

Name: Michela Negro

Code: 661

Home institution: University of Maryland Baltimore County (UMBC)

Name of task: Fermi LAT (661.032)

Role in task/What do you do for CRESST:

Since the Fall of 2019, as CRESST II postdoc at NASA Goddard Space Flight Center, I'm focusing on gamma-ray astrophysics in a multi-messenger context: studying the gamma-ray emission in combination with other cosmic "messengers", such as neutrinos. I'm also working on future technology (such as the AstroPix project led by Regina Caputo, my advisor at Goddard) and mission development that will operate in the MeV energy band (e.g. AMEGO-X and GECCO). Recently I found myself interested in the physics and phenomenology of magnetar giant flares and the search for such events in Fermi archival data. In my spare time I love drawing with my soft pastels, singing, reading, and watching tv shows.



What is your background:

In 2013 I was awarded a fellowship to spend the summer working at SLAC National Laboratories in California, where I "met" *Fermi* (a NASA gamma-ray mission) for the first time. At SLAC I worked with Seth Digel and Luigi Tibaldo on the gamma-ray emissivity of high-velocity clouds to constrain the cosmic-ray diffusion Galactic halo. After graduating from the University of Torino (Italy) in 2014, with a thesis on the measurement of the cosmic-ray electron spectrum with Fermi data, I left the academic environment to work for Thales Alenia Space (Torino), an aerospace manufacturer specializing in the space industry. After one year, I returned to my *alma mater* to continue working on *Fermi* data analysis at the University of Torino. Supervised by Luca Latronico and Nicolao Fornengo, I obtained my Ph.D. in 2019 with an analysis of the small scales anisotropy of the gamma-ray background.

Highlight of research as a CRESST Scientist:

I started as a CRESST Scientist in September 2019 focusing my research on the gamma-rays/high-energy neutrinos connection with a cross-correlation study involving IceCube data and the Fermi-LAT unresolved gamma-ray background. In parallel, I found myself involved in a population study of magnetar giant flares and I developed a deep interest in the topic, which led me to win a Fermi-GI large proposal award to investigate more about these events in the gamma-ray data. I also enjoy being involved in the team activities for the development of new NASA mission concepts for the exploration of the MeV gamma-ray sky (e.g. AMEGO-X and GECCO).

Selected list of recent publications, talks and awards:

Public talks

- *Wyoming Stargazing* public talk: "What do telescopes look like in the era of multimessenger Astrophysics?"

Invited Talks at conferences

- @ CRIS 2020 (Postponed) - *Review of main Fermi-LAT recent results. (On behalf of the Fermi-LAT collaboration).*
- @ PHOTON 2019 - *Unveiling the gamma-ray background through its anisotropies.*
- @ 19th Lomonosov Conference 2019 - *Anisotropies in the gamma-ray sky.*
- @ VHEPU, 14th Rencontres du Vietnam - *Unveiling the unresolved Gamma-ray background.*
- @ BAM 2018 (Barolo Astroparticle Meeting) - *The power of the unresolved: autocorrelation analysis of the unresolved Gamma-ray background*
- @ 8th Fermi Symposium 2018 - *Unveiling the unresolved Gamma-ray background.*
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Recent Accepted Contributed Talks

- @ ICRC 2021 - *Detection of the third class of gamma-ray bursts: magnetar giant flares.*
- @ APS April meeting 2021 - *Seeking the Link Between IceCube High-energy Neutrinos and the Unresolved Gamma-ray Background*

Selected Recent Publications

- E. Burns et al. (MN as analysis contributor) *Identification of a local sample of gamma-ray bursts consistent with a magnetar giant flare origin* – *Astrophys. J. Letters.* 2021
- Brewer, MN et al. (MN as leader of the simulation part) *Developing the Future of Gamma-ray Astrophysics with Monolithic Silicon Pixels*, accepted to *Nuclear Inst. and Methods in Physics Research, A*.
- M. Di Mauro et al. (MN for data analysis contribution) *Investigating the presence of “-ray halos around three bright sources detected by HAWC up to 100 TeV.* – *Phys. Rev D.* 2021.
- *Fermi-LAT Collaboration* (MN as only contact author), *Unresolved Gamma-Ray Sky through its Angular Power Spectrum*, *Phys. Rev. Lett.* 121, 241101 (2018).
- *Fermi-LAT Collaboration* (MN’s master’s degree thesis), *Cosmic-ray electron-positron spectrum from 7 GeV to 2 TeV with the Fermi Large Area Telescope*, *Phys.Rev. D*95 (2017) no.8, 082007.
- L. Tibaldo et al. (MN as contributing author), *Fermi-LAT Observations of High- and Intermediate-Velocity Clouds: Tracing Cosmic Rays in the Halo of the Milky Way*, *Astrophys.J.* 807 (2015) no.2, 161.

List of awards won:

- 2021 - Principal Investigator (PI) of a Large proposal selected by NASA Fermi Guest Investigator Program (Cycle 14th). Project Title: *Fermi* and the Search for Lost Magnetar Giant Flares.
- 2021 - Co-I of a Regular (1 years) proposal selected by NASA Fermi Guest Investigator Program (Cycle 14th). Project Title: The *Fermi* LAT light curve repository. (PI: Daniel Kocevsky).
- 2014 - Winner of the ISSNAF-ASI Internship Program for Italian students in the USA (NASA-Goddard Space Flight Center, Greenbelt (MD), USA).
- 2013 - Winner of the INFN scholarship at SLAC National Laboratory MenloPark (CA), USA.

To Contact Michela to learn more about her work and collaboration, she can be reached at:

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