

CURRICULUM VITAE

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Education

Ph.D. (2005) - Atmospheric Science, Colorado State University (CSU)

- Adviser: Dr. Steven A. Rutledge
- Specialization in Radar Meteorology and Lightning

M.S. (2000) - Physics, New Mexico Institute of Mining and Technology (NMIMT)

- Adviser: Dr. Paul R. Krehbiel
- Specialization in Atmospheric Physics

B.S. (1997) - Physics (Highest Honors), NMIMT, 1997

Professional Employment (in brief)

2007 - present *Assistant Professor*, Atmospheric Science, Texas Tech University, Lubbock, TX

2005 - 2007 *Post-Doctoral Researcher*, Los Alamos National Laboratory, Los Alamos, NM

2000 - 2005 *Graduate Research Assistant*, Atmospheric Science, Colorado State University, Fort Collins, CO

2000 *Graduate Research Assistant*, Severe Thunderstorm Electrification and Precipitation Study (STEPS)

1998 *Research Assistant*, Los Alamos National Laboratory, Los Alamos, NM

1995 - 1997 *Research Assistant*, Langmuir Laboratory for Atmospheric Research, Socorro, NM

Professional Employment (details)

- 2007 - present *Assistant Professor*, Atmospheric Science, Texas Tech University, Lubbock, TX
- 2005 - 2007 *Post-Doctoral Researcher*, Los Alamos National Laboratory, Los Alamos, NM
- Supervisor: Dr. David Suszcynsky
 - Using satellite-based measurements of very high frequency (VHF) lightning radiation to quantify relationships among spaced-based measurements of lightning, ground-based measurements of total lightning and thunderstorm convective strength and severity.
 - Goals of this research include determination of the viability of a satellite-based VHF global lightning mapper, improved worldwide storm tracking and forecasting, and further understanding of the meteorological context of the so-called Narrow Bipolar Events (NBEs) that constitute the most powerful and readily measurable VHF lightning signal observed from space.
 - See *Wiens et al.* (2008).
- 2000 - 2005 *Graduate Research Assistant*, Atmospheric Science, Colorado State University, Fort Collins, CO
- Supervisor: Dr. Steven A. Rutledge
 - In addition to my dissertation work, I . . .
 - Developed comprehensive graphical user interface software tools (in IDL) for ingestion, analysis and display of thunderstorm-related data sets. These tools are now widely used by scientists in my research group and in the thunderstorm research community in general.
 - Developed a fuzzy logic hydrometeor classification algorithm which uses polarimetric radar measurements to partition radar echo into regions of hail, rain, ice crystals, etc. This algorithm is now being used in a quasi-operational mode for CSU's on-going studies of radar-based quantitative prediction of rain and hail.
- 2000 *Graduate Research Assistant*, Severe Thunderstorm Electrification and Precipitation Study (STEPS)
- Supervisors; Drs. Paul R. Krehbiel and Steven A. Rutledge
 - Designed, constructed and deployed an array of electric field change antennas used in the STEPS. Developed software (in Perl, C and IDL) for real-time acquisition and analysis of data from these electric field change antennas.
 - Assisted in deployment and operation of the NMIMT lightning mapping array (LMA) which locates impulsive sources of RF radiation emitted by lightning discharge processes.
 - Assistant operator of the S-Pol radar.

- 1998 *Research Assistant*, Los Alamos National Laboratory, Los Alamos, NM
- Supervisor: Dr. Abram Jacobson
 - Designed, constructed, installed, and maintained an array of electric field change antennas used to measure the time and location of lightning flashes both for scientific purposes and to provide ground-truth for the Los Alamos FORTE satellite.
 - Developed software (in IDL) for analysis of data from these antennas.
 - This array of antennas (now called Edot or Los Alamos Sferic Array (LASA)) has since been augmented and improved upon and continues to provide useful scientific and programmatic data.
 - See, for example, <http://edot.lanl.gov/> and *Smith et al.* (2002).
- 1995 - 1997 *Research Assistant*, Langmuir Laboratory for Atmospheric Research, Socorro, NM
- Supervisor: Dr. William P. Winn
 - Assisted in and eventually led lightning triggering operations, which involved design and construction of rockets which were fired into thunderstorms with the purpose of triggering lightning strikes.
 - Constructed, assembled, and maintained meteorological instrumentation.

Teaching Experience

- 2007 - present *Instructor*, Texas Tech University (TTU)
- ATMO 5321 – (Graduate) Cloud and Precipitation Physics
 - ATMO 1300 – (Undergraduate) Introduction to Atmospheric Science
- 2004 *Guest Lecturer*, Colorado State University (CSU)
- AT 741 – (Graduate) Radar Meteorology
- 2001 - 2002 *Graduate Teaching Assistant*, CSU
- AT 620 - (Graduate) Thermodynamics and Cloud Physics (Prof. Steven Rutledge)
 - AT 605 - (Graduate) General Atmospheric Circulation (Prof. David Randall)
- 2000 *Substitute Instructor*, New Mexico Institute of Mining and Technology (NMIMT)
- PHYS 242 - (Sophomore-level) Vibrations and Waves in Physics (Prof. Paul Krehbiel)
 - PHYS 242L - (Sophomore-level) Vibrations and Waves Lab (Prof. Paul Krehbiel)

1998 - 1999 *Instructor*, NMIMT

- Freshman Physics labs

1994 - 1996 *Tutor*, NMIMT

- Physics, Calculus, and Chemistry

Graduate Advisory Committees

<i>Chair</i>	Candace Cyrek (M.S.)	TTU, ATMO (2007-present)
<i>Member</i>	Rich Cullin (M.S.)	CSU, ATMO (2007-present)
<i>Member</i>	Patrick Skinner (M.S.)	TTU, ATMO (2008-present)

Awards and Honors

- NMIMT Wilkening Award for excellence in experimental Physics, 2000
- NMIMT Graduate Research Fellowship, 1998-2000
- NMIMT Brook Prize for academic excellence in Physics, 1997

Professional Affiliations

- Sigma Pi Sigma (Physics Honors Society)
- American Geophysical Union
- American Meteorological Society

Computer Skills

- Familiar with Mac OS, Linux/Unix, and Microsoft operating systems
- Familiar with C, FORTRAN, Matlab, Perl, Python
- Proficient with **IDL**
 - 10 years of experience, ~100,000 lines of code
 - Developed extensive IDL graphical user interface software packages for unified visualization and analysis of STEPS data sets (radar, Lightning Mapping Array, National Lightning Detection Network, balloons, etc.). This software has been widely used by the STEPS community.
 - Developed a better and similarly extensive IDL tool for my work at LANL. It's called ANGEL (Analysis of NEXRAD, GPS, EDOT, and LMA).
 - See my CSU IDL web-page at <http://radarmet.atmos.colostate.edu/kwiens/software.html>

Publications (peer reviewed)

1. Hamlin, T., **K. C. Wiens**, A. R. Jacobson, T. E. L. Light, and K. B. Eack (2008), An overview of some recent lightning research at Los Alamos National Laboratory, *chapter in Springer-Verlag monograph on Lightning*, Hans Betz (Ed.), **submitted**.
2. Lyons, W. A., S. A. Cummer, M. A. Stanley, **K. C. Wiens**, and T. E. Nelson (2008), Supercells and Sprites, *Bull. Amer. Meteor. Soc.*, **in review**.

3. **Wiens, K. C.**, T. Hamlin, J. Harlin, and D. M. Suszcynsky (2008), Relationships among narrow bipolar events, “total” lightning, and radar-inferred convective strength in Great Plains thunderstorms, *J. Geophys Res.*, **113**, D05201, doi:10.1029/2007JD009400.
4. Tessendorf, S.A., **K. C. Wiens**, and S. A. Rutledge (2007), Radar and lightning observations of the 3 June 2000 electrically inverted storm from STEPS, *Mon. Wea. Rev.*, **135**, 3665–3681.
5. Tessendorf, S. A., S. A. Rutledge, and **K. C. Wiens** (2007), Radar and lightning observations of normal and inverted polarity multicellular storms from STEPS, *Mon. Wea. Rev.*, **135**, 3682–3706.
6. Shao, X. M., J. Harlin, M. Stock, M. Stanley, A. Regan, **K. Wiens**, T. Hamlin, M. Pongratz, D. Suszcynsky, and T. Light (2005), Katrina and Rita were lit up with lightning, *EOS Trans., AGU*, **86**(42), 398. doi:10.1029/2005EO420004.
7. Tessendorf, S. A., L. J. Miller, **K. C. Wiens**, and S. A. Rutledge (2005), The 29 June 2000 supercell observed during STEPS. Part I: Kinematics and microphysics. *J. Atmos. Sci.*, **62**, 4127–4150.
8. **Wiens, K. C.**, S. A. Rutledge, and S. A. Tessendorf (2005), The 29 June 2000 supercell observed during STEPS. Part II: Lightning and charge structure. *J. Atmos. Sci.*, **62**, 4151–4177.
9. MacGorman, D. R., W. D. Rust, P. R. Krehbiel, E. Bruning, and **K. Wiens** (2005), The electrical structure of two supercell storms during STEPS. *Mon. Wea. Rev.*, **133**, 2583–2607.
10. Lang, T.J., S. A. Rutledge, and **K. C. Wiens** (2004), Origins of positive cloud-to-ground lightning flashes in the stratiform region of a mesoscale convective system. *Geophys. Res. Lett.*, **31**, L10105, doi:10.1029/2004GL019823.
11. Smith, D. A., M. J. Heavner, A. R. Jacobson, X. M. Shao, R. S. Massey, R. J. Sheldon, and **K. C. Wiens** (2004), A method for determining intracloud lightning and ionospheric heights from VLF/LF electric field records, *Radio Sci.*, **39**, RS1010, doi:10.1029/2002RS002790.
12. Smith, D.A., K. B. Eack, J. Harlin, M. J. Heavner, A. R. Jacobson, R. S. Massey, X. M. Shao, and **K. C. Wiens** (2002), The Los Alamos Sferic Array: A research tool for lightning investigations. *J. Geophys. Res.* **107** (D13), 10.1029/2001JD000502.

Selected Conference Presentations

1. **Wiens, K. C.**, and D. M. Suszcynsky (2006), Narrow bipolar events as indicators of severe thunderstorms, *EOS Trans. AGU, Fall Meet. Suppl.*, Abstract AE53A-0282.
2. Suszcynsky, D. M. and **K. Wiens** (2006), Narrow bipolar events, strong VHF pulses and the detection of severe weather from GPS orbit, *2nd Conf. on Meteorol. Applications of Lightning Data, AMS Annual Meeting, Atlanta, GA*, Abstract P1.9.
3. **Wiens, K. C.** (2006), Thunderstorm electrical structures observed by lightning mapping arrays, (**Invited Talk**), *2nd Conf. on Meteorol. Applications of Lightning Data, AMS Annual Meeting, Atlanta, GA*, Abstract 3.1.
4. Hamlin, T., **K. C. Wiens**, X. M. Shao, J. Harlin, M. A. Stanley, and M. Stock (2005), Lightning location and classification with the Great Plains Los Alamos Sferic Array, *EOS Trans., AGU*, **86**(52), Abstract AE41A-0149.
5. Shao, X., J. Harlin, M. Stanley, M. Stock, **K. Wiens**, and T. Hamlin (2005), Initial analysis of the Los Alamos Sferic Arrays in north-central Florida and Great Plains, *EOS Trans.*,

- AGU*, **86**(52), Fall Meet. Suppl., Abstract AE43A-03.
6. Suszcynsky, D. M., **K. C. Wiens**, and X. Shao (2005), Narrow bipolar events, strong VHF pulses and their relationship to thunderstorm evolution, *EOS Trans. AGU*, **86**(52), Fall Meet. Suppl., Abstract AE21A-0975.
 7. **Wiens, K. C.**, and D. M. Suszcynsky (2005), Observed relationships among narrow bipolar events, total lightning and convective strength in summer 2005 Great Plains thunderstorms, *EOS Trans., AGU*, **86**(52), Fall Meet. Suppl., Abstract AE21A-0974.
 8. **Wiens, K. C.**, S. A. Tessendorf, and S. A. Rutledge (2003), STEPS June 29, 2000 Supercell: Observations of kinematic, microphysical, and electrical structure. *Proceedings of the 12th International Conference on Atmospheric Electricity*, Int. Comm. on Atmos. Electr., Versailles, France, 9-13 June, pp. 263-266.
 9. **Wiens, K. C.**, S. A. Tessendorf, and S. A. Rutledge (2002), June 29, 2000 STEPS supercell storm: Relationships between kinematics, microphysics, and lightning. *Preprints, 21st Conference on Severe Local Storms, San Antonio, Amer. Meteor. Soc.* pp. 315-318.
 10. **Wiens, K.**, W. P. Winn, P. R. Krehbiel, T. Hamlin, R. J. Thomas, and W. Rison (1999), Explanations of strange ground-based electric field measurements using the New Mexico Tech Lightning Mapping System. *EOS Trans. AGU*, Fall Meet. Suppl., Abstract A31A-23.
 11. Smith, D., R. Massey, **K. Wiens**, K. Eack, X. Shao, D. Holden, P. Argo (1999), Observations and inferred physical characteristics of compact intracloud discharges. In *Proceedings of the 11th International Conference on Atmospheric Electricity*, edited by H. Christian, *NASA Conf. Publ.*, 209261, pp. 6-9.
 12. **Wiens, K.**, R. Massey, X. Shao, M. Eberle, and K. Eack (1998), The Los Alamos Electric-Field-Change Sensor Array. *EOS Trans. AGU*, Fall Meet. Suppl., Abstract A31D-04.

Reviewer of Articles for the Following Journals

- Journal of Geophysical Research
- Monthly Weather Review
- Journal of Lightning Research

Reviewer of Grant Applications for the Following Agencies

- National Science Foundation