

# Simon George Shepherd

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## Education

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<b>Ph.D.</b> <i>Physics</i> , Dartmouth College, Hanover, NH	1993–1998
Thesis: “Auroral Ionospheric Electron Gyroharmonic Radio Emissions: Observation and Theory” Advisor: James LaBelle	
<b>M.S.</b> <i>Mechanical Engineering</i> , U. of Washington, Seattle, WA	1989–1991
Thesis: “An Implementation of Functionally Constructed Solid Geometry” Advisor: Mark A. Ganter	
<b>B.A.</b> <i>Physics</i> , Middlebury College, Middlebury, VT	1985–1989
(honors, <i>magna cum laude</i> , Phi Beta Kappa) Thesis: “Sonic Measurements of Wind Velocity” Advisor: Robert Gould	

## Positions Held

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Research Assistant Professor and Lecturer	Thayer School of Engineering, Dartmouth College	2003–now
Visiting Research Assistant Professor	Thayer School of Engineering, Dartmouth College	2001–2003
Visiting Assistant Professor	Dept. of Physics and Astronomy, Dartmouth College	2001–2002
Senior Staff Scientist	Applied Physics Laboratory, Johns Hopkins University	2000–2001
Postdoctoral Physicist	Applied Physics Laboratory, Johns Hopkins University	1998–2000
Research/Teaching Assistant	Dept. of Physics and Astronomy, Dartmouth College	1993–1998
MIS Engineer	Burton Snowboards, Inc., Burlington, Vermont	1992–1993
Software Engineer	AeroHydro, Inc., Southwest Harbor, Maine	1991–1993
Research/Teaching Assistant	Mechanical Engineering, University of Washington	1989–1991

## Honors

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Outstanding First Paper, JHU/APL Technical Digest	2000
Dartmouth College/NASA Space Grant recipient	1998
First prize CEDAR Student Poster Competition	1998

## Membership/Service

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American Geophysical Union member	since 1995
Manuscript referee for Journal of Geophysical Research	since 1999
Proposal reviewer for National Science Foundation	since 1998
JHU/APL Space Department Computer Networking Committee	1998–2001
JHU/APL Space Department Computing Directions Committee	1998–2001
JHU/APL Recycling Committee	1998–2001

## Sources of Support

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NOAA: Auroral Electrojets and GICs PI: William Lotko	<i>awarded</i>	\$200,000	03/01/01 – 08/31/03 (18.5 months)
NSF: Characterization of the Electric Field Variability in the High-Latitude Ionosphere	<i>awarded</i>	\$175,000	06/15/02 – 05/31/04 (9 months)
NSF/NSWP: Induced Electric and Magnetic Fields in a Non-Uniformly Conducting Earth	<i>awarded</i>	\$297,822	07/01/03 – 06/30/06 (12 months)
NASA/SEC: Characterization of the Transpolar Potential and its Variability Using Widespread SuperDARN Measurements	<i>pending</i>	\$313,732	01/01/04 – 12/31/06 (12 months)

- w<sup>3</sup> Shepherd, S. G., J. M. Ruohoniemi, and R. A. Greenwald, Direct measurements of the ionospheric convection variability near the cusp/throat, *Geophys. Res. Lett.*, *30*(21), 2109, 10.1029/2003GL017668, 2003.
- w<sup>3</sup> Shepherd, S. G. and F. Shubitidze, Method of auxiliary sources for calculating the magnetic and electric fields induced in a layered Earth, *J. Atmos. Sol.-Terr. Phys.*, *65*(10), 10.1016/S1364-6826(03)00159-7, 1151–1160, 2003.
- w<sup>3</sup> Shepherd, S. G., J. M. Ruohoniemi, and R. A. Greenwald, Testing the Hill model of transpolar potential with Super Dual Auroral Radar Network observations, *Geophys. Res. Lett.*, *30*(1), 2237, 10.1029/2002GL015426, 2003.
- Greenwald, R. A., S. G. Shepherd, T. S. Sotirelis, J. M. Ruohoniemi, and R. J. Barnes, Dawn and dusk sector comparisons of small-scale irregularities, convection, and particle precipitation in the high-latitude ionosphere, *J. Geophys. Res.*, *107*(A9), 1241, 2002.
- w<sup>3</sup> Shepherd, S. G., R. A. Greenwald, J. M. Ruohoniemi, Cross polar cap potentials measured with Super Dual Auroral Radar Network during quasi-steady solar wind and interplanetary magnetic field conditions, *J. Geophys. Res.*, *107*(A7), 10.1029/2001JA000152, 2002.
- w<sup>3</sup> Ruohoniemi, J. M., S. G. Shepherd, and R. A. Greenwald, The response of the high-latitude ionosphere to IMF variations, *J. Atmos. Sol.-Terr. Phys.*, *64*, 159, 2002.
- Ruohoniemi, J. M., R. J. Barnes, R. A. Greenwald, and S. G. Shepherd, The Response of the high-latitude ionosphere to the coronal mass ejection event of April 6, 2000: A practical demonstration of space weather nowcasting with the Super Dual Auroral Radar Network HF radars, *J. Geophys. Res.*, *106*, 30,085, 2001.
- w<sup>3</sup> Shepherd, S. G. and J. M. Ruohoniemi, Electrostatic potential patterns in the high latitude ionosphere constrained by SuperDARN measurements, *J. Geophys. Res.*, *105*, 23,005, 2000.
- w<sup>3</sup> Shepherd, S. G., R. A. Greenwald, and J. M. Ruohoniemi, A possible explanation for rapid, large-scale ionospheric responses to southward turnings of the IMF, *Geophys. Res. Lett.*, *26*, 3197, 1999.
- w<sup>3</sup> Shepherd, S. G., J. LaBelle, G. Rostoker, and C. W. Carlson, The latitudinal dynamics of auroral roar emissions, *J. Geophys. Res.*, *104*, 17,217, 1999.
- w<sup>3</sup> Shepherd, S. G., J. LaBelle, R. A. Doe, M. McCready, and A. T. Weatherwax, Ionospheric structure and the generation of auroral roar, *J. Geophys. Res.*, *103*, 29,253, 1998.
- Yoon, P. H., A. T. Weatherwax, T. J. Rosenberg, J. LaBelle, and S. G. Shepherd, Propagation of medium frequency (1–4 MHz) auroral radio waves to the ground via the *z*-mode radio window, *J. Geophys. Res.*, *103*, 29,267, 1998.
- w<sup>3</sup> Shepherd, S. G., J. LaBelle, and M. L. Trimpi, Further investigation of auroral roar fine structure, *J. Geophys. Res.*, *103*, 2219, 1998.
- LaBelle, J., S. G. Shepherd, and M. L. Trimpi, Observations of auroral medium frequency bursts, *J. Geophys. Res.*, *102*, 22221, 1997.
- w<sup>3</sup> Shepherd, S. G., J. LaBelle, and M. L. Trimpi, The polarization of auroral radio emissions, *Geophys. Res. Lett.*, *24*, 3161, 1997.
- Letcher Jr., J. S., D. M. Shook, and S. G. Shepherd, Relational geometric synthesis: Part 1—framework, *Computer-Aided Design*, *27*, 821, 1995.

### Selected Presentations (of 43 first author talks and posters)

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- Shepherd, S. G. and D. L. Murr, Semi-Global SuperDARN–Magnetometer Determinations of the Ionospheric Hall Conductance, (talk) Fall AGU Meeting, San Francisco, California, December 8–12, 2003.
- Shepherd, S. G., R. A. Greenwald, J. M. Ruohoniemi, and William A. Bristow, SuperDARN Observations of the Cross Polar Cap Potential, (invited talk) GEM Workshop, June 22–27, Snowmass, Colorado, 2003.
- Shepherd, S. G. and J. M. Ruohoniemi, SuperDARN Convection Velocity Variability: Small- and Large-Scales, (invited talk) GEM Workshop, June 22–27, Snowmass, Colorado, 2003.
- Shepherd, S. G., J. M. Ruohoniemi, and R. A. Greenwald, SuperDARN Observations of Electric Field Variability in the Convection Throat, (talk) SuperDARN Workshop, Kiljavanrata, Finland, May 19–23, 2003.