

## About

Deeply passionate about climate physics, statistical and dynamical properties of rare and extreme climate events, disordered and complex systems. Profoundly intrigued and concerned about the societal, environmental and health impacts of climate change. Coordinator of the [EArth](#) project: bridging art and climate by reimagining art masterpieces under the effects of climate change. Enthusiastic about art history, baking, swimming and running.

## Education

- 2021–2024 **Ph.D. in Physics, *Ecole Normale Supérieure de Lyon***  
Title: *Studying extreme heatwaves using novel theoretical approaches*, advised by Prof. Freddy Bouchet.  
Published manuscript available [here](#).  
**Maria Skłodowska-Curie ITN H2020 fellow**, within project [EDIPI](#)
- 2019–2020 **M.Sc. in Complex systems modelling, *King's College London*, Highest honors**  
Dissertation: *Analysis of Bayesian classification - Naive Bayes approach for the analysis of medical data*  
Selected modules: Elements of statistical learning - Pattern Recognition, neural Networks and Deep Learning  
- Statistics in finance - Theory of complex networks - Dynamical and equilibrium analysis of complex systems.
- 2016–2019 **B.Sc. in Physics Engineering, *Politecnico di Torino*, Highest honors**  
Dissertation: *Deterministic and stochastic analysis of epidemics. SIS and SIR approaches to model the spread of epidemics.*  
Selected modules: Mathematical analysis - Linear algebra and geometry - Advanced mathematical methods  
- Computer science - Mechanics and thermodynamics - Quantum mechanics - Solid-state physics - Physics of complex systems - Nuclear physics.

## Research visits

- Oct. - Dec. 2023 **Visiting PhD student of Prof. Francesco Ragone, Royal Meteorological Institute of Belgium**
- Oct. - Dec. 2022 **Visiting PhD student of Prof. Nili Harnik, Tel Aviv University, Department of Geoscience**

## Experience

### Participation to schools and trainings

- 2025– **Impacts of climate change on health courses**
  - South and Southeast Asia Climate and Health Responders, Columbia University.
  - European Climate Resilient Health Systems Course, Columbia University.
- 2021–2024 **Third academic year (2023-2024)**
  - EDIPI ITN 5th training week at KIT, Karlsruhe, Germany
  - EDIPI ITN 6th training week - *Network-wide ESR Research and Soft Skills Training* at Cyprus Institute, Nicosia, Cyprus
  - Participation to the European Geosciences Union General Assembly, Wien, Austria
  - Workshop - *Prévisibilité dans les sciences de l'atmosphère et Points de bascule* for the Group De Recherche "Défis théoriques pour les sciences du climat", Institut Henri Poincaré, Paris, France
  - Workshop - *Interfaces dans le système climatique*, for the Group De Recherche "Défis théoriques pour les sciences du climat", Grenoble, France

## Second academic year (2022-2023)

- **Workshop** - *Mathematics and theoretical physics for climate dynamics*, Ecole Normale Supérieure de Lyon, Lyon, France
- **Summer school** - *Climate sensibility*, Ecole Normale Supérieure de Lyon, Lyon, France
- EDIPI ITN 4th training week - *Idealized modelling in climate sciences*, Institut Royal Météorologique, Brussels, Belgium
- **Summer school** - *Out of equilibrium statistical physics*, Beg Rohu, France
- Course - *Granular, jammed and disordered media*, Ecole Normale Supérieure de Lyon, Lyon, France
- Participation to the European Geosciences Union General Assembly, Wien, Austria

## First academic year (2021-2022)

- Course - *Large deviations in physics*, Ecole Normale Supérieure de Lyon, Lyon, France
- Course - *Climate change, climate change impacts, and energetic transition*, Ecole Normale Supérieure de Lyon, Lyon, France
- **Summer school** - *Artificial intelligence for detection and attribution of climate extremes*, XAIDA project, ICTP, Trieste, Italy
- **School** - *Machine Learning and the Physics of Climate* and Workshop on *Extreme Events in Weather and Climate*, Fletcher Hotel, Berg en Daal, The Netherlands
- EDIPI ITN 1st & 2nd training weeks - *Basics of statistics, probability, extreme events modelling and extreme value theory*, Uppsala University, Uppsala, Sweden
- EDIPI ITN 3rd training week - *Attribution studies, tipping point of climate and advanced statistical methods for extremes*, Ecole Normale Supérieure, Paris, France
- Journées de la physique statistique, Ecole Normale Supérieure, Paris, France
- Journées du lancement du Group De Recherche 'Défis théoriques pour les sciences du climat', Auditorium TOTEM, Paris, France

## Traineeship at the European Commission's Joint Research Centre

2020–2021 **Trainee in the Text Mining & Analysis Competence Centre team**, working in the field of sentiment analysis of text from news and social media in the aim of advancing social listening capabilities.

## Talks and posters

- 2025 **EMS2025**, Presentation of the work: Rare events algorithm study of extreme double jet summers and their connection to heatwaves over Eurasia.
- 2025 **University of Chicago**, Invited speaker. Presentation of the work: Gaussian framework and optimal projection of weather fields for prediction of extreme events.
- 2025 **Stormtracks2025**, Poster presentation of the work: Rare events algorithm study of extreme double jet summers and their connection to heatwaves over Eurasia
- 2025 **ETH Zurich**, Invited speaker. Presentation of the work: Gaussian framework and optimal projection of weather fields for prediction of extreme events. Invited by Prof. Dr. Daniela Domeisen
- 2024 **European Geosciences Union General Assembly, EGU24**, Presentation of the work: A Gaussian Framework for Optimal Prediction of Extreme Heatwaves
- 2023 **GdR Défis théoriques pour les sciences du climat**, Poster presentation of the work: Heatwaves prediction using Gaussian assumption
- 2023 **Beg Rohu School of Out of equilibrium statistical physics**, Presentation of the work: Heatwaves prediction using Gaussian assumption
- 2023 **European Geosciences Union General Assembly, EGU23**, Presentation of the work: Comparing the influence of Atlantic Multidecadal Variability and spring soil moisture on European summer heatwaves
- 2022 **Tel-Aviv University, Department of Geoscience**, Presentation of the work: Comparing the influence of Atlantic Multidecadal Variability and spring soil moisture on European summer heatwaves
- 2022 **GdR Défis théoriques pour les sciences du climat**, Poster presentation of the work: Comparing the influence of Atlantic Multidecadal Variability and spring soil moisture on European summer heatwaves

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## Skills

**Programming** Python, MATLAB, C, Bash, L<sup>A</sup>T<sub>E</sub>X, Microsoft Office

**Languages** Italian, English, French, Neapolitan

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## Interests

**Sports** Running, hiking, swimming

**Hobbies** Baking, cooking, poetry and novels reading and writing, art's history and museums

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## Publications

- [1] Valeria Mascolo. *Studying extreme heatwaves using novel theoretical approaches*. PhD thesis, École normale supérieure de Lyon, 2024. <https://theses.hal.science/tel-04843914/>.
- [2] Valeria Mascolo, Clément Le Priol, Fabio D'Andrea, and Freddy Bouchet. Comparing the influence of atlantic multidecadal variability and spring soil moisture on european summer heat waves. *Oxford Open Climate Change*, 5(1), 2025. <https://doi.org/10.1093/oxfclm/kgae023>.
- [3] Valeria Mascolo, Alessandro Lovo, Corentin Herbert, and Freddy Bouchet. Gaussian framework and optimal projection of weather fields for prediction of extreme events. *Journal of Advances in Modeling Earth Systems*, 17(6), 2025. <https://doi.org/10.1029/2024MS004487>.
- [4] Valeria Mascolo, Francesco Ragone, Nili Harnik, and Freddy Bouchet. Rare events algorithm study of extreme double jet summers and their connection to heatwaves over Eurasia, 2025. <https://arxiv.org/abs/2507.13101>, Submitted to *Climate Dynamics*.