, CO, 1 May 2006.
36. Hack, James J., 2006: Predicting the Earth System Across Scales. Fall 2007 WGNE Meeting, Boulder, CO, 26 October 2006.
37. Hack, J. J., and E. Bierly, 2007: Computational and Informational Rate Limiters to the Advancement of Climate Change Science. BERAC-ASCAC Climate Science Subcommittee, 29 November 2007.
38. Testimony before the United States Senate Committee on Commerce, Science, and Transportation on Improving the Capacity of U.S. Climate Modeling for Decision-Makers and Other End-Users. 8 May 2008.
39. Hack, James J., 2008: Understanding Climate Change, Climate Change Implications for National Security and Defense Planning, Washington, DC, 29 October 2008.
40. Hack, James J., 2008: Scientific Discovery through Advanced Computing. Fall 2008 WGNE Meeting, Montreal, Canada, 4 November 2008.
41. Hack, James, J., 2008: Understanding Climate Change and Its Consequences. Supercomputing 08, Austin, TX, 18 November 2008.
42. Hack, James J., 2009: Leadership Computing at the National Center for Computational Science: An Enabling Partner for Breakthrough Science, The 23rd Annual National High Performance Computing and Communications Conference, Newport, RI, 24 March 2009.
43. Hack, James J., 2009: Challenges in Climate Change Research: Computation as an Enabling Technology, Cray User Group Meeting (invited), Atlanta, GA, 4 May 2009.

44. Hack, James J., 2009: Climate Change Science Opportunities Enabled By High-Performance Computing, DOE Office of Science Ice Sheet Science Team Workshop (invited), Annapolis, MD, 16 September 2009.
45. Hack, James J., 2009: Consequences of Global Change: Improving the science basis for decision-support. National Security Implications of Climate Change on U.S. Naval Forces (invited). National Academy of Sciences, 19 October 2009.
46. Hack, James J., 2009: Trends in the Simulation of Global Climate Change: The newfound emphasis on horizontal resolution (invited). WMO Working Group on Numerical Experimentation, Offenbach, Germany, 6 November 2009.
47. Hack, James J., 2010: Challenges in Climate Change Science and the Role of Computing at the Extreme Scale (invited), DOE Exascale Workshop, Washington, DC, 19-20 January 2010.
48. Hack, James J., 2010: Energy-Carbon-Water Challenges for Climate Change Science (invited), Energy and Climate Research Opportunities for Collaboration Meeting Between German Research Organizations, NSF, and DOE, National Science Foundation and U.S. State Department, 17-18 February 2010.
49. Hack, James J., 2010: Challenges in Climate Change Research: Computation as an Enabling Technology (invited), Procter & Gamble Modeling & Simulation Spring Symposium, Cincinnati, OH, 27 April 2010.
50. Hack, James J., 2010: Paradigm Shifts: Transformational Changes Facing Climate Science (invited), LLNL Institute for Scientific Computing Research: *Current Challenges in Computing*, Napa, CA, 31 August 2010.
51. Hack, James J., 2011: Ultra High Resolution Global Climate Simulation to Explore and Quantify Predictive Skill for Climate Means (invited), Variability and Extremes, Regional Climate Modeling Workshop, Santa Fe, NM, 3 August 2011.
52. Hack, James J., 2011: Transformational Changes Facing Global Simulation Science (invited), WMO Working Group on Numerical Experimentation, Boulder, CO, 20 October 2011.
53. Hack, James J., 2012: Climate Modeling and Simulation (invited), Industry-National Laboratory Workshop on Modeling and Simulation, Austin, TX, 7 March 2012.
54. Hack, James J., 2012: Leadership Computing at the National Center for Computational Science: Transitioning to Heterogeneous Architectures (invited), 15th ECMWF Workshop on High Performance Computing in Meteorology, Reading, UK, 4 October 2012.
55. Hack, James J., 2012: Transformational Changes Facing Climate Change Science (invited), AGU Town Hall on Strategies for Leadership Class Computing and Climate Modeling at DOE, San Francisco, CA, 5 December 2012.
56. Hack, James J., 2012: Virtualizing the Environment and the Connection to High-Performance Computing (invited), Symposium on Physics Energy Computing and Cities (SPECC-2012), New York University, 17 December 2012.
57. Hack, James J., 2013: Leadership Computing Directions at Oak Ridge National Laboratory: Navigating the Transition to Heterogeneous Architectures (invited), International Symposium on Computing in Atmospheric Sciences, Annecy, France, 8-12 September 2013.
58. Hack, James J., 2014: Navigation in a Virtual World (invited), Smithsonian Institution Symposium, Living in the Anthropocene: Prospects for Climate, Economics, Health, and Security, Washington, DC, 9 October 2014.
59. Hack, James J., 2015: Climate Change Research: Computation as an Enabling Technology (invited), University of Tennessee Knoxville Physics Department Colloquium, Knoxville, TN, 26 January 2015.

60. Hack, James J., 2015: Navigating Computational Paradigm Changes: Lessons Learned from the Last Major Transition (Invited), CCSI Earth System Modeling Workshop, Oak Ridge National Laboratory, Oak Ridge, TN, 9 June 2015.
61. Hack, James J., 2017: Perspectives on Rate Limiters to Advancing Earth System Modeling Capabilities (Invited), The Future of Earth System Modeling: California Institute of Technology, JPL Center for Climate Sciences, Pasadena, CA, 8 November 2017
62. Hack, James J., 2018: Evolution of Rate Limiters to Progress in Developing Earth System Models (Invited), National Academies of Sciences, Engineering, and Medicine (NASEM) scoping meeting on The Future of Advanced/High Performance Computing for Atmospheric, Weather, and Climate Research, Washington DC, 19 November 2018.

AWARDS/HONORS

Honors Group, Westinghouse Science Talent Search Scholarships and Awards, 1971.

Full tuition undergraduate academic scholarship (three-year program), 1971–1974.

Rita L. Bole Award for Outstanding Scholarship, Lyndon State College, Lyndonville, VT, June 1974.

NCAR Incentive Award for contributions to the development of the Community Climate Model, 1989.

NCAR Incentive Award for organization of and contributions to the NSF Intra America Institute (IAI) Workshop, 1996.

First Community Climate System Model (CCSM) Distinguished Achievement Award, June 2001.

UT-Battelle Science & Technology R&D Leadership Award, Director Level, 2013.

Elected Fellow of the American Meteorological Society, 2014.

COMMITTEE/OTHER ACTIVITY (active)

DOE Computational Science Graduate Fellowship Steering and Review Committees, 1990-1999, 2003-present.

DOE Office of Science Biological and Environmental Advisory Committee, March 2014 – present.

Associate Editor and Member of the Editorial Board, ***IEEECS Computing in Science and Engineering***, March 2015 – present.

Member, National Renewable Energy Laboratory (NREL) Computational Science and Energy Analysis Technical Review Panel, June 2018 – present.

OTHER COMMITTEE AND COMMUNITY SERVICE ACTIVITIES (selected)

Member of the NCAR Scientific Computing Division (SCD) Advisory Panel, 1985–1988; 1994–2000.

Member of the UCAR/NCAR Committee for the Strategic Planning of Computing at NCAR, January-September 1986.

Member of the NCAR Community Climate Model (CCM) Executive Committee, 1986–1987.

Chair, Technical Review Group on NCAR Remote Communications Strategies, July-September 1986.

Lecturer, Computational Mathematics Program, University of Colorado-Denver, Fall 1987.

NSF Workshop on Computer Resources for Research in Science and Engineering Panel Member, Washington, DC, September 11, 1987.

NCAR Community Climate Model (CCM) Coordinating Committee, 1987–1995.

Florida State University Supercomputer Computations Research Institute External Program Advisory Board, Tallahassee, FL, September 28–29, 1987.

Head, NCAR Community Climate Model Development Group, 1987–1995.

NSF Institutional Infrastructure Site Review Team at the University of Utah, December 14, 1988.

NSF Division of Advanced Scientific Computing (DASC) Supercomputer Center Site Review Team at the University of California at San Diego, January 9–10, 1989.
Chair, NSF DASC Supercomputer Center Site Review Team at Cornell University, January 23–24, 1989.

NSF DASC Supercomputer Center Reclama and Final Review Renewal Process, Washington, DC, February 27, 1989 and March 7–8, 1989.

NSF Workshop on Scientific Computing Performance Analysis, Boulder, CO, August 29–31, 1989.

NSF Institutional Infrastructure Program Evaluation Panel, Washington, DC, October 18–19, 1989.

NASA Tropical Rainfall Measurement Mission (TRMM), Science Data Requirements Workshop, Greenbelt, MD, December 11–12, 1989.

Invited participant in the JASON/MITRE Winter Study, *Computer Architecture — Global Climate Model Requirements*, La Jolla, January, 1990.

NSF DASC Program Plan Review Panel, Washington, DC, January 16–17, 1990.

DOE General Circulation Model Intercomparison Workshop, Brookhaven National Laboratory, December 3–4, 1990.

DOE CHAMMP Program Review Panel, Washington, DC, April 23–25, 1991.

NSF DASC Program Plan Review Panel, Washington, DC, December 17–18, 1991.

DOE U.S. Supercomputer Performance Evaluation Committee, 1991 - 1995.

Invited participant in the JASON/MITRE Mini-Symposia, *Global Change Modeling, Process Modeling: Parameterization of Cloud Amount*, LaJolla, July 1-3, 1991.

Member of DOE Climate Change Prediction Program (CCPP), formally Computer Hardware, Advanced Mathematics and Model Physics (CHAMMP), Science Team, November 1991 - 2009.

DARPA National High Performance Computing and Communication Consortium organizational meeting, Arlington, VA, January 22, 1992.

GEWEX/WGNE Workshop on Global Observations, Analysis, and Simulation of Precipitation, Camp Springs, MD, October 26–30, 1992.

DOE Atmospheric Radiation Measurement (ARM) Hierarchical Diagnosis Workshop, Richland, WA, December 15–18, 1992.

DOE CHAMMP Workshop on Alternatives to GCM's, Berkeley, CA, February 10–12, 1993.

Working Group 4: Precipitating Convectively-Driven Cloud Systems, GEWEX Cloud System Study (GCSS) Working Group, June - October, 1993.

DOE Atmospheric Radiation Measurement (ARM) Science Team, March 1994-1998.

DOE CHAMMP Program Review Panel, Washington, DC, May 20, 1994.

DOE CHAMMP Science Team Proposal Review Panel, Washington, DC, June 19–21, 1994.

Invited participant in JASON/MITRE Review of the *DOE Atmospheric Radiation Measurement Program* on the topic of AGCM Validation Opportunities, LaJolla, June 27-29, 1994.

DOE OPA Review Panel Meeting, July 14, 1994, Bethesda, MD.

External Review Team, George Mason University Institute for Computational Sciences and Informatics, November 7-8, 1994.

NASA FIRE-III Proposal Prioritization Panel, January 10–11, 1995, Washington, DC.

NCAR Climate Simulation Laboratory (CSL) Supercomputer Evaluation and Selection Committee, March 1995 – October 1997. NSF Multidisciplinary Challenge Pre-Proposal and Final Review Panel, Arlington, VA, April 10–11, 1995; July 27–28, 1995.

Program Committee for the 1995 International Workshop on Computer Performance, Measurement, and Analysis (PERMEAN '95), Beppu, Japan, August 20–23, 1995.

Organizing Committee for the NSF Intra America Institute (IAI) Workshop, 26 February–8 March, 1996.

NSF Program for Advanced Computational Infrastructure Review Panels; 25-27 September 1996, 4-7 November 1996, and 18-20 December 1996.

Co-chair, NCAR Climate Systems Model (CSM) Atmospheric Model Working Group, 1997–2001.

Editor, Journal of Climate, 1998–2001.

Invited participant in Joint JASON/USGCRP Workshop on Global Climate Modeling and the Accelerated Climate Prediction Initiative, LaJolla, July 1–3, 1998.

Session Chair, Gordon Research Conference on Solar Radiation and Climate, June 14–19, 1998, Plymouth, NH.

Co-chair, NCAR Scientific Computing Division Director Search Committee, June–August 1998.

NCAR Strategic Planning Committee for a high-performance simulation environment, 1999-2000.

Session Chair, Cess Symposium, Scripps Institute of Oceanography, 18-22 October 1999, La Jolla, CA.

U.S. Common Modeling Infrastructure Committee, 26-28 April 1999, NASA GSFC, Greenbelt; 2-4 August 1999, NRL, Monterey; 6-7 December 1999, NCEP, Camp Springs, MD; 22-23 February 2000, NCAR, Boulder, CO.

Co-convener of Spring 2001 AGU Special Session on *Climate Model Diagnosis: Tools and Techniques*, 29 May - 2 June 2001, Boston, MA.

Co-convener of Fall 2001 AGU Special Session on *Diagnosing Systematic Errors in Numerical Models of the Climate System*, 10-14 December 2001, San Francisco, CA.

Co-convener of Fall 2001 AGU Special Session on *Climate Observing System Challenges*, 10-14 December 2001, San Francisco, CA.

Review Panel for the Computing and Computational Sciences Directorate at the Oak Ridge National Laboratory, 11-12 February 2002.

Chair of the Review Panel for the Lawrence Livermore National Laboratory Program for Model Diagnosis and Intercomparison, 11-12 March 2002.

Session Chair/Discussion Leader, Gordon Research Conference on Solar Radiation and Climate, July 13–18, 2003, New London, NH.

LBNL/NERSC Review Committee, 28-29 January 2004

ORNL/Cray X1 Review Committee, 9-11 February 2004

U.S. Water Cycle Scientific Steering Group, 2002-2006

U.S. CLIVAR Process Studies and Model Improvement Panel (Co-chair), 2005 – 2007

U.S. GEWEX Cloud Systems Study (GCSS) Scientific Steering Group, 2003-2007

LLNL/PCMDI Advisory Committee (Chair), 2003-2008.

Oak Ridge National Laboratory Computer Science and Mathematics Division Advisory Committee, 1998-2005.

CCSM Scientific Steering Committee, January 2002 – 2007.

Co-chair, NCAR Clouds and Climate Program 1998-2005.

DOE Office of Science Advanced Scientific Computing Advisory Committee, September 2003-2012 (Appointment by the Secretary of Energy)

Member of Joint Scientific Committee (JSC) for the World Climate Research Programme and the WMO Commission for Atmospheric Sciences (CAS) JSC/CAS Working Group on Numerical Experimentation (WGNE), 1 January 2006 – 31 December 2009.

Member of the NCAR Scientific Computing Division (SCD) Climate Simulation Laboratory Advisory and Allocation Panel, 2002 - 2013.

Member of National Research Council study on A National Strategy for Advancing Climate Modeling, December 2010 – August 2012.

Member of the NOAA Science Advisory Board (SAB) Climate Working Group, 2009 – 2014

Member of NSF Advisory Committee for Cyberinfrastructure, May 2011 – 2014.

Community Earth System Model (CESM) Scientific Steering Committee, September 2011 – 2015.

Member of Pacific Northwest National Laboratory Fundamental & Computational Science Directorate Advisory Committee, June 2012 – 2014.

NCAR Appointments Review Group (ARG) Investigative Committees:

- Peter Hess (Scientist III), 2001
- Anne Smith (Senior Scientist), 2002
- Mary Barth (Scientist III), 2004
- Andrew Crook (Senior Scientist), 2005
- Gang Lu (Senior Scientist), 2006

Reviewer for:

- Journal of the Atmospheric Sciences
- Monthly Weather Review
- Journal of Climate
- Atmosphere-Ocean
- Meteorology and Atmospheric Physics
- Journal of Geophysical Research
- Quarterly Journal of the Royal Meteorological Society
- Tellus
- Journal of the Meteorological Society of Japan
- IEEE Computer
- Parallel Computing
- NSF
- NOAA
- NASA
- Department of Energy
- Air Force Office of Scientific Research
- Deutsche Forschungsgemeinschaft (German Research Foundation)

Contributed reviews to the following for selection of participants:

- NCAR Scientific Computing Division (computing request reviews)
- NCAR Postdoctoral Program
- Community Climate Model Workshops
- NCAR Summer Supercomputing Institutes
- Workshops for Numerical Solutions of Fluid Flow in Spherical Geometry
- 1995 International Workshop on Computer Performance, Measurement, and Analysis

Formalized University/Laboratory Interactions

Professor Adjoint at the University of Colorado, 1991-1995, 2003 – 2007.

Ph.D. Committee (Co-Advisor) Ruediger Jakob (University of Colorado). Ph.D. awarded August, 1993.

Co-directive Status, Program in Meteorology, College of Arts and Sciences, Florida State University.

Ph.D. Committee (and Co-chairperson) for Mahandra Kharki (Florida State University), Department of Meteorology. Ph.D. awarded 1996.

Ph.D. Committee for Alice Gilliland (Georgia Inst. of Tech.). Ph.D. awarded 1997.

Ph.D. Committee for Shaocheng Xie (Stony Brook University). Ph.D. awarded 1998.

Ph.D. Committee for Ping Zhu (Miami University). Ph.D. awarded 2002.

Ph.D. Committee for Jingbo Wu (Stony Brook University), Ph.D. awarded 2006.

Ph.D. Committee (Co-Advisor) for Stefan Muszala (University of Colorado). Ph.D. awarded 2007.

PROFESSIONAL SOCIETIES

American Meteorological Society (Fellow)

American Geophysical Union