# 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, Department of Atmospheric Sciences, University of Hawai'i
**2015-2018** Research Associate, Earth & Planetary Sciences, Harvard University
**2014-2015** Research Assistant, Earth & Planetary Sciences, Harvard University
**2012-2014** Environmental Fellow, Center for the Environment, Harvard University

## PUBLICATIONS

### Atmospheric Science

Torri, G., K. McColl, and Z. Kuang – A three-dimensional perspective at radiative-convective equilibrium over land, *in preparation*.

Torri, G., D. Adams, and Z. Kuang – The diurnal cycle of precipitable water vapor over Sumatra, *in preparation*.

Torri, G. and Z. Kuang – On cold pool collisions in tropical boundary layers, *submitted.*

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 , Surv Geophys (2017) 38: 1283, https://doi.org/10.1007/s10712-017-9447-x.

Torri, G., D. Ma, and Z. Kuang (2017) – Stable water isotopes and large-scale vertical motions in the Tropics, doi: 10.1002/2016JD026154

Torri, G. and Z. Kuang (2016) – Rain evaporation and moist patches in tropical boundary layers, Geoph. Res. Let., **43**, doi:10.1002/2016GL070893.

Torri, G. and Z. Kuang (2016) – A Lagrangian study of precipitation-driven downdrafts, *J. Atmos. Sci*., **73**, 839-854, doi:10.1175/JAS-D-15-0222.1

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.

## TEACHING EXPERIENCE

### Imperial College London

**2011 – 2012** Demonstrator and assessor for the 3rd undergraduate Physics laboratory.

**2010 – 2011** Demonstrator and assessor for the 2nd undergraduate Physics laboratory.

## INVITED PRESENTATIONS

**2018** Woods Hole Oceanographic Institute, Woods Hole, USA
Title: *The study of cold pools with a Lagrangian particle model*

**2018** Colorado State University, Fort Collins, USA
Title: *Using Lagrangian techniques to study deep convection*

**2018** ETH, Zürich, Switzerland
Title: *A tale of cold pools and deep convection*

**2017** Ludwig-Maximilian Universität, Munich, Germany
Title: *A Lagrangian view on precipitating convection*

**2016** University of Washington, Seattle, USA
Title: *What can we learn about deep convection using Lagrangian particles?*

**2016** Max-Planck-Institut für Meteorologie, Hamburg, Germany
Title: *A Lagrangian view on cold pools*.

**2014** Massachusetts Institute of Technology, Cambridge, USA
Title: *A Lagrangian study of the mechanisms of convection triggering by cold pools*.

**2010** Strings, Cosmology and Gravity Student Conference, Paris, France
Title: *Counting gauge invariant operators using Hilbert series*.

**2010** University of California, Davis, USA
Title: *Brane tilings and M2-brane theories*.

## CONFERENCE PRESENTATIONS

### Talks

1. *A Lagrangian perspective on convective downdrafts*, 28th Conference on Severe Local Storms, Portland, 2016

2. *Investigating cold pool dynamics with a Lagrangian perspective*, 32nd Conference on Hurricanes and Tropical Meteorology, Puerto Rico, 2016
3. *Investigating the dynamics of deep convective systems with a Lagrangian perspective*, 16th Conference on Mesoscale Processes, Boston, 2015
4. *Deep convective dynamics and Lagrangian particles*, 7th North Eastern Tropical Conference, MIT Endicott House, Dedham, 2015
5. *Probing deep convective dynamics using a Lagrangian particle model*, American Geophysical Union Fall Meeting, San Francisco, 2014
6. *Brane tilings*, Cargese Summer Institute, Corsica, 2010
7. *Hilbert series and the problem of counting operators in supersymmetric gauge theories*, Galileo Galilei Institute, Florence, Italy, 2009

**Posters**

1. *Stable Water Isotopes and Large-Scale Velocities*, American Geophysical Union Fall Meeting, New Orleans, 2017.
2. *Studying cold pools using Lagrangian particles*, 28th Conference on Severe Local Storms, Portland, 2016
3. *Probing cold pool dynamics with a Lagrangian model*, American Geophysical Union Fall Meeting, San Francisco, 2015
4. *A Lagrangian study of precipitation-driven downdrafts*, 20th Conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, 2015
5. *Investigating aspects of the transition from shallow to deep convection with a Lagrangian particle model*, 14th Conference on Cloud Physics, Boston, 2014.

## AWARDS & SCHOLARSHIPS

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| **2015** | The Foundation Blanceflor Boncompagni Ludovisi, née Bildt Scholarship |
| **2012-14** | Harvard University Center for the Environment – Ziff Environmental Fellowship |
| **2012** | The Foundation Blanceflor Boncompagni Ludovisi, née Bildt Scholarship (declined) |
| **2012** | Fondazione Angelo Della Riccia Scholarship |
| **2011** | Fondazione Angelo Della Riccia Scholarship |
| **2007** | Università degli Studi di Milano – Bicocca Distinction award |
| **2005** | Università degli Studi di Milano – Bicocca Distinction award |

## SERVICE

**Committee Experience**

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| **2015** | Chaired session "Other Mesoscale Processes" at 16th Conference on Mesoscale Processes, Boston |

**2016** Proposal reviewer for National Science Foundation

**2015 – 2016** Reviewer for Geophysical Research Letters

**2010 – 2012** Reviewer for Journal of High Energy Physics

### Educational Outreach

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

**2010 – 2012** Contributor for "Paese mio" a magazine published in my hometown, for which I wrote short stories centered around the world of Particle Physics.

**2010** Organizer of a series of conferences in Northern Italy to raise awareness on climate change.

**2008** Tutor of a project organized by Alenia Space and the Italian National Institute for Astrophysics to provide orientation for high school students on the main research topics in contemporary Physics.

**2007** Organizer of a short course on public speaking and science outreach in my college residence halls.

**2006 – 2008** Organizer of a seminar cycle in my college residence halls where students presented topics from their major or their dissertation to their colleagues in a way accessible to all.

## PROFESSIONAL MEMBERSHIP

American Geophysical Union, American Meteorological Society, American Physics Society, Royal Meteorological Society, Italian Meteorological Society.