# Guillem Martí-Devesa | CV

Astroparticle Physicist

**Current Position:** Research Grant at Universitá di Trieste & INFN
**Fields:** Astroparticle Physics, Gamma-Ray Astronomy
**Coding:** Python, C, Fortran, R, Java
**Languages:** Catalan, Spanish, English (professional), German (basic)
**Tools:** Fermitools, XSPEC, git, Tempo2, LaTeX

Via Alfonso Valerio 2
Trieste, Italy
Dipartimento di Fisica
guillem.marti-devesa@ts.infn.it

## Summary

Astroparticle physicist, member of the *Fermi* Large Area Telescope (*Fermi* LAT) and the High Energy Stereoscopic System (H. E. S. S.) Collaborations.

Expertise on Galactic Astroparticle Physics, particularly in stellar systems – binaries and stellar clusters – using multi-wavelength data (optical, X-ray, and $\gamma$ ray). Main methods employed: Maximum-Likelihood Estimation and Time-Series Analysis.

## Education

**PhD in Physics** - Universität Innsbruck, Austria 2017 – 2020

· Thesis: *Observational Studies on the Population of Binaries in the Gamma-Ray Sky*

· Doctoral schools at DIAS-DCU (Ireland), LAPP-CNRS (France) and ECAP-FAU (Germany). Radio analysis workshops by JIVE (Netherlands) and UK ARC-UM (United Kingdom)

**MSc in Astro-, Particle Physics and Cosmology** - Universitat de Barcelona, Spain 2016 – 2017

· Thesis: *First Multi-Filter Photometric Monitoring of the Be-BH System MWC 656*

· Courses on Statistics and Programming at ICCUB

**BSc in Physics** - Universitat de Barcelona, Spain 2012 – 2016

· Thesis: *Light Pollution in Barcelona: Night Sky Background Analysis*

· Observations performed at COU (Lleida, Spain) and Calar Alto (Almería, Spain)

**Professional Degree in Music** - Conservatori de Música de Barcelona, Spain 2008 – 2014

· Honour Commendations in Chamber Music (2014) and Viola (2014)

· Concerts performed in Spain (Barcelona, Valencia, Pamplona, and others), Austria (Innsbruck), France (Toulouse), Germany (Steingaden), and Italy (Dobbiaco) with multiple semi-professional and amateur orchestras.

## Work Experience

**General** - Professional Service

· Member of the *Fermi*-LAT and H.E.S.S. collaborations since 2018
· *Fermi*-LAT's Galactic Science Group co-coordinator since September 2022
· Journal referee for *AJ*, *ApJ*, and *A&A*

**Research Grant** - Università di Trieste & INFN, Italy 2024 – Now

· Studies on Galactic and Extragalactic $\gamma$-ray sources
· Development of new analysis methods for *Fermi*-LAT

**Universitätsassistent – Postdoc** - Universität Innsbruck, Austria 2020 – 2023

· Studies on Galactic $\gamma$-ray sources
· Teaching between 4 and 6 hours weekly every semester

**Graduate researcher** - Universität Innsbruck, Austria 2017 – 2020

· Studies on $\gamma$-ray binary systems
· One-month shift at H.E.S.S. site (Namibia), and remote data quality monitoring shifts with H.E.S.S. and *Fermi*-LAT

**Research assistant** - Institut d'Estudis Espacials de Catalunya, Spain 2015 – 2017

· Studies on light pollution in natural reserves
· Participation in the LoNNe calibration campaign in 2016 at COU observatory

## Teaching

PR: Practical training course; PS: Exercise course; SE: Seminar; VO: Lecture; VU: Lecture-exercise course

**At Universität Innsbruck** 2021 - 2023

| | |
|---|---|
| · PR Programming for Physics Students | BSc – Summer 2021 & 22 & 23 |
| · PS Physics IV: Nuclear and Particle Physics | BSc – Summer 2021 & 22 |
| · VU Astroparticle Physics I | MSc – Fall 2021/22 |
| · PR Laboratory for Computational Physics A | MSc – Fall 2021/22 & 21/22 |
| · VU Binary Systems in Astrophysics (new creation) | MSc – Fall 2021/22 |
| · PS Physics I: Mechanics and Thermodynamics | BSc – Fall 2022/23 |
| · VO Introduction to Astroparticle Physics | BSc – Fall 2022/23 |
| · SE Bachelor Thesis Seminar (Astroparticle and Particle Physics coordinator) | BSc – 2023 |
| · VU Astroparticle Physics II | MSc – Summer 2023 |
| · VU Theoretical Astrophysics | MSc – Summer 2023 |

## Supervision

### Bachelor Theses

| | |
|---|---|
| · *High-Energy Gamma-Rays from the Omega Nebula* – Daniel Resch | Summer 2021 |
| · *Gamma-Ray Flares of the Microquasar Cygnus X-3: a Fermi-LAT Perspective* – Mike Wettke | Summer 2022 |
| · *Understanding the High-Energy Emission from the Omega Nebula* – Sandrino Achenreiner | Summer 2022 |
| · *The Crab Nebula seen by H.E.S.S. and Fermi-LAT with Open-Source Tools* – Melanie Federer† | Summer 2023 |
| · *The PWN MHS 15-52 as seen with H.E.S.S. and Fermi-LAT* – Lukas Sabathil† | Summer 2023 |
| · *Neutrinos from Colliding Stellar Winds* – Bernhard Lang | Summer 2023 |
| · *Anisotropic Inverse Compton from Cygnus X-1* – Philipp Aichner | Summer 2023 |

### Master Theses

| | |
|---|---|
| · *Star Forming Regions as Hadronic Cosmic-Ray Accelerators* – Nadine Bourriche* | 2021 – 2022 |

† Co-supervised with Dr. Markus Holler
* Co-supervised with Prof. Olaf Reimer

### Other

| | |
|---|---|
| · Mentor within the *Fermi* LAT Mentoring Program | Since 2022 |

## Granted observing time

### Proposals

| | |
|---|---|
| · VLA (PI: Marcote): *CEN 1a and 1b: The third case of a colliding wind binary emitting gamma rays?* | 2023 |
| · EVN+e-Merlin (PI: Marcote): *CEN 1a and 1b: The third case of a colliding-wind binary emitting gamma rays?* | 2023 |
| · NICER Cycle 5 (PI: Martí-Devesa): *Wind-wind interaction and particle acceleration in the Kleinmann Star trapezium system*. Additional NuSTAR time. | 2023 |
| · H.E.S.S. internal proposals (PI or co-author, information not public) | 2020/24 |

## Talks

### Conferences

· TAUP 2023, Vienna, Austria — August 2023
· VGGRS Workshop VI, Innsbruck, Austria (invited talk & LOC) — April 2023
· Cosmic Magnetism in Voids and Filaments, Bologna, Italy — January 2023
· Gamma 2022, Barcelona, Spain — July 2022
· 9th Fermi Symposium, Johannesburg, South Africa (Virtual) — April 2021
· VGGRS Workshop V, Barcelona, Spain — September 2019

### Invited seminars

· ICCUB Seminar, Barcelona, Spain — September 2022
· MPIK's Astrophysics Seminar, Heidelberg, Germany (Virtual) — July 2021

## Outreach

### Activities

· Cloud chamber experiment and Sun observations with high-school students — ICCUB – Jan 2017

### Talks

· *Understanding the Universe: Astroparticle Physics in Tirol* — Mittelschule 2 Wörgl – Oct 2022

## Publications

### Main journal publications

[1] **G. Martí-Devesa*** et al. "Early-time $\gamma$-ray constraints on cosmic-ray acceleration in the core-collapse SN 2023ixf with the Fermi Large Area Telescope". In: *A&A* accepted; NASA press release (Apr. 2024).

[2] P. Da Vela*, **G. Martí-Devesa**, F. G. Saturni, P. Veres, A. Stamerra and F. Longo. "Intergalactic magnetic field studies by means of $\gamma$-ray emission from GRB 190114C". In: *PRD* 107, 6 (Mar. 2023), p. 063030. DOI: 10.1103/PhysRevD.107.063030. arXiv: 2303.03137 [astro-ph.HE].

[3] **G. Martí-Devesa***, O. Reimer, and A. Reimer. "Limits on the non-thermal emission of the WR-WR system Apep". In: *A&A* 670, L6 (Feb. 2023), p. L6. DOI: 10.1051/0004-6361/202245332. arXiv: 2212.10146 [astro-ph.HE].

[4] C. C. Cheung*, T. J. Johnson*, P. Jean*, M. Kerr, K. L. Page, J. P. Osborne, A. P. Beardmore, K. V. Sokolovsky, F. Teyssier, S. Ciprini, **G. Martí-Devesa**, I. Mereu, S. Razzaque, K. S. Wood, S. N. Shore, S. Korotkiy, A. Levina and A. Blumenzweig. "Fermi LAT Gamma-ray Detection of the Recurrent Nova RS Ophiuchi during its 2021 Outburst". In: *ApJ* 935.1, 44 (Aug. 2022), p. 44. DOI: 10.3847/1538-4357/ac7eb7. arXiv: 2207.02921 [astro-ph.HE].

[5] **G. Martí-Devesa*** and O. Reimer. "$\eta$ Carinae with Fermi-LAT: two full orbits and the third periastron". In: *A&A* 654, A44 (Oct. 2021), A44. DOI: 10.1051/0004-6361/202140451. arXiv: 2109.05950 [astro-ph.HE].

[6] **G. Martí-Devesa*** and O. Reimer. "X-ray and $\gamma$-ray orbital variability from the $\gamma$-ray binary HESS J1832-093". In: *A&A* 637, A23 (May 2020), A23. DOI: 10.1051/0004-6361/202037442. arXiv: 2001.02701 [astro-ph.HE].

[7] **G. Martí-Devesa***, O. Reimer, J. Li and D. F. Torres. "Hints of $\gamma$-ray orbital variability from $\gamma^2$ Velorum". In: *A&A* 635, A141 (Mar. 2020), A141. DOI: 10.1051/0004-6361/202037462. arXiv: 2001.02708 [astro-ph.HE].

### Reports in The Astronomer's Telegram

[8] C. C. Cheung*, T. J. Johnson, P. Jean, and **G. Martí-Devesa**. "Fermi-LAT daily aperture light curve of T CrB now available". In: *The Astronomer's Telegram* 16336 (Nov. 2023), p. 1.

[9] **G. Martí-Devesa***. "Fermi-LAT gamma-ray observations of SN 2023ixf". In: *The Astronomer's Telegram* 16075 (June 2023), p. 1.

[10] **G. Martí-Devesa***. "Fermi-LAT detection of enhanced gamma-ray activity from the FSRQ PKS 0700-465". In: *The Astronomer's Telegram* 16048 (May 2023), p. 1.

[11] T. J. Johnson, **G. Martí-Devesa**, and C.C. Cheung*. "Detection of enhanced emission above 100 MeV, using Fermi-LAT data, associated with the PSR B1259-63/LS 2883 binary system approximately 60 days after periastron". In: *The Astronomer's Telegram* 14540 (Apr. 2021), p. 1.