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EDUCATION

THE UNIVERSITY OF OKLAHOMA Norman, OK

Ph. D., Electrical Engineering, 2001

M.S., Electrical Engineering, 1997

NATIONAL UNIVERSITY OF MAR DEL PLATA Mar del Plata, Argentina

B.S., Electrical Engineering, 1995

EXPERIENCE

6/97 – Present

THE UNIVERSITY OF OKLAHOMA Norman, OK

Senior Research Scientist – CIMMS

Team Leader – Advanced Radar Techniques, National Severe Storms Laboratory (NSSL)

- Leading the research, development, and technology transfer associated with the evolution of the US network of weather radars (NEXRAD)
- Leading the demonstration of new capabilities of phased-array radars on the National Weather Radar Testbed under the Multifunction Phased Array Radar (MPAR) umbrella
- Investigating new capabilities of phased-array radars including advanced signal processing, adaptive scanning, and multifunction
- Researching and developing signal processing techniques to improve the quality, coverage, accuracy, precision, and timeliness of meteorological products from weather radars
- Providing scientific and administrative leadership to a team of eight engineers
- Serving as Assoc. Editor for the AMS Journal of Atmospheric and Oceanic Technology since 2016

1/15 - Present

Assistant Director for NOAA Relations – CIMMS

- Working with senior leadership to develop policies and tools for consistent performance evaluations and professional development/career advancement of CIMMS staff
- Serving as liaison between CIMMS and NSSL management teams

1/05 – Present

Faculty Member – Advanced Radar Research Center (ARRC)

Adjunct Associate Professor – School of Electrical and Computer Engineering (ECE)

- Co-advising graduate students and member of the graduate faculty
- Invited lecturer for graduate course *Weather Radar Theory and Practice*
- Served as Associate Director for the ARRC from June 2010 through June 2012
- Served as Chairman of local organizing committee for the 2nd International Symposium on Earth-science Challenges between the University of Oklahoma and Kyoto University, Sep 2011

2/06 – Present

SMT CONSULTING Norman, OK

Independent Consultant

- *Baron Services, Inc.*, consulting services, May 2015-July 2017
- *National University of Buenos Aires (Argentina)*, short course, Sep 2012
- *INVAP (Argentina)*, short course and consulting services, Nov 2011-July 2012
- *Beijing Metstar Radar Co. (China)*, consulting services, Aug 2011-July 2012
- *Polytechnic University of Madrid (Spain)*, short course, May 2011
- *Vaisala, Inc. (Finland)*, consulting services, Feb 2007-Apr 2010, Feb-Mar 2012
- *Kyungpook Natl. Univ. and Pukyong Natl. Univ. (South Korea)*, short course, Feb-Mar 2006

3/91 - 1/96

NATIONAL UNIVERSITY OF MAR DEL PLATA Mar del Plata, Argentina
Research Assistant – Signal Processing and Measurements Laboratory

- Conducted research in the fields of image and signal processing
- Worked in a team of engineers and forensic anthropologists to restore fingerprint images that allowed identification of murder victims

**EXTERNALLY-
FUNDED
RESEARCH**

- D. Bodine, B. L. Cheong, C. Fulton, R. Palmer, and **S. Torres**, 7/1/18-6/30/21: Exploring Tornadoes and Debris Through Observed and Simulated Radar Signatures, National Science Foundation, \$787,353.
- R. Palmer, D. Bodine, **S. Torres**, B. L. Cheong, and C. Fulton, 9/1/13-8/31/16: Understanding Polarimetric Radar Tornadic Debris Signatures Using Modeling, Simulations, and Field Measurements, National Science Foundation, \$860,163.
- D. Forsyth, **S. Torres**, and R. Palmer, 9/1/10-8/31/11: Advanced Detection and Mitigation of Wind Turbine Clutter for the Multi-Mission Phased Array Radar (MPAR) Program, *U.S. Dept. of Homeland Security, Science and Technology Directorate, Office of Special Programs*, \$300,000.
- B. L. Cheong, R. Palmer, and **S. Torres**, 7/1/09-2/28/10: Automatic Detection of Wind Turbine Clutter Using Level II Data, *U.S. Dept. of Commerce, NOAA*, \$91,181.
- D. Forsyth, **S. Torres**, and R. Palmer, 8/1/08-7/31/09: Windfarm Mitigation Studies, *U.S. Dept. of Homeland Security, Science and Technology Directorate, Office of Special Programs*, \$250,000.
- R. Palmer, M. Xue, T. Yu, J. Brotzge, **S. Torres**, P. Heinselman, R. Doviak, and D. Zrnić, 4/1/08-3/31/11: Radar-derived refractivity and its impact on model analysis and forecasting using the ensemble-Kalman filter, *National Science Foundation*, \$709,621.
- T. Yu, M. Xue, M. Yearly, R. D. Palmer, **S. Torres**, and M. Biggerstaff, 7/1/06-6/30/09: Meteorological studies with the phased array weather radar and data assimilation ensemble Kalman filter, *DoD-DEPSCoR*, \$464,467.
- T. Yu, M. Xue, M. Yearly, R. D. Palmer, **S. Torres**, and M. Biggerstaff, 5/1/07-4/31/09: Meteorological studies with the phased array weather radar and data assimilation ensemble Kalman filter, *Oklahoma State Regents for Higher Education, Research Matching Funds*, \$96,300.

**FORMAL
PUBLICATIONS**

- Umeyama, A., B. Cheong, **S. Torres**, and D. Bodine, 2018: Orientation analysis of simulated tornadic debris. *J. Atmos. Oceanic Technol.*, **35**, 993-1010.
- Curtis, C. and **S. Torres**, 2017: Adaptive range oversampling processing for nontraditional radar-variable estimators. *J. Atmos. Oceanic Technol.*, **34**, 1607-1623.
- Warde, D. and **S. Torres**, 2017: Spectrum width estimation using matched autocorrelations. *IEEE Geosci. and Remote Sensing Letters*, **14**, 1661-1664.
- **Torres, S.**, C. Curtis, and D. Schwartzman, 2017: Requirement-driven design of pulse compression waveforms for weather radars. *J. Atmos. Oceanic Technol.*, **34**, 1351-1369.
- Cheong, B., D. Bodine, C. Fulton, **S. Torres**, T. Maruyama, and R. Palmer, 2017: SimRadar: A polarimetric radar time-series simulator for tornadic debris studies. *IEEE Trans. Geosci. Remote Sensing*, **55**, 2858-2870.
- Umeyama, A., **S. Torres**, and B. Cheong, 2017: The bootstrap dual-polarimetric spectral density estimator. *IEEE Trans. Geosci. Remote Sensing*, **55**, 2299-2312.
- Warde, D. and **S. Torres**, 2017: Staggered PRT sequences for Doppler weather radars. Part II: The CLEAN-AP Filter. *J. Atmos. Oceanic Technol.*, **34**, 703-716.
- Schwartzman, D., **S. Torres**, and T. Yu, 2016: Weather Radar-Spatio Temporal Saliency: A first look at an information-theory-based human attention model adapted to reflectivity images. *J. Atmos. Oceanic Technol.*, **34**, 137-152.
- **Torres, S.** and D. Warde, 2017: Staggered PRT Sequences for Doppler weather radars. Part I: Spectral Analysis using the Autocorrelation Spectral Density. *J. Atmos. Oceanic Technol.*, **34**, 51-63.

- Nai, F., **S. Torres**, and R. Palmer, 2016: Adaptive beamspace processing for phased-array weather radars. *IEEE Trans. Geosci. Remote Sensing*, **54**, 5688-5698.
- **Torres, S.**, R. Adams, C. Curtis, E. Forren, D. Forsyth, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2016: Adaptive-weather-surveillance and multifunction capabilities of the National Weather Radar Testbed Phased-Array Radar. *IEEE Proc.*, **104**, 660-672.
- **Torres, S.** and C. Curtis, 2015: The impact of range-oversampling processing on tornado velocity signatures obtained from WSR-88D superresolution data. *J. Atmos. Oceanic Technol.*, **32**, 1581-1592.
- Curtis, C. and **S. Torres**, 2014: Adaptive range oversampling to improve estimates of polarimetric variables on weather radars. *J. Atmos. Oceanic Technol.*, **31**, 1853-1866.
- **Torres, S.** and D. Warde, 2014: Ground clutter mitigation for weather radars using the autocorrelation spectral density. *J. Atmos. Oceanic Technol.*, **31**, 2049-2066.
- Warde, D. and **S. Torres**, 2014: The autocorrelation spectral density for Doppler-weather-radar signal analysis. *IEEE Trans. Geosci. Remote Sensing*, **52**, 508-518.
- Curtis, C. and **S. Torres**, 2013: Real-time measurement of the range correlation for range oversampling processing. *J. Atmos. Oceanic Technol.*, **30**, 2885-2895.
- Ivić, I, C. Curtis, and **S. Torres**, 2013: Radial-based noise power estimation for weather radars. *J. Atmos. Oceanic Technol.*, **30**, 2737-2753.
- Nai, F., **S. Torres**, and R. Palmer, 2013: On the mitigation of wind-turbine clutter for weather radars using range-Doppler spectral processing. *IET Radar, Sonar & Navigation*, **7**, 178-190.
- **Torres, S.** and C. Curtis, 2013: The importance of accurately measuring the range correlation for range oversampling processing. *J. Atmos. Oceanic Technol.*, **30**, 261-273.
- **Torres, S.** and C. Curtis, 2012: The impact of signal processing on the range weighting function for weather radars. *J. Atmos. Oceanic Technol.*, **29**, 796-806.
- Curtis, C. and **S. Torres**, 2011: Adaptive range oversampling to achieve faster scanning on the National Weather Radar Testbed Phased Array Radar. *J. Atmos. Oceanic Technol.*, **28**, 1581-1597.
- Heinselman, P. and **S. Torres**, 2011: High-temporal resolution capabilities of the National Weather Radar Testbed phased-array radar. *J. Applied Meteor.*, **50**, 579-593.
- Reinoso-Rondinel, R., T.-Y. Yu, and **S. Torres**, 2010: Multifunction phased-array radar: time balance scheduler for adaptive weather sensing. *J. Atmos. Oceanic Technol.*, **27**, 1854-1867.
- Hood, K., **S. Torres**, and R. Palmer, 2010: Automatic detection of wind turbine clutter for weather radars. *J. Atmos. Oceanic Technol.*, **27**, 1868-1880.
- **Torres, S.**, R. Passarelli, A. Siggia, and P. Karhunen, 2010: Alternating dual-pulse, dual-frequency techniques for range and velocity ambiguity mitigation on weather radars. *J. Atmos. Oceanic Technol.*, **27**, 1461-1475.
- Le, K., R. Palmer, B. Cheong, T. Yu, G. Zhang, and **S. Torres**, 2010: Reducing the effects of noise on atmospheric imaging radars using multilag correlation, *Radio Sci.*, **45**, RS1008.
- Warde, D., and **S. Torres**, 2010: The CLEAN-AP filter: A novel ground-clutter eliminator for NEXRAD, *Bull. Amer. Meteor. Soc.*, **91**, 1173-1174.
- Palmer, R., M. Yearly, M. Biggerstaff, P. Chilson, J. Crain, K. Droegemeier, Y. Hong, A. Ryzhkov, T. Schuur, **S. Torres**, T.Y. Yu, G. Zhang, and Y. Zhang, 2009: Weather radar education at the University of Oklahoma - An integrated interdisciplinary approach. *Bull. Amer. Meteor. Soc.*, **90**, 1277-1282.
- **Torres, S.**, 2009: Processing of oversampled signals in range on polarimetric weather radars with mismatched channels. *J. Atmos. Oceanic Technol.*, **26**, 1289-1301.
- Le, K. D., R. D. Palmer, B. L. Cheong, T. Y. Yu, G. Zhang, and **S. Torres**, 2009: On the use of auxiliary receive channels for clutter mitigation with phased array weather radars. *IEEE Trans. Geosci. Remote Sensing*, **47**, 272-284.
- **Torres, S.**, and P. Heinselman, 2009: Super resolution for the NEXRAD network, *National Weather Association Newsletter*, 09-1, 2.

- Palmer, R., G. Zhang, M. Biggerstaff, P. Chilson, J. Crain, **S. Torres**, M. Yearly, T. Yu, and Y. Zhang, May 2007: University profile: Atmospheric Radar Research Center at the University of Oklahoma. *IEEE Trans. Geosci. Remote Sensing. Newsletter*, 10–16.
- **Torres, S.**, and W. González-Espada, 2006: Calculating 'g' from acoustic Doppler data. *Phys. Teach.*, **44**, 536-539.
- **Torres, S.**, Y. Dubel, and D. Zrnić, 2004: Design, implementation, and demonstration of a staggered PRT algorithm for the WSR-88D. *J. Atmos. Oceanic Technol.*, **21**, 1389-1399.
- **Torres, S.**, C. Curtis, and J. Cruz, 2004: Pseudowhitening of weather radar signals to improve spectral moment and polarimetric variable estimates at low signal-to-noise ratios. *IEEE Trans. Geosci. Remote Sensing*, **42**, 941-949.
- **Torres, S.**, and D. Zrnić, 2003: Whitening of signals in range to improve estimates of polarimetric variables. *J. Atmos. Oceanic Technol.*, **20**, 1776-1789.
- Ivić, I., **S. Torres**, and D. Zrnić, 2003: Whitening in range to improve weather radar spectral moment estimates. Part II: Experimental evaluation. *J. Atmos. Oceanic Technol.*, **20**, 1449-1459.
- **Torres, S.**, and D. Zrnić, 2003: Whitening in range to improve weather radar spectral moment estimates. Part I: Formulation and simulation. *J. Atmos. Oceanic Technol.*, **20**, 1433-1448.
- DeBrunner, V., and **S. Torres**, 2000: Multiple fully adaptive notch filter design based on allpass sections. *IEEE Trans. Signal Processing*, **48**, 550-552.
- **Torres, S.**, and D. Zrnić, 1999: Ground clutter filtering with a regression filter. *Journal of Atmospheric and Oceanic Technology*, **16**, 1364-1372.

CONFERENCE PRESENTATIONS

- **Torres, S.** and K. Hondl, 2018: The Advanced Technology Demonstrator at the National Severe Storms Laboratory. *10th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Ede, Netherlands, KNMI and Wageningen University, Paper 178.
- Schwartzman, D. and **S. Torres**, 2018: Are SENSR's temporal resolution requirements for the weather function feasible using adaptive scanning? *10th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Ede, Netherlands, KNMI and Wageningen University, Paper 311.
- Nai, F., C. Curtis, D. Schwartzman, J. Boettcher, and S. Torres, 2018: Using the SPARC simulator to refine and justify SENSR weather surveillance requirements. *10th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Ede, Netherlands, KNMI and Wageningen University, Paper 320.
- Warde, D. and **S. Torres**, 2018: Automated identification of ground clutter contamination for polarimetric Doppler weather radars. *10th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Ede, Netherlands, KNMI and Wageningen University, Paper 347.
- Lyons, S., T. Darlington, **S. Torres**, and D. Warde, 2018: Investigation into using a neural network to select between using filtered or aloft measurements to improve QPE in clutter contaminated regions. *10th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Ede, Netherlands, KNMI and Wageningen University, Paper 214.
- **Torres, S.**, J. Boettcher, C. Curtis, F. Nai, and D. Schwartzman, 2018: Can an MPAR solution for SENSR meet all weather-surveillance mission-critical needs? 2018 IEEE Radar Conference (RadarConf18), Oklahoma City, OK, IEEE, 67-71.
- **Torres, S.**, 2017: The future is here: Capabilities and plans for the advanced technology demonstrator at the National Severe Storms Laboratory. *38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Poster 122.
- Nai, F., D. Schwartzman, C. Curtis, and **S. Torres**, 2017: Using simulations to refine weather surveillance radar requirements for SENSR. *38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Poster 209.
- Warde, D., **S. Torres**, and D. Schwartzman, 2017: SZ-2 algorithm updates for the NEXRAD network. *38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Poster 198.
- Lyons, S., T. Darlington, **S. Torres**, and D. Warde, 2017: Application of the CLEAN-AP clutter filter using WET for improved quantitative precipitation estimation. *38th Conference on Radar Meteorology*, Chicago, IL, Amer. Meteor. Soc., Poster 278.

- **Torres, S.** and T. Darlington, 2017: Signal processing across the Atlantic: a partnership between the UKMO and the US National Severe Storms Laboratory. *33rd Conf. on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., Poster 9.
- Schvartzman, D., Warde, D., and **S. Torres**, 2017: Hybrid-scan estimator: using split-cut data to improve the quality of polarimetric variables. *33rd Conf. on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., Paper 8A.2.
- Warde, D., and **S. Torres**, 2017: Adapting CLEAN-AP for C-band polarimetric Doppler weather radars. *33rd Conf. on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., Paper 7A.5.
- Cheong, B. L., D. Bodine, C. Fulton, **S. Torres**, T. Maruyama, and R. Palmer, 2017: SimRadar: A radar simulator to investigate dual-pol characteristics of tornadic debris. *33rd Conf. on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., Paper 8A.4.
- Umeyama, A., **S. Torres**, and B. Cheong, 2017: The bootstrap dual polarimetric spectral density estimator. *33rd Conf. on Environmental Information Processing Technologies*, Seattle, WA, Amer. Meteor. Soc., Paper 7A.4.
- Umeyama, A., **S. Torres**, and B. Cheong, 2016: Polarimetric spectral densities for the analysis of tornado-vortex radar observations. *32nd Conf. on Environmental Information Processing Technologies*, New Orleans, LA, Amer. Meteor. Soc., Paper 530.
- Warde, D. and **S. Torres**, 2016: Assessing phase noise effects on weather-radar data quality. *32nd Conf. on Environmental Information Processing Technologies*, New Orleans, LA, Amer. Meteor. Soc., Paper 535.
- Schvartzman, D., T. Y. Yu, and **S. Torres**, 2015: Spatio-temporal visual saliency for adaptive weather sensing. *Proceedings, Progress In Electromagnetics Research Symposium*, Prague, Czech Republic, The Electromagnetics Academy, 2700-2704.
- **Torres, S.**, C. Curtis, and D. Schvartzman, 2015: A first look at combining pulse compression and range oversampling. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 2B.2.
- Nai, F., **S. Torres**, and R. Palmer, 2015: Beam-space adaptive processing for phased-array weather radars. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 2B.5.
- Curtis, C. and **S. Torres**, 2015: Is adaptive pseudowhitening compatible with new radar-variable estimators? *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 45.
- Warde, D. and **S. Torres**, 2015: Mitigating ground-clutter contamination on polarimetric Doppler weather radars. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 7.
- Cheong, B., D. Bodine, T. Maruyama, C. Fulton, **S. Torres**, and R. Palmer, 2015: Emulation of polarimetric weather radar signals from tornadic debris. *31st Conf. on Environmental Information Processing Technologies*, Phoenix, AZ, Amer. Meteor. Soc., Paper 7A.3.
- Umeyama, A., **S. Torres**, and B. Cheong, 2015: Polarimetric spectral analysis of tornadic debris signatures. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 54.
- Schvartzman, D., **S. Torres**, and T. Yu, 2015: Spatio-temporal visual saliency for adaptive weather sensing using phased array radars. *37th Conference on Radar Meteorology*, Norman, OK, Amer. Meteor. Soc., Paper 177.
- Cheong, B., D. Bodine, T. Maruyama, C. Fulton, **S. Torres**, and R. Palmer, 2015: Emulation of polarimetric weather radar signals from tornadic debris. *31st Conf. on Environmental Information Processing Technologies*, Phoenix, AZ, Amer. Meteor. Soc., Paper 7A.3.
- Warde, D. and **S. Torres**, 2015: Minimizing the impact of ground-clutter filtering along the zero-isodop in polarimetric Doppler weather radars. *31st Conf. on Environmental Information Processing Technologies*, Phoenix, AZ, Amer. Meteor. Soc., Paper 11.5.

- **Torres, S.**, R. Adams, C. Curtis, E. Forren, D. Forsyth, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2014: Demonstration of adaptive weather-surveillance and multifunction capabilities on the National Weather Radar Testbed phased-array radar. *Int. Radar Conf. 2014*, Lille, France, SEE, Paper WEO.3.12.
- **Torres, S.** and C. Curtis, 2014: Does range oversampling help or hurt NEXRAD's ability to detect tornados? *8th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Garmisch-Partenkirchen, Germany, Deutscher Wetterdienst and Deutsches Zentrum für Luft- und Raumfahrt, Paper 12b.3.
- Warde, D. and **S. Torres**, 2014: Improved spectrum width estimators for Doppler weather radars. *8th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Garmisch-Partenkirchen, Germany, Deutscher Wetterdienst and Deutsches Zentrum für Luft- und Raumfahrt, Paper TEC.P10.
- Jain, M., **S. Torres**, and A. Ryzhkov, 2014: Improving the NEXRAD network: an update on NSSL radar division's research-to-operations activities. *8th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Garmisch-Partenkirchen, Germany, Deutscher Wetterdienst and Deutsches Zentrum für Luft- und Raumfahrt, Paper TEC.P21.
- Cheong, B., D. Bodine, T. Maruyama, C. Fulton, **S. Torres**, and R. D. Palmer, 2014: A radar-cross-section database driven radar time-series simulator. *8th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Garmisch-Partenkirchen, Germany, Deutscher Wetterdienst and Deutsches Zentrum für Luft- und Raumfahrt, Paper 12a.6.
- **Torres, S.**, R. Ice, and P. Heinselman, and K. Bowden, 2014: Understanding forecasters' needs to improve radar observations using adaptive scanning. *30th Conf. on Environmental Information Processing Technologies*, Atlanta, GA, Amer. Meteor. Soc., Paper 6.4.
- Nai, F., **S. Torres**, and R. Palmer, 2014: Mitigation of wind turbine clutter using adaptive beamforming for phased array radars. *30th Conf. on Environmental Information Processing Technologies*, Atlanta, GA, Amer. Meteor. Soc., Paper 7.2.
- Warde, D., **S. Torres**, R. Ice, and A. Heck, 2014: Deployment of the Staggered PRT algorithm on the NEXRAD network. *30th Conf. on Environmental Information Processing Technologies*, Atlanta, GA, Amer. Meteor. Soc., Paper 5.4.
- Kurdzo, J., B. Cheong, R. Palmer, F. Nai, D. Bodine, G. Zhang, and **S. Torres**, 2014: Waveform design applications for observations of severe local storms and tornadoes. *30th Conf. on Environmental Information Processing Technologies*, Atlanta, GA, Amer. Meteor. Soc., Paper 5.6.
- **Torres, S.**, R. Adams, C. Curtis, E. Forren, D. Forsyth, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2013: A demonstration of adaptive weather-surveillance capabilities on the National Weather Radar Testbed phased-array radar. *Proceedings, Int. Symp. on Phased Array Systems & Technology*, Waltham, MA, IEEE, Paper 12.1.
- Nai, F., **S. Torres**, and R. Palmer, 2013: Adaptive beamforming for weather observations using the Atmospheric Imaging Radar. *Proceedings, Int. Symp. on Phased Array Systems & Technology*, Waltham, MA, IEEE, Paper 18.6.
- **Torres, S.**, R. Adams, C. Curtis, E. Forren, D. Forsyth, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2013: A demonstration of multifunction capabilities on the National Weather Radar Testbed phased-array radar. *36th Conf. on Radar Meteorology*, Breckenridge, CO, Amer. Meteor. Soc., Paper 3B.2.
- Curtis, C. and **S. Torres**, 2013: Improving the quality of dual polarization estimates using adaptive pseudowhitening. *36th Conf. on Radar Meteorology*, Breckenridge, CO, Amer. Meteor. Soc., Paper 4B.6.
- Nai, F., J. Kurdzo, D. Bodine, R. Palmer, and **S. Torres**, 2013: Weather observation using the Atmospheric Imaging Radar and adaptive beamforming. *36th Conf. on Radar Meteorology*, Breckenridge, CO, Amer. Meteor. Soc., Paper 4B.2.
- Kilambi, A., F. Fabry, and **S. Torres**, 2013: Improving polarimetric radar parameter estimates and target identification: a comparison of different approaches. *36th Conf. on Radar Meteorology*, Breckenridge, CO, Amer. Meteor. Soc., Paper 328.

- **Torres, S.**, R. Adams, C. Curtis, E. Forren, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2013: New weather-surveillance capabilities for NSSL's phased-array radar. *29th Conf. on Environmental Information Processing Technologies*, Austin, TX, Amer. Meteor. Soc., Paper 8.2.
- Warde, D. and **S. Torres**, 2013: Automated real-time mitigation of ground clutter contamination for dual-polarization Doppler weather radars using the alternating transmission mode. *29th Conf. on Environmental Information Processing Technologies*, Austin, TX, Amer. Meteor. Soc., Paper 17.
- Priegnitz, D., **S. Torres**, and P. Heinselman, 2013: Enhancements to the National Weather Radar Testbed phased array radar storm tracking function. *29th Conf. on Environmental Information Processing Technologies*, Austin, TX, Amer. Meteor. Soc., Paper 19.
- Yu, T., **S. Torres**, and B. Liu, 2013: A framework for adaptive weather sensing with multi-mission phased array radar. *29th Conf. on Environmental Information Processing Technologies*, Austin, TX, Amer. Meteor. Soc., Paper 8.4.
- Nai, F., R. Palmer, **S. Torres**, J. Kurdzo, and D. Bodine, 2013: High-resolution tornado observations using the Atmospheric Imaging Radar. *29th Conf. on Environmental Information Processing Technologies*, Austin, TX, Amer. Meteor. Soc., Paper 7B.3.
- Kurdzo, J., F. Nai, D. Bodine, R. Palmer, and **S. Torres**, 2013: Volumetric supercell and tornado analysis with six-second temporal resolution using the Atmospheric Imaging Radar. *29th Conf. on Environmental Information Processing Technologies*, Austin, TX, Amer. Meteor. Soc., Paper 18.
- **Torres, S.**, R. Adams, C. Curtis, E. Forren, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2012: New weather-surveillance capabilities for NSSL's phased-array radar. *7th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Toulouse, France, Meteo France, Paper 13B.2.
- Warde, D., and **S. Torres**, 2012: Automated real-time mitigation of ground clutter contamination for dual-polarization Doppler weather radars. *7th European Conf. on Radar Meteor. and Hydrology (ERAD)*, Toulouse, France, Meteo France, Paper 200 SP.
- **Torres, S.**, P. Heinselman, R. Adams, C. Curtis, E. Forren, I. Ivić, D. Priegnitz, J. Thompson, and D. Warde, 2012: ADAPTS Implementation: Can we exploit phased-array radar's electronic beam steering capabilities to reduce update times? *28th Conf. on Interactive Information and Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology*, New Orleans, LA, Amer. Meteor. Soc., Paper 6B.3.
- Heinselman, P., **S. Torres**, D. Russell, and R. Adams, 2012: ADAPTS performance: can we further reduce update time? *28th Conf. on Interactive Information and Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology*, New Orleans, LA, Amer. Meteor. Soc., Paper 6B.4.
- Priegnitz D., **S. Torres**, and P. Heinselman, 2012: An adaptive pedestal control algorithm for the National Weather Radar Testbed phased array radar. *28th Conf. on Interactive Information and Processing Systems (IIPS) for Meteorology, Oceanography, and Hydrology*, New Orleans, LA, Amer. Meteor. Soc., Paper P1.7.
- **Torres, S.** and C. Curtis, 2011: A fresh look at the range weighting function for modern weather radars. *35th Conf. on Radar Meteor.*, Pittsburgh, PA. Amer. Meteor. Soc., Paper 16B.1.
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INTELLECTUAL PROPERTY

- Warde, D. and **S. Torres**: Clutter Environment Analysis using Adaptive Processing: The CLEAN-AP Filter. University of Oklahoma disclosure No. 10NOR002-WARDE
- Karhunen, P., **S. Torres**, A. Siggia, and R. Passarelli: Method for extension of unambiguous range and velocity of a weather radar. U.S. Patent No. 7605744.
- Zrnić, D. and **S. Torres**: Efficient estimation of spectral moments and the polarimetric variables on weather radars, sonars, lidars, sodars, and similar active remote sensing instruments. U.S. Patent No. 6448923

INVITED TALKS

- Getting ready for the next radar revolution: demonstrating advanced weather-surveillance capabilities with NSSL's phased-array radar. McGill University. June 26, 2013. Montreal, Canada.
- PAR research at NSSL: Polarimetry and improved weather observations. *Speaker*. NEXTGEN Surveillance and Weather Radar Capability Industry Day. October 18, 2012. Washington, DC.
- From the laboratory to the operations center: present and future technologies for weather radars. *Panelist*. Symposium on Weather Radar and Hydrometeorological Warning Systems. September 11-13, 2012. Buenos Aires, Argentina.
- Mitigation of wind turbine effects on weather radar - Recent advances in signal processing strategies. CanWEA International Wind and Radar Forum: Experiences and Lessons Learned. June 28-29, 2011. Ottawa, Canada.
- Future radar systems - where do we stand in 10-20 years? *Panelist*. 6th European Conf. on Radar Meteor. and Hydrology (ERAD). September 2010. Sibiu, Romania.
- Phased array radars: Unique capabilities. *Workshop*. 2nd Multi-function Phased-Array Radar (MPAR) Symposium. November 2009. Norman, OK.
- New operational capabilities of the National Weather Radar Testbed phased-array radar for weather observations. International Symposium on Radar and Modeling Studies of the Atmosphere. November 2009. Kyoto, Japan.
- Multifunction Phased Array Radar (MPAR) for weather and aircraft surveillance. International Radar Conference. October 2009. Bordeaux, France.

PROFESSIONAL AFFILIATIONS

- Institute of Electrical and Electronics Engineers, Senior Member
- American Meteorological Society, Member

HONORS AND AWARDS

- 2016 University of Oklahoma College of Atmospheric and Geographic Sciences Dean's Award for Outstanding Service.
- U.S. Dept. of Commerce Gold Medal, 2011. As a member of the Radar Research and Development Division at NSSL for scientific and engineering excellence in adapting military phased array radar technology to improve U.S. weather radar capabilities
- 2003-2004 Outstanding Scientific Paper Award, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration, U.S. Department of Commerce
- U.S. Dept. of Commerce Silver Medal, 1999. As a member of the Stormscale Research and Applications Division at NSSL for making significant enhancements to the NEXRAD system
- Outstanding Graduate Student of the Year, 1997. Electrical and Computer Engineering Department, School of Engineering, The University of Oklahoma
- First Place, 1997 Graduate Student Research Poster Session. Graduate College and Graduate Student Senate, The University of Oklahoma
- Cleo Cross International Student Scholarship, The University of Oklahoma
- Best GPA of 1995, School of Engineering, National University of Mar del Plata
- Outstanding undergraduate student, National University of Mar del Plata

VITA

Sebastian Torres received the B.S degree from the National University of Mar del Plata (Argentina) and the M.S. and Ph.D. degrees from The University of Oklahoma in 1995, 1997, and 2001, respectively, all in electrical engineering. In 1997, he joined the Cooperative Institute for Mesoscale Meteorological Studies at The University of Oklahoma where he currently is the Assistant Director and a Senior Research Scientist affiliated with the National Severe Storms Laboratory (NSSL). As the leader of the Advanced Radar Techniques group at NSSL, he conducts research and development of innovative signal processing and adaptive sensing techniques to improve the quality, coverage, accuracy, and timeliness of meteorological products from weather radars. In addition, he is involved in the exploration and demonstration of unique capabilities offered by multifunction phased-array radar for weather observations; and the transfer of technology to existing radar systems in government, public, and private organizations. Dr. Torres has received the 2016 Dean's Award for Outstanding Service, the 2011 Department of Commerce Gold Medal as a member of the Radar Research and Development Division at NSSL for scientific and engineering excellence in adapting military phased-array-radar technology to improve U.S. weather radar capabilities, and the 2003-2004 Office of Oceanic and Atmospheric Research Outstanding Scientific Paper Award. Dr. Torres holds an Adjunct Faculty position in the School of Electrical and Computer Engineering, and is a member of the Graduate Faculty and the Advanced Radar Research Center at The University of Oklahoma.