David Pelosi

PhD Candidate - Astroparticle and Space Physics

Contact Information

Dipartimento di Fisica e Geologia
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Current Position

PhD Candidate at **Dipartimento di Fisica e Geologia, Università degli Studi di Perugia — UniPG**, Perugia, Italy.

Thesis title: *The PgLIS Model: A forecasting model for Galactic Cosmic Rays Variability and Orbital Radiation Risk Assessment in Space Missions*

Supervisor: Nicola Tomassetti

Co-Supervisor: Miguel Orcinha

End of PhD expected in October 2026.

Education

Dipartimento di Fisica e Geologia, Università degli Studi di Perugia — UniPG, Perugia, Italy

M.Sc. in **Physics** **Apr 2023**

Specialization: Astrophysics and Astroparticle Physics

Thesis title: *A Numerical Model for the Transport of Cosmic Rays in the Heliosphere.*

Supervisor: Nicola Tomassetti

Grade: 110/110 *cum laude*

B.Sc. in **Physics** **Jun 2020**

Thesis title: *Development of a web application for monitoring cosmic radiation and solar activity.*

Supervisor: Nicola Tomassetti

Co-Supervisor: Matteo Duranti

Grade: 110/110

Liceo Scientifico Galeazzo Alessi, Perugia, Italy

High School Diploma **Jul 2015**

Grade: 100/100

Teaching Experience

Università degli Studi di Perugia — UniPG, Perugia, Italy

Physics

classes for *B.Sc. in Civil and Environmental Engineering*:

Jan 2021–Jun 2021 as a Teaching Collaborator

Jan 2022–Jun 2022 as a Teaching Collaborator

classes for *M.Sc. in Building Engineering and Architecture*:

Jan 2021–Jun 2021 as a Teaching Collaborator

Fellowships, Grants & Awards

Invited Visiting Researcher **Jan 2026 — March 2026**

Location: Laboratório de Instrumentação e Física Experimental de Partículas (LIP), Lisbon, Portugal

Contact person: Fernando José de Carvalho Barão

Scientific Research Grant **Mar 2025 — Jun 2025**

Title: SCOSTEP Visiting Scholar (SVS) program 2025

Position: Visiting Researcher

Location: Space Physics and Astronomy Research Unit at the University of Oulu, Finland

Funding: Scientific Committee on Solar-Terrestrial Physics (SCOSTEP).

Scientific Research Grant **Mar 2025 — Jun 2025**

Title: Advancing Galactic Cosmic Ray modeling and its implications for atmospheric chemistry and climate dynamics

Position: Visiting Researcher
Location: Space Physics and Astronomy Research Unit at the University of Oulu, Finland
Funding: Geomagnetic Excursions/Reversals: Assessment of Climate Impacts in Silico (GERACLIS) funded by the Research Council of Finland for 2023-2027 and hosted by the University of Oulu in consortium with Finnish Meteorological Institute.
Contact persons: Ilya Usoskin, Pauli Väisänen

Franco Mariani Award **Nov 2024**
The "Premio Franco Mariani" is awarded by the Space Weather Italian Community (SWICO) for the best master's thesis in Space Weather research.

Ph.D. Grant **Oct 2023 — Oct 2026**
Topic: Phenomenological study of energetic charged radiation in space
Position: PhD student
Funding: Università degli Studi di Perugia — UniPG

Postgraduate Research Fellow **Jan 2022 — Oct 2023**
Topic: Implementation of an efficient model for predicting the flux of galactic cosmic rays.
Position: Master student
Project: Comprehensive spAce wEather Studies for the ASPIS prototype Realization (CAESAR) project, supported by the Italian Space Agency (ASI) and the National Institute for Astrophysics (INAF).

Refereed Journal Publications

The following papers were published in the following international peer-reviewed journals: **Physical Review Letters Advances in Space Research** and **Il Nuovo Cimento C**. A complete reference list of the publications can be found on the INSPIRE database **here**.

10. D. Pelosi et al., "A forecasting framework for galactic cosmic ray flux in space weather applications", Advances in Space Research 76 (2025) 5700-5713, doi: 10.1016/j.asr.2025.08.022

9. M. Aguilar et al. (AMS Collaboration), "Properties of Cosmic Lithium Isotopes Measured by the Alpha Magnetic Spectrometer", Phys. Rev. Lett. 134 (2025) 20, 201001, doi: 10.1103/PhysRevLett.134.201001

8. M. Aguilar et al. (AMS Collaboration), "Antiprotons and Elementary Particles over a Solar Cycle: Results from the Alpha Magnetic Spectrometer", Phys. Rev. Lett. 134 (2025) 051002, doi: 10.1103/PhysRevLett.134.051002

7. M. Aguilar et al. (AMS Collaboration), "Solar Modulation of Cosmic Nuclei over a Solar Cycle: Results from the Alpha Magnetic Spectrometer", Phys. Rev. Lett. 134 (2025) 051001, doi: 10.1103/PhysRevLett.134.051001

6. D. Pelosi et al. "Development of a web application for monitoring solar activity and cosmic radiation". Nuovo Cim.C 44 (2021), 1259. doi:10.1393/ncc/i2021-21097-2

Conference Proceedings

5. D. Pelosi et al. "Modeling the heliospheric modulation of cosmic-ray particles and antiparticles in light of new multichannel data from AMS-02 in space". Proceedings of 39th International Cosmic Ray Conference (2025) — PoS(ICRC2025), 1371. doi:10.22323/1.501.1371

4. D. Pelosi et al. "Analysis of Galactic Cosmic Ray Variability and Time-Lagged Relation to Solar Activity". Proceedings of 39th International Cosmic Ray Conference (2025) — PoS(ICRC2025), 1353. doi:10.22323/1.501.1353

3. M. Orcinha, F. Barão, B. Bertucci, E. Fiandrini, D. Pelosi and N. Tomassetti, "Understanding variations of galactic energetic particles in the heliosphere: modelling and radiation hazard assessment", Cent. Eur. Astrophys. Bull. 48 (2024), (awaiting publication), The 28th European Cosmic Ray Symposium — ECRS 2024, Hvar, Croatia, 23-27 September 2024, doi: 10.48550/arXiv.2509.11837

2. D. Pelosi, F. Barão, B. Bertucci, E. Fiandrini, M. Orcinha, A. Reina Conde and N. Tomassetti, "Cross-correlation analysis for cosmic ray flux forecasting", EPJ Web Conf. 319 (2025) 13004, Roma International Conference on AstroParticle Physics — RICAP-24, Frascati, Italy, 23-27 September 2024, doi: 10.1051/epjconf/202531913004

1. D. Pelosi et al. "A web application for monitoring cosmic rays and solar activity". Proceedings of 37th International Cosmic Ray Conference (2021) — PoS(ICRC2021), 1259. doi:10.22323/1.395.1259

CONFERENCE & WORKSHOP PRESENTATIONS

The speaker of each presentation is marked with an asterisk (*).

Contributed talks at international conferences and workshops

30 Oct 2025 "Cosmic radiation near Earth: Impact of solar activity and the geomagnetic field in long-term modelling of dose from cosmic radiation in space", M. Orcinha*, F. Barão, B. Bertucci, E. Fiandrini, **D. Pelosi**, N. Tomassetti, 27-31 October 2025, European Space Weather Week — ESWW2025, Umeå, Sweden

28 Oct 2025 "Solar Activity and Galactic Cosmic Rays: A Comprehensive Model for Long-Term Forecasting", **D. Pelosi***, F. Barão, B. Bertucci, E. Fiandrini, M. Orcinha, N. Tomassetti, 27-31 October 2025, European Space Weather Week — ESWW2025, Umeå, Sweden

17 Jul 2025 "Modeling the heliospheric modulation of cosmic-ray in light of new data from AMS-02 in space", N. Tomassetti* and A. Reina Conde and B. Bertucci and **D. Pelosi** and E. Fiandrini F. Barao and F. Faldi and M. Orcinha, 14-24 July 2025, International Cosmic-Ray Conference — ICRC2025, Geneva, Switzerland

17 Jul 2025 "Modeling the heliospheric modulation of cosmic-ray in light of new data from AMS-02 in space", N. Tomassetti* and A. Reina Conde and B. Bertucci and **D. Pelosi** and E. Fiandrini F. Barao and F. Faldi and M. Orcinha, 14-24 July 2025, International Cosmic-Ray Conference — ICRC2025, Geneva, Switzerland

16 Jul 2025 "Temporal Evolution of the Daily Proton and Helium Fluxes with AMS-02", F. Faldi* and M. Orcinha and **D. Pelosi**, on Behalf of AMS-02 Collaboration, 14-24 July 2025, International Cosmic-Ray Conference — ICRC2025, Geneva, Switzerland

28 Oct 2025 "Solar Activity and Galactic Cosmic Rays: A Comprehensive model for Long-term forecasting and Radiation Safety", **D. Pelosi***, F. Barão, B. Bertucci, E. Fiandrini, M. Orcinha, N. Tomassetti, 26-28 March 2025, Physics Days 2025, Oulu, Finland.

27 Nov 2024 "An Effective and Predictive Model for the Long-Term Variations of Cosmic Rays in the Heliosphere", **D. Pelosi***, M. Orcinha, F. Barão, B. Bertucci, E. Fiandrinni and N. Tomassetti, Space Weather Italian Community (SWICO) Congress — Italian Space Agency (ASI), Rome, Italy.

8 Nov 2024 "Long-term variations of cosmic rays in the heliosphere: modelling, forecasting and radiation hazard assessment", M. Orcinha*, F. Barão, B. Bertucci, F. Faldi, E. Fiandrinni, **D. Pelosi**, N. Tomassetti, P. Väisänen, European Space Weather Week 2024 — ESWW2024, Coimbra, Portugal

23 Sep 2024 "An effective and predictive model for the long-term variations of Cosmic Rays in the Heliosphere", M. Orcinha*, F. Barão, B. Bertucci, E. Fiandrinni, **D. Pelosi**, A. Reina Conde, N. Tomassetti, 28th European Cosmic Ray Symposium — ECRS2024, Hvar, Croatia

14 Sep 2023 "An effective and predictive model for the long-term variations of Cosmic Rays in the Heliosphere", **D. Pelosi***, F. Barão, B. Bertucci, E. Fiandrinni, M. Orcinha, A. Reina Conde, N. Tomassetti, 14 September 2023, 109 Congresso Nazionale, Società Italiana di Fisica, Salerno, Italy

17 May 2023 "An Effective and Predictive Model for the Long-term Variations of Cosmic Rays in the Heliosphere", **D. Pelosi***, B. Bertucci, E. Fiandrinni and N. Tomassetti, 15 - 17 May 2023, Space Environments Monitoring Workshop – SPACEMON 2023, ESA/ESTEC, Noordwijk, The Netherlands.

Poster sessions

14 Jul 2025 "Analysis of Time Variability of Galactic Cosmic Rays", **D. Pelosi***

and F. Barão and B. Bertucci and F. Faldi and E. Fiandrini and M. Orcinha and N. Tomassetti and P. Väisänen and R. C. Venterea, 14-24 July 2025, International Cosmic-Ray Conference — ICRC2025, Geneva, Switzerland

23 Sep 2024 "An effective and predictive model for the long-term variations of Cosmic Rays in the Heliosphere", **D. Pelosi***, F. Barão, B. Bertucci, E. Fiandrinni, M. Orcinha, A. Reina Conde, N. Tomassetti, 23-27 September 2024, RICAP24, Frascati, Italy

14 Apr 2024 "An effective and predictive model for the long-term variations of Cosmic Rays in the Heliosphere", **D. Pelosi***, F. Barão, B. Bertucci, E. Fiandrinni, M. Orcinha, A. Reina Conde, N. Tomassetti, 14–19 April 2024, European Geosciences Union — EGU, Vienna, Austria

12 Jul 2021 "A Web Application for Monitoring Cosmic Rays and Solar Activity", **D. Pelosi***, M. Duranti and N. Tomassetti, 12-23 July 2021, International Cosmic-Ray Conference — ICRC2021, Berlin, Germany

ADVANCED EDUCATION

Participation in international schools

29 Sept - 9 Oct 2025
XVI INFN International School on Efficient Scientific Computing (ESC25) about "Architectures, tools and methodologies for the development of large-scale scientific computing applications".
Location: Bertinoro, Italy
Organizers: INFN, CNAF
Successfully passed the final evaluation test.

25 Aug - 10 Sept 2024
The ESA-FAIR Space Radiation School 2024.
Location: Darmstadt, Germany
Organizers: European Space Agency and GSI/FAIR

13 - 17 May 2024
INFN School of Statistics
Organizers: INFN and University "Federico II", Naples. Location: Paestum, Italy

29 Apr - 3 May 2024
ESPD summerschool.
Theme: Energisation and heating in the solar plasma.
Organizers: European Solar Physics Division (ESPD) of the European Physical Society (EPS).
Location: Dubrovnik, Croatia

23 - 27 Oct 2023
International School on Open Science Cloud (SOSC 2023).
Theme: Computing Models for Scientific Experiments.
Location: Perugia, Italy
Organizers: INFN, University of Bologna and the University of Perugia.
Successfully passed the final evaluation test

16 - 18 Sep 2021
NiPS-EnABLES Summer School 2021
Theme: Powering the Internet of Things.
Location: Perugia, Italy
Organizers: NiPS Laboratory

KNOWLEDGE TRANSFER

Invited talks at academic institutions

5 March 2026 "The PGLis model and radiation dose studies", LIP — Laboratório de Instrumentação e Física Experimental de Partículas, Lisbon, Portugal

8 Apr 2025 "Long-term forecasting of Galactic Cosmic Rays and radiation dose studies", Space Physics Seminars, Space Physics and Astronomy Research Unit at the University of Oulu, Finland

28 Nov 2024 "Plans for Future Research on GCR and Radiation Dose Studies," talk given at the award ceremony of the "Premio Franco Mariani," Space Weather Italian Community (SWICO) Congress — Italian Space Agency (ASI), Rome, Italy.

Outreach initiatives

Jun 2019 – Jun 2021
President, Italian Association of Physics Students (AISF) Local Committee of Perugia.

26 Sep 2025 Participation on "Particelle nella Nebbia", made for SHARPER — the EU's Researcher's Night 2025, organized by INFN and Dept. of Physics & Geology of Dipartimento di Fisica e Geologia, Università degli Studi di Perugia — UniPG, Perugia, Italy

26 Nov 2024 Participation on "International Cosmic Day" (ICD-2024), organized by INFN-Perugia and Dept. of Physics & Geology of Dipartimento di Fisica e Geologia, Università degli Studi di Perugia — UniPG, Perugia, Italy. Nationally coordinated by the newtork OCRA — Outreach Cosmic Ray Activities

30 Sep 2023 Participation on "Particelle nella Nebbia", made for SHARPER — the EU's Researcher's Night 2023, organized by INFN and Dept. of Physics & Geology of Dipartimento di Fisica e Geologia, Università degli Studi di Perugia — UniPG, Perugia, Italy

SCIENTIFIC PROJECTS

CAESAR **Jan 2022 - Oct 2023**
Title: CAESAR — Comprehensive spAce wEather Studies for the ASPIS prototype Realization
Funding: INAF-ASI — Instituto Nazionale di Astrofisica, Agenzia Spaziale Italiana, Italy, ref. 2020-35-HH.0
Role: Master student

OTHER SCIENTIFIC ACTIVITIES

Current Scientific positions & Memberships

2023 - present — **Associated Researcher** of the Istituto Nazionale di Fisica Nucleare — INFN, Perugia, Italy

2023 - present — **Member** of AMS — international scientific collaboration Alpha Magnetic Spectrometer

2023 - present — **Member** of CERN — the European Organization for Nuclear Research

Service

2023 - present — AMS Collaboration — shifter for the TEE sub-detector group (TRD, ACC, TRK).

2024 – present — Responsible for coordinating the Italian side of the AMS Collaboration in the organization and management of shifts for the TEE sub-detector group (TRD, ACC, TRK).