Brian Hannon Kahn

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Summary of Research Interests:

Dr. Brian Kahn is a Staff Scientist with the Atmospheric Infrared Sounder (AIRS) group at the NASA Jet Propulsion Laboratory (JPL). His research interests broadly encompass the theory and application of remote sensing observations of temperature, water vapor, clouds, precipitation, aerosols, and trace gas species using a synthesis of multiple satellite platforms. An emphasis of his research is on the quantification of the composition, formation and evolution of cirrus clouds, and their contributions to climate forcing and feedbacks. Furthermore, his research interests include weather and climate forecasting, the representation of clouds and feedback processes in climate models, and the mechanisms that lead to preferred spatial scales of baroclinic and tropical cyclones.

Education:

- Ph.D, Atmospheric Sciences, University of California at Los Angeles (UCLA) Department of Atmospheric and Oceanic Sciences (DAOS) (2004)
- M.S., Atmospheric Sciences, UCLA DAOS (2001)
- B.S. (with honors), Meteorology, San Jose State University (SJSU) (1995)

Experience:

- Staff Scientist, JPL (2009–)
- Assistant Researcher IV, JIFRESSE/UCLA (2008)
- Visiting Researcher, JIFRESSE/UCLA (2007; 2009–)
- NASA Post-doctoral Program (NPP) Fellow (2005–2008)
- Academic Part-Time Researcher, AIRS Science Integration Team (2003–2005)
- Graduate Research Assistant to Dr. Annmarie Eldering (2000–2004)
- Teaching Fellow, Air Pollution and the Atmospheric Environment, UCLA (1999–2002)
- On-Air Personality for *Pulse of This Planet*, KKUP, 91.5 FM, Cupertino, CA (1998–2004)
- Lab Instructor, Introduction to Physics, SJSU (1997–1999)
- Lecturer, Introduction to Weather and Climate, SJSU (1997–1999)
- Exchange Student, Urals State University, Ekaterinburg, Russia (1996–1997)
- Lab Instructor, Introduction to Atmospheric Dynamics, SJSU (1995–1996)
- Internship (Programmer), NWSFO Anchorage, Alaska (Summers of 1994 and 1995)

Honors and Awards:

- NPP Fellowship Award (2005–2008)
- Student Poster Award, AMS Satellite Meteorology and Oceanography Conference (2004)
- NASA Earth Systems Science (ESS) Fellowship (2001–2004)
- Brian Bosart Award, UCLA DAOS (2001)
- Neiburger Teaching Award, UCLA DAOS (2000)
- Scholarship to attend Urals State University, Ekaterinburg, Russia (1996–1997)

Competed Funding Support (Current):

- NASA Earth System Science Research using Data and Products from the Terra, Aqua, and ACRIMSAT Satellites, "Upper tropospheric clouds: Developing a global long-term dataset with quantitative error estimates", Annmarie Eldering (PI), Brian Kahn (Co-I), funded from 2008–2011.
- NASA Making Earth System data records for Use in Research Environments (MEaSUREs), "A multi-sensor water vapor climate data record using cloud classification", Eric Fetzer (PI), Brian Kahn (Co-I), funded from 2008–2012.

Professional Activities:

- Member, CALIPSO/CloudSat Science Team (2008–present)
- Member, American Geophysical Union (AGU) and the American Meteorological Society (AMS)
- Lead cloud scientist for the NASA AIRS project: participation in validation analyses, multi-instrument comparisons, and development of new cloud products (2005–present)
- Participation in the NASA CloudSat project: AIRS humidity and CloudSat cloud profile synergy (2006–present)
- Participation in the Global Energy and Water Cycle Experiment (GEWEX) Cloud Assessment (2008–present)
- Reviewer for Atmospheric Chemistry and Physics, Geophysical Research Letters, IEEE Geoscience and Remote Sensing Letters, Journal of Applied Meteorology, Journal of Applied Meteorology and Climatology, Journal of Atmospheric and Oceanic Technology, Journal of the Atmospheric Sciences, Journal of Geophysical Research–Atmospheres, Remote Sensing of Environment, and reviewer of NASA and ARM proposals
- Mentoring Calvin Liang, a graduate student at UCLA, and Dr. Mathias Schreier, a post-doctoral fellow at JIFRESSE/UCLA

Works in Progress:

Kahn, B. H., and S. L. Nasiri, "Impacts of cloud heterogeneity on infrared thermodynamic phase assessment", (in preparation)

Kahn, B. H., A. Gettelman, A. Eldering, E. J. Fetzer, and C. K. Liang, "Cloudy and clear sky relative humidity distributions in the upper troposphere observed by the A-train", submitted to *J. Geophys. Res*. (CALIPSO special issue)

de la Torre-Juarez, M., **B. H. Kahn**, and E. J. Fetzer, "Cloud-type dependencies of MODIS and AMSR-E liquid water path differences", submitted to *Atmos. Chem. Phys*.

Kahn, B. H., and J. Teixeira, "A global climatology of temperature and water vapor variance scaling from the Atmospheric Infrared Sounder," submitted to *J. Climate*

Published Works:

Davis, S. M., L. M. Avallone, **B. H. Kahn**, K. G. Meyer, and D. Baumgardner (2009), Comparison of airborne in situ measurements and MODIS retrievals of cirrus cloud optical and microphysical properties during the Midlatitude Cirrus Experiment (MidCiX), *J. Geophys. Res*., doi:10.1029/2008JD010284 (in press).

Fetzer, E. J., W. G. Read, D. Waliser, **B. H. Kahn**, B. Tian, H. Vömel, F. W. Irion, H. Su, A. Eldering, M. de la Torre-Juarez, J. Jiang, and V. Dang (2008), Comparison of upper tropospheric water vapor observations from the Microwave Limb Sounder and Atmospheric Infrared Sounder, *J. Geophys. Res.,* **113**, D22110, doi:10.1029/2008JD010000.

Nasiri, S. L., and **B. H. Kahn** (2008), Limitations of bispectral infrared cloud phase determination and potential for improvement, *J. Appl. Meteor. Climatol.*, **47**, 2895–2910.

Kahn, B. H., and D. M. Sinton (2008), A preferred scale for warm core instability in a non-convective moist basic state, *J. Atmos. Sci.*, **65**, 2907–2921.

Su, H., J. H. Jiang, Y. Gu, J. D. Neelin, **B. H. Kahn,** D. Feldman, Y. L. Yung, J. W. Waters, N. J. Livesey, M. L. Santee, and W. G. Read (2008), Variations of tropical upper tropospheric clouds with sea surface temperature and implications for radiative effects, *J. Geophys. Res.*, **113**, D10211, doi:10.1029/2007JD009624.

Kahn, B. H., C. K. Liang, A. Eldering, A. Gettelman, Q. Yue, and K. N. Liou (2008), Tropical thin cirrus and relative humidity observed by the Atmospheric Infrared Sounder, *Atmos. Chem. Phys.*, **8**, 1501–1518.

Kahn, B. H., M. T. Chahine, G. L. Stephens, G. G. Mace, R. Marchand, Z. Wang, C. D. Barnet, A. Eldering, R. E. Holz, R. E. Kuehn, and D. G. Vane (2008), Cloud-type comparisons of AIRS, CloudSat, and CALIPSO cloud height and amount, *Atmos. Chem. Phys.*, **8**, 1231–1248.

Yue, Q., K. N. Liou, S. C. Ou, **B. H. Kahn**, P. Yang, and G. G. Mace (2007), Interpretation of AIRS data in thin cirrus atmospheres based on a fast radiative transfer model, *J. Atmos. Sci.* **64**, 3827–3842.

Weisz, E., J. Li, W. P. Menzel, A. K. Heidinger, **B. H. Kahn**, and C.-Y. Liu (2007), Comparison of AIRS, MODIS, CloudSat and CALIPSO cloud top height retrievals, *Geophys. Res. Lett.*, **34**, L17811, doi:10.1029/2007GL030676.

Kahn, B. H., E. Fishbein, S. L. Nasiri, A. Eldering, E. J. Fetzer, M. J. Garay, and S.-Y. Lee (2007), The radiative consistency of Atmospheric Infrared Sounder and Moderate Resolution Imaging Spectroradiometer cloud retrievals, *J. Geophys. Res.*, **112**, D09201, doi:10.1029/2006JD007486.

Kahn, B. H., A. Eldering, A. J. Braverman, E. J. Fetzer, J. H. Jiang, E. Fishbein, and D. L. Wu (2007), Toward the characterization of upper tropospheric clouds using Atmospheric Infrared Sounder and Microwave Limb Sounder observations, *J. Geophys. Res.*, **112**, D05202, doi:10.1029/2006JD007336.

Tinetti, G., V. S. Meadows, D. Crisp, N. Kiang, **B. H. Kahn**, E. Bosc, E. Fishbein, T. Velusamy, and M. Turnbull (2006), Detectability of planetary characteristics in disk-averaged spectra II: Synthetic spectra and light-curves of Earth, *Astrobiology*, **6**, 881–900.

Kahn, B. H., K. N. Liou, S. -Y. Lee, E. F. Fishbein, S. DeSouza-Machado, A. Eldering, E. J. Fetzer, S. E. Hannon, and L. L. Strow (2005), Nighttime cirrus detection using Atmospheric Infrared Sounder channels and total column water vapor, *J. Geophys. Res.*, **110**, doi:10.1029/2004JD005430.

Eldering, A., **B. H. Kahn**, F. P. Mills, F. W. Irion, H. M. Steele, and M. R. Gunson (2004), Vertical profiles of aerosol volume from high–spectral–resolution infrared transmission measurements II. Results, *J. Geophys. Res.*, **109**, D20201, doi:10.1029/2004JD004623.

Braverman, A., and **B. Kahn** (2004), Visual data mining for quantized, spatial data. Invited paper, Proceedings in Computational Statistics, Physica-Verlag/Springer.

Kahn, B. H., A. Eldering, M. Ghil, S. Bordoni, and S. A. Clough (2004), Sensitivity analysis of cirrus cloud properties from high-resolution infrared spectra. Part I: Methodology and synthetic cirrus, *J. Climate*, **17**, 4856–4870.

Steele, H. M., A. Eldering, B. Sen, G. C. Toon, F. P. Mills, and **B. H. Kahn** (2003), Retrieval of Stratospheric Aerosol Size and Composition Information from Solar Infrared Transmission Spectra, *Appl. Opt.,* **42**, 2140–2154.

Kahn, B. H., A. Eldering, S. A. Clough, E. J. Fetzer, E. F. Fishbein, M. R. Gunson, S. -Y. Lee, P. F. Lester, and V. J. Realmuto (2003), Near micron-sized cirrus cloud particles in high-resolution infrared spectra: An orographic case study, *Geophys. Res. Lett.*, **30**(8), 1441, doi:10.1029/2003GL016909.

Kahn, B. H., A. Eldering, F. W. Irion, F. P. Mills, B. Sen, and M. R. Gunson (2002), Cloud identification in Atmospheric Trace Molecule Spectroscopy infrared occultation measurements, *Appl. Opt.*, **41**, 2368–2380.

Invited Presentations:

Kahn, B. H. (2008), An observational view of clouds, temperature, humidity, and small-scale variability from the A-train, Yuk Yung lunch seminar, California Institute of Technology, Pasadena, CA, November 4th.

Kahn, B. H. (2008), Relationships between clouds, temperature, and humidity: A perspective from AIRS, CloudSat, and CALIPSO, AeroCenter at the Goddard Space Flight Center, Greenbelt, MD, September 12th.

Kahn, B. H. (2008), Ice cloud and humidity distributions viewed by the A-train, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder, Colorado, March 24th.

Kahn, B. H. (2007), The retrieval of cirrus quantities from AIRS observations: Some challenges and opportunities, Hyperspectral Imaging and Sounding of the Environment topical meeting, Optical Society of America, Santa Fe, New Mexico, February 11–15.

Kahn, B. H., M. T. Chahine, G. G. Mace, R. Marchand, and G. L. Stephens (2006), A combined view of CloudSat and AIRS cloud fields, Fall Meeting, American Geophysical Union, San Francisco, CA.

Kahn, B. H. (2006), An AIRS-centric view of global cloudiness from the A-train, Department of Atmospheric Sciences, Texas A&M University, College Station, TX, October 17th.

Kahn, B. H. (2005), Towards characterizing cirrus clouds with the Atmospheric Infrared Sounder, Yuk Yung lunch seminar, California Institute of Technology, Pasadena, CA, August 16th.

Kahn, B. H. (2005), On the detection and retrieval of cirrus cloud properties using AIRS data, Department of Meteorology, Penn State University, State College, PA, April 21st.

Kahn, B. H. (2004), On cirrus (and aerosol) properties from high-resolution infrared spectra, Yuk Yung lunch seminar, California Institute of Technology, Pasadena, CA, January 20th.