

# Matteo Nurisso, Ph.D.

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## Employment

- 2024 – present     📌 **Assegno di ricerca Post Dottorale (Post-Doc)** Consiglio Nazionale delle Ricerche, Institute of Atmospheric Sciences and Climate (CNR-ISAC), Turin.  
Topic: EPOCHAL project about paleoclimate simulations and code development of AQUA in the Destination Earth project.
- 2022 – 2024     📌 **Assegno di ricerca professionalizzante** Consiglio Nazionale delle Ricerche, Institute of Atmospheric Sciences and Climate (CNR-ISAC), Turin.  
Topic: Teleconnections diagnostic and code development of the framework for the AQUA code in the Destination Earth project.

## Education

- 2018 – 2022     📌 **Ph.D., Scuola Internazionale di Studi Superiori Avanzati (SISSA)** Astrophysics and Cosmology.  
Thesis title: *Particles acceleration with Magnetic Reconnection in large scale MHD simulations*.  
Supervisors: Annalisa Celotti and Andrea Mignone
- 2014 – 2018     📌 **Master Degree , University of Turin** Astrophysics and Theoretical Physics.  
Thesis title: *Anisotropic Cosmic Ray transport in the galaxy with PLUTO*.  
Supervisors: Andrea Mignone and Nicolao Fornengo
- 2011 – 2014     📌 **Bachelor Degree , University of Turin** Physics.  
Thesis title: *The Heisenberg model and the Bethe Ansatz*.  
Supervisor: Marco Billó

## Research Publications

- 1     Caprioli, S., von Hardenberg, J., Ghinassi, P., Ghosh, S., Kluft, L., Koldunov, N., ... Davini, P. (2024). Aqua: A novel quality assessment tool for km-scale simulations in the destination earth climate digital twin - the diagnostics suite. 📄 doi:10.5194/egusphere-egu24-11230
- 2     Nazarova, N., von Hardenberg, J., Davini, P., **Nurisso, M.**, Caprioli, S., & Ghinassi, P. (2024). Evaluating tropical precipitation extremes: Insights from first simulations from nextgems and destination earth climate digital twin. 📄 doi:10.5194/egusphere-egu24-11498
- 3     **Nurisso, M.**, von Hardenberg, J., Caprioli, S., Ghosh, S., Koldunov, N., P. Kinoshita, B., ... Davini, P. (2024). Aqua: A novel quality assessment tool for km-scale simulations in the destination earth climate digital twin - the core framework. 📄 doi:10.5194/egusphere-egu24-10935
- 4     **Nurisso, M.**, Celotti, A., Mignone, A., & Bodo, G. (2023). Particles acceleration with magnetic reconnection in large scale RMHD simulations: I. current sheet identification and characterization. *Monthly Notices of the Royal Astronomical Society*. 📄 doi:10.1093/mnras/stad1348
- 5     **Nurisso, M.**, Celotti, A., Mignone, A., & Bodo, G. (2022). Particle acceleration via magnetic reconnection in large-scale MHD jet simulations. (Vol. 17, pp. 54–55). 📄 doi:10.1017/s1743921323000935
- 6     **Nurisso, M.** (2022). *Particles acceleration with magnetic reconnection in large scale mhd simulations* (Ph.D thesis). Retrieved from 📄 <https://hdl.handle.net/20.500.11767/130671>
- 7     **Nurisso, M.** (2018). Anisotropic cosmic ray transport in the galaxy with pluto. Retrieved from 📄 <https://api.semanticscholar.org/CorpusID:221133901>

## Projects

- 2024 – present
- Participation as Post-Doc in the PRIN: **Earth system modeling of PaleOClimatic HyperthermALs** (EPOCHAL) founded by the NextGeneration EU.
  - Participation in the WP14 and co-lead of Activity 8 (A8 corresponding to WP7 of the Phase 1) of the **Destination Earth Climate Digital Twin** project Phase 2, a flagship initiative of the European Commission.
- 2022 – 2024
- Participation in the WP7 of the **Destination Earth Climate Digital Twin** project Phase 1, a flagship initiative of the European Commission.

## Code contributions

- AQUA (Application for Quality Assessment)**. Developer of the code framework and the teleconnections and timeseries diagnostics.
- Stece code**. A collection of script and tools for EC-EARTH4.
- PLUTO code**. Developer of a module for magnetic reconnection particles acceleration in Magneto-Hydrodynamical simulations.

## Conferences and Hackatons

- 2024
- nextGEMS Cycle 4 Hazard hackathon** (Wageningen, Netherland)
  - Destination Earth Climate DT Final Kick-off** (Helsinki, Finland)
  - EGU General Assembly 2024** (Vienna, Austria) (Abstract: <https://meetingorganizer.copernicus.org/EGU24/EGU24-10935.html>)
  - EC-Earth General Assembly** (De Bilt, Netherlands)
- 2023
- 2nd Destination Earth User eXchange** (Bonn, Germany) (Poster from AQUA code: <http://bit.ly/aqua-poster>)
  - nextGEMS Cycle 3 Hackathon** (Madrid, Spain)
  - Destination Earth Hackathon @ BSC** (Barcelona, Spain)
- 2022
- 7th Heidelberg International Symposium on High-Energy Gamma-Ray Astronomy** (Barcelona, Spain)
  - Active Galactic Nuclei XIV: The Renaissance of Black Holes and Galaxies** (Florence, Italy)
- 2020
- EuroScience Open Forum 2020** (Trieste, Italy)
- 2019
- International Conference of Physics Students 2019** (Cologne, Germany)
- 2017
- International Conference of Physics Students 2017** (Turin, Italy)



## Skills

- Languages
- Strong reading, writing and speaking competencies for English and Italian. Moderate reading, writing and speaking competencies for French.
- Coding
- c, c++, Python (xarray, dask), Fortran
- Software
- Git, Github, Linux, Slurm, EC-Earth ESM code, CDO, CI/CD, MPI, OpenMP, Cuda, IDL, Visit, Html, PLUTO MHD code
- Scientific
- Climate simulations, Magnetohydrodynamic simulations, Academic research,  $\LaTeX$  type-setting and publishing.


## Miscellaneous Experience

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### Seminars

- 2024  **AQUA: a novel quality assessment tool for km-scale simulations in the Destination Earth Climate Digital Twin – An introduction to AQUA and to nextGEMS data access @ nextGEMS Storms, Eddies and Science hour**
-  **AQUA - a novel quality assessment tool for km-scale simulations in the Destination Earth Climate Digital Twin – The Core Framework @ EGU General Assembly 2024**






### Teaching

- 2017 – 2018  **Tutor** of "Introduzione alla programmazione", University of Turin






### Workshops

- 2023  **CodeRefinery workshop:** Introduction to Git, Collaborative distributed version control, Reproducible and tested code and research
- 2022  **SCtrain training week:** Introduction to Parallel Programming
- 2021  **Machine Learning Lectures** Cluster of Galaxies IFPU group
- 2020  **Deep Learning Day** AI Student Society

### Science Communication

- 2022  **Social media management and Personal Branding**
-  **Science Communication:** the use of objects and easy experiments in face-to-face events
- 2021  **Science Communication** mini-course
- 2019  **Training and Sharing:** Best practices in Science Communication
-  **Science Dialogues:** training course on Science Communication

### Outreach

- 2020-2022  **Trieste Next** volunteer
- 2018 – 2022  **Sissa4Schools** volunteer
- 2018-2021  **SISSA Student Day** speaker
- 2017  **ICPS** volunteer (International Conference of Physics Students)
- 2013 – present  Vicepresident (2014-2023) and President (since 2024) of **Silviadizenzero**, active in Climate Science outreach