Maria João Chinita

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RESEARCH INTERESTS

My research interests focus on atmospheric boundary layers and their modeling using a variety of models and observations to better understand the small-scale processes and turbulence structure, and thereby assist the development of parameterizations for convective and stable boundary layers in numerical weather prediction and climate models.

PROFESSIONAL EXPERIENCE

2020 — **University of California, Los Angeles JIFRESSE,** affiliated with and physically located at Jet Propulsion Laboratory, Pasadena, California
- Assistant Researcher Step I (May 2020 – June 2022)
- Assistant Researcher Step II — effective 1st July 2022

Currently, implementing an EDMF-type parameterization in the Department of Energy (DOE) climate model to improve the representation of shallow convection.

2019 — 2020 — **University of California, Los Angeles JIFRESSE,** affiliated with and physically located at Jet Propulsion Laboratory, Pasadena, California
- Postdoctoral scholar between May (2019) and May (2020)

Research in boundary layer processes from both weather and climate perspectives using model and remote sensing datasets.

2017 — 2018 — **University of Connecticut – Department of Mechanical Engineering,** Storrs, Connecticut
- Gratis affiliation as a research scientist

Research in strongly stable planetary boundary layers using large-eddy simulations.

Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California
- Participation in the JPL Visiting Student Researchers Program (JVSRP) between September (2017) and February (2018)

Research in strongly stable planetary boundary layers using large-eddy simulations.

2016	**Jet Propulsion Laboratory, California Institute of Technology**, Pasadena, California
	• Participation in the JPL Visiting Student Researchers Program (JVSRP) between February and December
	Research in turbulent flow decomposition to guide the development and evaluation of boundary layer convection parameterizations.
2015	**Jet Propulsion Laboratory, California Institute of Technology**, Pasadena, California
	• Participation in the JPL Visiting Student Researchers Program (JVSRP) between April and September
	Research in stable planetary boundary layers within the GABLS4 (GEWEX Atmospheric Boundary Layer Study) intercomparison study.
2012 — 2014	**Faculty of Sciences of the University of Lisbon**, Lisbon, Portugal
	• Research fellowship in IDL (an Associate Laboratory at the University of Lisbon) under the project SMOG – "Structure of Moist Convection in high-resolution GNSS observations and models" • WRF-ARW simulations
	Climatological study of mesoscale processes using WRF model data. *Numerical study of the physical structure of extreme mid-latitude cyclones using WRF model.* *Study of the relation between GPS tropospheric delay and water vapor content.*
2012	**Faculty of Sciences of the University of Lisbon**, Lisbon, Portugal
	• Assistant in theoretical-practical lessons of Meteorology

EDUCATION

2014 — 2018	**Faculty of Sciences of the University of Lisbon**, Lisbon, Portugal Ph.D. in Meteorology
	Thesis: *Dynamics of the moderately stable boundary layer.* (http://hdl.handle.net/10451/35919) Advisors: Pedro Miranda (IDL/University of Lisbon), Georgios Matheou (UConn), and João Teixeira (JPL/NASA).
2011 — 2013	**Faculty of Sciences of the University of Lisbon**, Lisbon, Portugal Master in Meteorology with 18/20 values.
	Thesis: *Study of the structure of the field of water vapour in severe storms in continental Portugal.* (Grade: 19 values in 20)
2008 — 2011	**Faculty of Sciences of the University of Lisbon, Lisbon, Portugal** Bachelor in Geophysical Sciences with 16/20 values.
	Final project: *Study of the geometry of the cost function in the context of data assimilation in chaotic systems.* (Grade: 19 values in 20)

AWARDS

Best Early-Career Scientist Poster at 3rd Decennial Workshop – Turbulence in Stably Stratified Planetary Boundary Layers, Delft (Netherlands), 2017.

PUBLICATIONS IN REFEREED JOURNALS

Witte M. K., A. Herrington, J. Teixeira, M. J. Kurowski, **M. J. Chinita**, R. L. Storer, K. Suselj, G. Matheou, and J. Bacmeister (2022): Augmenting the double-Gaussian representation of atmospheric turbulence and convection via a coupled stochastic multi-plume mass flux scheme. *Mon. Wea. Rev*. https://doi.org/10.1175/MWR-D-21-0215.1

Chinita, M. J., G. Matheou, P. Miranda, and J. Teixeira (2022): Large-eddy simulation of strongly stable boundary layers. Part I: Modeling methodology. *Q J R Meteorol Soc*, 1–19, https://doi.org/10.1002/qj.4279

Chinita, M. J., G. Matheou, P. Miranda, and J. Teixeira (2022): Large-eddy simulation of strongly stable boundary layers. Part II: Length scales and anisotropy in stratified atmospheric turbulence. *Q J R Meteorol Soc*, 1–16, https://doi.org/10.1002/qj.4280

Chinita, M. J., M. Richardson, J. Teixeira, and P. M. A. Miranda (2021): Global mean frequency increases of daily and sub-daily heavy precipitation in ERA5. *Environ. Res. Lett*., 16, https://doi.org/10.1088/1748-9326/ac0caa

Couvreux, F., E. Bazile, Q. Rodier, B. Maronga, G. Matheou, **M. J. Chinita**, J. Edwards, B. Van Stratum, C. van Heerwaarden, J. Huang, A. F. Moene, A. Cheng, V. Fuka, S. Basu, E. Bou-Zeid, G. Canut, and E. Vignon (2020): Intercomparison of Large-Eddy Simulations of the Antarctic boundary layer for Very Stable Stratification. *Boundary-Layer Meteorol*., 176, 369–400, https://doi.org/10.1007/s10546-020-00539-4.

Chinita, M. J., G. Matheou, and J. Teixeira, (2018): A joint probability density-based decomposition of turbulence in the atmospheric boundary layer. *Mon. Wea. Rev*., 146, 503-523, https://doi.org/10.1175/MWR-D-17-0166.1

Soares, P. M. M., R. M. Cardoso, A. Semedo, **M. J. Chinita** and R. Ranjha (2014): Climatology of Iberia Coastal Low-Level Wind Jet: WRF High Resolution Results. *Tellus A*, 66, 22377, https://doi.org/10.3402/tellusa.v66.22377

Benevides, P., J. Catalão, P. Miranda, and **M. J. Chinita** (2013): Analysis of the relation between GPS tropospheric delay and intense precipitation. *Proceedings of SPIE - The International Society for Optical Engineering*, https://doi.org/10.1117/12.2028732

PUBLICATIONS IN REVIEW

Chinita, M. J., M. Witte, M. J. Kurowski, J. Teixeira, G. Matheou, P. Bogenschutz (2022): Improving the representation of shallow cumulus convection with the Simplified Higher-Order Closure Mass-Flux (SHOC+MF v1.0) approach — *submitted to Geoscientific Model Development*

SELECTED ORAL COMMUNICATIONS

Chinita, M. J., M. Witte, M. Kurowski, J. Teixeira, K. Suselj, G. Matheou (2021): Improving Shallow Convection in the Simple Cloud-Resolving E3SM Atmosphere Model with the Stochastic Multi-Plume Mass-Flux Parameterization. *AGU Fall Meeting 2021*, New Orleans (USA).

Chinita, M. J., M. Richardson, J. Teixeira, and P. M. A. Miranda (2020 – 2021): Global mean frequency increases of daily and sub-daily heavy precipitation in ERA5.
- *AGU Fall Meeting 2020* (USA)
- *Center for Climate Sciences* (CCS), Jet Propulsion Laboratory, Los Angeles (USA)
- *IEEE MLA GRSS Chapter*, Los Angeles (USA)—Invited talk.

Chinita, M. J. and G. Matheou (2018): Large-eddy simulation of very stable boundary layers: Turbulence structure. *GABLS4 workshop 2018*, Toulouse (France).

Chinita, M. J. and G. Matheou (2017): Buoyancy-adjusted stretched-vortex model. *3rd Decennial Workshop – Turbulence in Stably Stratified Planetary Boundary Layers*, Delft (Netherlands).

SELECTED CONFERENCE POSTER COMMUNICATIONS

Witte, M., A. Herrington, J. Teixeira, M. Kurowski, **M. J. Chinita**, R. Storer, K. Suselj, G. Matheou, J. Bacmeister (2021): Augmenting the double-Gaussian representation of atmospheric turbulence and convection via a coupled stochastic multi-plume mass flux scheme. *AGU Fall Meeting 2021*, New Orleans (USA).

Herrington, A., M. Witte, J. Teixeira, J. Bacmeister, M. Kurowski, **M. J. Chinita**, R. Storer, K. Suselj, G. Matheou (2021): Improving on the representation of subtropical clouds in the Community Atmosphere Model using CLUBB+MF. *AGU Fall Meeting 2021*, New Orleans (USA).

Chinita, M. J. and G. Matheou (2017): Large-eddy simulation of the very stable boundary layer. *3rd Decennial Workshop – Turbulence in Stably Stratified Planetary Boundary Layers*, Delft (Netherlands).

Chinita, M. J. and G. Matheou (2016): Large-eddy simulation of the very stable boundary layer. *AGU Fall Meeting,* San Francisco (USA).

Soares, P. M. M., A. Semedo, R. M. Cardoso, **M. J. Chinita,** and R. Ranjha (2013): The Coastal Low-Level Jet off the West Coast of the Iberian Peninsula: Euro-Cordex simulation. *International Conference of Regional Climate* – CORDEX 2013, Brussels (Belgium).

Soares, P.M.M., A. Semedo, R. M. Cardoso, **M. J. Chinita,** and R. Ranjha (2013): A Coastal Low-Level Jet Feature off the West Costo of the Iberian Peninsula. *Annual Meeting of the European Geosciences Union* (EGU), Viena (Austria).