

Victor A. Pinto

Ph.D. (c) Atmospheric and Oceanic Sciences

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Education

University of California, Los Angeles **2019**

Ph.D. Atmospheric and Oceanic Sciences

Co-advisor: Dr. Larry Lyons. *Co-advisor:* Dr. Jacob Bortnik

Title: Influence of the solar wind in the dynamics of relativistic electrons on the Earth's radiation belts

University of California, Los Angeles **2014**

M.S. Atmospheric and Oceanic Sciences

Universidad de Chile, Santiago, Chile **2011**

M.S. Physics (Summa Cum Laude)

Advisor: Dr. Alejandro Valdivia. *Co-advisor:* Dr. Marina Stepanova

Title: Studies of the turbulence in the Earth's magnetosphere using data from SAMBA and THEMIS

Universidad de Chile, Santiago, Chile **2006**

B.S. Physics (Cum Laude)

Research Experience

Postdoctoral Research Associate **January 2019 – present**

Institute for the Study of the Earth, Oceans and Space – Space Science Center

University of New Hampshire, Durham, NH

Part of the project NSF-EPSCoR "*Harnessing Big Data to Improve Understanding and Predictions of Geomagnetically Induced Currents*". Main objective is to introduce Machine Learning techniques to improve data-driven models of GIC forecasting.

Graduate Student Researcher (50% time appointment) **2017 – 2019**

Department of Atmospheric and Oceanic Sciences, UCLA

Studied the effects of several solar wind parameters on the occurrence of relativistic electron in the Earth's radiation belt. Developed a simple forecasting model of MeV electrons at geostationary orbit. Studied the occurrence, formation and decay of transient three-belt configurations and remnant belts.

Visiting Researcher **Summer 2016**

NASA Goddard Space Flight Center, Greenbelt, MD

Developed code to process and analyze data from Van Allen Probes and GOES satellites for studies of the evolution of multi-MeV radiation belt electrons during geomagnetic storm.

Chilean Scientific Antarctic Expedition 47 **February 2011**

Coordinated the logistics between the Chilean Antarctic Institute and UCLA to replace and maintain magnetometers located in two Chilean Antarctic bases. Led the field team that replaced and calibrated the instruments.

Publications

1. **Pinto, V. A.**, Mourenas, D., Bortnik, J., Zhang, X.-J., Artemyev, A. V., Moya, P. S., & Lyons, L. R.. (2019), Decay of ultrarelativistic remnant belt electrons through scattering by plasmaspheric hiss. *Journal of Geophysical Research: Space Physics*, 124. <https://doi.org/10.1029/2019JA026509>
2. Gabrielse, C., **Pinto, V. A.**, 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>
3. Stepanova, M., Antonova, E. E., Moya, P. S., **Pinto, V. A.**, & Valdivia, J. A. (2019). Multisatellite analysis of plasma pressure in the inner magnetosphere during the 1 June 2013 geomagnetic storm. *Journal of Geophysical Research: Space Physics*, 124, 1187–1202. <https://doi.org/10.1029/2018JA025965>
4. **Pinto, V. A.**, Bortnik, J., Moya, P. S., Lyons, L. R., Sibeck, D. G., Kanekal, S. G., et al. (2018). Characteristics, occurrence, and decay rates of remnant belts associated with three-belt events in the Earth's radiation belts. *Geophysical Research Letters*, 45, 12,099–12,107. <https://doi.org/10.1029/2018GL080274>
5. Antonova, E. E., Stepanova, M. V., Moya, P. S., **Pinto, V. A.**, Vovchenko, V. V., Ovchinnikov, I. L., & Sotnikov, N. V. (2018). Processes in auroral oval and outer electron radiation belt. *Earth, Planets and Space*, 70(1), 127. <https://doi.org/10.1186/s40623-018-0898-1>
6. **Pinto, V. A.**, Kim, H.-J., Lyons, L. R., & Bortnik, J. (2018). Interplanetary parameters leading to relativistic electron enhancement and persistent depletion events at geosynchronous orbit and potential for prediction. *Journal of Geophysical Research: Space Physics*, 123, 1134–1145. <https://doi.org/10.1002/2017JA024902>
7. Farías, C., **Pinto, V. A.**, & Moya, P. S. (2017). What is the temperature of a moving body? *Scientific Reports*, 7(1), 17657. <https://doi.org/10.1038/s41598-017-17526-4>
8. Moya, P. S., **Pinto, V. A.**, Sibeck, D. G., Kanekal, S. G., & Baker, D. N. (2017). On the effect of geomagnetic storms on relativistic electrons in the outer radiation belt: Van Allen Probes observations. *Journal of Geophysical Research: Space Physics*, 122, 11,100–11,108. <https://doi.org/10.1002/2017JA024735>
9. Kim, H.-J., Lyons, L., **Pinto, V. A.**, Wang, C.-P., and Kim, K.-C. (2015), Revisit of relationship between geosynchronous relativistic electron enhancements and magnetic storms, *Geophys. Res. Lett.*, 42, 6155–6161, doi:10.1002/2015GL065192.
10. Moya, P. S., **Pinto, V. A.**, Viñas, A. F., Sibeck, D. G., Kurth, W. S., Hospodarsky, G. B., and Wygant, J. R. (2015), Weak kinetic Alfvén waves turbulence during the 14 November 2012 geomagnetic storm: Van Allen Probes observations, *J. Geophys. Res. Space Physics*, 120, 5504–5523, <https://doi.org/10.1002/2014JA020281>.
11. **Pinto, V. A.**, Stepanova, M., Antonova, E. E., & Valdivia, J. A. (2011). Estimation of the eddy-diffusion coefficients in the plasma sheet using THEMIS satellite data. *Journal of Atmospheric and Solar-Terrestrial Physics*, 73(11–12), 1472–1477. <https://doi.org/10.1016/j.jastp.2011.05.007>
12. Stepanova, M., **Pinto, V. A.**, Valdivia, J. A., and Antonova, E. E. (2011), Spatial distribution of the eddy diffusion coefficients in the plasma sheet during quiet time and substorms from THEMIS satellite data, *J. Geophys. Res.*, 116, A00I24, doi:10.1029/2010JA015887.

Conference papers, Pre-prints.

1. Antonova, E. E., Vorobjev, V. G., Riazantseva, M. O., Kirpichev, P., Yagodkina, O. I., Ovchinnikov, I. L., Vovchenko, V. V., Pulnits, M. S., Znatkova, S. S., Demianov, A. I., Sotnikov, N. A., Stepanova, M. V., Moya,

- P. S., **Pinto, V. A.** (2017). Auroral oval and outer electron radiation belt, Physics of Auroral Phenomena, Proc. XL Annual Seminar, Apatity, pp. 6-10.
2. C. A. Farías, P. S. Moya, and **V. A. Pinto** (2008), On the Relationship between Thermodynamics and Special Relativity, arXiv:0712.3793
 3. Silva, P., Farías, C., L'Huissier, P., **Pinto, V. A.**, Zambra, M., & Soto, L. (2008). Hard X-ray measurement from a plasma focus of low energy. Journal of Physics: Conference Series, 134, 012045. <https://doi.org/10.1088/1742-6596/134/1/012045>

Conference presentations, invited talks (selected)

1. **Pinto, V. A.**, Solar wind and magnetospheric parameters driving relativistic electron dynamics on the Earth's Radiation Belts. UCLA EPSS Department Space Physics Seminar, February 2019, Los Angeles, CA (**invited**)
2. **Pinto, V. A.**, et. al. Spatial characterization of relativistic electron enhancements in the Earth's outer radiation belt during the Van Allen Probes era. AGU Fall Meeting, December 2018, Washington, DC (**invited**)
3. **Pinto, V. A.**, et. al. Characteristics, occurrence, and decay rates of remnant belts associated with three-belt events in the Earth's radiation belts. AGU Fall Meeting, December 2018, Washington, DC (poster)
4. **Pinto, V. A.** Influence of the solar wind in the dynamics of relativistic electrons on the Earth's radiation belts. UCLA Atmospheric and Oceanic Sciences Department 270 Seminar, October 2018, Los Angeles, CA (**seminar**)
5. **Pinto, V. A.** Dinámica de electrones relativistas en los anillos de radiación de Van Allen. Departamento de Física, Facultad de Ciencias, Universidad de Chile. August 2018, Santiago, Chile (**invited**)
6. **Pinto, V. A.**, et. al. Solar wind influence in the occurrence of relativistic electron enhancement events in the Earth's radiation. GEM Summer Workshop, June 2018, Santa Fe, NM (poster)
7. **Pinto, V. A.**, et. al. Spatial characterization of relativistic electron enhancements in the Earth's outer radiation belt. AGU Fall Meeting, December 2017, New Orleans, LA (**OSPA award**)
8. **Pinto, V. A.**, et. al. Monitoring relativistic electron enhancements in the Earth's outer radiation belt. The Magnetosphere: New Tools, New Thinking, New Results, November 2017, Puerto Varas, Chile
9. **Pinto, V. A.** Relativistic electrons in the Earth's Radiation Belts: from concepts to science. UCLA Career Center Jumpstart your career in Physics, February 2017, Los Angeles, CA (**invited**)
10. **Pinto, V. A.**, et. al. Spatial and temporal characterization of relativistic electron enhancements during the Van Allen Probes era. AGU Fall Meeting, December 2016, San Francisco, CA (poster)
11. **Pinto, V. A.** Electrones relativistas en los anillos de radiación: conceptos e impactos. Departamento de Física, Facultad de Ciencias, Universidad de Chile. November 2016, Santiago, Chile (**invited**)
12. **Pinto, V. A.**, et. al. Dynamics of Relativistic Electrons for Van Allen Probes and GOES satellites. GEM Summer Workshop, June 2016, Santa Fe, NM (poster)
13. **Pinto, V. A.**, et. al. Relativistic Electron Enhancement and Dropout Events at GEO Orbit associated to CME and CIR driven storms. GEM Summer Workshop, June 2015, Aspen, CO (poster)
14. **Pinto, V. A.**, et. al. Relevance of solar wind parameters in the occurrence of relativistic electron events at geostationary orbit. AGU Fall Meeting, December 2014, San Francisco, CA (poster)
15. **Pinto, V. A.**, et. al. Relevance of solar wind parameters in the occurrence of relativistic electron event at geosynchronous orbit. GEM Summer Workshop, June 2014, Portsmouth, VA (poster)

Awards, Fellowships and Grants

- Outstanding Student Paper Award**, American Geophysical Union Fall Meeting 2017 2018
Awarded to 5% of top evaluated students at AGU Fall Meeting for poster presentation "Spatial characterization of relativistic electron events in the Earth's outer radiation belt".
- Top 100 Physics paper in 2017**, Scientific Reports Journal 2018
Awarded to top 100 most read paper out of 3000 published in that year, for paper "What is the temperature of a moving body?"
- UCLA/Salesforce Data Science Challenge 2017 (3rd place)**, UCLA 2017
Team competition to predict and improve graduation rates of vulnerable students in charter schools of Boston using machine learning tools.
- Becas Chile Fellowship Program for Graduate Studies abroad**, Chilean Government. 2011
Full tuition and yearly stipend to pursue Ph.D. studies in a foreign country.
- Thesis support in Antarctic topics grant**, Chilean Antarctic Institute 2009
Awarded to top two proposals every year. Grant offered funding for travel to international conferences and a fully funded trip to develop projects at the Antarctic Peninsula.

Teaching Experience

- Teaching Fellow, (former Associate, Assistant) 2015 – 2019**
Department of Atmospheric and Oceanic Sciences, UCLA
- Led discussion sessions for lower and upper division courses, ranging in size from 30 to 270 students, during 11 academic quarters supporting 6 different faculty members from the AOS department
 - Facilitated weekly discussion sessions, complementing class material and/or assisting with homework. Developed and revised class material, homework assignments and exams
 - Hosted weekly office hours, proctored exams, graded exams and homework assignments
 - **List of Courses:** Climate Change: from puzzles to policy, Introduction to the Atmospheric Environment, Fundamentals of Air and Water Pollution, Climate Change and Climate Modeling, Introduction to Atmospheric Chemistry and Air Pollution
- Assistant Professor, Department of Physics, Mathematics and Statistics 2010 – 2011**
Universidad Catolica del Maule, Talca, Chile
- Taught classes at the undergrad level for physics, engineering and high school teachers. Developed and revised class material, homework assignments and exams. Supervised teaching assistants
 - Led the curricular revision committee, tasked with re-design and modernization of several outdated courses. Results included the expansion of key topics generally ignored (electromagnetism, optics)
 - Obtained top researcher award university wide in 2011
 - **List of Courses:** Introduction to Geophysics, Thermodynamics and fluid dynamics, Mechanics for Engineers, Introduction to Physical Sciences, Introduction to Programming in Python
- Lecturer (part-time), Department of Engineering 2010 – 2011**
Universidad de Valparaiso, Santiago, Chile
- Taught theoretical classes and laboratories for students in diverse engineering majors

- Led the committee in charge of the implementation of the physics lab
- **List of Courses:** Electromagnetism, Optics and Waves, Mechanics

High School Physics Teacher

2009

Liceo Experimental Manuel de Salas, Santiago, Chile

- Taught courses for students in 9th and 10th grade (1st and 2nd grade of high school)
- Prepared class material, evaluation content and laboratory material

Teaching Assistant, Department of Physics

2005 – 2008

Universidad de Chile, Santiago, Chile

- Led discussion sessions for students in the physics department and for students in life sciences, ranging in size from 15 to 90 students
- **List of Courses:** Electromagnetism, Mechanics, Mathematical Methods for Physicist, Electrodynamics, Introduction to Programming, Experimental Physics

Relevant Skills and Abilities

- **Programming:** Science oriented programming and scripting. Languages include: Python (SciPy, Pandas, Numpy, Matplotlib, scikit-learn, SpacePy) IDL, Matlab, Bash, \LaTeX , HTML
- **Space physics oriented missions:** THEMIS (including SPEDAS), Van Allen Probes (MagEIS, REPT, EM-FISIS, EFW), GOES (particles and fields), OMNI. Some experience with Ground-based Magnetometers (SAMBA, MACCS, THEMIS GBO, CARISMA) and SuperDARN
- **Communication:** Public speaking, presentations and posters. Scientific writing and publishing
- **Miscellaneous:** Linux operating systems, Inkscape, LimeSurvey survey manager, Office Suite
- **Spoken Languages:** English, Spanish (Native)

Leadership and Service

UCLA AOS Graduate Students Association

September 2012 - June 2017

President (2016 - 2017) and Webmaster (2012 - 2016).

UCLA Dashew Center for International Students and Scholars

September 2016 - June 2017

International Ambassador for graduate students of Chile, Argentina, Ecuador, Peru, and Uruguay.

UCLA Math, Physics and Sciences Council

September 2015 - June 2017

Board member and representative to the UCLA Graduate Student Association

National Association of Graduate Students (Chile)

June 2009 - Present

Founder Member of the association, election official