

ALESSIO MEI

PhD in Astroparticle Physics

CONTACT INFO

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ABOUT ME

Observational and theoretical astrophysicist, studying the high energy emission of gamma-ray bursts using *Fermi* and *Swift* satellites. The goal of my research is to understand the underlying physical processes leading to high energy emission and the cosmological implications of these transient sources using a multi-wavelength and multimessenger approach. My main expertise is based on observations, data analysis and theoretical modeling.

EDUCATION

PhD in Astroparticle Physics (with honors) **Nov 2020-Jun 2025**
Gran Sasso Science Institute (GSSI) | L'Aquila, Italy

- Thesis title: "On the common properties across the gamma-ray burst population: discovering a standard behavior and unique events"
- Advisor: Gor Oganessian
- Co-advisors: Marica Branchesi, Biswajit Banerjee

Master's Degree in Astrophysics **Dec 2018-Sep 2020**
University of Rome Tor Vergata | Rome, Italy

- Thesis title: "X-ray analysis of the broad-line radio galaxy 3C 215"
- Advisor: Francesco Tombesi
- Final degree grade: 110/110 with honors

Bachelor's Degree in Physics **Sep 2015-Dec 2018**
University of Rome Tor Vergata | Rome, Italy

- Thesis title: "Spin measurement methods for supermassive black holes"
- Advisor: Fausto Vagnetti
- Final degree grade: 107/110

WORK EXPERIENCE

GSSI Alumni Association **Mar2023-May2025**
Gran Sasso Science Institute (GSSI) | L'Aquila, Italy

- Secretary and member of the Board of Directors

Review activity
Gran Sasso Science Institute (GSSI) | L'Aquila, Italy

- Co-reviewer of one scientific article for Nature Communication

Tutor**Mar-Jun 2020****University of Rome Tor Vergata** | Rome, Italy

- Tutoring for the course "Physics 2" (Electromagnetism, circuits, waves), Applied Chemistry bachelor degree
- Supervisor: Francesco Tombesi

Laboratory Assistant**Mar-Oct 2018****University of Rome Tor Vergata** | Rome, Italy

- Assisting students during laboratory experiences for the course "Laboratory of Physics 2" (Electromagnetism, circuits, waves), Physics bachelor degree
- Supervisor: Annalisa D'Angelo

Part-time Digital Content Creator**Oct-Dec 2016****Treccani Web Portal**

- Creation of multimedial presentations on physics topics for high-school students

SKILLS

Programming languages

- Python (advanced)
- Bash (basic)

Software and Tools

- \LaTeX
- HEASOFT, XSPEC
- Fermi tools

Languages

- Italian (native)
- English (advanced)

AWARDS

Award for Academic Excellence**Dec 2021****University of Rome Tor Vergata** | Rome, Italy**Award for Academic Excellence****Nov 2019****University of Rome Tor Vergata** | Rome, Italy**PUBLICATIONS**

Short Author-List Papers**8. "Gamma-ray burst prompt emission spectra at high energies"**

S. Macera, B. Banerjee, **A. Mei**, P. Tiwari, G. Oganessian, M. Branchesi; *arXiv preprint*, 2025.

[arXiv:2501.10507](https://arxiv.org/abs/2501.10507) [astro-ph.HE]

7. "Gamma-ray burst spectral-luminosity correlations in the synchrotron scenario"

A. Mei, G. Oganessian, S. Macera; *Astronomy&Astrophysics*, 2025.

[DOI:10.1051/0004-6361/202451776](https://doi.org/10.1051/0004-6361/202451776)

6. "A mega-electron volt emission line in the spectrum of a gamma-ray burst"

M. E. Ravasio, O. S. Salafia, G. Oganesyan, **A. Mei**, G. Ghirlanda, S. Ascenzi, B. Banerjee, S. Macera, M. Branchesi, P. G. Jonker, A. J. Levan, D. B. Malesani, K. B. Mulrey, A. Giuliani, A. Celotti, and G. Ghisellini; *Science*, 2024.

DOI:10.1126/science.adj3638

5. "Camelidae on BOAT: observation of a second spectral component in GRB 221009A"

B. Banerjee, S. Macera, A. L. De Santis, **A. Mei**, J. Tissino, G. Oganesyan, D. Frederiks, A. L. Lysenko, D. S. Svinkin, A. Tsvetkova, M. Branchesi; *arXiv preprint*, 2024.

arXiv:2405.15855 [astro-ph.HE]

4. "Neutrino search from gamma-ray bursts during the prompt and X-ray afterglow phases using 10 years of IceCube public data"

F. Lucarelli, G. Oganesyan, T. Montaruli, M. Branchesi, **A. Mei**, S. Ronchini, F. Brighenti, B. Banerjee, G. G. Voutsinas; *Astronomy&Astrophysics*, 2023.

DOI:10.1051/0004-6361/202244815

3. "Constraints on the physics of the prompt emission from distant and energetic gamma-ray burst GRB 220101A"

A. Mei, G. Oganesyan, A. Tsvetkova, M.E. Ravasio, B. Banerjee, F. Brighenti, S. Ronchini, M. Branchesi, D. Frederiks; *The Astrophysical Journal*, 2022.

DOI:10.3847/1538-4357/aca091

2. "Gigaelectronvolt emission from a compact binary merger"

A. Mei, B. Banerjee, G. Oganesyan, O. S. Salafia, S. Giarratana, M. Branchesi, P. D'Avanzo, S. Campana, G. Ghirlanda, S. Ronchini, A. Shukla, P. Tiwari; *Nature*, 2022.

DOI:10.1038/s41586-022-05404-7

1. "XMM-Newton spectrum of the radio-loud quasar 3C 215: Slim accretion disk or SMBH binary"

A. Mei, F. Tombesi; *Astronomy&Astrophysics*, 2021.

DOI:10.1051/0004-6361/202140473

VISITINGS

Astronomical Observatory of Brera

7-14 Apr 2024

Merate, Italy

- Collaboration with Giancarlo Ghirlanda, Om Sharan Salafia and Lara Nava

Cosmic Dawn Center

Jan-Apr 2024

Copenhagen, Denmark

- Collaboration with Daniele Bjørn Malesani and Darach Watson

PHD SCHOOLS

The Transient Universe 2023

30 May - 9 Jun 2023

Cargèse, France

INFN School of Statistics

15-20 May 2022

Paestum, Italy

SELECTED CONFERENCES & SEMINARS

17th Marcel Grossmann Meeting <i>Pescara, Italy</i> (invited talk)	7-12 Jul 2024
3rd Nanjing GRB Conference <i>Suzhou, China</i> (contributed talk)	21-25 May 2024
DAWN Summit 2024 <i>Copenhagen, Denmark</i> (contributed talk)	15-17 Apr 2024
HERMES Science meetings <i>online</i> (invited talk)	5 Feb 2024
The IV Gravi-Gamma-Nu Workshop <i>L'Aquila, Italy</i> (invited talk)	4-6 Oct 2023
GRB50: The Past, Present, and Future of Gamma-Ray Bursts <i>Warrenton, Virginia, USA</i> (posters presentation)	28-30 Aug 2023
ENGRAVE workshop <i>Garching, Germany</i> (contributed talk)	6-8 Feb 2023
ENGRAVE collaboration webinar <i>online</i> (invited talk)	1 Dec 2022
Tenth International Fermi Symposium <i>Johannesburg, South Africa</i> (contributed talk)	9-15 Oct 2022
GRB-V: V Congresso Nazionale GRB <i>Trieste, Italy</i> (contributed talk)	12-15 Sep 2022
COSPAR 44th Annual Assembly 2022 <i>Athens, Greece</i> (2 contributed talks)	16-24 Jul 2022
EAS Annual Meeting 2022 <i>Valencia, Spain</i> (posters presentation)	27 Jun - 1 Jul 2022

MEMBERSHIPS

LIGO-Virgo-KAGRA Collaboration

Einstein Telescope Collaboration

ENGRAVE Collaboration

GRAWITA Collaboration

Teongrav Collaboration

OUTREACH ACTIVITIES

SHARPER | L'Aquila, Italy

- Yearly participation to the outreach activities of the European Researchers' Night (24 September 2021, 30 September 2022 and 29 September 2023)

PhTea Talks | L'Aquila, Italy

- Co-founder and co-organizer of outreach talks for PhD students at GSSI

The Science Breaker | Online

- I published an outreach article to lay audience: "*Long or short doesn't matter: the tale of an unusual gamma-ray burst*"

Space Explorers | L'Aquila, Italy

- Participation to outreach events for elementary school students about space and physics

Astronomy On Tap | Copenhagen, Denmark

- Outreach seminar to lay audience during my visiting in Copenhagen

IDeAS - Incontri di Divulgazione e Astrofisica in Sardegna | Sardinia, Italy

- Member of IDeAS, non-profit association which promotes outreach activities in Sardinia
- Participant of **Scienza in Bidda**, series of seminars, workshop and public debates made across Sardinia
- Participant of **Cuatro Cuartus de Scienza**, multilingual outreach events supported by INFN, INAF, GSSI and Physics Department of University of Cagliari
- Participation to **Fotosintesi - Arte sostenibile**, artists residency in Sant'Antioco (Sardinia), carrying out outreach events
- Organizer of **On the Edge of the Eyelid**, artists residency in between L'Aquila and Sardinia (Italy), carrying out outreach events