

Dr. Bea Gallardo-Lacourt
Postdoctoral Researcher
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Education

Ph.D. Atmospheric and Oceanic Sciences, 2016 – Atmospheric and Oceanic Sciences
Department, UCLA

Advisors: Professor Larry R. Lyons & Dr. Yukitoshi Nishimura

M. Sc., 2012, Atmospheric and Oceanic Sciences, UCLA, USA

Awards and Fellowships

2020: Editor's citation for Excellence in Refereeing, Journal of Geophysical Research

2019: NASA Postdoctoral Program Fellowship

2016: UCLA Bosart Award: For Unselfish Service to Fellow Students

2015-2016: UCLA Dissertation Year Fellowship

2015: UCLA Morris Neiburger Award: For Excellence in Graduate Teaching

2014: Outstanding Student Paper Award, AGU Fall Meeting 2014

2014: First place student Poster Award on Ionosphere-Thermosphere, CEDAR workshop

2010: AGU Fall Meeting Student travel grant (Grad Student)

2009: AGU Fall Meeting Student travel grant (Undergraduate)

Experimental Experience

Magnetometer Installation

Installing two magnetometers of the SAMBA Project (South American Meridional B-field
Array) in Antarctica bases Escudero and Bernardo O'Higgins. January 2013

Employment

Postdoctoral Researcher	NASA - Goddard Space Flight Center	May 2019 – Present
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Postdoctoral Scholar	Department of Physics and Astronomy University of Calgary	March 2017 – April 2019
Postdoctoral Scholar	Department of Atmospheric and Oceanic Sciences UCLA	August 2016 – March 2017
Teaching Assistant	Department of Atmospheric and Oceanic Sciences UCLA	September 2014 – March 2014
Graduate Student Researcher	Department of Atmospheric and Oceanic Sciences UCLA	January 2011 – June 2016

Community and Volunteer Activities

June 2020 - Present	Magnetosphere and Aeronomy Editor for the American Geophysical Union (AGU) Books
January 2018 - Present	Member of the AGU Global Engagement Committee
August 2018 - Present	Reviewer for Geophysical Research Letters (GRL)
March 2015 - Present	Reviewer for Journal of Geophysical Research (JGR)
April 2017 - Present	Volunteer for Calgary Reads. Initiative which focuses on creating positive changes in literacy outcomes for children
March 2017 – Present	Member of the University of Calgary's Postdoc Association
June 2017	Poster Judge, Cedar Workshop 2017
June 2015 – June 2016	Vice President of Atmospheric and Oceanic Sciences Department student association (XEP), University of California, Los Angeles
August 2015 – March 2017	Member, Organization for Cultural Diversity in Science - UCLA The Organization for Cultural Diversity in Science strives to create a close-knit community among the graduate students in the sciences, with an emphasis in cultural diversity through the underrepresented groups at UCLA

Memberships

American Geophysical Union, 2008 - Present

Japan Geoscience Union, 2018 - Present

Selected Press Coverage

- [“Scientists Solve The Mystery of STEVE, And Find It’s So Much More Than An Aurora”](#)—Forbes Magazine, 2019
- [“Steve the odd ‘aurora’ revealed to be two sky shows in one”](#)—National Geographic, 2019
- [“It’s official: The Strange, Aurora-Like STEVE Is a Completely Unique Celestial Phenomenon”](#)—Space, 2019
- [“The aurora named STEVE is not an aurora”](#)—Nature, 2018
- [“The bright purple ribbon—named STEVE—is an entirely new celestial phenomenon”](#)—Science Magazine, 2018
- [“Scientists Are Puzzled By Mysterious Lights In The Sky. They Call Them STEVE”](#)—NPR, 2018
- [“STEVE the Aurora Isn’t An Aurora After All”](#)—Discover Magazine, 2018
- [“STEVE the Purple Beam of Light Is Not An Aurora After All”](#)—Smithsonian Magazine
- [“New Kind of Aurora Is Not An Aurora At All”](#)—AGU Newsroom, 2018

Diversity, Equity, and Inclusion activities

- Panelist at Diversity, Equity, and Inclusion from an International AGU Perspective: A Panel Discussion of a Global Issue from a non-US World View, December 2020
- Member of NASA Goddard—Heliophysics Division Equity Task Force, Since September 2020
- How did I get here? Invited talk at STEM para Todas, a workshop to motivate young Peruvian girls into STEM careers, Virtual Presentation, February 2020

Peer Reviewed Publications

1. **Gallardo-Lacourt, B.**, H. Frey, and C. Martinis (2020), Proton Aurora, Subauroral Structures and Emissions from Other Planets, Book Chapter: Review of the Aurora, Accepted in Space Science Reviews.
2. **Gallardo-Lacourt, B.**, G. W. Perry, W. E. Archer, and E. Donovan (2019), How did we miss this? An upper atmospheric discovery named STEVE, Eos, 100, <https://doi.org/10.1029/2019EO117351>.
3. **Gallardo-Lacourt, B.**, J. Liang, Y. Nishimura, E. Donovan (2018), *On the origin of STEVE: Particle precipitation or ionospheric skyglow?* Geophysical Research Letters, 45. <https://doi.org/10.1029/2018GL078509> **[Featured paper]**
4. **Gallardo-Lacourt, B.**, Nishimura, Y., Donovan, E., Gillies, D. M., Perry, G. W., Archer, W. E., et al. (2018). *A statistical analysis of STEVE*. Journal of Geophysical Research: Space Physics, 123, 9893–9905. <https://doi.org/10.1029/2018JA025368>
5. **Gallardo-Lacourt B.**, G. W. Perry., W. E. Archer, and E. F. Donovan (2018), *An upper atmospheric discovery in the eyes of early career scientists*, Submitted to EOS

6. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, E. V. Mishin, J. M. Ruohoniemi, E. Donovan, V. Angelopoulos, and N. Nishitani (2017), *Influence of auroral streamers on rapid evolution of ionospheric SAPS flows*, *Journal of Geophysical Research: Space Physics.*, 122, 12, 406-12, 420, doi: 10.1002/2017JA024198 .
7. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, J. M. Ruohoniemi, E. Donovan, V. Angelopoulos, K. A. McWilliams, and N. Nishitani (2014), *Ionospheric flow structures associated with auroral beading at substorm auroral onset*, *J. Geophys. Res. Space Physics*, 119, 9150-9159, doi:10.1002/2014JA020298
8. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, S. Zou, V. Angelopoulos, E. Donovan, K. A. McWilliams, J. M. Ruohoniemi, and N. Nishitani (2014), *Coordinated SuperDARN THEMIS ASI observations of mesoscale flow bursts associated with auroral streamers*, *J. Geophys. Res. Space Physics*, 119, doi:10.1002/2013JA019245 [\[Featured article\]](#)
9. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, and E. Donovan (2012), *External triggering of substorms identified using modern optical versus geosynchronous particle data*, *Ann. Geophys.*, 30, 667-673, doi:10.5194/angeo-30-667-2012
10. Archer, W. E., St.- Maurice, J.-P., **Gallardo-Lacourt, B.**, Perry, G. W., Cully, C. M., & Donovan, E. et al. (2019b). The vertical distribution of the optical emissions of a Steve and Picket Fence event. *Geophysical Research Letters*, 46, 10719– 10725.
<https://doi.org/10.1029/2019GL08447>. [\[Featured article\]](#)
11. Archer, W. E., **Gallardo-Lacourt, B.**, Perry, G. W., St.-Maurice, J.-P., Buchert, S. C., & Donovan, E. F. (2019a). Steve: The optical signature of intense subauroral ion drifts. *Geophysical Research Letters*, 46, 6279– 6286.
<https://doi.org/10.1029/2019GL082687>
12. Gillies, D. M., Donovan, E., Hampton, D., Liang, J., Connors, M., Nishimura, Y., **Gallardo-Lacourt, B.**, and Spanswick, E. (2019). First observations from the TREx Spectrograph: The optical spectrum of STEVE and the Picket Fence phenomena. *Geophysical Research Letters*, 46, 7207– 7213.
<https://doi.org/10.1029/2019GL083272>
13. Nishimura, Y., **Gallardo-Lacourt, B.**, Zou, Y., Mishin, E., Knudsen, D. J., Donovan, E. F., et al. (2019). Magnetospheric signatures of STEVE: Implications for the magnetospheric energy source and interhemispheric conjugacy. *Geophysical Research Letters*, 46, 5637– 5644. <https://doi.org/10.1029/2019GL082460>. [\[Featured article\]](#)
14. Gabrielse, C., Pinto, V., Nishimura, Y., Lyons, L., **Gallardo-Lacourt, B.**, & Deng, Y. (2019). Storm time mesoscale plasma flows in the nightside high-latitude ionosphere: A statistical survey of characteristics. *Geophysical Research Letters*, 46, 4079– 4088.
<https://doi.org/10.1029/2018GL081539>.
15. Liang, J., E. Donovan, M. Connors, D. M. Gillies, J.-P. St.-Maurice, B. Jackel, **B. Gallardo-Lacourt**, E. L. Spanswick, and X. Chu (2019), Optical spectra and emission altitudes of double-layer STEVE: A case study, Submitted to GRL.
16. Forsyth, C., V. Sergeev, Y. Nishimura, M. G. Henderson, **B. Gallardo-Lacourt**, Large-Scale Auroral Phenomena, Book Chapter: Review of the Aurora, Submitted to Space Science Reviews.
17. Chu, X., Malaspina, D., **Gallardo-Lacourt, B.**, Liang, J., Andersson, L., Ma, Q., et al (2019). Identifying STEVE's magnetospheric driver using conjugate observations in the magnetosphere and on the ground. *Geophysical Research Letters*, 46. <https://doi.org/10.1029/2019GL082789>
18. Gabrielse, C., Y. Nishimura, L. R. Lyons, **B. Gallardo-Lacourt**, Y. Deng, and E. Donovan (2018), *Statistical properties of meso-scale plasma flows in the nightside high-latitude ionosphere*, *Journal of Geophysical Research: Space Physics*, 123, 6798– 6820. <https://doi.org/10.1029/2018JA025440>.

19. E. A. MacDonald, E. Donovan, Y. Nishimura, D. M. Gillies, **B. Gallardo-Lacourt**, W. Archer, E. L. Spanswick, M. Connors, N. Case, B. Jackel, D. Knudsen, N. Bourassa, M. Heavner, B. Kosar, C. Ratzlaff, I. Schofield (2018), *New Science in Plain Sight: Citizen Scientists Lead to Discovery of Optical Structure in the Upper Atmosphere*, Science Advances, vol.4, no. 3, eaaq0030, DOI: 10.1126/sciadv.aaq0030.
20. Liu, J., L. R. Lyons, W. E. Archer, **B. Gallardo-Lacourt**, Y. Nishimura, Y. Zou, C. Gabrielse, and J. M. Weygand (2018), *Flow shears at the poleward boundary of omega bands observed during conjunctions of Swarm and THEMIS ASI*, Geophysical Research Letters, 45, 1218-1227, doi: 10.1002/2017GL076485.
21. Lyons, L. R., Y. Zou, Y. Nishimura, **B. Gallardo-Lacourt**, V. Angelopoulos, and E. Donovan (2018), *Stormtime substorm onsets: occurrence and flow channel triggering*, Earth, Planets and Space, 70: 81, doi: 10.1186/s40623-018-0857-x.
22. L. R. Lyons, **B. Gallardo-Lacourt**, Y. Zou, Y. Nishimura, P. Anderson, V. Angelopoulos, E. F. Donovan, J. M. Ruohoniemi, E. Mitchells, L. J. Paxton, and N. Nishitani (2017), *Driving of Strong Nightside Reconnection and Geomagnetic Activity by Polar Cap Flows: Applications to CME Shocks and Possible Other Situations*, Submitted to Journal of Atmospheric and Solar-Terrestrial Physics.
23. L. R. Lyons, **B. Gallardo-Lacourt**, S. Zou, J. M. Weygan, Y. Nishimura, W. Li, M. Gkioulidou, V. Angelopoulos, E. F. Donovan, J. M. Ruohoniemi, B. J. Anderson, S. G. Shepherd, and N. Nishitani (2016), *2013 March 17 Storm: Synergy of Observations Related to Electric Field Modes and their Ionospheric and Magnetospheric Effects*, J. Geophys. Res. Space Physics, 121, 10,880-10,897, doi:10.1002/2016JA023237
24. Lyons L. R., Nishimura Y., **Gallardo-Lacourt B.**, Zou Y., Donovan E. F., Mende S., Angelopoulos V., Ruohoniemi J. M., McWilliams K. A., Hampton D. L., Nicolls M. J. (2015). *Dynamics Related to Plasma Sheet Flow Bursts as Revealed from the Aurora*. Auroral Dynamics and Space Weather.
25. Lyons, L. R., Nishimura Y., **Gallardo-Lacourt B.**, Nicolls M. J., Chen S., Hampton D. L., Bristow W. A., Ruohoniemi J. M., Nishitani N., Donovan E. F., and Angelopoulos V. (2015). *Azimuthal flow bursts in the Inner Plasma Sheet and possible connection with SAPS and Plasma sheet earthward flow bursts*. Journal of Geophysical Research, Space Physics. 5009-5021.
26. Lyons, L. R., Y. Nishimura, **B. Gallardo-Lacourt**, Y. Zou, E. Donovan, S. Mende, V. Angelopoulos, J. M. Ruohoniemi, and K. McWilliams (2013), *Westward traveling surges: Sliding along boundary arcs and distinction from onset arc brightening*, J. Geophys. Res. Space Physics, 118, 7643–7653, doi:10.1002/2013JA019334

Invited Presentations and Lectures

1. **Gallardo-Lacourt B.**, High and midlatitude electrodynamics with an emphasis on ground-based instruments, Space Weather Class thought by Dr. Anna DeJong, Catholic University of America, November 2020
2. **Gallardo-Lacourt, B.**, S. Wing, L. Kepko, D.M. Gillies, E. Spanswick, E. Donovan, Tracking auroral and solar structures using the Optical Flow techniques & automatic identification of the Polar Cap Boundary, Invited Seminar at Rice University, November 2020
3. **Gallardo-Lacourt, B.**, L. Kepko, D. M. Gillies, N. Alzate, E. Spanswick, N. Viall, C. DeForest, Optical flow technique applied to the aurora and STEREO data, PUNCH Science Meeting, June 2020
4. **Gallardo-Lacourt, B.**, Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick. STEVE, the mysterious subauroral optical phenomenon,

Invited Talk, Space Weather Workshop, Boulder, USA, April 2020—Suspended due to Covid-19

5. **Gallardo-Lacourt, B.**, Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick. *What do we know about STEVE so far? Invited Seminar*, Boston University, Boston, USA, October 2019
6. **Gallardo-Lacourt, B.**, and Archer W. E., *The Mysterious STEVE*, Invited Lecture, Royal Astronomical Society of Canada, Calgary, AB, Canada, April 2019.
7. **Gallardo-Lacourt, B.**, Donovan E., Y. Nishimura, J. Liang, M. Gillies, W. E. Archer, G. W. Perry, and E. L. Spanswick, *STEVE*, SIMLE workshop, Banff, AB, Canada, November 2018.
8. **Gallardo-Lacourt, B.**, D. M. Gillies, E. L. Spanswick, E. Roy, E. Donovan, D. Guo, and A. Ridley, *Polar Cap Boundary Identification Using Redline Imaging Data*, Smile Workshop, Banff, AB, Canada, November 2018.
9. **Gallardo-Lacourt, B.**, Y. Nishimura, E. Donovan, L. Lyons, D. M. Gillies, W. E. Archer, G. W. Perry, E. L. Spanswick, J. M. Ruohoniemi, *Mesoscale Structures in the Auroral and Subauroral Regions*, International Space Science Institute (ISSI) Workshop, Bern, Switzerland, August 2018.
10. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick, *STEVE, the mysterious subauroral feature*, Canadian Association of Physicists, Halifax, NS, June 2018
11. **Gallardo-Lacourt B.**, Y. Nishimura, E. Donovan, L. Lyons, G. Perry, W. Archer, J. Liang, D. M. Gillies, E. Spanswick, and J. M. Ruohoniemi, *Properties of Mesoscale Structures in the Auroral and Subauroral regions*, International Space Science Institute (ISSI) Workshop, Bern, Switzerland, August 2018
12. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick, *STEVE, the mysterious subauroral feature*, Canadian Association of Physicists, Halifax, NS, June 2018
13. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick, *The knowns and unknowns of STEVE*, CONNEX workshop, Banff, AB, May 2018
14. **Gallardo-Lacourt B.**, Y. Nishimura, L. Lyons, E. Donovan, J. M. Ruohoniemi, G. W. Perry, W. E. Archer, J. Liang, D. M. Gillies, E. Spanswick, E. MacDonald, and D Knudsen, *An analysis of optical structures: From the Polar Cap Boundary to the Subauroral Region*, NASA Teleconference, Greenbelt, MD, March 2018
15. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick, *A new subauroral phenomenon called STEVE*, The Magnetosphere: New Tools, New Thinking, New Results, Puerto Varas, Chile, November 2017
16. **Gallardo-Lacourt, B.**, W. A. Archer, and J. Brown, *Effective Presentations: Communicating efficiently with your scientific peers*, CEDAR Workshop, [Invited Tutorial](#), Keystone, CO, June 2017
17. **Gallardo-Lacourt B.**, *Ionospheric Geography: Coupling, Energetics and Dynamics of Atmospheric Regions*, GEM-CEDAR workshop, [Invited tutorial](#), Santa Fe, NM, June 2016
18. **Gallardo-Lacourt B.**, Y. Nishimura, L. Lyons, Y. Zou, V. Angelopoulos, E. Donovan, K. McWilliams, J. M. Rouhoniemi, and N. Nishitani, *SuperDARN observations of structured flows associated with substorm onset beads*, Mechanics of the Magnetospheric System and effects in the Polar Regions, Patagonia, Chile, Noviembre 2013

Outreach presentations

1. **Gallardo-Lacourt, B.**, Y. Collado-Vega, and M.-J. Viñas, Live Coverage of the South American Eclipse, December 14, 2020
2. **Gallardo-Lacourt, B.**, Basic concepts of Space Physics and the Aurora, Primary School Science Fair, Chile, November 2020
3. **Gallardo-Lacourt, B.**, The Aurora, Five-minutes thesis webinar on Space Weather, NOAA Space Weather Prediction Center, August 2020

Selected Recent Presentations

1. **Gallardo-Lacourt, B.**, J. Liang, Y. Nishimura, E. F. Donovan, D. M. Gillies, G. W. Perry, W. E. Archer, O. A. Nava, and E. L. Spanswick, On the Origin and geomagnetic conditions of STEVE's formation, AGU Fall Meeting, Washington D.C., December 2018.
2. **Gallardo-Lacourt B.**, E. Spanswick, D. M. Gillies, E. Roy, G. Guo, E. Donovan, and A. Ridley, *Automatic Polar Cap Boundary identification using redline all-sky imagers*, CEDAR Workshop, Santa Fe, NM, June 2018
3. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, and E. Spanswick, O. Nava, and B. Kosar, *STEVE: An optical structure in the subauroral region*, CEDAR Workshop, Santa Fe, NM, June 2018
4. **Gallardo-Lacourt B.**, E. Spanswick, D. M. Gillies, E. Roy, G. Guo, E. Donovan, and A. Ridley, *Polar Cap Boundary identification using redline all-sky imagers*, GEM Workshop, Santa Fe, NM, June 2018
5. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, E. Spanswick, O. Nava, and B. Kosar, *STEVE: An optical structure in the subauroral region. Location and Geomagnetic conditions during its formation*, GEM Workshop, Santa Fe, NM, June 2018
6. **Gallardo-Lacourt B.**, E. Donovan, Y. Nishimura, G. Perry, W. Archer, J. Liang, D. M. Gillies, E. Spanswick, *On the location of STEVE, the mysterious Subauroral feature*, AGU Fall Meeting, New Orleans, LA, December 2017
7. **Gallardo-Lacourt, B.**, E. Donovan, Y. Nishimura, E. MacDonald, M. Gillies, E. Spanswick, E. Mishin, and M. Ruohoniemi, *Steve: A new Subauroral Phenomenon*, CEDAR Workshop, Kesytone, CO, June 2017
8. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, E. V. Mishin, V. Angelopoulos, E. Donovan, J. M. Ruohoniemi, and N. Nishitani, *What magnetic conditions determine the latitudinal extent of SAPS/SAID subauroral flow enhancements*, AGU Fall Meeting, San Francisco, CA, December 2016
9. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, E. V. Mishin, V. Angelopoulos, E. Donovan, J. M. Ruohoniemi, and N. Nishitani, *Influence of auroral streamers on the rapid evolution of SAPS flows*, Gem Workshop, Santa Fe, NM, June 2016
10. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, E. V. Mishin, V. Angelopoulos, E. Donovan, J. M. Ruohoniemi, and N. Nishitani, *Analysis of campaign events: SAPS flow enhancements due to auroral streamers*, GEM Workshop, Santa Fe, NM, June 2016
11. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, E. V. Mishin, J. M. Ruohoniemi, E. Donovan, V. Angelopoulos, and N. Nishitani, *Influence of auroral streamers on rapid evolution of SAPS flows*, AGU Chapman Conference on Currents and Geospace and Beyond, Dubrovnik, Croatia, May 2016
12. **Gallardo-Lacourt, B.**, Y. Nishimura, L. R. Lyons, E. V. Mishin, J. M. Ruohoniemi, E. Donovan, V. Angelopoulos, and N. Nishitani, *Influence of auroral streamers on rapid evolution of SAPS flows*, AGU Fall Meeting, San Francisco, CA, December 2015

13. **Gallardo-Lacourt, B.**, Student tutorial: *Testing proposed links between mesoscale auroral and polar cap dynamics and substorms*, GEM Workshop - Student day, Snowmass, CO, June 2015
14. **Gallardo-Lacourt B.**, Nishimura T., Lyons L., Angelopoulos V., Donovan E., J. M. Ruohoniemi, Nishitani N., *Influence of auroral streamers on rapid evolution of SAPS flows*, AGU Fall Meeting, San Francisco, CA, December 2014
15. **Gallardo-Lacourt B.**, Nishimura T., Lyons L., Angelopoulos V., Donovan E., McWilliams K., J. M. Ruohoniemi, Nishitani N., *Ionospheric Flow structures associated with auroral beading at the substorm auroral onset*, The 12th. International Conference on Substorms (ICS-12), Ise, Japan, November 2014
16. **Gallardo-Lacourt B.**, Nishimura T., Lyons L., Angelopoulos V., Donovan E., J. M. Ruohoniemi, Nishitani N., *Evaluation of Large and variable ionospheric flows associated with substorm auroral onset*, presented at NSF Geospace Environment Modeling (GEM) Workshop Portsmouth, VA, June 2014