

Curriculum Vitae

SONIA G. LASHER-TRAPP

Department of Earth and Atmospheric Sciences
Purdue University
550 Stadium Mall Drive
West Lafayette, IN 47907-2051
(765) 496-2866
slasher@purdue.edu
<http://www.purdue.edu/eas/cloud/>

EDUCATION

The University of Oklahoma, Ph.D. in Meteorology, 1998

Dissertation: *Ultragiant Aerosol Growth by Collection within a Warm Continental Cumulus Congestus*

Principal Advisors: Dr. Jerry M. Straka and Dr. Charles Knight (National Center for Atmos. Research)

The University of Oklahoma, M.S. in Meteorology, 1993

Thesis: *A Measure of Spatial Irregularity in Observation Networks*

Principal Advisor: Dr. Charles A. Doswell

Saint Louis University, B.S. in Meteorology Summa cum Laude, 1990

APPOINTMENTS

Sabbatical Visitor, School of Environment, University of Leeds, January 2010- August 2010

Associate Professor, Department of Earth and Atmospheric Sciences, Purdue University, August 2009-present

Assistant Professor, Department of Earth and Atmospheric Sciences, Purdue University, January 2003-July 2009

Research Scientist, New Mexico Institute of Mines and Technology, in residence at the National Center for Atmospheric Research, Dec 2000- Dec 2002

Postdoctoral Fellow, Advanced Study Program, National Center for Atmospheric Research/Texas A&M University, Aug 1998-Nov 2000

GRANTS AND FUNDING

Principle Investigator: *Numerical Modeling of Precipitation Changes Resulting from Regional Climate Change Across the U.S.*, Purdue Climate Change Research Center, \$6,000, Summer 2010

Principle Investigator: *The Application of a Successful Research-Based Laboratory Model to Atmospheric Science*, NSF, \$150,000, 2009-2011

Principle Investigator: *Entrainment, Ultragiant Particles, and Warm Rain Formation in Trade Wind Cumulus* (supplement), NSF, \$20,807, 2008-2009

Principle Investigator: *The Effects of Entrainment and Mixing on Droplet Populations in Trade Wind Cumuli*, Purdue Research Foundation, \$16,300, 2008-2009

Co-principal Investigator: *Sub-Daily Scale Extreme Precipitation in Future Climate-Change Scenarios: A Pilot Study*, NSF, \$275,075, 2006-2008

Co-principal Investigator: *Collaborative Research: An Advanced Interactive Multifield, Multisource Atmospheric Visual Analysis Environment*, NSF, \$686,163, 2005-2009

Principal Investigator: *Entrainment, Ultragiant Particles, and Warm Rain Formation in Trade Wind Cumulus*, NSF, \$352,761, 2004-2008

Co-principal Investigator: *Interdisciplinary Earth and Atmospheric Science Research: A Unique Challenge for Graduate Student Recruitment*, Purdue Graduate College, \$10,000, 2004-2005

Principal Investigator: *Supercooled Large Drop Formation by Ultragiant Particles in Wintertime Stratiform Clouds during the Second Alliance Icing Research Study (AIRS II)*, NSF, \$201,089, 2003-2006

Co-principal Investigator: *Interdisciplinary Earth and Atmospheric Science Research: A Unique Challenge for Graduate Student Recruitment*, Purdue Graduate College, \$5,000, 2003-2004

Co-principal Investigator: *The Roles of Ultragiant Aerosols and Entrainment and Mixing in the Warm Rain Process*, NSF, \$193,139, 2000-2003

PUBLICATIONS

● FORMAL, IN PRINT:

Arthur, D. K., S. Lasher-Trapp, A. Abdel-Haleem, N. Klosterman, and D. S. Ebert, 2009: A New Three-Dimensional Visualization System for Combining Aircraft and Radar Data and Its Application to RICO Observations. *J. Atmos. Oceanic Tech.*, 27, 811-828.

Reiche, C. H., and S. Lasher-Trapp, 2010: The minor importance of giant aerosol to precipitation development within small trade wind cumuli observed during RICO. *Atmospheric Research*, 95, 386-399.

Parker, L. C., G. H. Krockover, S. Lasher-Trapp and D. C. Eichinger, 2008: Ideas about the nature of science held by undergraduate atmospheric science students. *Bull. Amer. Meteor. Soc.*, 1681-1688.

Lasher-Trapp, S.*, S. Anderson-Bereznicki, A. Shackelford, C. H. Twohy and J. G. Hudson, 2008: An investigation of the influence of droplet number concentration and giant aerosol particles upon supercooled large drop formation in wintertime stratiform clouds. *J. Appl. Meteor. Climatol.*, 47, 2659-2678.

Lasher-Trapp, S., 2007: Clouds in a warmer climate: Friend or foe? *Forum on Public Policy*, 3, 353-368.

Rauber, R. M., and coauthors, 2007: Rain in shallow cumulus over the ocean—the RICO campaign. *Bull. Amer. Meteor. Soc.*, 88, 1912-1928.

Rauber, R. M., and coauthors, 2007: Supplement to Rain in shallow cumulus over the ocean. *Bull. Amer. Meteor. Soc.*, 88, S12-S18.

Lasher-Trapp, S., and J. P. Stachnik, 2007: Giant and Ultragiant Aerosol Particle Variability over the Eastern Great Lakes Region. *J. Appl. Meteor.*, 46, 651-659.

Song, Y., J. Ye, N. Svakhine, S. Lasher-Trapp, M. Baldwin and D. S. Ebert, 2006: An Atmospheric Visual Analysis and Exploration System. *IEEE Transactions on Visualization and Computer Graphics*, 12, 1157-1164.

Barth, M., and coauthors, 2006: Coupling Between Land Ecosystems and the Atmospheric Hydrologic Cycle through Biogenic Aerosol Pathways. *Bull. Amer. Meteor. Soc.*, 86, 1738-1742.

Blyth, A. M., S. G. Lasher-Trapp and W. A. Cooper, 2005: A Study of Thermals in Cumulus Clouds. *Quart. J. Roy. Meteor. Soc.*, 131, 1171-1190.

Lasher-Trapp, S. G., W. A. Cooper and A. M. Blyth, 2005: Broadening of Droplet Size Distributions from Entrainment and Mixing in a Cumulus Cloud. *Quart. J. Roy. Meteor. Soc.*, 131, 195-220.

Blyth, A. M., S. G. Lasher-Trapp, W. A. Cooper, C. A. Knight and J. Latham, 2002: The Role of Giant and Ultra-giant Aerosols in the Initiation of Rain in Warm Cumulus Clouds. *J. Atmos. Sci.*, 60, 2557-2572.

Knight, C. A., J. Vivekanandan and S. Lasher-Trapp, 2002: First Radar Echoes and Early ZDR History of Florida Cumulus. *J. Atmos. Sci.*, 59, 1454-1472.

Lasher-Trapp, S. G., W. A. Cooper and A. M. Blyth, 2002: Measurements of Ultragiant Aerosol Particles in the Atmosphere from the Small Cumulus Microphysics Study. *J. Atmos. Ocean. Tech.*, 19, 402-408.

Lasher-Trapp, S., C. A. Knight and J. M. Straka, 2001: Early Radar Echoes from Ultragiant Aerosol in a Cumulus Congestus: Modeling and Observations. *J. Atmos. Sci.*, 58, 3545-3562.

Doswell, C. A. III, and S. G. Lasher-Trapp, 1997: Measuring the Degree of Irregularity in Observation Networks. *J. Atmos. Ocean. Tech.*, 14, 120-132.

● CONFERENCE PROCEEDINGS:

Lasher-Trapp, S., W. A. Cooper and A. M. Blyth, 2008: Effects of entrainment and mixing on droplet coalescence in a simulated warm cumulus cloud. Preprints, *15th Int. Conf. on Clouds and Precipitation*, Cancun, Mexico, ICCP, CD-ROM.

Bewley, J. L., and S. Lasher-Trapp, 2008: The effects of entrainment and mixing on droplet populations: A comparison of numerical modeling and aircraft observations. Preprints, *15th Int. Conf. on Clouds and Precipitation*, Cancun, Mexico, ICCP, CD-ROM.

Arthur, D. K., S. Lasher-Trapp, A. Abdel-Haleem, N. Klosterman, and D. S. Ebert, 2008: A new three-dimensional visualization system for combining aircraft and radar data and its application to RICO observations. Preprints, *15th Int. Conf. on Clouds and Precipitation*, Cancun, Mexico, ICCP, CD-ROM.

Henry, C. and S. Lasher-Trapp, 2006: When can giant aerosol fail to produce rain? Preprints, *12th Conf. on Cloud Physics*, Madison, WI, Amer. Meteor. Soc. CD-ROM.

Lasher-Trapp, S., S. Anderson-Bereznicki and C. Twohy, 2005: Giant Aerosol Particles as a Potential Source of Supercooled Large Drops in Wintertime Stratiform Clouds. *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract A33E-05.

Lasher-Trapp, S., S. Bereznicki and J. Stachnik, 2004: Giant and Ultragiant Aerosol Particles: Source of Large Supercooled Drops in Mixed-phase Clouds? *Proc. 14th Int. Conf. on Clouds and Precipitation*, Bologna, Italy, 831-835.

Blyth, A. M., S. G. Lasher-Trapp and W. A. Cooper, 2004: Observations of Reduced Liquid Water Content in the Centre of Cumulus Cloud Updrafts. *Proc. 14th Int. Conf. on Clouds and Precipitation*, Bologna, Italy, 491-493.

Lasher-Trapp, S., W. A. Cooper and A. M. Blyth, 2002: Supersaturation Variations Among Droplet Trajectories Through a Warm Cumulus: Effects on Droplet Size Distributions. *Proc. 11th Conf. On Cloud Physics*, Ogden, UT.

Blyth, A. M., S. Lasher-Trapp and W. A. Cooper, 2002: Entrainment and Mixing in Small Cumulus Clouds. *Proc. 11th Conf. On Cloud Physics*, Ogden, UT.

Blyth, A. M., S. G. Lasher-Trapp and W. A. Cooper, 2000: Observations of Thermals in Cumulus Clouds. *Proc. 13th Int. Conf. on Clouds and Precipitation*, Reno, NV, 67-70.

Lasher-Trapp, S. G. and W. A. Cooper, 2000: Comparison of theory and observations of broadening of cloud droplet size distributions in warm cumuli. *Proc. 13th Int. Conf. on Clouds and Precipitation*, Reno, NV, 90-93.

Lasher-Trapp, S., C. A. Knight and J. M. Straka, 1998: Ultragraining aerosol growth by collection within a warm continental cumulus, Preprints, 10th *Conf. on Cloud Physics*, Everett, WA, Amer. Meteor. Soc., 494-497.

Brooks, H. E., C. A. Doswell III, E. N. Rasmussen and S. Lasher-Trapp, 1995: Detailed observations of complex dryline structure in Oklahoma on 14 April 1994. *Proc. 14th Conf. on Weather Analysis and Forecasting*, Dallas, TX, Amer. Meteor. Soc., 62-67.

Trapp, R. J., E. N. Rasmussen, S. G. Lasher-Trapp, A. I. Watson and T. R. Shepherd, 1995: Multi-platform observation of a severe thunderstorm during VORTEX. Preprints, 27th *Conf. on Radar Meteorology*, Vail, CO, Amer. Meteor. Soc., 517-518.

PRESENTATIONS

● INVITED SPEAKER/SEMINARS:

Oxford Round Table (Invited speaker), Oxford, England, 2007: "Clouds in a Warmer Climate: Friend or Foe?"

Dept. of Geosciences, University of Nebraska (Stout lecture), 2007: "Aerosol Effects Upon Supercooled Clouds and Aircraft Icing"

National Severe Storms Laboratory, 2005: "When Do the Microphysics Matter?"

Department of Physics, Michigan Technical University, 2005: "Evidence for Giant Aerosol Particles as a Source of Large Supercooled Drops, and a Possible Forecasting Technique"

National Center for Atmospheric Research, 2005: "More Evidence for Giant Aerosol Particles as a Source of Large Supercooled Drops in Stratiform Mixed-Phase Clouds"

Department of Physics, DePauw University, 2004: "Giant Aerosol Particles and Aircraft Icing: A New Connection"

National Center for Atmospheric Research, 2004: “Giant Aerosol Particles: Source of Large Supercooled Drops in Mixed-Phase Clouds?”

Department of Atmospheric Science, U. of Illinois Urbana-Champaign, 2003: “Broadening of Droplet Size Distributions from Entrainment and Mixing in a Cumulus Cloud”

Department of Geological and Atmospheric Sciences, Iowa State University, 2002: “Observational Analysis of Microphysical Processes within Cores of Small Warm Cumuli”

Department of Atmospheric Science, Texas A&M University, 2000: “Modeling and Observations of Warm Rain Processes in Small Cumuli”

Department of Atmospheric Science, University of Wyoming, 1999: “The Importance of Ultragrained Aerosol Particles to Warm Rain Formation”

● PRESENTATIONS AT CONFERENCES, SYMPOSIA, AND WORKSHOPS:

Quardokus, K., S. Lasher-Trapp and E. M. Riggs, 2010: Bringing Authentic Science Practice to the Undergraduate Classroom. 19th Symposium on Education, 90th AMS Annual Meeting, Atlanta, GA.

Lasher-Trapp, S., 2010: CCN vs GA: Strength in Numbers. Meeting on Cloud-Aerosol Interactions, University of Leeds, Leeds, UK.

Lasher-Trapp, S., 2010: ICE-T: Warm Rain- Ice Interactions and Cloud Dynamics. NSF ICE-T workshop, Boulder, CO.

Lasher-Trapp, S., 2009: The Relative Importance of CCN and Giant Aerosol Particles to Warm Rain Formation: Strength in Numbers. *Symposium on Aerosol, Clouds and Climate*, American Meteorological Society Annual Meeting, Phoenix, AZ.

Lasher-Trapp, S., W. A. Cooper and A. M. Blyth, 2008: Effects of entrainment and mixing on droplet coalescence in a simulated warm cumulus cloud. *Proc. 15th Int. Conf. on Clouds and Precipitation*, Cancun, Mexico, available on CD.

Bewley, J. L., and S. Lasher-Trapp, 2008: The effects of entrainment and mixing on droplet populations: A comparison of numerical modeling and aircraft observations. *Proc. 15th Int. Conf. on Clouds and Precipitation*, Cancun, Mexico, available on CD.

Arthur, D. K., S. Lasher-Trapp, A. Abdel-Haleem, N. Klosterman, and D. S. Ebert, 2008: A new three-dimensional visualization system for combining aircraft and radar data and its application to RICO observations. *Proc. 15th Int. Conf. on Clouds and Precipitation*, Cancun, Mexico, available on CD.

NSF Workshop on Enabling Science Discoveries through Visual Exploration, Sept 2007, Washington D.C.: “*Visualization Needs for Multi-Scale Atmospheric Science Problems*”

Lasher-Trapp, S., Y. Song, N. Svakhine and D. Ebert, 2006: Turbulence and liquid water patterns in simulated small cumulus. 12th AMS Conf. on Cloud Physics, Madison, WI.

Bewley, J. and S. Lasher-Trapp, 2006: Can cloud droplet number increase with height? 12th AMS Conf. on Cloud Physics, Madison, WI.

Stachnik, J. and S. Lasher-Trapp, 2006: Hailstorm simulations using the Weather Research and Forecasting (WRF) model: Microphysical parameterization sensitivities and preliminary verification. 12th AMS Conf. on Cloud Physics, Madison, WI.

Shackelford, A. and S. Lasher-Trapp, 2006: The significance of giant aerosol in stratiform clouds. 12th AMS Conf. on Cloud Physics, Madison, WI.

Lasher-Trapp, S., C. Henry and J. Bewley, 2006: Precipitation initiation studies. Second RICO Workshop, Boulder, CO.

Lasher-Trapp, S., C. Henry and J. Bewley, 2005: Warm rain initiation: Our interests at Purdue. First RICO Workshop, Boulder, CO.

Lasher-Trapp, S., 2004: Warm rain formation by ultragiant particles and cumulus entrainment. Pre-RICO Workshop, Boulder, CO.

Lasher-Trapp, S., S. Bereznicki, and J. Stachnik, 2004: AIRS II Giant Aerosol and SLD. AIRS II Workshop, Montreal, Canada.

PROFESSIONAL ACTIVITIES

Associate Editor, *Journal of the Atmospheric Sciences*, 2008 and 2009

Elected Member, International Commission on Clouds and Precipitation, 2008-2012

Member, NSF Observing Facilities Assessment Panel (OFAP), 2006-2009

Chair, program committee, AMS 12th Conference on Cloud Physics, 2005-2006

Member, AGU Cloud and Precipitation Committee, 2005-2007

Member, AMS Cloud Physics committee, 2001-2007

Session chair: AMS 11th Conference on Cloud Physics, 2002

PROFESSIONAL SOCIETY MEMBERSHIPS

American Meteorological Society

American Geophysical Union

Sigma Xi

HONORS AND AWARDS

College of Science Graduate Mentoring Award, Purdue University, 2010

Outstanding Contribs. to Undergrad. Teaching by an Assist. Professor, Purdue College of Science, 2007

Outstanding Faculty Graduate Advisor, Dept. of Earth and Atmospheric Sciences, 2006

Patricia Roberts Harris Fellow, The University of Oklahoma

Phi Beta Kappa Honor Society

Alpha Sigma Nu Jesuit Honor Society

Valedictorian, Heritage Hills High School, Lincoln City, Indiana