Mark Alan Stanley

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Summary:
- More than 11 years of research experience in atmospheric physics and instrumentation
- Authored 22 papers, including 14 peer-reviewed papers in leading scientific journals
- Practical experience in proposal writing
- Extensive software programming experience in IDL, Matlab, C, C++, Python, Perl, Unix shell, Assembly, Fortran, Java, and Basic
- Secretary of AGU Atmospheric and Space Electricity Focus Group

Degrees:
- PhD 2000 (Atmospheric Physics, New Mexico Tech)
- MS 1992 (Astrophysics, Michigan State University)
- BS 1991 (Honors Physics, Purdue University)

Awards:
- Large Team Award, Los Alamos National Lab, 2005, for highly successful EdotX
- Small Team Award, Los Alamos National Lab, 2004, for innovative new EdotX project
- Langmuir Award, New Mexico Tech, 2000, for outstanding contributions to physics
- Case for Mars Award, Planetary Society, 1987, for best paper in international contest

Research Experience:

Independent Research — Jan 2006 – current
- Developing electric and cross-magnetic field stations which, collectively, will geolocate and determine the charge moments of lightning discharges in real time

Staff Research, Los Alamos National Laboratory — Dec 2004 – Dec 2005
- Obtained direct evidence that intracloud (IC) lightning discharges are responsible for most terrestrial gamma-ray flashes and obtained altitudes for some of these ICs
- Deployed and operated the new LANL Great Plains Network extension of LASA, which became the most sensitive lightning geolocation system in the United States

Postdoctoral Research, Los Alamos National Laboratory — Dec 2001 – Dec 2004
- Critical contributions to the design, development, and operation of the new Los Alamos Sferic Array (LASA), also referred to as "EdotX"
- Involved in numerous highly successful programmatic activities
- Developed software to determine the RF gain and phase pattern of arbitrary antenna configurations using parallel computations
- Assembled and analyzed radar and severe weather data in relationship to narrow bipolar lightning events detectable from GPS orbit
- Established a relationship between energetic positive cloud-to-ground lightning and induced upward lightning from tall towers

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Postdoctoral Research, New Mexico Tech — May 2000 – Dec 2001

- Coprincipal investigator on a highly successful National Science Foundation proposal
- Coauthored a paper which appeared on the cover of Nature
- Analyzed and compared diverse data sets from multiple acquisition systems

Dissertation Research, New Mexico Tech — January 1998 – May 2000

- Analyzed high speed video of sprites and associated sferics with fundamentally new results published in 3 peer-reviewed papers and highlights printed in "Science News"
- Detected, analyzed, and published the first daytime sprite data in a leading scientific journal with highlights printed in "American Scientist"
- Jointly obtained and published the first data of sprites associated with negative-polarity cloud-to-ground discharges
- Presented the first quantitative measurements of sprite-producing discharge height and horizontal extent in the dissertation "Sprites and Their Parent Discharges"

Graduate Research, New Mexico Tech — August 1993 – December 1997

- Provided critical assitance in the design and construction of a new high-performance GPS-based data acquisition system
- Wrote fast and versatile real-time data acquisition and display software in Assembly and C
- Correlated VHF interferometer and time-of-arrival lightning maps with radar data to explore the relationship of lightning to storm development and structure
- Obtained the first direct evidence that sprites emit ELF radiation
- Played a key role in obtaining funding for sprite research via an Air Force contract

Graduate Research, Michigan State University — September 1991 – December 1992

- Constructed, maintained, and analyzed a database of galactic clusters
- Wrote software in Fortran to parameterize the degree of galactic clustering

Applied Research, Crown International — May – August 1991

- Operated a scanning electron microscope and developed an analysis procedure for diagnosing power semiconductor failure

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Publications:

1. **Journals:**

- Shao, X.M., M. Stanley, A. Regan, J. Harlin, and M. Pongratz, Total lightning observations with the new and improved Los Alamos Sferic Array (LASA), *J. Atmos. Ocean. Tech., in press,* 2006.
- Stanley, M.A., X.M. Shao, D.M. Smith, L.I. Lopez, M.B. Pongratz, J.D. Harlin, M. Stock, and A. Regan, A link between terrestrial gamma-ray flashes and intracloud lightning discharges, *Geophys. Res. Lett., 33,* L06803, doi:10.1029/2005GL025537, 2006.
- Shao, X.M., J. Harlin, M. Stock, M. Stanley, A. Regan, K. Wiens, T. Hamlin, M. Pongratz, D. Suszcynsky, and T. Light. Katrina and Rita were lit up with lightning, *EOS, 86(42),* 398, 2005.
- Maggio, C., L. Coleman, T. Marshall, M. Stolzenburg, M. Stanley, T. Hamlin, P. Krehbiel, W. Rison, and R. Thomas, Lightning initiation locations as a remote sensing tool of large thunderstorm electric field vectors, *J. Atmos. Ocean. Tech., 22,* 1059–1068, 2005.
- Cummer, S.A., Y. Zhai, W. Hu, D.M. Smith, L.I. Lopez, and M.A. Stanley, Measurements and implications of the relationship between lightning and terrerstrial gamma-ray flashes, *Geophys. Res. Lett., 32,* L08811, doi:10.1029/2005GL022778, 2005.
- Lyons, W.A., T.E. Nelson, E.R. Williams, S.A. Cummer, and M.A. Stanley, Characteristics of sprite-producing positive cloud-to-ground lightning during the 19 July 2000 STEPS mesoscale convective systems, *Mon. Weather Rev., 131,* 2417–2427, 2003.
- Lyons, W.A., T.E. Nelson, R.A. Armstrong, V.P. Pasko, and M.A. Stanley, Upward electrical discharges from thunderstorm tops, *Bull. Am. Meteorol. Soc., 84,* 445–454, 2003.
- Pasko, V.P., M.A. Stanley, J.D. Mathews, U.S. Inan, and T.D. Wood, Electrical discharge from a thundercloud top to the lower ionosphere, *Nature, 416,* 152–154, 2002.
- Barrington-Leigh, C.P., U.S. Inan, and M. Stanley, Identification of sprites and elves with intensified video and broadband array photometry, *J. Geophys. Res., 106,* 1741–1750, 2001.
- Stanley, M., M. Brook, P. Krehbiel, and S.A. Cummer, Detection of daytime sprites via a unique sprite ELF signature, *Geophys. Res. Lett., 27,* 871–874, 2000.
- Barrington-Leigh, C.P., U.S. Inan, M. Stanley, and S. Cummer, Sprites directly triggered by negative lightning discharges, *Geophys. Res. Lett., 26,* 3605–3608, 1999.

- Cummer, S. and M. Stanley, Submillisecond resolution lightning currents and sprite development: observations and implications, *Geophys. Res. Lett., 26,* 3205–3208, 1999.
- Stanley, M., P. Krehbiel, M. Brook, C. Moore, W. Rison, and B. Abrahams, High speed video of initial sprite development, *Geophys. Res. Lett., 26,* 3201–3204, 1999.
- Smith, D.A., X.M. Shao, D.N. Holden, C.T. Rhodes, M. Brook, P.R. Krehbiel, M. Stanley, W. Rison, and R.J. Thomas, A distinct class of isolated intracloud lightning discharges and their associated radio emissions, *J. Geophys. Res., 104,* 4189–4212, 1999.

2. **Conference Proceedings:**

- Stanley, M.A. and M.J. Heavner, Tall structure lightning induced by sprite-producing discharges, *Proc. 12th Int. Conf. on Atmos. Elec.,* 2003.
- Stanley, M., P. Krehbiel, M. Brook, W. Rison, C.B. Moore, and R. Thomas, Parameterization of sprites and their parent discharges, *Proc. 11th Int. Conf. on Atmos. Elec.,* 88–91, 1999.
- Stanley, M., P. Krehbiel, W. Rison, L. Maier, and C. Lennon, Lightning as a precursor of outflow and downbursts from thunderstorms, *Proc. 28th Int. Conf. Radar Met., Austin, Texas, Amer. Meteor. Soc.,* 1997.
- Krehbiel, P., T. Chen, R. Scott, M. Stanley, W. Rison, G. Gray, and M. Brook. Dual-polarization radar observations of electrical alignment and lightning structure in storms, *Proc. 10th Int. Conf. Atmos. Elec., Osaka, Japan,* 1996.
- Shao, X.M., M. Stanley, P. Krehbiel, W. Rison, G. Gray, and V. Mazur, Results of observations with the New Mexico Tech VHF lightning interferometer, *Proc. 10th Int. Conf. on Atmos. Elec.,* 317–320, 1996.
- Stanley, M., P. Krehbiel, L. Maier, and C. Lennon, Comparison of lightning observations from the KSC LDAR system with NEXRAD radar observations, *Proc. 10th Int. Conf. on Atmos. Elec.,* 224–227, 1996.
- Maier, L., C. Lennon, P. Krehbiel, M. Stanley, and M. Robison, Comparison of lightning and radar observations from the KSC LDAR and NEXRAD radar systems, *Proc. 27th Int. Conf. Radar Met., Vail, Colorado, Amer. Meteor. Soc.,* 648–650, 1995.
- Scott, R., P. Krehbiel, M. Stanley and S. McCrary, Relation of lightning channels to storm structure from interferometer and dual-polarization radar observations, *Proc. 27th Int. Conf. Radar Met., Vail, Colorado, Amer. Meteor. Soc.,* 645–647, 1995.

3. **Selected Conference Abstracts (41 total):**

- Stanley, M.A., X. Shao, J. Harlin, M. Stock, M. Pongratz, A. Regan, D.M. Smith, and L.I. Lopez, A link between terrestrial gamma-ray flashes and intracloud lightning (INVITED), *Eos Trans. AGU, 86,* 2005.
- Stanley, M.A., M. Pongratz, X. Shao, J Harlin, and A. Regan, The new LANL sferic array: operation and calibration, *Eos Trans. AGU, 85,* F266, 2004.
- Stanley, M.A., D.M. Suszcynsky, and M.J. Heavner, The meteorological setting of narrow bipolar events, *Eos Trans. AGU, 84,* F202, 2003.
- Stanley, M.A., A. Jacobson, and X.M. Shao, The power versus frequency behavior of lightning at VHF, *Eos Trans. AGU, 83,* Fall Meet. Suppl., 2002.
- Stanley, M.A., V.P. Pasko, and J.D. Mathews, Comparison of New Mexico Tech VHF interferometer and Arecibo radar data of lightning, *Eos Trans. AGU, 82,* Fall Meet. Suppl., F148, 2001.
- Stanley, M.A., P. Krehbiel, W. Rison, R. Thomas, T. Hamlin, J. Harlin, W.A. Lyons, and T. Nelson, Sprite-producing discharge development, *Int. Union of Radio Sci.,* 2001.
- Stanley, M.A., P.R. Krehbiel, R. J. Thomas, W. Rison, T. Hamlin, and J. Harlin, Comparison of the interferometer and time-of-arrival techniques of lightning mapping at VHF, *Eos Trans. AGU, 81,* Fall Meet. Suppl., F47, 2000.
- Stanley, M., P. Krehbiel, M. Brook, C. Moore, W. Rison, and B. Abrahams, High speed video of sprites and elves (INVITED), *Trans. IUGG XXII Gen. Assy.,* Birmingham, United Kingdom, A29, 1999.
- Stanley, M., M. Brook, S. Cummer, C. Barrington-Leigh, and E. Gerken, Broadband detection and characterization of day-time sprites and of negative CGs which initiated sprites, *Eos Trans. AGU, 79,* Fall Meet. Suppl., F177, 1998.
- Stanley, M., P. Krehbiel, W. Rison, C. B. Moore, Observations and sprites and their parent lightning discharges in Florida storms, *Eos Trans. AGU, 78,* Fall Meet. Suppl., F69, 1997.
- Stanley, M., P. Krehbiel, W. Rison, C. Moore, M. Brook, and O.H. Vaughn, Observations of sprites and jets from Langmuir Laboratory, New Mexico, *Eos Trans. AGU, 77,* Fall Meet. Suppl., F69, 1996.
- Stanley, M., P. Krehbiel, M. Robison, L. Maier, and C. Lennon, Comparison of lightning observations from the KSC LDAR system with NEXRAD radar observations, *Eos Trans. AGU, 76,* Fall Meet. Suppl., F101, 1995.
- Stanley, M., P.R. Krehbiel, D. Davis, C.B. Moore, J. Mathis, W.P. Winn, W. Rison, M. Brook, V. Idone, and J. Payne, A 47-Stroke triggered lightning discharge, *Eos Trans. AGU, 75,* Fall Meet. Suppl., F104, 1994.