# Giuseppe Torri

Department of Atmospheric Sciences
University of Hawai'i at Mānoa
2525 Correa Road, HIG 338, Honolulu, HI 96822

Phone: +1 (808) 956-2564 Email: gtorri@hawaii.edu Email: giuseppetorri.com

## RESEARCH VISION

My long-term research goal is to become a leading expert in atmospheric convection and cloud dynamics, focusing in particular on improving the understanding of cloud processes across different scales and on convective extremes. I use a combination of high-resolution numerical models, innovative Lagrangian diagnostics, and field observations to focus on the fundamental dynamics of convective systems. Through my research, I aim to contribute to improving weather and climate predictions and informing decision-making for communities affected by severe weather.

## EDUCATION

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

## POSITIONS

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| **Associate Professor** | Department of Atmospheric Sciences,<br>*University of Hawai'i at Mānoa* | 2023–present |
| **Affiliate Faculty** | Water Resources Research Center,<br>*University of Hawai'i at Mānoa* | 2022–present |
| **Assistant Professor** | Department of Atmospheric Sciences,<br>*University of Hawai'i at Mānoa* | 2018–2023 |
| **Research Associate** | Earth & Planetary Sciences Department,<br>*Harvard University* | 2014–2018 |
| **Environmental Fellow** | Center for the Environment and Earth & Planetary Sciences Department, *Harvard University* | 2012–2014 |

## ACTIVE GRANTS

### *Lead/Sole PI*

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| **$699,648** | CAREER: Investigating Climate Variability in Hawai‘i through Scientific and Indigenous Approaches, *NSF.* | 2024–2029 |
| **$290,165** | RII Track-4: Improving subseasonal-to-seasonal forecasts of Central Pacific extreme hydrometeorological events and their impacts in Hawai‘i, *NSF.* | 2024–2026 |
| **$168,845** | RAPID: Investigating drivers and improving forecasts of sub-seasonal-to-seasonal wildfire potential in Hawai‘i, *NSF*. | 2023–2025 |
| **$505,472** | Initiation of deep convection by boundary-layer circulations during TRACER, *DOE.* | 2023–2026 |
| **$875,486** | An evaluation of the NextGen National Water Model in tropical conditions with the aim of improving hyperlocal flood forecasting, *NOAA.* | 2022–2025 |
| **$202,667** | A new approach to studying supercell storms: the use of water isotopes, *Merage Foundation.* | 2021–2025 |
| **$299,971** | A Lagrangian investigation of stable water vapor isotopes in deep convective systems, *NSF.* | 2020–2025 |

### *Co-PI*

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| **$828,199** | Understanding diurnal rainfall processes over tropical islands to improve subseasonal-to-seasonal forecasts, *NOAA.* | 2022–2025 |
| **$400,000** | CC* Compute: Koa–a high-performance and flexible research computing resource, *NSF.* | 2022–2025 |

### *Senior Personnel*

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| **$20,000,000** | RII Track-1: Change Hawai‘i; harnessing the data revolution for island resilience, *NSF.* | 2022–2027 |

## TEACHING EXPERIENCE

### *University of Hawai‘i at Mānoa, Graduate Level*

**ATMO 620 Physical Meteorology** Fall 2018–present

- Focus on atmospheric thermodynamics, cloud microphysics, and atmospheric radiation.
- Strong emphasis on foundational physical concepts.

**ATMO 606 Cumulus Dynamics** Spring 2021

- Revamped the course after not being offered for more than a decade.
- Restructured the content to include advanced topics on the subject.
- Integrated recent journal articles and invited authors for expert discussions with students.

**ATMO 765 Seminars in Meteorology** Spring 2020

- Invited voice coaches and opera singers to help students learn breathing and basic voice control techniques.

### *University of Hawai'i at Mānoa, Undergraduate Level*

**ATMO 304 Global and Local Perspectives on Severe Weather** Spring 2023

- Developed the course blending scientific and cultural perspectives place-based learning techniques.
- High student engagement with several students pursuing careers in meteorology as a result of the class

**ATMO 305 Meteorological Analysis and Observations** Spring 2022

- Taught as a substitute during the regular instructor's maternity leave.
- Used experiential learning techniques to help students connect theoretical concepts to real-world atmospheric phenomena (e.g., using a sling psychrometer to measure wet-bulb temperature).

**ATMO 412 Meteorological Analysis and Forecasting** Spring 2020/2024

- Implemented state-of-the-art software (CAVE) for meteorological forecasting and analysis.
- Combined problem-solving sessions with case studies on real-world weather events.

**ATMO 416 Tropical Analysis and Forecasting** Spring 2019

- Fostered student engagement through hands-on analysis of tropical weather systems and mesoscale phenomena, enhancing their practical forecasting abilities.
- Helped prepare students for careers in tropical meteorology, with one student now working as a weather forecaster in American Samoa.

## AWARDS & SCHOLARSHIPS

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| NSF CAREER Award | 2024 |
| Board of Regents Excellence in Teaching Award (nominated) | 2024 |
| School of Ocean and Earth Sciences and Technology Teaching Award | 2024 |
| Italian Excellence Award | 2023 |
| American-Made Challenges Solar Forecasting Prize | 2021 |

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| Pacific Asian Center for Entrepreneurship Innovation Challenge | 2021 |
| Innovation2Impact Initiative Award | 2021 |
| University of Hawai'i Venture Competition (Second place) | 2021 |
| Board of Regents Excellence in Teaching Award (nominated) | 2021 |
| University of Hawai'i Innovation Impact Challenge | 2020 |
| The Foundation Blanceflor Boncompagni Ludovisi, née Bildt Scholarship | 2015 |
| Harvard University Center for the Environment – Ziff Environmental Fellowship | 2012–2014 |
| Fondazione Angelo dalla Riccia Scholarship | 2011–2012 |
| Università degli Studi di Milano Bicocca Distinction Award | 2005–2007 |

## INVITED PRESENTATIONS

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| *The isotopic composition of rainfall on a subtropical island*, **National Center for Atmospheric Research (CGD group)**, Boulder, USA | 2023 |
| *Using stable water isotopes to study atmospheric convection*, **Tohoku University**, Sendai, Japan | 2023 |
| *Water vapor isotopes and atmospheric dynamics*, **University of Iowa** | 2023 |
| *Studying deep convection using stable water isotopes*, **EUREC4A-iso** Workshop | 2022 |
| *Modeling cold pools*, **Tropical Pacific Observing Needs Workshop** | 2021 |
| *The isotopic composition of cold pools*, **ATOMIC group** | 2020 |
| *The physics of atmospheric convection,* **Durham University**, Durham, UK | 2020 |
| *Cold pool dynamics: a Lagrangian view*, **Università degli Studi di Milano – Bicocca**, Milan, Italy | 2019 |
| *Studying deep convective clouds with a Lagrangian model*, **Woods Hole Oceanographic Institute**, Woods Hole, USA | 2018 |
| *Studying deep convective clouds with a Lagrangian mode*l, **Colorado State University**, Fort Collins, USA | 2018 |
| *On the dynamics of precipitation-driven downdrafts*, **Ludwig-Maximilian Universität**, Munich, Germany | 2017 |
| *Studying cold pools with a Lagrangian approach*, **University of Washington**, Seattle, USA | 2016 |
| *A Lagrangian perspective on cold pool dynamics*, **Max-Planck-Institut für Meteorologie**, Hamburg, Germany | 2016 |
| S*tudying convective triggering mechanisms with a Lagrangian particle model*, **Massachusetts Institute of Technology**, Cambridge, USA | 2014 |

## PROFESSIONAL SERVICE

### *Departmental/School Service*

**Chair,** Assistant Professor Hiring Committee 2023–2024
Department of Atmospheric Sciences

- Led a successful hiring process for a tenure-track position in climate science, collaborating with colleagues across departments to evaluate candidates.

**Member,** Dean Search Advisory Committee 2022
School of Ocean and Earth Science and Technology

- Developed the criteria for the selection of the school's dean, examined numerous applications, and participated in several interviews with finalists.

**Member,** Curriculum Committee 2019–2023
Department of Atmospheric Sciences

- Reviewed courses, aligned program offerings with strategic goals, and gathered and analyzed student feedback.

**Member,** Graduate Student Research Committees 2018–present
University of Hawai'i at Mānoa and various international universities.

- Served/serving as a member of 28 graduate student research committees, helping to mentor students' research and monitor their progress.

**Member,** Cyberinfrastructure Faculty Advisory Committee 2018–present
University of Hawai'i at Mānoa

- Strategic planning, assessment of needs, and policy development for the University's high-performance computing infrastructure.

### *Professional Service*

**Voting Member,** NSF Unidata Strategic Advisory Committee 2023–present

- Contributes to creating company policies that consider high-level, long-term trends to anticipate the geoscience community's needs.

**Organizer and Chair,** AGU Fall Meeting 2018–present

- Organizing session "Atmospheric Convection: Processes, Dynamics, and Links to Weather and Climate."
- Gaining more than 100 attendees on average.

**Reviewer,** Various journals and funding agencies 2012–present

- Geophysical Research Letter, Journal of the Atmospheric Sciences, Journal of Geophysical Research, Journal of Climate, Nature, and various proposals for the National Science Foundation, the National Oceanic and Atmospheric Administration, and the Department of Energy.

## PROFESSIONAL MEMBERSHIP

**Member,** American Geophysical Union 2012–present
**Member,** American Meteorological Society
**Member,** Associazione Italiana di Scienze dell'Atmosfera e Meteorologia
**Member,** Società Italiana di Meteorologia

## ENTREPRENEURSHIP

**Co-founder and Chief Science Officer,** Nimbus AI LLC 2012–present

- Leading the development of cutting-edge AI tools to forecast solar irradiance in areas with complex terrain.
- Participating in several incubator programs, partnering with academic institutions to develop and implement Nimbus AI's technology.