

Giuseppe Torri, Ph.D.

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RESEARCH SUMMARY

I am interested in Atmospheric Physics. My research focuses primarily on precipitating convection, which I study using the combination of Large Eddy Simulations/Cloud Resolving Models and a Lagrangian Particle Dispersion Model to obtain a process level understanding of the fundamental dynamics, and also using observational data from satellites and stable water isotopes in precipitation. I apply these tools to research topics such as downdraft and cold pool dynamics, and also to the study of severe and extreme weather events and how these will respond to climate change.

EDUCATION

- 2012 Ph.D.**, Theoretical Physics, Imperial College London
Thesis: “Counting gauge invariant operators in supersymmetric theories using Hilbert series”
Advisor: Prof. Amihay Hanany
- 2007 M.Sc.**, Theoretical Physics, Università degli Studi di Milano – Bicocca
Thesis: “Partition functions for the chiral ring of supersymmetric gauge theories”
Advisor: Prof. Alberto Zaffaroni
Final grade: 110/110 magna cum laude
- 2005 B.Sc.**, Physics, Università degli Studi di Milano – Bicocca
Final dissertation: “Representations of SU(3) and the quark model”
Advisor: Prof. Alberto Zaffaroni
Final grade: 110/110 magna cum laude

POSITIONS

- 2018-current** Assistant Professor, Dept. Atmospheric Sciences, U. of Hawai‘i at Mānoa
- 2015-2018** Research Associate, Earth & Planetary Sciences, Harvard University
- 2012-2015** Post-Doctoral Fellow, Earth & Planetary Sciences, Harvard University

Atmospheric Science

- Torri, G. (accepted pending revisions) – On the isotopic composition of cold pools in radiative-convective equilibrium, *J. Geophys. Res. Atmos.*
- Dores, D., E., C. R. Glenn, G. Torri, R. B. Whittier, B. N. Popp (2020) – Stable isotopic composition of precipitation on Oahu, Hawaii, during the 2017-2018 La Niña and implications for groundwater recharge. *Hydrological Processes*. 34: 34: 4676-4696.
- Torri, G., D. K. Adams, H. Wuang, Z. Kuang (2019) – On the diurnal cycle of GPS-derived column water vapor over Sumatra, *Journal of the Atmospheric Sciences*, **76(11)**, <https://doi.org/10.1175/JAS-D-19-0094.1>.
- Torri, G. and Z. Kuang (2019) – On cold pool collisions in tropical boundary layers, *Geophysical Research Letters*, **46**, doi: 10.1029/2018GL080501
- Zuidema, P., G. Torri, C. Muller, A. Chandra (2017) – A survey of precipitation-induced atmospheric cold pools over oceans and their interactions with the larger-scale environment, *Surveys in Geophysics*, **38(6)**, 1283-1305.
- Torri, G., D. Ma, and Z. Kuang (2017) – Stable water isotopes and large-scale vertical motions in the tropics, *J. Geophys. Res. Atmos.*, **122**, 3703-3717.
- Torri, G. and Z. Kuang (2016) – Rain evaporation and moist patches in tropical boundary layers, *Geoph. Res. Let.*, **43(18)**.
- Torri, G. and Z. Kuang (2016) – A Lagrangian study of precipitation-driven downdrafts, *J. Atmos. Sci.*, **73**, 839-854.
- Gentine, P., A. Girelli, S. Park, J. Nie, G. Torri and Z. Kuang (2016) – Role of surface heat fluxes underneath cold pools, *Geoph. Res. Let.*, **43**, 874-883.
- Torri, G., Z. Kuang and Y. Tian (2015) – Mechanisms for convection triggering by cold pools, *Geoph. Res. Let.*, **42(6)**, 1943-1950.

Theoretical Physics (authors in alphabetical order)

- J. Davey, A. Hanany, N. Mekareeya, G. Torri (2011) – M2-branes and Fano 3-folds, *J. Phys. A*, **44**, 40.
- A. Hanany, G. Torri – Brane tilings and supersymmetric gauge theories (2011), *Nucl. Phys. Proc. Suppl.*, **216**, 1, 270-272.
- A. Hanany, E. E. Jenkins, A. V. Manohar, G. Torri (2011) – Hilbert series for flavor invariants of the Standard Model, *J. High En. Phys.*, **2011**, 3, 96.
- J. Davey, A. Hanany, N. Mekareeya, G. Torri (2010) – Brane tilings, M2-branes and Chern-Simons theories, *Acta Phys. Pol. B Proc. Suppl.*, **2**, 3, 639-655.
- I. R. Klebanov, G. Torri (2010) – M2-branes and AdS/CFT, *Int. J. Mod. Phys. A*, **25**, 2-3, 332-350.
- J. Davey, A. Hanany, N. Mekareeya, G. Torri (2009) – Higgsing M2-branes, *J. High En. Phys.*, **2009**, 11, 28.

- J. Davey, A. Hanany, N. Mekareeya, G. Torri (2009) – Phases of M2-branes, *J. High En. Phys.*, **2009**, 6, 25.
- A. Hanany, N. Mekareeya, G. Torri (2008) – The Hilbert series of Adjoint SQCD, *Nucl. Phys. B*, **825**, 1-2, 52-97.

GRANTS AND CONTRACTS

Collaborative Research: Dynamics of Unsaturated Downdrafts, Cold Pools, and Their Roles in Convective Initiation and Organization, NSF/Harvard, subc, \$461,274, 05/01/17–04/31/20.

Assessment of Cloud Development and Organization Processes within the Madden Julian Oscillation using ARM Observations and Lagrangian Modeling, DOE, co-I, \$576,876, 10/01/19–09/30/22

A Lagrangian investigation of stable water vapor isotopes in deep convective systems, NSF, PI, \$299,971, 07/01/20—06/30/23

TEACHING EXPERIENCE

| Course | Instr. | Sem | Schedule |
|---|--------------------|------------|------------------|
| ATMO 620 Physical Meteorology | w/ Yuqing Wang | F, 2018 | T Th 10:30-11:45 |
| ATMO 416 Tropical Analysis and Forecasting | w/ Steven Businger | S, 2019 | T Th 13:30-17:30 |
| ATMO 620 Physical Meteorology | G.T. | F, 2019 | T Th 10:30-11:45 |
| ATMO 412 Meteorological Analysis Lab | G.T. | S, 2020 | T Th 13:30-17:30 |
| ATMO 765 Seminars in Meteorology | G.T. | S, 2020 | W 15:30-17 |
| ATMO 620 Physical Meteorology | G.T. | F, 2020 | Online |

INVITED PRESENTATIONS

- 2020** Durham University, Durham, UK
- 2019** Università degli Studi di Milano – Bicocca, Milan, Italy
- 2018** Woods Hole Oceanographic Institute, Woods Hole, USA
- 2018** Colorado State University, Fort Collins, USA
- 2017** Ludwig-Maximilian Universität, Munich, Germany
- 2016** University of Washington, Seattle, USA

2016 Max-Planck-Institut für Meteorologie, Hamburg, Germany

2014 Massachusetts Institute of Technology, Cambridge, USA

AWARDS & SCHOLARSHIPS

2015 The Foundation Blanceflor Boncompagni Ludovisi, née Bildt Scholarship

2012-14 Harvard University Center for the Environment – Ziff Environmental Fellowship

SERVICE

Committee Experience

2018-2020 Organizer of session “Atmospheric Convection: Processes, Dynamics, and Links to Weather and Climate” at AGU Fall Meeting

2017 Organized and chaired session “Land-Atmosphere Interactions, Biosphere-Boundary Layer Feedbacks, and Moist Convection” at AGU Fall Meeting

2015 Chaired session “Other Mesoscale Processes” at 16th Conference on Mesoscale Processes, Boston

2012-current Reviewer for Geophysical Research Letter, Journal of the Atmospheric Sciences, Journal of Geophysical Research, Journal of Climate, Nature, and various proposals for National Science Foundation.

Educational Outreach

2017-current Co-host of Point Nemo, a science podcast that discusses the most important questions and the research frontiers within each discipline.

PROFESSIONAL MEMBERSHIP

American Geophysical Union, American Meteorological Society.