John E. Barnes

EDUCATION:

Ph.D. Physics, minor Astronomy, University of Minnesota, Minneapolis, MN, 1988.
M.S. Physics, Colorado State University, Fort Collins, CO, 1980.
B.A. Physics and B.A. Mathematics, Saint Mary's College, Winona, MN, 1975.
Honors: Sigma Pi Sigma.

EXPERIENCE:

Research Scientist III, Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado, 12/2015 to present.

Director/Physical Scientist, NOAA/Earth System Research Laboratory/Mauna Loa Observatory, Hilo, HI – 7/1993 to 12/2015, Principle investigator for laser radar (LIDAR) instrument measuring stratospheric and tropospheric aerosols, temperature and water vapor. Responsible for overseeing observatory operations. Developed the CLidar (CCD camera lidar) method for measuring boundary layer aerosols, and a polar nephelometer.

Research Investigator, Space Physics Research Laboratory, University of Michigan, Ann Arbor, MI -8/1988 to 6/1993. Precision measurement of forbidden oxygen absorption bands and collision effects using photo-acoustic spectroscopy; and the design, construction and operation of a Light Detection and Ranging (LIDAR) experiment for measuring atmospheric winds and aerosols.

Process Engineer, Vertech Treatment Systems, Denver, CO - 10/1981 to 6/1984. Mathematical modeling of two-phase fluid flow and heat transfer in a chemical reactor; analysis of reactor operating data and comparison with modeling; structural analysis.

Engineer, Martin Marietta Aerospace, Denver, CO - 10/1980 to 7/1981. Computer modeling and data reduction for the Reaction Control System of the Space Shuttle. Analysis of clean room environment for shuttle payloads at Kennedy Space Center.

FUNDED RESEARCH as PI:

NOAA/ESDIM, 2000-2001, Recovery and Enhancement of the Mauna Loa Observatory Lidar data sets, $36,000 total for two years.

NASA, NRA00-OES-03, (with Sam Oltmans), 2002-2003, Validation of humidity, temperature and ozone measurements of the AIRS instrument over Mauna Loa Observatory, Hawaii, $207,200 total for two years

NRC Post-doc, one year (with John Ogren).

NOAA/SBIR grant, 2004, $74,995 for one year.

NOAA/SBIR grant, 2005-2006, $300,000 total for two years.

NASA, AURA Validation, 2005-2008, $135,000 total for three years, $14,860 augmentation.

FUNDED RESEARCH as Co-I:

NSF (with N.C. Parikh), Development of CLidar for measurement of boundary layer aerosols, 2004-2006, $267,496 total for three years.

PATENT:

Patent #8,531,516 awarded in 2013 for Imaging Polar Nephelometer.

AWARDS:

NOAA Oceanic and Atmospheric Research Outstanding Scientific Paper, 2010.

NOAA Administrator's Award, 2014.

PUBLICATIONS:

Mauersberger, K., J. Barnes, D. Hanson, and J. Morton, Measurement of the ozone absorption cross-section at the 253.7 nm mercury line, Geophysical Research Letters, Vol. 13, No. 7, 671-673, July 1986.

Mauersberger, K., D. Hanson, J. Barnes, and J. Morton, Ozone vapor pressure and absorption cross-section measurements: Introduction of an ozone standard, J. Geophysical Research, Vol. 92, No. D7, 8480-8482, July 20, 1987.

Barnes, J. and K. Mauersberger, Temperature dependence of the ozone absorption cross-section at the 253.7 nm mercury line, J. Geophysical Research, Vol.92, No. D12, 14861-14864, December 20, 1987.

Morton J., J. Barnes, B. Schueler, and K. Mauersberger, Laboratory Studies of Heavy Ozone, J. Geophysical Research, Vol.95, No. D1, 901-907, January 20, 1990.

Abreu, V.J., J. E. Barnes, and P.B.Hays, Observations of Winds with an Incoherent Lidar Detector, Applied Optics. Vol. 31, No. 22, 4509-4514, August, 1992.

Fischer, K. W., V. J. Abreu, W. R. Skinner, J. E. Barnes, M. J. McGill, T. D. Irgang, Visible wavelength Doppler lidar for measurement of wind and aerosol profiles during day and night, Optical Engineering, Vol. 34, 2, 499-511, February, 1995.

Hofmann, D. J. et al., Record low ozone at Mauna Loa Observatory during winter 1994-1995: A consequence of chemical and dynamical synergism?, Geophys. Res. Lett., 23, 1533-1536, 1996.

Bodaine, et al., New Ultraviolet spectroradiometer measurements at Mauna Loa Observatory, Geophys. Res. Lett., 23, 2121-2124, 1996.

Barnes, J. E., and D. J. Hofmann, Lidar measurements of stratospheric aerosol over Mauna Loa Observatory, Geophys. Res. Lett., 24, 1923-1926, 1997.

Barnes, J. E., and D. J. Hofmann, Variability in the stratospheric background aerosol over Mauna Loa Observatory, Geophys. Res. Lett., 28, 2895-2898 (2001).

Antuña, J. C., A. Robock, G. L. Stenchikov, L. W. Thomason, and J. E. Barnes, Lidar validation of SAGE II aerosol measurements after the 1991 Mount Pinatubo eruption, J. Geophys. Res., 107(D14), 4194 (2002).

Barnes, J. E., and P. B. Hayes, Pressure shifts and pressure broadening of the B and Gamma bands of oxygen, J. of Molecular Spectroscopy, 216, 98-104 (2002).

Barnes, J. E., S. Bronner, R. Beck, and N. C. Parikh, Boundary layer scattering measurements with a CCD camera lidar, Applied Optics, 42, 2647-2652 (2003).

Hofmann, D., J. Barnes, E. Dutton, T. Deshler, H. Jäger, R. Keen, and M. Osborn (2003), Surface-based observations of volcanic emissions to the stratosphere, in Volcanism and the Earth's Atmosphere, edited by A. Robock and C. Oppenheimer, pp.57-73, AGU, Washington, D. C.

Vömel, H., M. Fujiwara, M. Shiotani, F. Hasebe, S. J. Oltmans, and J. E. Barnes, The behavior of the Snow White chilled-mirror hygrometer in extremely dry conditions, J. of Atmos. and Oceanic Tech., 20, 1560-1567 (2003).

Eric Fetzer, Larry McMillin, David Tobin, Hartmut Aumann, Michael Gunson, W. Wallace McMillan, Denise Hagan, Mark Hofstadter, James Yoe, David Whiteman, John Barnes, Ralf Bennartz, Holger Vömel, Von Walden, Michael Newchurch, Peter Minnett, Robert Atlas, Francis Schmidlin, Edward Olsen, Mitch Goldberg, Sisong Zhou, HanJung Ding, Hank Revercomb, AIRS/AMSU/HSB Validation, IEEE Trans. Geosci. Remote Sensing, 41, Feb. (2003).

Philippe Keckhut, Stuart McDermid, Daan Swart, et al., Review of ozone and temperature lidar validations performed within the framework of the Network for the Detection of Stratospheric Change, J. Environ. Monitoring, 6, (2004).

Antuña, J. C., A. Robock, G. Stenchikov, J. Zhou, C. David, J. Barnes, and L. Thomason, Spatial and temporal variability of the stratospheric aerosol cloud produced by the 1991 Mount Pinatubo eruption, J. Geophys. Res., 108(D20), 4624 (2003).

Terry Deshler, Richard Anderson-Sprecher, Horst Jäger, John Barnes, David J. Hofmann, Barclay Clemesha, Dale Simonich, M. Osborn, R. G. Grainger, and Sophie Godin-Beekmann, Trends in the non-volcanic component of stratospheric aerosol over the period 1971 – 2004, JGR Atmospheres, 111, D01201 (2006).

Deshler, T., R. Anderson-Sprecher, J. Barnes, B. Clemesha, S. Godin-Beekmann, R. Graninger, D. Hofmann, H. Jager, S. Marsh, M. Osborn, and D. Simonich (2006), Non- volcanic stratospheric aerosol trends: 1971-2004. In SPARC Assessment of Stratospheric Aerosol Properties (ASAP), L. Thomason and T. Peter (Eds.), WMO World Climate Research Programme, Toronto, 177-218.

Barnes, John E., N. C. Parikh Sharma and Trevor B. Kaplan, Atmospheric aerosol profiling with a bistatic imaging lidar system, Applied Optics, 46, 2922-2929, May (2007).

Voemel H., J. Barnes, et al. (2007), Validation of Aura/MLS Water Vapor by Balloon Borne Cryogenic Frostpoint Hygrometer Measurements, J. Geophys. Res., 112, D24S37, doi:10.1029/2007JD008698.

Barnes, J. E., T. Kaplan, H. Vömel, and W. G. Read (2008), NASA/Aura/Microwave Limb Sounder water vapor validation at Mauna Loa Observatory by Raman lidar, J. Geophys. Res., 113, D15S03, doi:10.1029/2007JD008842.

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David Hofmann, John Barnes, Michael O'Neill, Michael Trudeau, and Ryan Neely, Increase in background stratospheric aerosol observed with lidar at Mauna Loa Observatory and Boulder, Colorado, Geophys. Res. Lett., 36, doi:10.1029/2009GL039008, 2009.

James M. Haywood, Andy Jones, Lieven Clarisse, Adam Bourassa, John Barnes, Paul Telford, Nicolas Bellouin, Olivier Boucher, Paul Agnew, Cathy Clerbaux, Pierre Coheur, Doug Degenstein, and Peter Braesicke, Observations of the eruption of the Sarychev volcano and simulations using the HadGEM2 climate model, J. Geophys. Res, 115, 2010

Parikh Sharma, N. C., John E. Barnes, Trevor B. Kaplan, and Antony D. Clarke, Coastal aerosol profiling with a camera lidar and nephelometer, J. of Atmos. Oceanic Technology, 28, 2011.

Ben Kravitz, Alan Robock, Adam Bourassa, Terry Deshler, Decheng Wu, Ina Mattis, Finger, Anne Hoffmann, Christoph Ritter Lubna Bitar, Thomas J. Duck, and John E. Barnes,

Simulation and observations of stratospheric aerosols from the 2009 Sarychev volcanic eruption, J. Geophys. Res., doi:10.1029/2010JD015501, 2011.

David Noone, et al., Properties of air mass mixing and humidity in the subtropics from measurements of the D/H isotope ratio of water vapor at the Mauna Loa Observatory, J. Geophys. Res., doi:10.1029/2011JD015773, 2011.

John E. Barnes and Nimmi C. P. Sharma, An inexpensive active optical remote sensing instrument for assessing aerosol distributions, JAWMA, 62, 198-203, 2012.

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Jingfeng Huang, N. Christina Hsu, Si-Chee Tsay, Brent N. Holben, Ellsworth J. Welton, Alexander Smirnov, Myeong-Jae Jeong, Richard A. Hansell, Timothy A. Berkoff, Zhaoyan Liu, Gin-Rong Liu, James R. Campbell, Soo Chin Liew, and John E. Barnes, Evaluations of Thin Cirrus Contamination and Screening in Ground Aerosol Observations Using Collocated Lidar Systems, JGR, doi:10.1029/2012JD017757, 2012.

D. A. Ridley, S. Solomon, J. E. Barnes, V. D. Burlakov, T. Deshler, S. I. Dolgii, A. B. Herber, T. Nagai, R. R. Neely III, A. V. Nevzorov, C. Ritter, T. Sakai, B. D. Santer, M. Sato, A. Schmidt, O. Uchino, and J. P. Vernier (2014), Total volcanic stratospheric aerosol optical depths and implications for global climate change, Geophysical Research Letters, 41, 10.1002/2014GL061541.

Nimmi C. P. Sharma and John E. Barnes, Boundary layer characteristics over a high altitude station, Mauna Loa Observatory, Aerosol and Air Quality Research, 16, 2016.

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Stefanie Kremser, Larry W. Thomason, Marc von Hobe, Markus Hermann, Terry Deshler, Claudia Timmreck, Matthew Toohey, Andrea Stenke, Joshua P. Schwarz, Ralf Weigel, Stephan Fueglistaler, Fred J. Prata, Jean-Paul Vernier, Hans Schlager, John E. Barnes, Juan-Carlos Antuña-Marrero, Duncan Fairlie, Mathias Palm, Emmanuel Mahieu, Justus Notholt, Markus Rex, Christine Bingen, Filip Vanhellemont, Adam Bourassa, John M. C. Plane, Daniel Klocke, Simon A. Carn, Lieven Clarisse, Thomas Trickl, Ryan Neely, Alexander D. James, Landon Rieger, James C. Wilson, and Brian Meland, Stratospheric aerosol-observations processes, and impact on climate (2016), Rev. Geophysics, 54,10.1002/2015RG000511.

Christine Bingen, et al., Stratospheric aerosol data records for the Climate Change Initiative: development, validation and application to Chemistry-Climate Modeling (2017), Remote Sensing Environment, Submitted.

Suzan Solomon, et al., Monsoon circulations and tropical heterogeneous chlorine chemistry in the stratosphere (2017), Geophysical Research. Letters, Submitted.