

## James H. Clemmons

### *Curriculum Vitae*

#### Address

University of New Hampshire  
Department of Physics & Astronomy and  
Space Science Center  
Durham, NH USA

#### Education

1992 Ph.D., Physics, University of California, Berkeley  
1983 M.A., Physics, University of California, Berkeley  
1982 B.S. *with High Distinction*, Physics, University of Illinois, Urbana  
1982 B.S. *with Highest Distinction*, Chemistry, University of Illinois, Urbana

#### Career Summary

2018-present Professor, Department of Physics & Astronomy, University of New Hampshire  
2008-2018 Principal Director, Space Science Applications Laboratory, Aerospace Corporation, El Segundo  
2005-2008 Director, Space Sciences Department, Aerospace Corporation, El Segundo, California  
1999-2005 Research Scientist, Aerospace Corporation, El Segundo, California  
1997-1999 Senior Member of the Technical Staff, Aerospace Corporation, El Segundo, California  
1995-1997 Research Associate, NASA Goddard Space Flight Center, Greenbelt, Maryland  
1995 Visiting Scientist, Swedish Institute of Space Physics, Kiruna, Sweden  
1993-95 Stipendiat, Max-Planck-Institut für extraterrestrische Physik, Garching, Germany  
1992 Postgraduate Research Physicist, Space Sciences Laboratory, University of California  
1984-92 Graduate Student Researcher, Space Sciences Laboratory, University of California

#### Research Experience

James Clemmons has performed research in several realms of geospace, including the mesosphere, thermosphere, ionosphere, and magnetosphere. He has studied auroral particle acceleration phenomena and Joule heating, magnetospheric ULF waves and plasma entry, turbulence in the mesosphere, the physics of ionospheric disturbances and irregularities, and plasma-neutral coupling in the ionosphere-thermosphere system. He conducts an active program in the conception, design, test, and flight of scientific space instrumentation to support this research. His instrumentation development work currently focuses on sensors for measuring thermospheric winds *in situ*. He is the author or co-author of 105 published papers and has a citation h-index of 36 (per Google Scholar).

James Clemmons served as Principal Investigator for the ionization-gauge (pressure sensor) based IG-S on DARPA's Streak mission and Co-Investigator responsible for the MIGSI ionization gauge investigation on NASA's LLITED cubesat mission. He served as Co-Investigator on NASA's Van Allen Probes and Magnetospheric Multiscale missions. He also served as Principal Investigator for the operating DOS/SCM charged particle analyzer on one of the TWINS-ES platforms, and as Co-Investigator on its follow-on instrument, the HiLET/SCM, on the other TWINS-ES platform. Recently he served as Principal Investigator for the TOMEX-plus sounding rocket investigation, as well as Co-Investigator for the Dynamo2, Endurance, Dissipation, and RENU3 sounding rocket missions. He has served as Co-Investigator for numerous sounding rocket missions, providing electrostatic and magnetostatic analyzers, ionization gauges, mass spectrometers, and thermospheric winds sensors.

#### Key Publications

- 1 Earth's ambipolar electrostatic field and its role in ion escape to space, Glyn A. Collinson, Alex Glozer, Robert Pfaff, Aroh Barjatya, Rachel Conway, Aaron Breneman, James Clemmons, Francis Eparvier, Robert Michell, David Mitchell, Suzie Imber, Hassanali Akbari, Lance Davis, Andrew Kavanagh, Ellen Robertson, Diana Swanson, Shaosui Xu, Jacob Miller, Timothy Cameron, Dennis Chornay, Paulo Uribe, Long Nguyen, Robert Clayton, Nathan Graves, Shantanab Debchoudhury,

- Henry Valentine, Ahmed Ghalib, and The Endurance Mission Team, *Nature*, **632**, 1021-1025, doi:10.1038/s41586-024-07480-3, 2024.
- 2 Plasma-neutral interactions in the lower thermosphere-ionosphere: The need for in situ measurements to address focused questions, Theodoros Sarris, Minna Palmroth, Anita Aikio, Stephan Christoph Buchert, James Clemmons, Mark Clilverd, Iannis Dandouras, Eelco Doornbos, Lindsay Victoria Goodwin, Maxime Grandin, Roderick Heelis, Nickolay Ivchenko, Therese Moretto-Jørgensen, Guram Kervalishvili, David Knudsen, Han-Li Liu, Gang Lu, David M. Malaspina, Octav Marghitu, Astrid Maute, Wojciech J. Miloch, Nils Olsen, Robert Pfaff, Claudia Stolle, Elsayed Talaat, Jeffrey Thayer, Stelios Tourgaidis, Pekka T. Verronen, and Masatoshi Yamauchi, *Front. Space Sci.*, **9**, doi:10.3389/fspas.2022.1063190, 2022.
  - 3 Unmasking the Earth's atmospheric dynamo with spiral and currents driven by strong winds revealed by vapor trails and sounding rocket probes, R. Pfaff, M. Larsen, T. Abe, H. Habu, J. Clemmons, H. Freudenreich, D. Rowland, T. Bullett, M.-Y. Yamamoto, S. Watanabe, Y. Kakinami, T. Yokoyama, J. Mabie, J. Klenzing, R. Bishop, R. Walterscheid, M. Yamamoto, Y. Yamazaki, N. Murphy, and V. Angelopoulos, *Geophys. Res. Lett.*, **47**, e2020GL088803, doi:10.1029/2020GL088803, 2020.
  - 4 Electron-scale measurements of magnetic reconnection in space, J. L. Burch, R. B. Torbert, T. D. Phan, L.-J. Chen, T. E. Moore, R. E. Ergun, J. P. Eastwood, D. J. Gershman, P. A. Cassak, M. R. Argall, S. Wang, M. Hesse, C. J. Pollock, B. L. Giles, R. Nakamura, B. H. Mauk, S. A. Fuselier, C. T. Russell, R. J. Strangeway, J. F. Drake, M. A. Shay, Yu. V. Khotyaintsev, P.-A. Lindqvist, G. Marklund, F. D. Wilder, D. T. Young, K. Torkar, J. Goldstein, J. C. Dorelli, L. A. Avanov, M. Oka, D. N. Baker, A. N. Jaynes, K. A. Goodrich, I. J. Cohen, D. L. Turner, J. F. Fennell, J. B. Blake, J. Clemmons, M. Goldman, D. Newman, S. M. Petrinc, K. Trattner, B. Lavraud, P. H. Reiff, W. Baumjohann, W. Magnes, M. Steller, W. Lewis, Y. Saito, V. Coffey, M. Chandler, *Science*, **352**, doi:10.1126/science.aaf2939, 2016.
  - 5 Rapid, highly-structured meridional winds and their modulation by non-migrating tides: Measurements from the Streak mission, J. H. Clemmons, R. L. Walterscheid, A. B. Christensen, and R. L. Bishop, *J. Geophys. Res.*, **118**, 866-877, doi:10.1029/2012JA017661, 2013.
  - 6 The ionization gauge investigation for the Streak mission, J. H. Clemmons, L. M. Friesen, N. Katz, M. Ben-Ami, Y. Dotan, and R. L. Bishop, *Space Sci. Rev.*, **145**, 263-283, doi:10.1007/s11214-009-9489-6, 2009.
  - 7 Thermospheric density in the Earth's magnetic cusp as observed by the Streak mission, J. H. Clemmons, J. H. Hecht, D. R. Salem, and D. J. Strickland, *Geophys. Res. Lett.*, **35**, L24103, doi:10.1029/2008GL035972, 2008.
  - 8 Mass spectroscopy using a rotating electric field, J. H. Clemmons and F. A. Herrero, *Rev. Sci. Instrum.*, **69**, 2285-2291, 1998.
  - 9 Auroral measurements from space brought into the classroom, J. H. Clemmons and R. H. Evans, *Phys. Teach.*, **33**, 34-41, 1995.

### Awards and Honors

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|------------------------------------|----------------------------------------------------------|
| 2023, 2016, 2013, 2005, 1998, 1984 | Group Achievement Award, NASA                            |
| 2014                               | RHG Exceptional Achievement for Engineering Team, NASA   |
| 2003                               | Achievement Award, The Aerospace Corporation             |
| 1997                               | Service Award, NASA                                      |
| 1995-1997                          | Fellowship, National Research Council (NASA/Goddard)     |
| 1993-1994                          | Fellowship, Fulbright Commission (Physics and Astronomy) |
| 1988-1991                          | Graduate Student Researchers Program Fellowship, NASA    |

### Professional Societies

American Geophysical Union  
 American Physical Society  
 American Chemical Society