

Gaia Verna

Curriculum Vitae

Personal Information

Date of birth August, 11th 1994. Chiavari (Genoa), Italy
Nationality Italian
ORCID 0000-0001-5916-9028

Professional Experience

02/2023– Present **Postdoctoral researcher**, Ricercatrice a Tempo Determinato Junior - RTDa, Physics Department of the University of Siena, Italy.

2021–2022 **Lecturer at the University of Aix-Marseille (ATER - Attaché temporaire d'enseignement et de recherche)**, Physics tutor for first and second year bachelor students in Engineering and Physics (198 hours), Marseille, France.

2018–2022 **Ph.D. in Physics**, Aix-Marseille Université, CPPM - Centre de Physique des Particules de Marseille, Marseille, France.

Education

2018–2022 **Ph.D. in Physics**, Aix-Marseille Université, CPPM - Centre de Physique des Particules de Marseille, Marseille, France.

2016–2018 **Master Degree Physics**, University of Genova, Genova, Italy.

2013–2017 **Bachelor degree Physics**, University of Genova, Genova, Italy.

Ph.D. Thesis

Title *Study of the PeVatron candidate G106.3+2.7 and optimization of the CTA-North sensitivity at high energies*
Supervisors Franca Cassol, Heide Costantini

Master Thesis

Title *Estimation of CTA potentiality in the search of galactic cosmic rays accelerators*
Supervisors Silvano Tosi, Heide Costantini
Grade 110 *cum laude*

Awards

2021 **"Prof. Maurizio Lo Vetere" award for the master thesis**, University of Genoa (Italy).

2020 **Video communication rewarded by publication**, in the peer-reviewed journal "Il Nuovo Cimento" during the SIF - Società Italiana di Fisica - 106th National Congress.

Major Collaborations

2023-Present **MAGIC Collaboration**, 300 members.
Activities: Galactic Science

2020-Present **LST-1 Collaboration**, 300 members.
Activities: Galactic Science

2018-Present **CTA Collaboration**, 1500 members.
Activities: Galactic Science, reconstruction and software development

Organization of International Conferences

Oggi **II VHEgam Meeting**, Member of the Scientific Organizer Committee (SOC), 50 participants, Bari, Italy.

Oggi **MAGIC General Meeting**, Member of the Local Organizer Committee (LOC), 100 partecipanti, Siena, Italy.

10/2024 **Topical Overview on Stellar Cluster Astrophysics**, member of the LOC, 50 participants, Siena, Italy.

Main Publications

2021 **HAWC J2227+610: a potential PeVatron candidate for the CTA in the northern hemisphere**, G. Verna et al. for the CTA Consortium, Proceedings of Science, DOI: <https://doi.org/10.22323/1.395.0904>, ICRC 2021.

2020 **Reconstruction of truncated images for PeVatron searches with the Cherenkov Telescope Array**, G. Verna et al. for the CTA Consortium, Il Nuovo Cimento, vol. 44 C (2021) n.104, DOI: 10.1393/ncc/i2021-21104-8, Peer-reviewed journal.

2019 **Reply to Comment on "Rutherford's experiment on alpha particles scattering: the experiment that never was"**, M. Leone, N. Robotti e G. Verna, IOPScience – Phys. Educ., vol. 54 (2019) n.6, DOI 10.1088/1361-6552/ab38f4, Peer-reviewed journal.

2019 **Cherenkov Telescope Array potential in the search for Galactic PeVatrons**, E. O. Angüner, F. Cassol, H. Costantini, C. Trichard, G. Verna for the Cherenkov Telescope Array Consortium, Proceedings of Science, DOI: 10.22323/1.358.0618, ICRC 2019.

2018 **Rutherford Experiment" on alpha particles scattering: the experiment that never was**, M. Leone, N. Robotti and G. Verna, IOPScience – Phys. Educ., vol. 53 (2018) n.3, DOI 10.1088/1361-6552/aaa353, Peer-reviewed journal.

Publications

Publications as a member of the MAGIC Collaboration

01/2025 **Characterization of Markarian 421 during its most violent year: Multiwavelength variability and correlations**, K. Abe et al., Astronomy & Astrophysics, 694, A195 (2025), DOI 10.1051/0004-6361/202451624.

12/2024 **Time-dependent modelling of short-term variability in the TeV-blazar VER J0521+211 during the major flare in 2020**, K. Abe et al., Astronomy & Astrophysics, 694, A308 (2025), DOI 10.1051/0004-6361/202451378.

10/2024 **Insights from the first flaring activity of a high-synchrotron-peaked blazar with X-ray polarization and VHE gamma rays**, K. Abe et al., Astronomy & Astrophysics, 695, A217 (2025), DOI 10.1051/0004-6361/202452785.

09/2024 **Combined search in dwarf spheroidal galaxies for branon dark matter annihilation signatures with the MAGIC telescopes**, *MAGIC Collaboration*, JCAP03(2025)020, DOI 10.1088/1475-7516/2025/03/020.

Publications as a member of the LST-1 Collaboration

10/2024 **A new method of reconstructing images of gamma-ray telescopes applied to the LST-1 of CTAO**, *LST-1 Collaboration*, *Astronomy & Astrophysics*, 691, A328 (2024), DOI 10.1051/0004-6361/202450889.

10/2024 **A detailed study of the very-high-energy Crab pulsar emission with the LST-1**, *LST-1 Collaboration*, *A&A*, 690, A167.

+ **12 articoli di Collaborazione.**

Pubblicazioni come membro del CTA Consortium

10/2024 **Prospects for a survey of the galactic plane with the Cherenkov Telescope Array**, *CTA Consortium*, IOP Publishing, JCAP10(2024)081.

10/2024 **Prospects for gamma-ray observations of the Perseus galaxy cluster with the Cherenkov Telescope Array**, *CTA Consortium*, IOP Publishing, JCAP10(2024)004.

+ **6 articoli di Collaborazione.**

Publications as a member of the CTA Collaboration

10/2024 **Prospects for a survey of the galactic plane with the Cherenkov Telescope Array**, *CTA Consortium*, IOP Publishing, JCAP10(2024)081.

10/2024 **Prospects for gamma-ray observations of the Perseus galaxy cluster with the Cherenkov Telescope Array**, *CTA Consortium*, IOP Publishing, JCAP10(2024)004.

+ **6 Collaboration articles.**

Softwares

2020–Present **pyirf**, from v0.5.0 to v0.11.0, Zenodo.

Other

09/2024 **Confirmation of four hot Jupiters detected by TESS using follow-up spectroscopy from MaHPS at Wendelstein together with NEID and TRES**, *Astronomy & Astrophysics*, 692, A220 (2024), DOI 10.1051/0004-6361/202451404.

09/2024 **Awiggling filamentary jet at the origin of the blazar multi-wavelength behaviour**, *C. M. Raiteri et al.*, *Astronomy & Astrophysics*, 692, A48 (2024), DOI 10.1051/0004-6361/202452311.

Presentations

Invited seminars

04/2025 **Gamma-ray astrophysics with imaging atmospheric Cherenkov telescopes**, Lecture for the master course in Astrophysics at the Department of Physics of the University of Genova, Italy.

01/2025 **Study of the very high energy emission from star-forming regions and young massive star clusters with the CTAO and LST-1**, Seminar at the Instituto de Astrofísica de Andalucía, Granada, Spain.

05/2024 **Studying Stellar Clusters with the LST-1 and the LST array**, LST-1 General Meeting, Prague.

Presentations

07/2021 **HAWC J2227+610: a potential PeVatron candidate for the CTA in the northern hemisphere**, ICRC 2021, online.

05/2021 **HAWC J2227+610: a potential PeVatron candidate for the CTA in the northern hemisphere**, CTA Consortium Meeting, online.

09/2020 **Reconstruction of truncated images for PeVatron searches with the Cherenkov Telescope Array**, 106th National Congress of the Società Italiana di Fisica, online.

10/2019 **Two dimensional fitting for truncated images**, CTA Consortium Meeting, Bologna (Italy).

06/2019 **Searching for galactic PeVatrons with the Cherenkov Telescope Array**, CNRS Summer School "Cosmic Explosions", Cargèse (Francia).

Observational proposals

01/2025 **Study of the star cluster NGC 6611 with the LST-1 and MAGIC telescopes**, Principal Investigator, LST-1 and MAGIC - Cycle 3/20.
Grade: B (7.48/10)

02/2024 **Study of the star cluster NGC 6611 with the LST-1**, Principal Investigator, LST-1 - Cycle 2.
Grade: C (6.35/10)

11/2023 **HESS J1848-018: a stellar cluster PeVatron?**, Co-Investigator, MAGIC - Cycle 19.
Grade: C

ATels

01/2025 **ATel #116979**, *Strong multi-wavelength flaring activity from FSRQ OP 313 from optical to gamma rays*, Osservatorio Astronomico di Siena.

01/2024 **ATel #16951**, *An exceptional optical flare of the flat spectrum radio quasar PKS B2258-022*, Osservatorio Astronomico di Siena.

12/2024 **ATel #16953**, *The flat spectrum radio quasar OP 313 is again in a very bright optical state at R=13.7*, Osservatorio Astronomico di Siena.

11/2024 **ATel #16891**, *Intense optical flare of the flat spectrum radio quasar OP 313*, Osservatorio Astronomico di Siena.

09/2024 **ATel #16830**, *Evolution of the recent optical flare of the blazar BL Lacertae*, Osservatorio Astronomico di Siena.

Supervision Activities

Ph.D.

2023–Present **PhD thesis supervision of L. Nikolić**, University of Siena (Italy).

2023–Present **PhD thesis supervision of A. Abhishek**, University of Siena (Italy).

Bachelor

Present **Bachelor thesis of J. Pedro Maria Savino**, University of Siena (Italy).

2024 **Bachelor thesis of C. Ventani**, *Il blazar Mrk 421 osservato da LST-1: analisi dei dati raccolti tra il 2022 e il 2024*, Grade: 6/6, University of Siena (Italy).

Teaching activities

2023–Present **Lecturer at the bachelor course on Electromagnetism (exercises)**, University of Siena (Italy).

06/2024 **Tutor at the first CTAO School**, (4 hours), Bertinoro (Italy).

06/2024 **Lecturer at the Ph.D. course "Analysis techniques for ground-based gamma-ray astronomy"**, (4 hours), University of Siena (Italy).

2021–2022 **Lecturer at the University of Aix-Marseille (ATER - Attaché temporaire d'enseignement et de recherche)**, Physics tutor for first and second year bachelor students in Engineering and Physics (198 hours), Marseille (France).

2018 **Tutor hired by the University of Genova**, Physics tutor for first-year bachelor students (53 hours), Genoa (Italy).

Research sojourns

Invited visiting

01/2025 **Visiting in the VHEGA group of the Istituto de Astrofisica de Andalucia (IAA)**, 2 weeks, Granada.

Observational shifts

03/2025 **Turno LST-1 - Role: Shift Leader**, (3 weeks), La Palma (Spain).

08/2024 **Turno MAGIC - Role: Operator**, (1 mese, La Palma (Spain).

02/2024 **Turno LST-1- Role: Shift Leader**, (3 weeks), La Palma (Spain).

12/2023 **Turno LST-1- Role: Deputy Shift Leader**, (3 weeks), La Palma (Spain).

12/2020 **Turno LST-1 shift - Role: Operator**, (3 weeks), La Palma (Spain).

Outreach activities

Publications

04/2024 **"Astronomy for sailors": a web game to learn physics using the stars and a clock**, *S. Iovenitti, G. Verna, S. Orsenigo, F. Chirico, R. Sgarro, S. Tosi and E. Santopinto*, IOP Journal of Physics: Conference Series, 2750, 1 (G. Verna is the reference author).

Organization of events

09/2024 **"Tutti a caccia...di raggi gamma!"**, European Researchers' Night 2024, Role: ideator, organizer and speaker, Siena (Italy).

11/2021 **"Seconda stella a destra: stelle bussole e orologi per non perdere la rotta."**, Festival della Scienza, Role: ideator and organizer, Genoa (Italy).

Talks

10/2024 **"A caccia...di raggi gamma"**, Futuro Remoto 2024, Role: speaker, Naples (Italy).

06/2021 **Representative of the CTA group of CPPM during national videoconferences addressed to high school students**, during the celebrations for the 50 years of the IN2p3, Marseille (France).

10/2019 **Representative of the CTA group of CPPM during the "Fête de la Science"**, Marseille (France).

07/2019 **Practical lab assistant during a summer school**, Franco-Chinese school organized by the CPPM, Marseille (France).

Associations

2023 - **StarAntola**, *Association of the Astronomical Observatory of Monte Antola*, Genoa.
Present

2018 - **Observations and Research in Astronomical Sciences (ORSA)**, *Interdepartmental University Center for Observations and Research in Astronomical Sciences*, University of Genoa.
Present

Other

10/2017 **Scientific animator hired by Festival della Scienza**, (60 hours), Genoa (Italy).

Skills

Softwares gammipy, ctools, ctapipe, naima, ROOT
Programming python, C++, bash
Languages
Environments LaTex, Microsoft Office
Operating Systems Linux, Windows

Languages

Italian **Native**
English **Fluent**
French **Fluent**