

### Research Interests

- Tornado vortex structure, tornadogenesis, kinematics of convective systems, hurricane boundary layer kinematics, single- and multi-Doppler radar and integrated analysis of mesoscale phenomena

### Appointments

- Research and DOW Project Scientist, Center for Severe Weather Research, Boulder, CO (2008-Present)
  - *Conducts research; Supervises and assists in DOW facility readiness for scientific and education projects*
- Visiting Scientist, National Center for Atmospheric Research, Boulder, CO (2009-current)
- Visiting Scientist, University of Colorado, Boulder, CO (2009-2010)

### Education

- Ph.D., Atmospheric Science, Purdue University, West Lafayette, Indiana, 2009
  - *Dissertation: A comparison of radar observations to real data simulations of axisymmetric tornadoes*
- M.A.T., Teacher Education, Miami University, Oxford, Ohio, 2003
  - *Thesis: A study on the effects of inquiry-based instruction on the attitudes of future science teachers*
- M.S., Physics, Miami University, Oxford, Ohio, 2002
  - *Thesis: A laboratory investigation of the vertical velocities in and the effects of surface roughness on tornado-like vortices*
- B.S., Physics, Loyola University, Chicago, Illinois, 1999

### Grants Awarded

- PI: *RAPID: Collection and Analysis of Data in Major Landfalling Hurricanes (2017)*, NSF Grant (9/14/2017 – 8/31/2018).
- PI: *Collaborative Research: An Integrated Understanding of the Initiation and Subsequent Dynamical and Microphysical Characteristics of Deep Convective Storms during RELAMPAGO*, NSF Grant (2017-2021).
- Co-PI: VORTEX-SE: Characterization of environmental influences on downdraft processes occurring in potentially tornadic storms in the Southeast United States. NOAA grant (10/1/16 – 9/30/18)
- Co-PI: VORTEX-SE: Improving radar wind retrievals and understanding local environmental influences on downdraft processes in potentially tornadic storms in the southeastern United States. NOAA grant. (10/1/17 – 9/30/19)
- Co-PI: VORTEX-SE Type 1: Characterization of storm structure and storm environments through the integration, improvement and analysis of multi-platform radar data (current proposal). NOAA Grant. (2018 –2020).
- Co-PI: *Construction of Mobile C-band, Narrow-Beam, Dual-Frequency, Dual-Polarization, High-Power Radar*. NSF Grant (2017-2018).
- Co-Principle Investigator: *Relating Overshooting Cloud Tops, Lightning, and Cloud Microphysics to Tornadogenesis: A Design Study for a NASA-led Field Campaign*, NASA Grant. (07/01/2015 – 6/30/2016)
- Principle Investigator: *Mechanisms for severe wind production in nocturnal and transitioning convection*, NSF Grant (09/01/2015 – 08/31/2018)

- Co-Principle Investigator: *Doppler On Wheels National Mobile Doppler Radar Facility*, NSF Grant (01/2014 – 12/18).
- Principle Investigator: *Collaborative Research: OWLeS*, NSF Grant AGS-0910737. (09/01/2013 – 08/31/2016)
- Principle Investigator: *Modeling and analysis of the landfalling hurricane boundary layer*, NSF grant AGS-0910737. (09/15/2009 – 08/31/2013)
- Co-Principle Investigator: *A Multi-platform Kinematic and Thermodynamic Study of Tornado Genesis, Structure, and Evolution*, NSF grant AGS-1211132. (08/15/2012 – 07/31/2015)
- Co-Principle Investigator: *Collaborative research: VORTEX2--multi-scale and multi-platform study of tornadoes, supercell thunderstorms, and their environments*, NSF grant AGS-0801041. (06/01/2008 – 05/31/2013)

### Field Experience

- Remote sensing of Electrification, Lightning, And Mesoscale/Microscale Processes with Adaptive Ground Observations (RELAMPAGO), 2018
  - Principle Investigator
  - DOW Project Scientist
  - Staffing Management
- Great Plains Irrigation Experiment (GRAINEX), 2018
  - DOW Project Scientist
  - Staffing Management
- Seeded and Natural Orographic Wintertime clouds - the Idaho Experiment (SNOWIE), 2017
  - DOW Project Scientist
  - Staffing Management
- Tornadoic Winds: In situ and Radar observations at Low-levels (TWIRL), 2016
  - Principle Investigator
  - Project Scientist
  - Radar operator and coordination
- The Olympic Mountains Experiment (OLYPMEX), 2015
  - DOW Project Scientist
- Plains Elevated Convection at Night (PECAN), 2015
  - Principle Investigator
  - DOW Project Scientist
  - Project-wide radar coordinator (July)
- Ontario Winter Lake-effect Systems (OWLeS), 2013-14
  - Principle Investigator
  - DOW project scientist, Executive Committee Member
- Radar Observations of Tornadoes and Thunderstorms (ROTATE), 2004-08, 2011-14
  - Navigator, driver, forecaster, radar operator, data manager, DOW project scientist
- Agl Seeding Cloud Impact Investigation (ASCII), 2012
  - DOW project scientist, radar operator
- Long-Lake Axis-Parallel lake-effect storms project (LLAP), 2010-11
  - DOW project scientist, radar operator
- The Second Verification of the Origins in Tornadoes Experiment (VORTEX2), 2009-10
  - Principle Investigator
  - Radar operator, in situ Tornado Pod coordinator
- Hurricanes at Landfall (HAL), 2004, 2008, 2012, 2017
  - Principle Investigator (2012, 2017)
  - Navigator, Radar operator, DOW project scientist
- Convective and Orographically-Induced Precipitation Study (COPS), 2007
  - Radar operator, driver, data manager

## **Certifications**

- Wilderness First Responder, NOLS Wilderness Medical Institute (December 2016 – current)

## **Professional Activities**

- Chair, Organized Convection and Severe Phenomena, AMS 39<sup>th</sup> International Conference on Radar Meteorology (2019)
- Chief Scientist, RELAMPAGO Project (December 2018)
- Editor, Weather and Forecasting (2017 - current)
- Co-Chair, Physical Sciences, Vortex Southeast (2018 - current)
- Steering Committee Member, Vortex Southeast (2016 - current)
- Subcommittee Member, Organized Convection and Severe Phenomena, AMS 38<sup>th</sup> Conference on Radar Meteorology (2017)
- Committee Member, AMS 28<sup>th</sup> Conference on Severe Local Storms (2016)
- Conference Planning Committee Member, Vortex Southeast (2016)
- Associate Editor, Weather and Forecasting (2014 - 2016)
- Executive Committee Member, OWLeS Project (2013-14)
- Co-Chair, AMS 27<sup>th</sup> Conference on Severe Local Storms (2014)
- Committee Member, AMS Severe Local Storms Scientific and Technological Activities Commission (2013 - 2018)
- Reviewer of manuscripts for Monthly Weather Review (2009 - current), Bulletin of the American Meteorological Society (2010 - current), Journal of Atmospheric and Oceanic Technology (2011), and Journal of Applied Meteorology and Climatology (2011)
- Reviewer of proposals for the Physical and Dynamical Meteorology Division of the National Science Foundation (2011 - current)
- Session Chair (35<sup>th</sup> Conference in Radar Meteorology, 25<sup>th</sup> Conference on Severe Local Storms, 6<sup>th</sup> European Conference on Radar Meteorology and Hydrology, 5<sup>th</sup> European Conference on Severe Local Storms)

## **Outreach Activities**

- Invited Speaker, Benson Lecture, Miami University (March 2019)
- CoCoRaHS WxTalk Webinar (March 2019)
- Invited Speaker, X-STEM, Travis AFB (March 2019)
- Facilitated Advance Studies Institutes (ASI) Student Participation in DOW facility activities during RELAMPAGO (Fall 2018)
- Invited Speaker, University of North Dakota, Grand Forks, ND (April 2018)
- Invited Speaker, Wind Related Disasters and Mitigation, Sendai, Japan (March 2018)
- Invited Speaker, University of Arizona, Tucson, AZ (October 2017)
- Invited Speaker, 19<sup>th</sup> High Plains Conference (August 2017)
- Invited Speaker, Central Michigan University and Local AMS Chapter (2017)
- Invited Speaker, AMS Symposium on Severe Local Storms, Seattle, WA (2017)
- Invited Speaker, ChaserCon, Denver, CO (2011, 2013, 2017, 2018)
- Role Model, Girls and Science, Denver Museum of Nature and Science, Denver CO (5 March 2016)
- Invited Speaker, The Sixth Annual Great Lakes Atmospheric Science Symposium, Oswego, NY (17 October 2015)
- Invited Speaker, NWA Severe Storm and Doppler Radar Conference, Ankeny, IA (26 March 2015)
- Invited Speaker, 24<sup>th</sup> Annual DuPage Advanced Severe Weather Seminar, Wheaton, IL (14 March 2015)
- Invited Speaker, Severe Weather Symposium, Lawrence, KS (7 March 2015)
- Invited Speaker, TEDx, Phoenix, AZ (26 April 2015)

- Invited Speaker at the 16<sup>th</sup> Annual High Plains AMS/NWS Conference, Hastings, NE (Aug. 5, 2014)
- Guest Lecture and DOW data collection, SOARS Academy, Boulder, CO (June 17-19, 2014)
- Invited Speaker, Meteorology Club's Colloquia Series, California University of Pennsylvania (March 25, 2014)
- Invited speaker at X-Stem, Washington, D. C. (April 2014)
- Organized and presented at OWLeS Open House, Penn Yan Airport, NY (Dec. 5, 2013)
- Invited speaker at TEDYouth, New Orleans, LA (November 16, 2013)
- Lead teacher workshops (both remotely and onsite) on integrating weather observations and technology in the K-12 classroom (2012-2013)
- Participated in Denver Museum of Science and Nature's nationwide education program entitled "Scientists in Action" (2012, 2014)
- Participated in an iTwixie discussion of Storm Chasing for tween girls (May 2012)
- Invited speaker at the USA Science and Engineering Festival (April 2012, 2014)
- Interviewed for Washington Post article that highlighted VORTEX2 research (April 2012)
- Speaker at the Radar Meteorology Student Discussion at the 35<sup>th</sup> Conference on Radar Meteorology
- Participated in nationwide public and grade school education and outreach associated with the Tornado Alley IMAX film by visiting schools, museums, and local media to discuss tornado science and severe weather research (2011-13)
- Participated in the USA Science and Engineering Festival, Washington D.C., which involved 2 days of public outreach with the DOWs (October 2010, 2012, 2016)
- Traveled to community and technical colleges (IL, WY, CO) as part of the UCAR Careers in Science to discuss career options for students interested in weather (2010, 2011)
- Blogger, National Science Foundation VORTEX2 blog (2010)

### Media Activities

- Interviewed by various local and national media outlets regarding severe weather and severe weather research (e.g., Washington Post, National Geographic, National Geographic Kids, The Weather Channel, BBC, Discovery Channel, Mashable, The Verge)

### Service on Graduate Committees

- Kyle Pennington (M.S.) (2017)
- Mallie Toth (M.S.) (2012)

### Teaching Experience

- Instructor, University of Colorado (Fall 2015)
- Teaching Assistant, Purdue University, Department of Earth and Atmospheric Sciences (2006-2008)
- Teaching Assistant, Miami University, Department of Physics (1999-2003)
- Laboratory Assistant, Loyola University, Department of Physics (1998-99)

### Publications

- **Kosiba, K. A.**, J. Wurman, K. Knupp, K. Pennington, and P. Robinson, 2019: Ontario Winter Lake-effect Systems (OWLeS): Bulk characteristics and kinematic evolution of misovortices in long-lake-axis-parallel snowbands. *In Revision, Mon. Wea. Rev.*
- Fernández Cabán, P. L., Alford, A. A., Bell, M., Biggerstaff, M. I., Carrie, G. D., Hirth, B., **Kosiba, K.**; Phillips, B. M., Schroeder, J. L., Waugh, S. M., Williford, C. E., Wurman, J., Masters, F. J., 2018: Observing Hurricane Harvey's Eyewall at Landfall. *Accepted, Bull. Amer. Meteor. Soc.* <https://doi.org/10.1175/BAMS-D-17-0237.1>
- Wurman, J., and **K. A. Kosiba**, 2018: The role of small-scale vortices in enhancing surface winds and damage in Hurricane Harvey (2017). *Mon. Wea. Rev.*, <https://journals.ametsoc.org/doi/pdf/10.1175/MWR-D-17-0327.1>

- Mulholland, J. P., J. Frame, S. Nesbitt, S. Steiger, **K. Kosiba**, J. Wurman, 2017: Observations of Misovortices Within A Long Lake-Axis-Parallel Lake-Effect Snow Band During The OWLeS Project. *Mon. Wea. Rev.* <https://doi.org/10.1175/MWR-D-16-0430.1>
- Geerts, B., D. Parsons, C. Ziegler, T. Weckworth, D. Turner, J. Wurman, **K. Kosiba**, R. Rauber, M. Parker, R. Schumacher, M. Coniglio, K. Haghi, M. Biggerstaff, P. Klein, W. Gallus, B. Demoz, K. Knupp, R. Ferrare, X. Wang, J. Hanesiak, J. Pinto, J. Moore, 2017: The 2015 Plains Elevated Convection At Night (PECAN) field project. *Accepted, Bull. Amer. Meteor. Soc.*
- Kristovich, D. A. R., R. D. Clark, J. Frame, B. Geerts, K. R. Knupp, **K. A. Kosiba**, N. F. Laird, N. D. Metz, J. Minder, T. D. Sikora, W. J. Steenburgh, S. M. Steiger, J. Wurman, G. S. Young; 2017: "The Ontario Winter Lake-effect Systems (OWLeS) Field Project. *Bull. Amer. Meteor. Soc.*, **98**, 315–332, doi:<https://doi.org/10.1175/BAMS-D-15-00034.1>.
- Wakimoto, R.M., N.T. Atkins, K.M. Butler, H.B. Bluestein, K. Thiem, J.C. Snyder, J. Houser, **K. Kosiba**, J. Wurman, 2016: Aerial Damage Survey of the 2013 El Reno Tornado Combined with Mobile Radar Data. *Mon. Wea. Rev.*, **144**, 1749-1776, doi: 10.1175/MWR-D-15-0367.1
- Klees, A.M., Y.P. Richardson, P.M. Markowski, J. Wurman, and **K. Kosiba**, 2016: Comparison of the Tornadoic and Nontornadoic Supercells Intercepted by VORTEX2 on 10 June 2010. *Mon. Wea. Rev.*, **144**, 3201–3231, doi:10.1175/MWR-D-15-0345.1
- Marquis, J., Y. Richardson, P. Markowski, J. Wurman, and **K. Kosiba**, 2016: An Investigation of the Goshen County, Wyoming, Tornadoic Supercell of 5 June 2009 Using EnKF Assimilation of Mobile Mesonet and Radar Observations. Part II: mesocyclone-scale processes affecting tornado formation, maintenance, and decay. *Mon. Wea. Rev.*, **144**, 3441-3463, doi: 10.1175/MWR-D-15-0411.1
- Bell, M. M., R. A. Ballard, M. Bauman, A. M. Foerster, A. Frambach, **K. A. Kosiba**, W.-C. Lee, S. L. Rees, and J. Wurman, 2015: The Hawaiian Educational Radar Opportunity (HERO). *BAMS*, doi: <http://dx.doi.org/10.1175/BAMS-D-14-00126.1>
- Wurman, J., **K. Kosiba**, P. Robinson, T. Marshall, 2014: The Role of Multiple-Vortex Tornado Structure in Causing Storm Researcher Fatalities. *Bull. Amer. Meteor. Soc.*, **95**, 31–45.
- **Kosiba, K. A.**, and J. Wurman, 2014: Fine-scale dual-Doppler analysis of hurricane boundary layer structures in Hurricane Frances (2004) at landfall. *Mon. Wea. Rev.*, **142**, 1874-1891.
- **Kosiba, K. A.**, P. Robinson, P. W. Chan, J. Wurman, 2014: Wind Field of A Non-Mesocyclone Anticyclonic Tornado Crossing the Hong Kong International Airport. Accepted to *Advances in Meteorology*.
- Marquis, J., Y. Richardson, P. Markowski, D. Dowell, J. Wurman, **K. Kosiba**, P. Robinson, and G. Romine, 2014: An investigation of the Goshen County, Wyoming, tornadoic supercell of 5 June 2009 using EnKF assimilation of mobile radar and mobile mesonet observations collected during VORTEX2. Part I: Experiment design and verification of the EnKF analyses. *Mon. Wea. Rev.*, **142**, 530–554.
- **Kosiba, K. A.**, and J. Wurman, 2013: The three-dimensional structure and evolution of a tornado boundary layer. *Wea. Forecasting*. **28**, 1552-1561.
- **Kosiba, K. A.**, J. Wurman, F. Masters, and P. Robinson, 2013: Mapping of near-surface winds in Hurricane Rita using fine-scale radar, anemometer, and land-use data. *Mon. Wea. Rev.* **141**, 4337-4349.
- **Kosiba, K. A.**, J. Wurman, P. Markowski, Y. Richardson, P. Robinson, and J. Marquis, 2013: Genesis of the Goshen County, Wyoming Tornado on 05 June 2009 during VORTEX2. *Mon. Wea. Rev.*, **141**, 1157-1181.
- Wurman, J. and **K. A. Kosiba**, 2013: Fine-scale radar observations of tornado and mesocyclone structures. *Wea. And Forecasting*. doi: <http://dx.doi.org/10.1175/WAF-D-12-00127.1>
- Wurman, J., **K. Kosiba**, and P. Robinson, 2013: In Situ, Doppler radar, and video observations of the interior structure of a tornado and the wind–damage relationship. *Bull. Amer. Meteor. Soc.*, **94**, 835–846.

- Steiger, S. M., A. Stamm, D. Ruth, K. Jaszka, T. Kress, B. Rathbun, R. Schrom, J. Frame, J. Wurman, **K. Kosiba**, 2013: Circulations, bounded weak echo regions, and horizontal vortices observed within long lake-axis-parallel lake-effect storms by the Doppler on Wheels. *Mon. Wea. Rev.*, **141**, 2821-2840.
- Toth, M., R. J. Trapp, J. Wurman, **K. A. Kosiba**, 2013: Comparison of mobile-radar measurements of tornado Intensity with corresponding WSR-88D measurements. *Wea. Forecasting*, **28**, 418–426.
- Markowski, P., Y. Richardson, J. Marquis, J. Wurman, **K. Kosiba**, P. Robinson, D. Dowell, E. Rasmussen, and R. Davies-Jones, 2012a: The pretornadic phase of the Goshen County, Wyoming, supercell of 5 June 2009 intercepted by VORTEX2. Part I: Evolution of kinematic and surface thermodynamic fields. *Mon. Wea. Rev.*, **140**, 2887-2915.
- Markowski, P., Y. Richardson, J. Marquis, R. Davies-Jones, J. Wurman, **K. Kosiba**, P. Robinson, E. Rasmussen, and D. Dowell, 2012b: The pretornadic phase of the Goshen County, Wyoming, supercell of 5 June 2009 intercepted by VORTEX2. Part II: Intensification of low-level rotation. *Mon. Wea. Rev.*, **140**, 2916-2938.
- Chan, P. W., J. Wurman, C. M. Shun, P. Robinson, and **K. Kosiba**, 2011: An application of a method for the automatic detection and Ground-Based Velocity Track Display (GBVTD) analysis of a tornado crossing the Hong Kong International Airport. *Atmos. Res.*, **106**, 18-29.
- **Kosiba, K. A.** and J. Wurman, 2010: The three-dimensional axisymmetric wind field structure of the Spencer, South Dakota (1998) tornado. *J. Atmos. Sci.*, **67**, 3074-3083.
- Wurman, J., **K. A. Kosiba**, P. Markowski, Y. Richardson, D. Dowell, and P. Robinson, 2010: Fine-scale and dual-Doppler analysis of tornado intensification, maintenance, and dissipation in the Orleans, Nebraska, tornadic supercell. *Mon. Wea. Rev.*, **138**, 4439–4455.
- **Kosiba, K. A.**, R. J. Trapp, and J. Wurman, 2008: An analysis of the axisymmetric three-dimensional wind field in a tornado using mobile radar observations. *Geophys. Res. Lett.*, **35**, L05805, doi:10.1029/2007GL031851.