

Fernando S. Paolo

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Work Experience: I use very-precise satellite measurements (altimetry and imagery) to detect changes in the Earth's cryosphere (frozen Earth), and investigate the large-scale oceanic and atmospheric processes causing ice-sheet mass loss and consequent sea-level change. I leverage the power of computers and statistics to integrate and analyze large quantities of remote sensing data.

Professional Preparation

- 2017– **Postdoctoral Scholar**
NASA Jet Propulsion Laboratory, California Institute of Technology
- 2015 **Ph.D. in Earth Sciences (Geophysics)**
Scripps Institution of Oceanography, University of California, San Diego
- 2009 **M.S. in Geophysics** (w/honors)
University of São Paulo, Brazil
- 2007 **B.S. in Oceanography**, Marine Geophysics emphasis (w/honors)
University of São Paulo, Brazil

Appointments

- 4/17– Postdoc Researcher @ Jet Propulsion Laboratory/Caltech
- 9/15–3/17 Postdoc Researcher @ Scripps Oceanography/UC San Diego
- 9/09–9/15 Graduate Researcher (NASA ESS Fellow) @ Scripps Oceanography/UC San Diego
- 3/07–7/09 Graduate Researcher & Teaching Assistant (CNPq Fellow) @ University of São Paulo

Honors & Awards

- 2015 NASA Most Valuable Player Award for 2015, Cryospheric Sciences, *for my PhD work on change detection and analysis of Antarctic ice shelves using satellite altimetry*
- 2014 AGU Outstanding Student Paper Award, *for best presentation in the Cryosphere session of the American Geophysical Union*
- 2013–2015 NASA Earth and Space Science Fellowship (3 years), *for estimating long-term changes and variability in Antarctic ice shelves using multiple satellite radar altimeters*
- 2011 AAAS First Place Award for Excellence, *for best presentation in the Atmospheric & Oceanographic Science session of the American Association for the Advancement of Science*
- 2010 AGU Outstanding Student Paper Award, *for best presentation in the Cryosphere session of the American Geophysical Union*
- 2010 USP Honorable Mention, Best Geophysics M.S. Thesis of 2009, *for estimating the marine gravity field using heterogeneous geodetic data, University of São Paulo*
- 2008 Brazilian Ministry of Education Fellowship (1 year), *for training teaching Earth Sciences at undergraduate level at the University of São Paulo*

- 2007–2008 Brazilian Ministry of Sci. & Tech. Fellowship (2 years), *for deriving the marine gravity field using satellite altimetry and shipborne measurements*
- 2007 USP Honorable Mention, 2nd Best Oceanography B.S. Thesis of 2006, *for studying the dynamics of an estuary system using geophysical methods, University of São Paulo*
- 2005–2006 São Paulo Research Foundation Fellowship (2 years), *for studying the sediment transport of an estuary system using side-scan sonar, seismic reflection and GPS*
- 2004 Brazilian Ministry of Sci. & Tech. Fellowship (1 year), *for studying hydrocarbon concentrations in water and sediment from King George Island in Antarctica*

Teaching Experience

- 2008 Computing for Geophysicists, *Teaching Assistant at Univ. of São Paulo Aug–Dec*
- 2008 Introduction to Geophysics, *Teaching Assistant at Univ. of São Paulo, Mar–Jul*

Fieldwork Experience

- 2012, 2013 Structural Geology, Death Valley National Park/CA (6 days), Feb, Mar
- 2010–2014 Geology & Geomorphology, Anza Borrego State Park/CA, multiple trips (>15 days)
- 2004 Geophysical and Geological Survey, NE Brazilian coast (12 days at sea), Dec
- 2004 Brazilian Antarctic Research Station, Antarctica (30 days), Jan
- 2003 Environmental Monitoring Program, NE Brazilian coast (14 days at sea), Dec
- 2003 Oceanographic Moorings II, SE Brazilian coast (8 days at sea), Jan
- 2002 Oceanographic Moorings I, SE Brazilian coast (9 days at sea), Jul

Publications

a. Journal articles

- in prep. –Minchew B.M., G.H. Gudmundsson, A.S. Gardner, **F.S. Paolo**, H.A. Fricker, Response of glaciers to ice-shelf thinning along the Bellingshausen Sea, West Antarctica, *to be submitted*.
- Paolo F.S.**, L. Padman, H.A. Fricker, Rapid response of West Antarctic ice shelves to interannual climate variability, *to be submitted*.
- Gudmundsson G.H., **F.S. Paolo**, H.A. Fricker, Widespread and rapid changes in flow of the Antarctic ice sheet in response to thinning ice shelves, *to be submitted*.
- 2017 –Sun X., J.B. Abshire., A.A. Borsa, H.A. Fricker., D. Yi, J.P. DiMarzio, **F.P. Paolo**, K.M. Brunt, D.J. Harding, G.A. Neumann, ICESat/GLAS Altimetry Measurements: Received Signal Dynamic Range and Saturation Correction, *IEEE Transactions on Geoscience and Remote Sensing* (in press).
- Roberts J., B.K. Galton-fenzi, **F.S. Paolo**, C. Donnelly, D.E. Gwyther, L. Padman, D. Young, R. Warner, J. Greenbaum, H.A. Fricker, A.J. Payne, S. Cornford, A.L. Brocq, T.V. Ommen, D. Blankenship, M. Siegert, Ocean forced variability of Totten Glacier mass loss, *Geological Society of London, Special Publication* (in press).
- 2016 –**Paolo F.S.**, H.A. Fricker, L. Padman, Constructing improved decadal records of Antarctic ice-shelf height change from multiple satellite radar altimeters, *Remote Sensing of Environment*, vol.177, pp.192-205 (2016).[\[DOI\]](#)

- 2015 –Holland P.R., A. Brisbourne, H.F.J. Corr, D. McGrath, K. Purdon, J. Paden, H.A. Fricker, **F.S. Paolo**, A. Fleming, Oceanic and atmospheric forcing of Larsen C Ice-Shelf thinning, *The Cryosphere*, vol.9, pp.1005-1024 (2015).[\[DOI\]](#)
- Paolo F.S.**, H.A. Fricker, L. Padman, Volume loss from Antarctic ice shelves is accelerating, *Science*, vol.348, pp.327-331 (2015).[\[DOI\]](#)
- 2010 –**Paolo F.S.**, E.C. Molina, Integrated marine gravity field along the Brazilian coast from altimeter-derived sea-surface gradient and shipborne gravity, *Journal of Geodynamics*, vol.50, pp.347–354 (2010).[\[DOI\]](#)
- 2009 –Bícego M.C., E. Zanardi-Lamardo, S. Taniguchi, C.C. Martins, D.A.M. da Silva, S.T. Sasaki, A.C.R. Albergaria-Barbosa, **F.S. Paolo**, R.R. Weber, R.C. Montone, Results from a 15-year study on hydrocarbon concentrations in water and sediment from Admiralty Bay, King George Island, Antarctica, *Antarctic Science*, vol.21, pp.209-220 (2009).[\[DOI\]](#)
- 2008 –**Paolo F.S.**, M.M. Mahiques, Utilização de métodos acústicos em estudos de dinâmica costeira: Exemplo na desembocadura lagunar de Cananéia [Utilization of acoustic methods in coastal dynamics studies: Example in the Cananéia lagoonal mouth], *Brazilian Journal of Geophysics*, vol.26, pp.211-225 (2008).[\[DOI\]](#)

b. General-audience articles

- Padman L., **F.S. Paolo**, H.A. Fricker, Shrinking of Antarctic ice shelves is accelerating, *The Conversation* (2015).
- Padman L., **F.S. Paolo**, H.A. Fricker, Confused about ice shelf decay and sea ice increase?, *Scripps Institution of Oceanography* (2015).
- Paolo F.S.**, E.C. Molina, Será que todo o gelo da Antártica pode derreter? [Does all the ice of Antarctica could melt?], *Ciencia Hoje* (2015).

c. Theses

- Paolo F.S.** (2015), *Interannual and decadal variations of ice shelves using multi-mission satellite radar altimetry, and links with oceanic and atmospheric forcings*, PhD Dissertation, University of California, ProQuest Dissertations Publishing, 127 pages.[\[PDF\]](#)
- Paolo F.S.** (2009), *Altimetria por satélite e gravimetria marinha na representação integrada do campo de gravidade na região costeira do Brasil [Satellite altimetry and marine gravimetry on the integrated representation of the gravity field along the Brazilian coast]*, M.S. Thesis, University of São Paulo, 73 pages [in Portuguese].[\[PDF\]](#)
- Paolo F.S.** (2007), *Estudo da morfodinâmica de fundo do Estuário de Cananéia através de métodos geofísicos [Study of bottom morphodynamics of the Cananéi Estuary through geophysical methods]*, B.S. Thesis, University of São Paulo, 61 pages [in Portuguese].

d. Data sets

- Paolo F.S.**, H.A. Fricker, L. Padman, Antarctic ice-shelf height-change rate and height-change time series gridded products, *NASA Earth Observing System Data and Information System (EOSDIS)* <https://earthdata.nasa.gov>
- Moholdt G., H.A. Fricker, L. Padman, **F.S. Paolo**, Synthesized grounding line and ice shelf mask for Antarctica, *Scripps Institution of Oceanography, UCSD*, 25 pp. (2013).[\[DOI\]](#) [\[PDF\]](#)

Additional Training & Certifications

- 2016 **Data Science at Scale Specialization**
University of Washington, online course 4-month duration, 2016
- 2013–2014 **Public Speaking & Professional Communication**
UC San Diego Extension & Toastmasters International, 2013–2014
- 2011 **Cyberinfrastructure Summer Institute: Big Data and Big Computing**
San Diego Supercomputer Center, California, Aug 2011
- 2011 **Karthaus Summer School on Ice Sheets and Glaciers in the Climate System**
Utrecht University, based in South Tyrol/Italy, Aug 2011
- 2011 **Remote Sensing for Polar Scientists Summer School**
University of Reading, UK, Jul 2011
- 2003 **Pre-Antarctic training for the Brazilian Antarctic Program**
Brazilian Navy, Rio de Janeiro, Dec 2003

Other Skills & Qualifications

Programming

Python (using since 2005), C/C++, Fortran 90/95, JavaScript, R, Matlab, Shell Script, SQL, HTML, CSS, JSON, YAML, \LaTeX , Git (see my [GitHub](#))

Development

[CAP-toolbox](#) – NASA’s JPL Cryosphere Altimetry Processing Toolbox
[AltimPy](#) – Set of tools for processing satellite altimetry data (Python library)
[Makesite](#) – Extremely simple static site generator
[MPISubmit](#) – Simple data parallelization using MPI
[Xgrid.py](#) – Generate and submit batch files for Apple’s Xgrid computing

Languages

English (professional proficiency)
Portuguese (native speaker)
Spanish (native speaker)

Professional Service

Reviewer for: Geophysical Research Letters | Marine Geodesy | Journal of Glaciology | The Cryosphere | NASA High Mountain Asia Panel (Washington DC, Jul 2016) | National Science Foundation’s Polar Programs | UK Parliament POSTnote “Understanding Rising Sea Levels”.

(Co-)Organizer: International Glaciological Society Symposium Jul/2016, La Jolla/CA | Earth Section Seminar Series (2012) & Geophysics Seminar Series (2011), Scripps Oceanography | 1st Brazilian Oceanography Symposium, São Paulo, Aug/2002.

Webmaster for: [IGS Symposium 2011](#) | [Scripps Glaciology Group](#).

Affiliations: [American Geophysical Union](#) (AGU) | [European Geosciences Union](#) (EGU).

Conference Presentations (First author only)

- 2016 Paolo et al. (Dec 2016), *Rapid response of West Antarctic ice shelves to El Niño and La Niña*, AGU Fall Meeting 2016, San Francisco/California
- Paolo et al. (Oct 2016), *Response of West Antarctic ice shelves to El Niño and La Niña (a.k.a. interannual variability)*, WAIS Meeting, Sterling/Virginia (**invited**)
- Paolo et al. (Sep 2016), *Rapid response of West Antarctic ice shelves to El Niño and La Niña*, NASA Jet Propulsion Laboratory, Pasadena/California (**invited**)
- Paolo et al. (2016), *Response of Amundsen Sea ice-shelf thickness to El Niño-Southern Oscillation variability*, IGS Meeting, La Jolla/California
- Paolo et al. (2016), *18 years of satellite altimetry over Antarctic ice shelves: What have we learned?*, ISSM Workshop, La Jolla/California (**invited**)
- Paolo et al. (2016), *Ice-shelf height variability in Amundsen Sea linked to ENSO*, EGU General Assembly, Vienna/Austria
- 2015 Paolo et al. (2015), *Interannual Variability in Amundsen Sea Ice-Shelf Height Change Linked to ENSO*, AGU Fall Meeting 2015, San Francisco/California
- 2014 Paolo et al. (2014), *Complex Antarctic ice-shelf height changes revealed by eighteen years of satellite radar altimetry*, AGU Fall Meeting 2014, San Francisco/California (**award**)
- Paolo et al. (2014), *Eighteen years of height and mass changes in West Antarctic Ice Shelves*, WAIS Meeting 2014, Julian/California
- Paolo et al. (2014), *Monitoring Antarctic ice loss from space*, Scripps Student Symposium, La Jolla/California
- 2013 Paolo et al. (2013), *Ice-shelf elevation change from satellite radar altimetry: What are the uncertainties?*, AGU Fall Meeting 2013, San Francisco/California
- 2012 Paolo et al. (2012), *Spatio-temporal variability of Antarctic ice shelf elevations from multi-mission satellite altimetry*, AGU Fall Meeting 2012, San Francisco/California
- Paolo et al. (2012), *Interannual-to-decadal variability of Antarctic ice-shelf elevations from multi-mission satellite radar altimetry*, ESRIN Conference 2012, Rome/Italy
- Paolo et al. (2012), *Variability of Antarctic ice shelf elevations from multi-mission satellite radar altimetry*, SCAR 2012, Portland/Oregon
- Paolo et al. (2012), *Interannual and decadal variability of Antarctic ice-shelf elevations from multi-mission satellite radar altimetry*, 20YPRA Symposium 2012, Venice/Italy
- 2011 Paolo et al. (2011), *Lon-term elevation changes on Antarctic ice shelves from multi-mission satellite RA*, AGU Fall Meeting 2011, San Francisco/California (**award**)
- Paolo et al. (2011), *Elevation changes on antarctic ice shelves*, AAAS Annual Meeting 2011, San Diego/California (**invited, award**)
- 2010 Paolo et al. (2010), *Three decades of change on Antarctica's major ice shelves from multi-mission satellite radar altimetry*, AGU Fall Meeting 2010, San Francisco/California
- 2007 Paolo et al. (2007), *Caracterização da morfodinâmica de fundo da Barra de Cananéia através de métodos geofísicos*, 14th Scientific Initiation Symposium of the University of São Paulo

Press (Complete list and access to articles at fspaolo.net/press)

Interviews given to: *Los Angeles Times, The Washington Post, Reuters, BBC News, The Wall Street Journal, The Guardian, The Weather Channel, The Carbon Brief, Science/AAAS News...*