ALESSANDRO RAGANATO

Georgia Institute of Technology (GT)
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Google Scholar

MAIN INTERESTS

Application of computational methods and algorithms to describe natural phenomena; atmospheric and ocean climate variability; big data manipulation; applied data analysis.

ACADEMIC CAREER

PhD Physics Jan 2024 - Present
School of Earth and Atmospheric Sciences, GT, Atlanta, GA
I am working under the supervision of Prof. Annalisa Bracco on the application of *manifold learning* (Falasca et al., 2022) to investigate climate model behavior in simulating non-linear systems.

M.Sc. Physics 2020-2023
University of Trieste, Trieste, IT GPA: 29.42/30

- Focus areas: analyses of climate-related problems and how to approach them with computational methods. I also attended classes in theoretical physics such as Field Theory and Condensed Matter.
- Dissertation title: Extra-tropical response to tropical forcing in the SPEEDY model compared to observations and its dependence on the modifications of the subtropical jet in boreal winter
  Supervisor: Prof. Fred Kucharski
  Co-Supervisor: Dr. Muhammad Adnan Abid

B.Sc. Physics 2016-2020
La Sapienza University, Rome, IT

- I built strong foundations in physics, mathematics, and statistics. I also learned how to approach practical problems by attending several laboratory courses that gave me skills in data analysis and scientific programming.
- Dissertation title: Description of the Larmor formula in a massive field
  Supervisor: Prof. Paolo Pani

High School Diploma 2011-2016
Liceo Classico Anco Marzio, Rome, IT

- Five years High School Diploma in classical studies: Literature, Latin, Greek, History, Philosophy, English, Maths.

RESEARCH EXPERIENCE

Scientific Consultant April 2023 - October 2023
Earth System Physics (ESP) section, ICTP, Trieste, IT
The main purpose of my research was to study ENSO teleconnections and the role of the Indian Ocean Dipole in the North Atlantic Oscillation (NAO) response during early boreal winter.
Supervisor: Prof. Fred Kucharski
Co-Supervisor: Dr. Muhammad Adnan Abid

ACADEMIC PROJECTS

Earth System Physics (ESP) section, ICTP, Trieste, IT

- Study of why climate models struggle in simulating the extra-tropical response to the Indian Ocean Dipole forcing and the implication on the seasonal to sub-seasonal predictability of Europe and Atlantic climate.
- Research on how the intensity of the subtropical jet affects the North Atlantic and Pacific-North America response to an Indian Ocean Dipole heating anomaly using the intermediate complexity Atmospheric General Circulation Model (AGCM) called SPEEDY.

Physics Department, University of Trieste, Trieste, IT

- Application of the fourth-order Runge-Kutta algorithm to the Lotka-Volterra equations to study the prey-predator system's stability from a deterministic point of view.
- Creation of a self-living environment using a probabilistic approach following the Wa-Tor model.

Physics Department, La Sapienza University, Rome, IT

- Monte-Carlo simulations of a system with N particles implemented on C language to study the statistical behavior of a gas.
- Derivation of the laser's coherence time and the optical cavity's length studying the interference phenomenon between two monochromatic rays of light using the Michelson interferometer.

PUBLICATIONS

- Raganato, A., Abid, M. A., Kucharski, F. (2025). The Combined Link of the Indian Ocean Dipole and ENSO with the North Atlantic–European Circulation during Early Boreal Winter in Reanalysis and the ECMWF SEAS5 Hindcast. Journal of Climate, 38(2), 445-460.

TEACHING

Teaching Assistant, Introduction to Environmental Sciences Spring 2024
School of Earth and Atmospheric Sciences, Georgia Institute of Technology

- Prepared class activities for 15-25 undergraduates.
- Created and graded course assessments to ensure students understood material and stayed on track.

SPECIAL ACHIEVEMENTS

- I was awarded top honors *cum Laude* from the University of Trieste for my master's degree.

GRANTS

- I am supported by the Los Alamos National Laboratory (LANL) "PRIME , Improving Projections" project (GR00026829).

CONFERENCES

- 21st Annual EAS Graduate Research Symposium. Atlanta, GA April 2025
- APS March Meeting 2025 sponsored by GPC (Session). Anaheim, CA March 2025
- CESM Tutorial 2024 (flyer). Boulder, CO August 2024
- CAMAS Workshop and Early-Career School (flyer). Santa Fe, NM February 2024
- ESP group internal seminar series: "The impact of the Indian Ocean dipole on the North Atlantic-European circulation during early boreal winter: a study of ERA5 reanalysis and ECMWF-SEAS5"
  Trieste, IT October 2023
- 4th Summer School on Theory, Mechanisms and Hierarchical Modeling of Climate Dynamics: Atlantic Variability and Tropical Basin Interactions at Interannual to Multi-Decadal Time Scales (flyer) Trieste, IT August 2023
- ESP group internal seminar series: "The role of the subtropical jet in the Euro-Atlantic teleconnections - A SPEEDY simulation"
  Trieste, IT February 2023

DIGITAL SKILLS

- Proficient user of C/C++, Python, and Fortran.
- Skills in dealing with many of the commonly used research resources: Matlab, R, and Stata.
- Proficient user of LaTeX and Excel (Office 365 in general).

LANGUAGES

Italian:	Native speaker
TOEFL score:	100 out of 120
Spanish:	Basic level