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#### Education

- ✦ Doctor of Philosophy (Physics), August 2006  
Department of Physics, Michigan Technological University, Houghton, MI  
Thesis title: Studies of Discrete Fluctuations in Atmospheric Phenomena  
Thesis advisor: Dr. Alexander B. Kostinski  
Graduate GPA : 3.88
- ✦ Bachelor of Science (Physics), May 2001  
Department of Physics, Michigan Technological University, Houghton, MI  
GPA : 3.95 / Graduated *summa cum laude*

#### Professional Employment

- ✦ Assistant Professor, August 2007 - Present  
Department of Physics and Physical Science  
University of Nebraska at Kearney
- ✦ Consultant, August 2007 - Present  
Army Research Laboratory, Adelphi, MD
- ✦ National Research Council Postdoctoral Fellow, July 2006 - July 2007  
Army Research Laboratory, Adelphi, MD  
Funded Proposal: Analysis of the Role of Number Fluctuations in an Apparatus to Detect Hazardous Airborne Particles
- ✦ National Defense Science and Engineering Graduate Fellow, August 2003 - July 2006  
Sponsored by the DoD, Managed by ASEE
- ✦ Graduate Researcher in GSSP Summer Program, June 2003 - August 2003  
NASA-Goddard Earth Science and Technology Center  
Goddard Space Flight Center, Greenbelt, MD
- ✦ Graduate Research Assistant, June 2002-August 2003  
Graduate Fellow, January-June 2002  
Department of Physics  
Michigan Technological University

### Current Main Research Interests

- ✦ Radiative transfer through statistically correlated random media (cloudy atmospheres)
- ✦ Effects of finite sampling and dead-time on statistical inference
- ✦  $Z - R$  relationships in radar meteorology
- ✦ Fluctuations of aerosol particles, cloud droplets, and raindrops – quantification and applications
- ✦ Accounting for natural variability in airborne pathogen risk estimation
- ✦ Simple Monte-Carlo models for discrete spatial systems

### Funding Awarded – Last 5 Years

- ✦ NASA Nebraska Space Grant Minigrant (2009) and NASA Nebraska Travel Grant (2009)
- ✦ Program of Excellence Funds for a 3D-Ultrasonic Anemometer (2009)
- ✦ Focused Assessment Grant (2008-2009)
- ✦ University of Nebraska at Kearney Research Services Council (UNK RSC) University Research and Creative Activity grant (2008-2009) and Minigrant (2008)
- ✦ Summer Student Research Program Mentor (SSRP) 2008 (Noffke) and 2009 (Smydra & Stromer)
- ✦ National Research Council Postdoctoral Fellowship (NRC) (2006)
- ✦ National Defense Science and Engineering Graduate Fellowship (NDSEG) (2003-2006)

### Professional Activities

- ✦ Memberships: AAPT (American Association of Physics Teachers), AGU (American Geophysical Union), AMS (American Meteorological Society), UNK Graduate Faculty
- ✦ Serves as peer-reviewer for: *Aerosol Science and Technology*, *Applied Spectroscopy*, *Geophysical Research Letters*, *Journal of Applied Meteorology and Climatology*, *Journal of Atmospheric and Oceanic Technology*, *Journal of Hydrology*, *Journal of the Atmospheric Sciences*, *Nonlinear Processes in Geophysics*, *Quarterly Journal of Spectroscopy and Radiative Transfer*, National Science Foundation
- ✦ Courses Taught: Computers in Physics (S2010), Modern Physics (F2009), Physical Science (F2007, S2008, F2008, S2009), Earth Science/Honors Earth Science (F2007, F2008, S2009, F2009, S2010), Meteorology (S2008, S2009, S2010), Special Topics in Physics – Qualitative Reasoning in Physics (S2009, F2009), Research in Physics (S2008, F2008, S2009, F2009, S2010)
- ✦ Current and former undergraduate research mentees: Josh Beck, Dawn Carrillo, Jose Carrillo, Benjamin Fullerton, David Hayes, Matt Noffke, Danielle Policarpio, Grant Saltzgaber, Kyle Smydra, Aaron Steele, Jeremy Stromer

## Peer-Reviewed Publications

- ✦ Identifying the Scaling Properties of Rainfall Accumulation as Measured by a Tipping-Bucket Rain Gauge Network  
M.L. Larsen, A. Clark, M. Noffke, G. Saltzgaber, and A. Steele  
Submitted to *Atmospheric Research*
- ✦ Simple Dead-Time Corrections for Discrete Time Series of Non-Poisson Data  
M.L. Larsen and A.B. Kostinski  
*Measurement Science and Technology*, 20, 095101 (2009).
- ✦ Spatial Distributions of Aerosol Particles: Investigation of the Poisson Assumption  
M.L. Larsen  
*Journal of Aerosol Science*, 38 (8), 807-822 (2007).
- ✦ The Texture of Rain: Exploring Stochastic Micro-structure at Small Scales  
A.B. Kostinski, M.L. Larsen, and A.R. Jameson  
*Journal of Hydrology*, 328 (1-2), 38-45 (2006).
- ✦ Observation and Analysis of Steady Rain  
M.L. Larsen, A.B. Kostinski, and A. Tokay  
*Journal of the Atmospheric Sciences*, 62 (11), 4071-4083 (2005).
- ✦ Small-scale Drop Size Variability: Impact on Estimation of Cloud Optical Properties  
Y. Knyazikhin, A. Marshak, M.L. Larsen, W.J. Wiscombe, J.V. Martonchik, and R.B. Myneni  
*Journal of the Atmospheric Sciences*, 62 (7), 2555-2567 (2005).
- ✦ Small-scale Drop Size Variability: Empirical Models for Drop Size-Dependent Clustering in Clouds  
A. Marshak, Y. Knyazikhin, M.L. Larsen, and W.J. Wiscombe  
*Journal of the Atmospheric Sciences*, 62 (2), 551-558 (2005).
- ✦ Response from Authors to Comment on Detection of Spatial Correlations among Aerosol Particles  
M.L. Larsen, W. Cantrell, A.B. Kostinski, and J. Kannosto  
*Aerosol Science and Technology*, 38 (2), 129-130 (2004).
- ✦ Detection of Spatial Correlations among Aerosol Particles  
M.L. Larsen, W. Cantrell, J. Kannosto, and A.B. Kostinski  
*Aerosol Science and Technology*, 37 (6), 476-485 (2003).
- ✦ Towards Quantifying Droplet Clustering in Clouds  
R.A. Shaw, A.B. Kostinski, and M.L. Larsen  
*Quarterly Journal of the Royal Meteorological Society*, 128 (582), 1043-1057 (2002).

## Books

- ✦ Discrete Fluctuations in Atmospheric Science  
M.L. Larsen  
218 pp., VDM Verlag Dr. Mueller e.K. (2008).
- ✦ Investigations in Earth Science  
M.L. Larsen  
160 pp., Published In-House by UNK (2008).  
2nd Ed. 183 pp., Published In-House by UNK (2009).

## Conference Presentations

- ✦ Examination of Sub-Pixel Accumulation Variability in Central Nebraska  
M.L. Larsen, A. Clark, M. Noffke, G. Saltzgaber, and A. Steele. *34th Conference on Radar Meteorology*. Williamsburg, VA. 5-9 October, 2009.
- ✦ Direct Simulation of Radiative Transfer through a 3-Dimensional Correlated Medium  
M.L. Larsen, A. Clark, and A. Steele. *Gordon Research Conference on Radiation and Climate*. Colby-Sawyer College, New London, NH. 5-10 July, 2009.
- ✦ Developing an Undergrad Research Program from Scratch: Perspective from Two Physicists  
M.L. Larsen and L. Kreminska. *Research at Primarily Undergraduate Institutions*. Kearney, NE. 6 March, 2009.
- ✦ Unresolved Small-Scale Optical Variability of Clouds: Two Ways of Assessing its Impact on Remote Sensing Observations and Energy Budget Estimations  
A.B. Davis, M.L. Larsen, and K. Pfeilsticker. *2006 Fall AGU Meeting*. San Francisco, CA. 11-15 December, 2006.
- ✦ A New Model of Spatial Cloud Drop Distribution that Simulates the Observed Drop Clustering: Effect of clustering in Extinction Coefficient Estimates  
A. Marshak, Y. Knyazikhin, M. L. Larsen, and W. Wiscombe. *2006 Fall AGU Meeting*. San Francisco, CA. 11-15 December, 2006.
- ✦ Impact of Unresolved, Correlated, or Anti-Correlated Spatial Structure on the Bulk Transport of Radiation Inside and Between Clouds, with Applications to Remote Sensing and Energy Budgeting  
A.B. Davis, M.L. Larsen, and M.K. Dubey. *2nd International Conference on Global Warming and the Next Ice Age*. Sante Fe, New Mexico. 17-21 July, 2006.
- ✦ A New Model of Cloud Drop Distribution that Simulates the Observed Drop Clustering: Effects of Clustering on Extinction Coefficient Estimates  
Y. Knyazikhin, A. Marshak, M.L. Larsen, and W.J. Wiscombe. *16th Annual Meeting of the ARM Science Team*. Albuquerque, New Mexico. 27-31 March, 2006.

- ✦ Reconsideration of Certain Aspects of the Z-R Problem  
M.L. Larsen and A.B. Kostinski. *14th International Conference on Cloud Physics and Precipitation – ICCP 2004*. Bologna, Italy. 13-18 July, 2004.
- ✦ Exploring the Stochastic Micro-structure of Rain: Scale Dependence of Spatial Correlations  
A.B. Kostinski, A.R. Jameson, and M.L. Larsen. *17th Conference on Hydrology. 83rd Annual Meeting of the American Meteorological Society*. Long Beach, California. 9-13 February, 2003.
- ✦ Spatial Correlations among Aerosol Particles  
W. Cantrell, A.B. Kostinski, M.L. Larsen, and D. Harrington. *2002 Fall Meeting of the American Geophysical Union*. San Francisco, California. 6-10 December, 2002.
- ✦ Stochastic Micro-structure of Rain and Scale Dependence of Spatial Correlations  
A.B. Kostinski, A.R. Jameson, and M.L. Larsen. *2002 Fall Meeting of the American Geophysical Union*. San Francisco, California. 6-10 December, 2002.
- ✦ Possible Implications of Droplet Clustering for Radiative Transfer in Clouds  
A.B. Kostinski, M.L. Larsen, and R.A. Shaw. *11th AMS Conference on Cloud Physics, jointly with 11th AMS Conference on Atmospheric Radiation*. Ogden, Utah. 3-7 June, 2002.
- ✦ Quantifying Droplet Clustering in Clouds  
M.L. Larsen, A.B. Kostinski, and R.A. Shaw. *11th AMS Conference on Cloud Physics*. Ogden, Utah. 3-7 June, 2002.
- ✦ 14 Additional Presentations by Undergraduate Mentees (2007-2009)

#### Institutional Committee Service

- ✦ UNK College of Natural and Social Sciences Oversight Committee (2009-Present)
- ✦ Young Nebraska Scientist Initiative Advisory Committee Member (2009-Present)
- ✦ UNK Research Services Council Committee Member (2008-Present) (Only Natural Science Rep.)
- ✦ UNK College of Natural and Social Sciences ITech Committee (2007-Present)
- ✦ UNK Sci-Math Colloquium Steering Committee Member (2007-Present)