

Curriculum vitae

PERSONAL INFORMATION

Family name: ALBERTI

First name: TOMMASO

Researcher unique identifiers: ORCID [0000-0001-6096-0220](https://orcid.org/0000-0001-6096-0220)

Date of birth: 18 November 1989

Nationality: Italian

● **EDUCATION**

2013 – 2016 PhD in Physics, Univ. of Calabria, Rende, Italy (Supervisor: F. Lepreti)

2011 – 2013 Master Degree in Physics, Univ. of Calabria, Rende, Italy (Supervisor: V. Carbone)

● **CURRENT POSITION**

2022 – now Researcher at Istituto Nazionale di Geofisica e Vulcanologia, Rome, Italy

● **PREVIOUS POSITIONS**

2020 – 2022 Researcher (fixed-term) at INAF-IAPS, Rome, Italy

2017 – 2020 Postdoc at INAF-IAPS, Rome, Italy (Advisor: M. Laurenza)

2017 – 2017 Postdoc at University of Calabria, Rende, Italy (Supervisor: F. Lepreti)

● **RESEARCH INTERESTS**

My research primarily deals with the understanding of critical phenomena in geosciences and complex systems at different spatiotemporal scales by combining dynamical systems and statistical mechanics. Systems which feature critical phenomena range from extreme weather events, climate change, and turbulence, up to finance and epidemiology. My investigations revolve around several key areas:

- **Critical Phenomena:** I concentrate on the understanding of the relation between climate extreme events and the processes that modify their dynamics under the climate change, with a particular emphasis on their occurrence and impact within the Mediterranean region. This involves the analysis of historical climate data and the development of predictive models to better understand and potentially mitigate these events.
- **Turbulence in Fluids and Plasmas:** I delve into the complexities of turbulence in both fluid systems and plasmas by combining theoretical findings with high quality experimental datasets. This research helps in understanding several features of turbulent flows such as the dissipation anomaly or the existence of singularities in the governing equations.
- **Complex Systems Theory:** I am involved in the development of rigorous statistical methods for identifying transition thresholds in complex systems at bifurcation points through approaches that combine statistics and physics through stochastic process theory. This research contributes to a deeper understanding of the fundamental principles governing transitions between different metastable states in complex systems.

In summary, my research is multidisciplinary in nature, combining mathematical and statistical tools with a deep understanding of critical phenomena in geosciences and complex systems. Through the application of dynamical system and statistical mechanics approaches, I aim to shed light on rare events, turbulence, complex systems, and chaos in these domains, ultimately contributing to a more comprehensive understanding of our natural world.

● **TRACK RECORD**

During my career I published 110 peer-reviewed papers in major international peer-reviewed scientific journals, with H-Index 18 and 944 citations (Source: [Scopus](https://scopus.com)).

I gave 12 invited talks, 42 talks, and 23 poster presentations at international and national conferences. I gave 2 lectures at international schools and 4 invited seminars in international. I taught for 3 academic years at the University of Calabria on the topic “Solar Physics and Sun-Earth relations”.

● **FELLOWSHIPS AND AWARDS**

2023 – 2034 Qualified as Full Professor for the disciplinary field of 02/C1 - Astronomy, astrophysics, Earth and planetary physics, FIS/06 Physics for the Earth system and the circumterrestrial medium

- 2022 [EGU Outstanding Early Career Scientist Award - NP Division](#)
 Motivation: “for outstanding research in the fields of data analysis and modeling, via dynamical system approaches, to understand complexity in geoscience, space plasma, and the planetary environment”
- 2018 [“Vincenzo Ferraro” Award](#)
 Motivation: “for his outstanding studies on the existence of a scale separation between the processes linked to the fast and slow dynamics of the Earth's magnetosphere”
- 2017 Complimentary member of the European Geosciences Union, Germany

- **ORGANISATION OF SCIENTIFIC MEETINGS**

- 2018 – now Conveners of six (6) Scientific Sessions on Turbulence and analysis of complex geoscientific time series at EGU General Assemblies 2018 – 2023, Wien, Austria
- 2018 – now Conveners of Committee of five (5) Short Courses on data analysis methods for geoscientific time series at EGU General Assemblies 2018 – 2023, Wien, Austria
- 2022 – 2023 Organizing Committee of the Webinar Series “Scaling and multifractals : from historical perspectives to recent developments”
- 2020 – 2021 Organizing Committee of the Webinar Series “Perspectives on Climate Science: from historical developments to research frontiers”

- **INSTITUTIONAL RESPONSIBILITIES**

- 2023 – now Science Officer of the Nonlinear Processes in Geosciences (NP) Division of the European Geosciences Union (EGU) for the programme “[NPI: Mathematics of Planet Earth](#)”
- 2023 – now [Regional Representative for Europe](#) "Early Career Network (ECN)" of the PAGES (Past Global Changes) project
- 2023 – now Member of the [ClimaMeter](#) project, a rapid experimental framework for putting weather extremes in a climate perspective
- 2021 – now Associate scientist of the "Parker Solar Probe Theory Group"
- 2022 – 2023 Member of the project "UnderstaNDing the rEcurrence of Rare atmosPherIc eveNts: a dynamical systems approach ([UNDERPIN](#))" financed by the CNRS
- 2019 – 2023 Early Career Scientists (ECS) representative for the Nonlinear Processes in Geosciences (NP) Division of the European Geosciences Union (EGU)
- 2019 – 2022 Young Scientist within the ISSI team "Complex Systems Perspectives Pertaining to the Research of the Near-Earth Electromagnetic Environment" (Team Leader: G. Balasis)

- **REVIEWING ACTIVITIES**

Referee for *Physical Review Letters*, *Monthly Notices of the Royal Astronomical Society*, *Chaos: An Interdisciplinary Journal of Nonlinear Science*, *Entropy*, *The Astrophysical Journal*, *Geophysical Research Letters*, *Journal of Geophysical Research*, *Journal of Advances in Modeling Earth Systems*, *Atmosphere*, *Annals of Geophysics*, *Journal of Space Weather and Space Climate*, *Astronomy&Astrophysics*, *Frontiers in Physics*, *Nonlinear Processes in Geophysics*, *Earth, Planets and Space*, *Applied Sciences*, *Journal of Plasma Physics*, *Journal of Atmospheric and Solar Terrestrial Physics*

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

- 2016 – now Member, *American Geophysical Union (AGU)*
- 2015 – now Member, *European Geosciences Union (EGU)*

- **MAJOR COLLABORATIONS**

- Prof. Vincenzo Carbone, Dynamical systems and Turbulence, University of Calabria, Italy
- Prof. Berengere Dubrulle, Turbulence, CNRS, France
- Dr. Davide Faranda, Extreme events and Climate Change, CNRS, France
- Prof. Valerio Lucarini, Extreme Value Theory and Statistics, University of Leicester, UK

Rome, 26 March 2024