James William LaBelle

Address
Department of Physics and Astronomy
Dartmouth College
Hanover, New Hampshire 03755

Date and Place of Birth

June 21, 1958 Denver, Colorado (*U.S. citizen*)

Education

June, 1980	B.S., Physics, Stanford University
August, 1982	M.S., Applied Physics, Cornell University
June, 1985	Ph.D., Applied Physics, Cornell University

Career Summary

Jul 2001-present	Professor, Department of Physics and Astronomy, Dartmouth College, Hanover, New Hampshire (Department Chair, 2013-2016)
Jul 1995-Jun 2001	Associate Professor, Department of Physics and Astronomy, Dartmouth College, Hanover, New Hampshire
Sep 1989-Jun 1995	Assistant Professor, Department of Physics and Astronomy, Dartmouth College, Hanover, New Hampshire
Dec 1987-Sep 1989	Research Associate, Center for Atmospheric and Space Science, Utah State University, Logan, Utah
Nov 1985-Nov 1987	Postdoctoral Associate, Max-Planck Institute for Extraterrestrial Physics, Garching, Germany
May 1985-Nov 1985	Postdoctoral Associate, Cornell University, Ithaca

Professional Societies

American Geophysical Union
International Union of Radio Science, Commission H

Awards and Fellowships

McMullen Fellowship for Graduate Study, 1980-1981
Presidential Young Investigator Award, 1990-1995
Dartmouth Junior Faculty Fellowship, Spring 1993
University of Sydney International Visiting Research Fellowship, 2008
Lois L. Rodgers Professorship, Dartmouth College, 2010-present

Graduate Students Supervised

E. Gewirtz (M.Eng., 1992), A. Yue(M.S., 1993), A.T. Weatherwax (PhD, 1994), E.J. Lund (PhD, 1995), D. Ruppert (M.S., 1995), J.M. Jahn (PhD, 1997), S.G. Shepherd (PhD, 1998), K.L. McAdams (PhD, 1999), J. Clapper (M.S., 1999), J.M. Hughes (PhD, 2000), M. Samara (PhD, 2005), S. Ye (PhD, 2007), C. Colpitts (PhD, 2009), N. Bunch (PhD, 2010), X. Yan (M.S., 2013), M. Broughton (PhD, 2014), M. Dombrowski (PhD, 2016), H. Kim (M.S., 2016), S. Hatch (PhD, 2017), C. Moser, E. Hudson

J. LABELLE — PUBLICATIONS

1. Carpenter, D.L., and J.W. LaBelle, A study of whistlers correlated with bursts of electron precipitation near L=2, *J. Geophys. Res., 89*, 2955, 1982.
2. Kintner, P.M., J. LaBelle, M.C. Kelley, L.J. Cahill, T. Moore, and R. Arnoldy, Interferometric phase velocity measurements, *Geophys. Res. Lett., 11*, 19, 1984.
3. LaBelle, J., Mapping of electric field structures from the equatorial ionosphere to the underlying E-region, *J. Geophys. Res., 90*, 4341, 1985.
4. Baker, K.D., J. LaBelle, R.F. Pfaff, L.C. Howlett, N.B. Rao, J.C. Ulwick, and M.C. Kelley, Absolute electron density measurements in the equatorial ionosphere, *J. Atmos. Terr. Phys., 47*, 781, 1985.
5. Whalen, B.A., A.W. Yau, F. Creutzberg, D.D. Wallis, A.G. McNamara, F.R. Harris, M.B. Pongratz, P.A. Bernhardt, P.M. Kintner, J. LaBelle, W.R. Sheldon, J.R. Benbrook, E.A. Bering, P.A. Forsyth, and R.A. Koehler, Waterhole auroral arc modification experiments: electrodynamic response, *J. Geophys. Res., 90*, 8377, 1985.
6. LaBelle, J., Ionospheric turbulence: case studies in equatorial spread F and development of a rocket-borne interferometer, PhD. Thesis, Cornell University, 1985.
7. LaBelle, J., P.M. Kintner, A.W. Yau, and B.A. Whalen, Large amplitude wave packets observed in the ionosphere in association with transverse ion acceleration, *J. Geophys. Res., 91*, 7113, 1986.
8. LaBelle, J., P.M. Kintner, and M.C. Kelley, Interferometric phase velocity measurements in the auroral electrojet, *Planet. Space Sci., 34*, 1285, 1986.
9. LaBelle, J., and M.C. Kelley, The generation of kilometer scale irregularities in equatorial spread F, *J. Geophys. Res., 91*, 5504, 1986.
10. LaBelle, J., M.C. Kelley, and C.E. Seyler, An analysis of the role of drift waves in equatorial spread F, *J. Geophys. Res., 91*, 5513, 1986.
11. Kelley, M.C., J. LaBelle, E. Kudeki, B.G. Fejer, Sa. Basu, Su. Basu, K.D. Baker, C. Hanuise, P. Argo, R.F. Woodman, W.E. Swartz, D.T. Farley, and J.W. Meriwether, The CONDOR equatorial spread F experiment: an overview, *J. Geophys. Res., 91*, 5487, 1986.
12. Basu, Sa., Su. Basu, J. LaBelle, E. Kudeki, B.G. Fejer, M.C. Kelley, and H.E. Whitney, Gigahertz scintillations and spaced receiver drift measurements during the project CONDOR equatorial spread F campaign in Peru, *J. Geophys. Res., 91*, 5526, 1986.
13. Kintner, P.M., J. LaBelle, W. Scales, A.W. Yau, and B.A. Whalen, Observations of plasma waves within regions of perpendicular ion acceleration, *Geophys. Res. Lett., 13*, 1113, 1986.
14. Kintner, P.M., J. LaBelle, W. Scales, R. Erlandson, and L.J. Cahill, A comparison of plasma waves produced by ion accelerators in the F-region ionosphere, in *Ion Acceleration in the Magnetosphere and Ionosphere*, Geophysical Monograph 38, AGU, p. 206, 1986.
15. Treumann, R.A., O.H. Bauer, J. LaBelle, G. Haerendel, P.J. Christiansen, A.G. Darbyshire, A.J. Norris, L.C.J. Woolliscroft, R.R. Anderson, D.A. Gurnett, R.W. Holzworth, H.C. Koons, and J. Roeder, Electron Plasma waves in the solar wind: AMPTE/IRM and UKS observations, *Adv. Space Res., 6*, 353, 1986.
16. LaBelle, J., R.A. Treumann, G. Haerendel, O.H. Bauer, G. Paschmann, W. Baumjohann, H. Lühr, R.R. Anderson, H.C. Koons, and R. Holzworth, AMPTE/IRM observations of waves associated with flux transfer events in the magnetosphere, *J. Geophys. Res., 92*, 5827, 1987.

17. Baumjohann, W., N. Sckopke, J. LaBelle, B. Klecker, H. Lühr, and K.H. Glassmeier, Plasma and field observations of a compressional Pc5 wave event, *J. Geophys. Res., 92*, 12203, 1987.

18. Kintner, P.M., M.C. Kelley, G. Gustafsson, H. Koskinen, and J. LaBelle, Spatial density turbulence measured by the VIKING plasma wave interferometer, *Geophys. Res. Lett., 14*, 467, 1987.

19. Ögelman, H., H. Böhringer, S. Buchert, S. Chakir, J. LaBelle, and R.A. Treumann, Could there be terrestrial signatures of the EUV pulse from supernova 1987A?, *Astron. Astrophys., 183*, L27, 1987.

20. LaBelle, J., Are Fast Atmospheric Pulsations optical signatures of Lightning-induced Electron Precipitation?, *Geophys. Res. Lett., 15,* 277, 1988.

21. LaBelle, J., R.A. Treumann, W. Baumjohann, G. Haerendel, N. Sckopke, G. Paschmann, and H. Lühr, The duskside plasmapause/ring current interface: convection and plasma wave observations, *J. Geophys. Res., 93*, 2573, 1988.

22. LaBelle, J., and R.A. Treumann, Current-driven lower hybrid waves at the inner edge of the ring current, *J. Geophys. Res., 93*, 2591, 1988.

23. LaBelle, J., and R.A. Treumann, Plasma waves at the dayside magnetopause, *Space Sci. Rev., 47*, 175, 1988.

24. LaBelle, J., and G. Paschmann, Motions of the ring current inner edge inferred from plasma measurements, *J. Geophys. Res.,94,* 485, 1989.

25. LaBelle, J., R.J. Sica, C. Kletzing, G.D. Earle, M.C. Kelley, D. Lummerzheim, R.B. Torbert, K.D. Baker, and G. Berg, Ionization from soft electron precipitation in the auroral F-region, *J. Geophys. Res., 94*, 3791, 1989.

26. LaBelle, J., Radio Noise of Auroral Origin: 1968-1988, *J. Atmos. Terr. Phys., 51*, 197, 1989.

27. Baumjohann, W., R.A. Treumann, J. LaBelle, and R.R. Anderson, Average electric wave power across the plasma sheet and its relation to ion bulk speed, *J. Geophys. Res., 94*, 15221, 1989.

28. LaBelle, J., R.A. Treumann, M.H. Boehm, and K. Gewecke, Natural and man-made emissions at 1.0-5.6 MHz measured between 10 and 18 R_E, *Radio Sci., 24*, 725, 1989.

29. LaBelle, J., and P.M. Kintner, The measurement of wavelength in space plasmas, *Rev. Geophys., 27*, 495, 1989.

30. Baumjohann, W., R.A. Treumann, and J. LaBelle, Average electric wave spectra in the plasma sheet: dependence on ion density and ion beta, *J. Geophys. Res., 95*, 3811, 1990.

31. LaBelle, J., L.M. Kistler, R.A. Treumann, D.G. Sibeck, W. Baumjohann, D.N. Baker, and R.D. Belian, The interaction of impulsive solar wind discontinuities with the magnetosphere: a multi-satellite case study, *Planet. Space Sci., 38*, 841, 1990.

32. Treumann, R.A., L. Brostrom, J. LaBelle, and N. Sckopke, The plasma wave signature of a "magnetic hole" in the vicinity of the magnetopause, *J. Geophys. Res., 95*, 19099, 1990.

33. Treumann, R.A., J. LaBelle, and R. Pottelette, Plasma Diffusion at the Dayside Magnetopause, *J. Geophys. Res., 96*, 16009, 1991.

34. LaBelle, J., and E.J. Lund, Bispectral analysis of equatorial spread F density irregularities, *J. Geophys. Res., 97*, 8643, 1992.

35. LaBelle, J., and R.A. Treumann, Poynting vector measurements of electromagnetic ion cyclotron waves in the plasmasphere, *J. Geophys. Res., 97*, 13789, 1992.

36. Treumann, R.A., and J. LaBelle, Band-splitting in solar type II radio bursts, *Astrophys. J. Lett., 399*, L167-L170, 1992.

37. Olsen, E., A.T. Weatherwax, F. Dailami, and J. LaBelle, An LF–MF–HF Programmable Receiver for monitoring auroral radio emissions from remote sites, *Planet. Radio Emissions III,* ed. by H.O. Rucker, S.J. Bauer, and M.L. Kaiser, Austrian Acad. Sci. Press, pp. 219–230, 1992.

38. Treumann, R.A., J. LaBelle, G. Haerendel, and R. Pottelette, Plasma diffusion and the magnetopause boundary layer, *IEEE Trans. Plasma Sci., 20*, 1–10, 1992.

39. LaBelle, J., and A.T. Weatherwax, Ground-based observations of LF/MF/HF radio waves of auroral origin, *Proceedings of the 1992 Cambridge Workshop in Geoplasma Physics*, T. Chang, editor, Scientific Publishers, Cambridge, Mass., p. 223, 1993.

40. Weatherwax, A.T., J. LaBelle, M.L. Trimpi, and R. Brittain, Ground based observations of radio emissions near $2f_{ce}$ and $3f_{ce}$ in the auroral zone, *Geophys. Res. Lett., 20*, 1447, 1993.

41. LaBelle, J., R.A. Treumann, and E. Marsch, Elsässer variable analysis of fluctuations in the ion foreshock and undisturbed solar wind, *J. Geophys. Res., 99*, 65, 1994.

42. Weatherwax, A.T., J. LaBelle, M.L. Trimpi, R. Brittain, and R.A. Treumann, Broadband enhancements in the MF/HF noise level observed at ground level in the auroral zone, *J. Geophys. Res., 99*, 2109, 1994.

43. Lund, E.J., J. LaBelle, and R.A. Treumann, On quasi-thermal fluctuations near the plasma frequency in the outer plasmasphere: A case study, *J. Geophys. Res., 99*, 23651, 1994.

44. Weatherwax, A.T., J. LaBelle, and M.L. Trimpi, A new type of auroral radio emission at 1.4-3.7 MHz observed from the ground, *Geophys. Res. Lett., 21*, 2753, 1994.

45. LaBelle, J., A.T. Weatherwax, M.L. Trimpi, R. Brittain, R.D. Hunsucker, and J.V. Olson, The spectrum of LF/MF/HF radio noise at ground level during geomagnetic substorms, *Geophys. Res. Lett., 21*, 2749, 1994.

46. Rosenberg, T.J., S. Singh, C.S. Wu, J. LaBelle, R.A. Treumann, U.S. Inan, and L.J. Lanzerotti, Correlated bursts of AKR and VLF emissions associated with a Type III solar radio noise event, *J. Geophys. Res., 100*, 281, 1995.

47. Denton, R.E., S.P. Gary, X. Li, B.J. Anderson, J. LaBelle, and M. Lessard, Low-frequency fluctuations in the magnetosheath near the magnetopause, *J. Geophys. Res., 100*, 5665, 1995.

48. Li, X., H.R. Lewis, J. LaBelle, T.-D. Phan, and R.A. Treumann, Characteristics of the ion pressure tensor in the Earth's magnetosheath, *Geophys. Res. Lett., 22*, 667, 1995.

49. Weatherwax, A.T., J. LaBelle, M.L. Trimpi, R. Brittain, R.A. Treumann, and J. Minow, Statistical and case studies of $2f_{ce}$ and $3f_{ce}$ auroral roar from Alaska, *J. Geophys. Res., 100*, 7745, 1995.

50. LaBelle, J., M.L. Trimpi, R. Brittain, and A.T. Weatherwax, Fine structure of auroral roar emissions, *J. Geophys. Res., 100*, 21953, 1995.

51. Lund, E.J., J. LaBelle, M.C. Kelley, R.B. Torbert, W. Peria, K. Liou, F. Primdahl, C.A. Kletzing, H.C. Stenbaek-Nielsen, A. Ranta, G. Haerendel, and H. Frey, Observation of electromagnetic oxygen cyclotron waves in a flickering aurora, *Geophys. Res. Lett., 22*, 2465, 1995.

52. Lund, E.J., R.A. Treumann, and J. LaBelle, Quasi-thermal fluctuations in a beam-plasma system, *Phys. Plasmas, 3*, 1234, 1996.

53. Yoon, P.H., A.T. Weatherwax, T.J. Rosenberg, and J. LaBelle, Lower ionospheric cyclotron maser theory: A possible source of $2f_{ce}$ and $3f_{ce}$ auroral radio emissions, *J. Geophys. Res., 101*, 27015, 1996.

54. Jahn, J.-M., J. LaBelle, and R.A. Treumann, Evaluating the stationarity of equatorial spread F time series data, *J. Atmos. Solar-Terr. Phys., 59*, 439, 1997.

55. Jahn, J.-M., J. LaBelle, J.H.A. Sobral, T. Aggson, and W.B. Hanson, Simultaneous detection of an equatorial spread F bubble by ground-based photometers and the San Marco-5 satellite, to appear in *J. Atmos. Solar-Terr. Phys., 59*, 1601, 1997.

56. Carpenter, D.L., M. Galand, V.S. Sonwalkar, T.F. Bell, U.S. Inan, J. LaBelle, A.J. Smith, and T.D.G. Clark, Quasi-periodic 5–60 Hz s fluctuations of VLF signals propagating in the earth-ionospherewaveguide: A result of pulsating particle precipitation?, *J. Geophys. Res., 102*, 347, 1997.

57. LaBelle, J., J.M. Jahn, R.F. Pfaff, W.E. Swartz, J.H.A. Sobral, M.A. Abdu, P. Muralikrishna, and E. dePaula, The Brazil/Guará campaign equatorial spread F experiment: Large-scale results, *Geophys. Res. Lett., 24*, 1691, 1997.

58. Musman, S., J.M. Jahn, J. LaBelle, and W.E. Swartz, Imaging spread-F structures using GPS observations at Alcantara, Brazil, *Geophys. Res. Lett., 24*, 1703, 1997.

59. Jahn, J.M., J. LaBelle, and R.F. Pfaff, Electric field measurements from the Brazil/Guará spread F rocket, *Geophys. Res. Lett., 24*, 1695, 1997.

60. Taylor, M.J., J.V. Eccles, J. LaBelle, and J.H.A. Sobral, High resolution OI (630 nm) image measurements of F-region depletion drifts during the Guará campaign, *Geophys. Res. Lett., 24*, 1699, 1997.

61. Pfaff, R.F., J.H.A. Sobral, M.A. Abdu, W.E. Swartz, J. LaBelle, M. Larsen, and R. Goldberg, The Guará campaign: A series of rocket-radar investigations of the Earth's upper atmosphere at the magnetic equator, *Geophys. Res. Lett., 24*, 1666, 1997.

62. Lund, E.J., and J. LaBelle, On the generation and propagation of auroral electromagnetic ion cyclotron waves, *J. Geophys. Res., 102*, 17241, 1997.

63. LaBelle, J., S.G. Shepherd, and M.L. Trimpi, Observations of auroral medium frequency burst emissions, *J. Geophys. Res., 102*, 22221, 1997.

64. Lund, E.J., M.L. Trimpi, E.H. Gewirtz, R.H. Cook, and J. LaBelle, The plasma frequency tracker: an instrument for probing the frequency structure of narrow band MF/HF electric fields, Proc. Chapman Conf. on Measurement Techniques, 1997.

65. Shepherd, S.G., J. LaBelle, and M.L. Trimpi, The polarization of auroral roar emissions, *Geophys. Res. Lett., 24*, 3161, 1997.

66. LaBelle, J., Review of recent ground-level observations of terrestrial auroral radio emissions, *Planet. Radio Emissions IV,* ed. by H.O. Rucker, et al., Austrian Acad. Sci. Press, p. 283, 1997.

67. Jahn, J.M., and J. LaBelle, Rocket measurements of high-altitude spread F irregularities and the magnetic equator, *J. Geophys. Res., 103*, 23427, 1998.

68. Shepherd, S.G., J. LaBelle, and M.L. Trimpi, Further observations of auroral roar fine structure, *J. Geophys. Res., 103*, 2219, 1998.

69. Hughes, J., and J. LaBelle, The latitude dependence of auroral roar emissions, *J. Geophys. Res., 103*, 14910, 1998.

70. LaBelle, J., A.T. Weatherwax, M.L. Trimpi, J. Perring, and U.S. Inan, HF auroral hiss observations at high geomagnetic latitudes, *J. Geophys. Res., 103*, 20459, 1998.

71. Denton, R.E., M.R. Lessard, J. LaBelle, and S.P. Gary, Identification of low-frequency magnetosheath waves, *J. Geophys. Res., 103*, 23661, 1998.

72. McAdams, K.L., J. LaBelle, P.W. Schuck, and P.M. Kintner, PHAZE II observations of lower hybrid burst structures occuring on density gradients, *Geophys. Res. Lett., 25*, 3091, 1998.

73. Shepherd, S.G., J. LaBelle, R. Doe, M. McCready, and A.T. Weatherwax, Ionospheric structure associated with auroral roar emissions, *J. Geophys. Res., 103*, 29253, 1998.

74. 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*, 29267, 1998.

75. LaBelle, J., D.R. Ruppert, and R.A. Treumann, A statistical study of banded magnetospheric emissions, *J. Geophys. Res., 104*, 293, 1999.

76. Shepherd, S.G., J. LaBelle, C.W. Carlson, and G. Rostoker, The latitudinal dynamics of auroral roar emissions, *J. Geophys. Res., 104*, 17217, 1999.

77. McAdams, K.L., and J. LaBelle, Narrowband structure in HF waves above the Langmuir frequency in the auroral ionosphere, *Geophys. Res. Lett., 26*, 1825, 1999.

78. LaBelle, J., K.L. McAdams, and M.L. Trimpi, Structured low and medium frequency whistler mode emissions in the auroral ionosphere, *J. Geophys. Res., 104*, 28101, 1999.

79. McAdams, K.L., J. LaBelle, M.L. Trimpi, P.M. Kintner, and R.A. Arnoldy, Rocket observations of banded structure in HF waves near the Langmuir frequency in the auroral ionosphere, *J. Geophys. Res., 104*, 28109, 1999.

80. McAdams, K.L., R.E. Ergun, and J. LaBelle, HF Chirps: Eigenmode trapping in density depletions, *Geophys. Res. Lett., 27*, 321, 2000.

81. Hughes, J.M., J. LaBelle, and M.L. Trimpi, A medium frequency interferometer for studying auroral radio emissions, *Rev. Sci. Instruments, 71*, 3200, 2000.

82. Yoon, P.H., A.T. Weatherwax, and J. LaBelle, Discrete electrostatic eigenmodes associated with ionospheric density structure, *J. Geophys. Res., 105*, 27589, 2000.

83. Hughes, J.M., and J. LaBelle, First observations of flickering auroral roar, *Geophys. Res. Lett., 28*, 123, 2001.

84. Hughes, J.M., J. LaBelle, and J. Watermann, Statistical and case studies of $2f_{ce}$ auroral roar observed with a medium-frequency interferometer, *J. Geophys. Res., 106*, 21147, 2001.

85. Hughes, J.M., and J. LaBelle, Plasma conditions in auroral roar source regions inferred from radio and radar observations, *J. Geophys. Res., 106*, 21157, 2001.

86. LaBelle, J., and J.M. Hughes, Observations of Auroral Roar Emissions at Polar Cap Latitudes: Results from the Early Polar Cap Observatory, *Radio Sci., 36*, 1859–1868, 2001.

87. Greenberg, E.M., and J. LaBelle, Measurement and modeling of auroral absorption of HF radio waves using a single receiver, *Radio Sci., 37*, 10.1029/2000RS002550, 2002.

88. Weatherwax, A.T., P.H. Yoon, and J. LaBelle, Model results and interpretation related to topside observations of auroral roar, *J. Geophys. Res., 107*, 10.1029/2001JA000315, 2002.

89. LaBelle, J., and A.T. Weatherwax, Statistical study of auroral roar emissions observed at South Pole Station, *J. Geophys. Res., 107*, 10.1029/2001JA000319, 2002.

90. LaBelle, J., and R.A. Treumann, Auroral Radio Emissions, 1. Hisses, Roars, and Bursts, *Space Sci. Rev., 101*, 295–440, 2002.

91. Denton, R.E., J. LaBelle, and X. Zhu, Location of Pc1 waves relative to the magnetopause, *Ann. Geophys., 20*, 1763–1767, 2002.

92. Sobral, J.H.A., M.A. Abdu, P. Muralikrishna, J. LaBelle, V.M. Castillo, and C.J. Zamlutti, Rocket and ground-based electron density soundings versus IRI representation, *Adv. Space Res., 31*, 569–575, 2003.

93. LaBelle, J., P.H. Yoon, M. Karlicky, and R.A. Treumann, A model of zebra burst emission in solar radio bursts, *Astrophys. J., 593*, 1195–1207, 2003.

94. LaBelle, J., High-latitude radiowave propagation studies using a meridional chain of receivers, *Ann. Geophys., 22*, 1705–1718, 2004.

95. Samara, M., J. LaBelle, C.A. Kletzing, and S.R. Bounds, Electrostatic upper hybrid waves where the upper hybrid frequency matches the electron cyclotron harmonic in the auroral ionosphere, *Geophys. Res. Letters, 31*, **L22804**, doi:10.1029/2004GL021043, 2004.

96. LaBelle, J., A.T. Weatherwax, M. Tantiwiwat, E. Jackson, and J. Linder, Statistical study of medium-frequency burst emissions observed at South Pole Station and at multiple Canadian Observatories, *J. Geophys. Res., 110,* No. A2, **A02305**, doi:10.1029/2004JA010608, 2005.

97. Kletzing, C.A., S.R. Bounds, J. LaBelle, and M. Samara, Observation of the reactive component of Langmuir wave phase-bunched electrons, *Geophys. Res. Lett., 32*, No. 5, **L05106**, doi:10.1029/2004GL021175, 2005.

98. Yoon, P.H., and J. LaBelle, Discrete Langmuir waves in a density cavity, *J. Geophys. Res.*, **A11308**, doi:10.1029/2005JA011186, 2005.

99. Yoon, P.H., J. LaBelle, A.T. Weatherwax, and M. Samara, Mode conversion radiation in the terrestrial ionosphere and magnetosphere, in *Geospace Electromangetic Waves and Radiation*, ed. by R.A. Treumann and J. LaBelle, Springer-Verlag, 2006.

100. Kim, H., M.R. Lessard, J. LaBelle, and J.R. Johnson, Narrow-band ELF wave phenomena observed at South Pole Station, *Geophys. Res. Lett., 33*, **L06109**, doi:10.1029/2005GL023638, 2006.

101. Ye, S., J. LaBelle, and A.T. Weatherwax, Flickering auroral radio emissions: 1. Observations, *J. Geophys. Res.,111*, **A07301**, doi:10.1029/2005JA011271, 2006.

102. Weatherwax, A.T., P.H. Yoon, J. Hughes, J. LaBelle, and L.F. Ziebell, Flickering auroral radio emissions: 2. Modelling, *J. Geophys. Res., 111*, **A07302**, doi:10.1029/2005JA011288, 2006.

103. Samara, M., and J. LaBelle, LF/MF Whistler mode dispersive signals observed with rocket-borne instruments in the auroral downward current region, *J. Geophys. Res., 111*, **A09305**, doi:10.1029/2005JA011535, 2006.

104. Samara, M., and J. LaBelle, Structured waves near the plasma frequency observed in three auroral rocket flights, *Ann. Geophys., 24*, 2911–2919, 2006.

105. MacDonald, E.A., K.A. Lynch, M. Widholm, R. Arnoldy, P.M. Kintner, E.M. Klatt, M. Samara, J. LaBelle, G. Lapenta, and G. Delzanno, In situ measurement of thermal electrons on the SIERRA nightside auroral sounding rocket, *J. Geophys. Res.*, 111, A12310, doi:10.1029/2005-JA011493, 2006.

106. Lessard, M.R., W. Lotko, J. LaBelle, W. Peria, C.W. Carlson, F. Creutzberg, and D.D. Wallis, Ground and Satellite Observations of the Evolution of Growth–Phase Auroral Arcs, *J. Geophys. Res., 112*, A09304, doi:10.1029/2006JA011794, 2007.

107. Ye, S., J. LaBelle, P.H. Yoon, and A.T. Weatherwax, Experimental Tests of the Eigenmode Theory of Auroral Roar Fine Structure and its Application to Remote Sensing, *J. Geophys. Res., 112*, A12304, doi:10.1029/2007JA012525, 2007.

108. Lynch, K.A., J.L. Semeter, M. Zettergren, P.M. Kintner, R.A. Arnoldy, E. Klatt, J. LaBelle, R.G. Michell, E.A. MacDonald, and M. Samara, Auroral ion outflow: low altitude energization, *Ann. Geophys., 25*, 1967-1977, 2007.

109. Yoon, P.H., J.D. Menietti, S. Ye, J. LaBelle, and A.T. Weatherwax, Methods in the study of discrete upper hybrid waves, *J. Geophys. Res., 112*, A11305, doi:10.1029/2007JA012683, 2007.

110. Ye, S., and J. LaBelle, Ground-based observations of fine structure of low frequency auroral hiss, *J. Geophys. Res., 113*, A01313, doi:10.1029/2007JA012473, 2008.

111. Colpitts, C.A., and J. LaBelle, Mode Identification of Whistler Modes, Z-Modes, and Langmuir/Upper Hybrid Modes Observed in an Auroral Sounding Rocket Experiment, *J. Geophys. Res. 113*, A04306, doi:10.1029/2007JA012325, 2008.

112. Samara, M., J. LaBelle, and I. Cairns, Statistics of auroral Langmuir waves and test of stochastic growth theory, *Ann. Geophys., 26*, 3885-3895, 2008.

113. Bunch, N.L., J. LaBelle, A.T. Weatherwax, J.M. Hughes, Auroral Medium Frequency Burst radio emission associated with the March 23, 2007, THEMIS study substorm, *J. Geophys. Res., 113*, A00C08, doi:10.1029/2008JA013503, 2008.

114. Lessard, M., A.T. Weatherwax, M. Spasojevic, U.S. Inan, A. Gerrard, L. Lanzerotti, A. Ridley, M.J. Engebretson, N.J. Petit, R. Clauer, J. LaBelle, S.B. Mende, H.U. Frey, V.A. Pilipenko, T.J. Rosenberg, and D. Detrick, PENGUIn multi=instrument observations of dayside high-latitude injections during the 23 March 2007 substorm, *J. Geophys. Res., 114*, A00C11, doi:10.1029/2008-JA013507, 2009.

115. LaBelle, J., Spontaneous radio frequency emissions from natural aurora, in *Characterising the Ionosphere*, ed. G. Wyman; Technical Report RTO-TR-IST-051, Chapter 4, pp. 1-22. Available from: http://www.rto.nato.int/abstracts.aspx, 2009.

116. Colpitts, C.A., J. LaBelle, M. Samara, and P.H. Yoon, Rocket observations of two distinct types of dispersive features of auroral HF waves, *J. Geophys. Res., 114*, A05202, doi:10.1029/2008JA-013741, 2009.

117. Bunch, N.L., J. LaBelle, A.T. Weatherwax, J.M. Hughes, Experimental Tests of the Generation Mechanism of Auroral Medium Frequency Burst Radio Emissions, *J. Geophys. Res., 114*, A09302, doi:10.1029/2008JA013993, 2009.

118. Bunch, N.L., and J. LaBelle, Fully resolved observations of auroral medium frequency burst radio emissions, *Geophys. Res. Lett., 36*, L15104, doi:10.1029/2009GL038513, 2009.

119. Mende, S., W. Rachelson, R. Sterling, S. Harris, S. McBride, A. Weatherwax, T. Rosenberg, D. Detrick, J. Doolittle, M. Engebretson, U. Inan, J. LaBelle, and L. Lanzerotti, Observations of earth space by self powered stations in Antarctica, *Rev. Sci. Instrum., 80*, 124501, doi:10.1063/1.3262506, 2009.

120. Li, B., I.H. Cairns, P.A. Robinson, J. LaBelle, and C.A. Kletzing, Waveform and envelope field statistics for waves with stochastically-driven amplitudes, *Phys. Plasmas, 17*, 032110, doi:10.1063/1.3353092, 2010.

121. LaBelle, J., I.H. Cairns, and C.A. Kletzing, Electric field statistics and modulation characteristics of bursty Langmuir waves observed in the cusp, *J. Geophys. Res., 115*, A10317, doi:10.1029/2010-JA015277, 2010.

122. Colpitts, C.A., J. LaBelle, C.A. Kletzing, and P.H. Yoon, Further sounding rocket observations of structured whistler mode auroral emissions, *J. Geophys. Res., 115*, A10243, doi:10.1029/2009-JA015095, 2010.

123. LaBelle, J., An Explanation for the Fine Structure of MF Burst Emissions, *Geophys. Res. Lett., 38*, L03105, doi:10.1029/2010GL046218, 2011.

124. Bunch, N.L., J. LaBelle, P.H. Yoon, and A.T. Weatherwax, Theoretical Constraints on the Generation Mechanism of Auroral Medium Frequency Burst Radio Emissions, *J. Geophys. Res., 116*, A01315, doi:10.1029/2010JA015951, 2011.

125. LaBelle, J., and Anderson, R.R., Ground-level detection of Auroral Kilometric Radiation, *Geophys. Res. Lett., 38*, L04104, doi:10.1029/2010GL046411, 2011.

126. LaBelle, J., Medium Frequency Burst Emissions: A terrestrial analog to Solar Type III bursts?, *Planet. Radio Emissions VII,* ed. by H.O. Rucker, et al., Austrian Acad. Sci. Press, p. 271–282, 2011.

127. Layden, A., I.H. Cairns, P.A. Robinson, and J. LaBelle, Changes in mode properties versus mode conversion for waves in Earth's auroral ionosphere, *J. Geophys. Res., 116*, A12328, doi:10.1029/2011JA016956, 2011.

128. Dombrowski, M.P., J. LaBelle, D.E. Rowland, R.F. Pfaff, and C.A. Kletzing, Interpretation of vector electric field measurements of bursty Langmuir waves in the cusp, *J. Geophys. Res., 117*, A09209, doi:10.1029/2012JA017741, 2012.

129. Kaeppler, S.R., C.A. Kletzing, S.R. Bounds, J.W. Gjerloev, B.J. Anderson, H. Korth, J. LaBelle, M.P. Dombrowski, M. Lessard, R.F. Pfaff, D.E. Rowland, S. Jones, and C.J. Heinselman, Current Closure in the Auroral Ionosphere: Results From the Auroral Current and Electrodynamics Structure Rocket Mission, *Auroral Phenomenology and Magnetospheric Processes: Earth and Other Planets Perspective*, Geophys. Monogr. Ser., vol. 197, AGU, Washington, DC, pp. 183-192, 2012.

130. LaBelle, J., First observations of $5f_{ce}$ auroral roars, *Geophys. Res. Lett., 39*, L19106, doi:10.1029-/2012GL053551, 2012.

131. Broughton, M., J. LaBelle, M. McCready, N. Bunch, and G. Roberg-Clark, Experimental tests of a topside generation mechanism for auroral medium frequency radio emissions, *J. Geophys. Res., 117*, A12309, doi:10.1029/2012JA018034, 2012

132. Sergeev, E., S. Grach, A. Shindin, E. Mishin, P. Bernhardt, S. Briczinski, B. Isham, M. Broughton, J. LaBelle, and B. Watkins, Electromagnetic signatures of artificial ionospheric layers during frequency stepping experiments at HAARP, *Phys. Rev. Lett., 110*, doi:10.1103/PhysRev-Lett.110.065002, 2013.

133. Yan, X., J. LaBelle, G. Haerendel, M. Spasojevic, N. Bunch, D. Golden, H. Frey, and A.T. Weatherwax, Dayside Auroral Hiss Observed at South Pole Station, *J. Geophys. Res., 118*, doi:10.1002/JGRA.50141, 2013.

134. Cohen, I.J., M.R. Lessard, S.R. Kaeppler, S.R. Bounds, C.A. Kletzing, A.V. Streltsov, J. LaBelle, M.R. Dombrowski, S. Jones, R.F. Pfaff, D.E. Rowland, B.J. Anderson, H. Korth, and J.W. Gjerloev, Auroral Current and Electrodynamics Structure (ACES) observations of ionospheric feedback in the Alfven resonator and model responses, *J. Geophys. Res., 118*, 32883296, doi:10.1002/jgra.50348, 2013.

135. Akbari, H., J.L. Semeter, M.J. Nicolls, M. Broughton, and J. LaBelle, Localization of auroral Langmuir turbulence in thin layers, *J. Geophys. Res., 118*, 35763583, doi:10.1002/jgra.50314, 2013.

136. Yi, S., S.-Y. Lee, H.-E. Kim, D. Lim, J. Seough, P.H. Yoon, M.C. Broughton, and J. LaBelle, Z-mode maser instability, *J. Geophys. Res., 118*, 75847592, doi:10.1002/2013JA019376, 2013.

137. Broughton, M., J. LaBelle, and P.H. Yoon, A new natural radio emission observed at ground-level, *J. Geophys. Res., 119*, doi:10.1002/2013JA019467, 2014.

138. Broughton, M.C., J. LaBelle, and M. Parrot, DEMETER observations of bursty MF emissions and their relation to groundlevel auroral MF burst, *J. Geophys. Res., 119*, doi:10.1002/2014JA-020410, 2014.

139. Chilcote, M., J. LaBelle, F.D. Lind, A.J. Coster, E.S. Miller, I.A. Galkin, and A.T. Weatherwax, Detection of traveling ionospheric disturbances by medium frequency Doppler sounding using AM radio transmissions, *Radio Sci., 50*, doi:10.1002/2014RS005617, 2015.

140. LaBelle, J., X. Yan, M.C. Broughton, S. Pasternak, M. Dombrowski, R.R. Anderson, H.U. Frey, A.T. Weatherwax, and Y. Ebihara, Further Studies of Ground-Level Auroral Kilometric Radiation from Antarctica and Coordinated Geotail Satellite Observations, *J. Geophys. Res., 120*, doi:10.1002/2014JA020977, 2015.

141. LaBelle, J., and M. Dundek, Comparison of Fine Structures of Electron Cyclotron Harmonic Emissions in Aurora, *J. Geophys. Res., 120*, doi:10.1002/2015JA021631, 2015.

142. Broughton, M.C., J. LaBelle, E-H. Kim, P.H. Yoon, J.R. Johnson, and I.H. Cairns, On the propagation and mode conversion of auroral medium frequency bursts, *J. Geophys. Res., 121*, doi:10.1002/2015JA021851, 2016.

143. Dombrowski, M.P., J. LaBelle, D.G. McGaw, and M.C. Broughton, An Autonomous Receiver/Digital Signal Processor Applied to Ground-Based and Rocket-Borne Wave Experiments, *J. Geophys. Res., 121*, doi:10.1002/2016JA022441, 2016.

144. LaBelle, J., and Y. Chen, Right-hand polarized $4f_{ce}$ auroral roar, 1: observations, *J. Geophys. Res.*, 7974-7980, doi: 10.1002/2016JA022890, 2016.

145. Yoon, P.H., J. LaBelle, and A.T. Weatherwax, Right-hand polarized $4f_{ce}$ auroral roar, 2: Nonlinear generation theory, *J. Geophys. Res.*, 7981-7987, doi: 10.1002/2016JA022889, 2016.

146. Hatch, S.M., C.C. Chaston, and J. LaBelle, Alfven wave driven ionospheric mass outflow and electron precipitation during storms, *J. Geophys. Res., 121*, 7828-7846, doi: 10.1002/2016JA022805, 2016.

147. Kletzing, C.A., J. LaBelle, S.R. Bounds, J. Dolan, M. Dombrowski, and S. Kaeppler, A good resolution phase-sorting wave-particle correlator, *J. Geophys. Res., 121*, doi:10.1002/2016JA023334, 2016.

148. Kim, H., J. LaBelle, and M. Spasojevic, Long-hissler fine structure of auroral hiss: A review and synthesis, *J. Atmos. Solar-Terr. Phys., 156*, pp. 72–79, doi: 10.1016/j.jastp.2017.03.002, 2017.

149. Hatch, S.M., and J. LaBelle, Application of a new method for calculation of low-frequency wave vectors, *Planet. Radio Emissions VIII*, ed. by G. Fischer, G. Mann, M. Panchenko, P. Zarka, Austrian Acad. Sci. Press, pp. 247-259, 2017.

150. da Silva, C.L., R.M. Millan, D.G. McGaw, C.T. Yu, A.S. Putter, J. LaBelle, and J. Dwyer, Laboratory measurements of X-ray emissions from 1 centimeter-long streamer corona discharges, *Geophys. Res. Lett., 44*, 11,174-11,183. doi:10.1002/2017GL075262, 2017.

151. Hatch, S., J. LaBelle, B. Zhang, W. Lotko, and C.C. Chaston, IMF control of Alfvenic energy transport and deposition at high latitudes, *J. Geophys. Res., 122*, pp. 12189-12211, doi:10.1002/-2017ja024175, 2017.

152. Hatch, S., J. LaBelle, and C.C. Chaston, Alfvenic energy flux, ion outflow and electron precipitation during storm times: Implications for global rates, *J. Atmos. Solar-Terr. Phys., 167*, pp. 1-12, doi: 10.1016/j.jastp.2017.08.009, 2018.

153. LaBelle, J., Polarization measurements of unusual cases of medium frequency burst emissions extending below 1.5 MHz, *Earth, Planets, and Space, 70*, 143, doi: 10.1186/s40623-018-0912-7, 2018.

154. Hatch, S., C.C. Chaston, and J. LaBelle, Nonthermal Limit of Monoenergetic Precipitation in the Auroral Acceleration Region, *Geophys. Res. Lett., 45*, 10,16710,176. doi: 10.1029/2018GL-078948, 2018.

155. Hatch, S., J. LaBelle, and C.C. Chaston, Inferring source properties of monoenergetic electron precipitation from kappa and Maxwellian moment-voltage relationships, *J. Geophys. Res., 124*, doi: 10.1029/2018JA026158, 2019.

156. Shindin, A.V., S.M. Grach, E.N. Sergeev, V.P. Smolina, N.A. Pogorelko, P.A. Bernhardt, S. Briczinski, M. Broughton, J. LaBelle, and M.J. McCarrick, Properties of the stimulated electromagnetic emissions during the inclined highfrequency pumping of the ionosphere near the fourth electron gyroharmonic at the HighFrequency Active Auroral Research Program facility, *Geophys. Res. Lett., 46*, doi: 10.1029/2019GL082890, 2019.

157. Dombrowski, M.D., J. LaBelle, C.A. Kletzing, and S.R. Bounds, I.H. Cairns, and S. Kaeppler, Statistical study of electron bunching in auroral Lanmguir waves, *J. Geophys. Res., 124*, doi: 10.1029/2018JA026262, 2019.

158. Burnett, A., and J. LaBelle, Estimating polar cap density and medium-frequency burst source heights using $2f_{ce}$-roar radio emissions, *J. Geophys. Res., 125*, doi:10.1029/2020JA028166, 2020.

Submitted or in preparation

159. Moser, C., J. LaBelle, S. Hatch, J.I. Moen, A. Spicher, T. Takahashi, C.A. Kletzing, S.R. Bounds, K. Oksavik, F. Sigernes, and T. Yeoman, The Cusp as a VLF Saucer Source: First Rocket Observations of Long-Duration VLF Saucers on the Dayside, submitted to *Geophys. Res. Lett.*, 2020.

160. Akbari, H., J. LaBelle, and D. Goldman, Langmuir turbulence in the auroral ionosphere: Origins and effects, submitted to *Frontiers*, 2020.

(Note: A.T. Weatherwax, E.J. Lund, J.M. Jahn, D.R. Ruppert, S.G. Shepherd, K.L. McAdams, J.M. Hughes, E.M. Greenberg, M. Samara, S. Ye, C.A. Colpitts, N.L. Bunch, M. Dombrowski, M. Broughton, X. Yan, M. Chilcote, H. Kim, S. Hatch, C. Moser, and A. Burnett were students of J. LaBelle.)