

# Milena CRNOGORČEVIĆ

## PhD Candidate | Astronomy

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## 🔍 RESEARCH INTERESTS

- Axion-like particles from core-collapse supernovae: observational signatures and indirect searches
- $\gamma$ -ray instrumentation: sensitivity to indirect dark matter searches with the current and future instruments
- Precursor emission in gamma-ray bursts
- Multimessenger astronomy: searches for coincident electromagnetic and gravitational-wave or astrophysical neutrino emission to understand the origin and relevant production mechanisms

## 🎓 EDUCATION

- exp. March 2023 **Doctor of Philosophy, University of Maryland**, Department of Astronomy
- Thesis Title: *New Messengers & New Physics: A survey of the High-energy Universe*
  - Thesis Committee: Dr. R. Caputo (NASA/GSFC)<sup>1</sup>, Dr. M. Meyer (Univ. of Hamburg), Prof. M. Ricotti (Univ. of Maryland), Prof. C. Miller (Univ. of Maryland), Prof. C. Reynolds (Univ. of Cambridge)
- 2019 **Master of Science, University of Maryland**, Department of Astronomy
- Thesis Title: *Axion-like Particles and Where to Find Them: Searching for ALP-induced Core-collapse Supernovae with Fermi*
- 2017 **Bachelor of Arts, Middlebury College**, major in physics and minor in mathematics
- Honors Thesis: *Probing into the quasar/galaxy co-evolution using the OSIRIS data*
  - *magna cum laude* with high honors
- 2013 **Bi-lingual International Baccalaureate Diploma**, Li Po Chun United World College of Hong Kong

## 🧰 RESEARCH EXPERIENCE

- April 2018 **University of Maryland & NASA Goddard Space Flight Center**,  
now **Research Assistant to Dr. R. Caputo**
- Member of the *Fermi*-LAT Collaboration. Affiliated with the *Fermi*-GBM and *Swift*-BAT Teams.
  - Science coordinator of the *Fermi*-LAT Dark Matter & New Physics working group (2022–now). *Fermi*-LAT GRB advocate ( 10 week-long shifts/year).
- September 2016 **Department of Physics, Middlebury College**,  
May 2017 **Research Assistant to Prof. E. Glikman**, *honors thesis*
- Investigating the co-evolution of post-merger galaxies and dust-redenned quasars using integral-field spectrography.
- May 2016 **Department of Physics, Middlebury College**,  
August 2016 **Research Assistant to Prof. N. Graham**
- Computing edge-correction coefficients to the proximity force approximation for the Casimir energy of an oblate spheroid facing a plane.
- May 2015 **Department of Physics, Middlebury College**,  
August 2015 **Research Assistant to Prof. E. Glikman**
- Spectral analysis of red and obscured quasars in SDSS Stripe 82.

<sup>1</sup>Primary advisor noted in italic

- 2022 **Fermi GI Program Cycle 15: Principal Investigator (\$50k)**  
*Light at the end of the Tunnel: Search for ALP dark matter in precursor emission of long GRBs*
- 2022 **Department Service Award**, Department of Astronomy, University of Maryland  
*Honoring exceptional contributions to the department through service.*
- 2022 **Best Poster Award: The High Energy Astrophysics Division (HEAD)**, 19th Divisional Meeting of HEAD
- 2022 **Outstanding Graduate Research Assistant Award**, University of Maryland  
*Recognized as among the top 2% Graduate Assistants in a given year at the University of Maryland.*
- 2021 **Award for the best talk promotion video**, Kashiwa Dark Matter Symposium
- 2021 **Price Prize nomination**, Center for Cosmology and Astroparticle Physics at The Ohio State University
- 2020 **John Mather Nobel Scholar (\$3k)**
- 2019–20 **College of Computer, Mathematical, and Natural Sciences Dean’s Fellowship (\$5k)**
- 2017–18 **Graduate School Dean’s Fellowship (\$10k)**
- 2013–17 **Davis UWC Scholar (\$20k per annum)**
- 2011–13 **Li Po Chun UWC, full merit-based scholarship (\$30k per annum)**
- 2009 **Junior Balkan Mathematical Olympiad, bronze medal**

## PUBLICATIONS

8. **M. Crnogorčević**, J. DeLaunay, and A. Tohuvavohu *for the Swift-BAT analysis*, C. Fletcher, J. Wood, P. Veres, and R. Hamburg, *on behalf of the Fermi-GBM Team; and the LVK Collaboration, under LVK review.* (to be submitted in <2 months)  
*A Joint Fermi-GBM and Swift-BAT Analysis of Gravitational-Wave Events from the GWTC-3 Catalog*
7. M. Negro, **M. Crnogorčević**, E. Burns, E. Charles, K. Feng, and R. Caputo, in prep. (to be submitted in < 3 months)  
*Search for spatial correlation between IceCube neutrino events and the Fermi-LAT unresolved gamma-ray sky*
6. **M. Crnogorčević**, M. Meyer, N. Omodei, and R. Caputo, in prep. (to be submitted in <6 months)  
*GRB precursor emission: a comprehensive search for ALP signatures in different time windows with Fermi LAT*
5. **M. Crnogorčević**, R. Caputo, M. Meyer, N. Omodei, and M. Gustafsson, 2021, Phys. Rev. D.  
*Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique*
4. I. Mereu, S. Cutini, E. Cavazzuti, G. Tosti and 111 co-authors, incl. **M. Crnogorčević**, 2021, ApJS.  
*Catalog of Long-Term Transient Sources in the First 10 Years of Fermi-LAT Data*
3. M. Ajello and 108 co-authors, incl. **M. Crnogorčević**, 2021, Nature Astronomy  
*High-energy emission from a magnetar giant flare in the Sculptor galaxy*
2. M. Ajello and 123 co-authors, incl. **M. Crnogorčević**, 2019, ApJ.  
*A Decade of Gamma-Ray Bursts Observed by Fermi-LAT: The Second GRB Catalog*
1. E. Glikman and 13 co-authors incl. **M. Crnogorčević**, 2018, ApJ.  
*Luminous WISE-selected Obscured, Unobscured, and Red Quasars in Stripe 82*

A full list of publications, including the GCN notices (real-time notices in the transient community), can be found at the ADS website.

## INVITED TALKS

- > “Astrophysical searches for axion-like particles in gamma-ray energies & multimessenger studies of the high-energy Universe,” oral presentation at the Department of Physics/WIPAC Seminar Series, University of Wisconsin, Madison, WI (September, 2022)<sup>2</sup>
- > “Astrophysical searches for axion-like particles in gamma-ray energies & multimessenger studies of the high-energy Universe,” oral presentation at the CCAPP Seminar Series, The Ohio State University, Columbus, OH (September, 2022)
- > “Catching the next wave: Searching for gamma-ray counterparts to gravitational-wave events with Fermi-GBM and Swift-BAT,” oral presentation at the NASA Marshall Space Flight Center & University of Alabama, Huntsville, AL (July, 2022)
- > “Astrophysical searches for axion-like particles in gamma-ray energies & multimessenger studies of the high-energy Universe,” oral presentation at the THEAPA seminar, IoA, Cambridge, UK (June, 2022)
- > “Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique,” oral presentation at the CCAPP Seminar Series, The Ohio State University, Columbus, OH (November, 2021)
- > “Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique,” oral presentation at the NASA Astroparticle Physics Lab meeting, Greenbelt, MD (August, 2021)
- > “Picture a Scientist,” panelist at the ICRC 2021 Diversity session, online (July, 2021)

<sup>2</sup>Expected talks noted in italic

## CONTRIBUTED TALKS

- > “Searching for Axionlike Particles from Gamma-ray Bursts with Fermi,” oral presentation at the TeVPA Meeting (August, 2022)
- > “Searching for Gamma- and hard X-ray Counterparts to Gravitational-wave events in GWTC-3 with Fermi-GBM and Swift-BAT,” oral presentation at the TeVPA Meeting (August, 2022)
- > “Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique,” oral presentation at the APS April Meeting (April, 2022)
- > “Searching for Gamma- and X-ray Counterparts to Gravitational-wave events with Fermi-GBM and Swift-BAT,” poster presentation at the APS April Meeting (April, 2022)
- > “Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique,” poster presentation at the 19th HEAD Meeting (March, 2022)
- > “Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique,” oral presentation at the 239th AAS Meeting (January, 2022)—*canceled due to the COVID-19 outbreak*.
- > “Searching for Axion-like Particles from Core-Collapse Supernovae with Fermi LAT’s Low Energy Technique,” oral presentation at Kashiwa Dark Matter Symposium (November, 2021)
- > “Axion-like Particles from Core-collapse Supernovae: Investigating Fermi’s Sensitivity,” poster presentation at A Rainbow of Dark Sectors, Aspen Center for Physics (March, 2021)
- > “Axion-like Particles from Core-collapse Supernovae: Investigating Fermi’s Sensitivity,” oral presentation at the virtual *Fermi* Collaboration Meeting (March, 2020)
- > “Axion-like Particles from Core-collapse Supernovae: Investigating Fermi’s Sensitivity,” poster presentation at UCLA Dark Matter 2020, Los Angeles, CA (March, 2020)—*canceled due to the COVID-19 outbreak*.
- > “ALP-induced Core-collapse Supernovae,” oral presentation at *Fermi* Collaboration Meeting, Santa Cruz, CA (September, 2019)
- > “Axion-like Particles and Where to Find Them,” oral presentation at *Fermi* Summer School, Lewes, DE (June, 2018)
- > “Quasar/Galaxy Co-evolution with OSIRIS,” oral presentation at Undergraduate Spring Research Symposium, Middlebury College (April, 2017)
- > “Quasar/Galaxy Co-evolution with OSIRIS,” oral presentation at APS Conference for Undergraduate Women in Physics, Harvard University (January, 2017)
- > “Edge Expansion of Scalar Casimir Energies,” poster presentation at Undergraduate Summer Research Symposium, Middlebury College (August, 2016)
- > “New Selection Criteria for Red and Obscured Quasars in Stripe 82,” poster presentation at APS Conference for Undergraduate Women in Physics, Syracuse University (January, 2016)
- > “New Selection Criteria for Red and Obscured Quasars in Stripe 82,” presentation at Keck Northeast Astronomy Consortium Undergraduate Symposium on Research in Astronomy, Williams College (October, 2015)
- > “New Selection Criteria for Red and Obscured Quasars in Stripe 82,” Keck Northeast Astronomy Consortium Undergraduate Research in Astronomy Journal (October, 2015)
- > “Hilbert’s Theorem 90,” publication in “Petničke sveske” and a presentation at the IX Conference of Scientific Research Center Petnica, Belgrade (September, 2010)

## TEACHING EXPERIENCE

**Teaching Assistant for Introductory Astronomy**, College Park, MD 2017–2018  
*Astronomical observations and history of astronomy, Solar system, stellar evolution, galaxy morphology and evolution, cosmology* • Instructors: Prof. Suvi Gezari (Fall 2017), Prof. Alberto Bolatto (Spring 2018)

**Astronomy Outreach & Telescope Operator**, Middlebury, VT 2015–2017  
*Conducting observatory events and operating telescopes at the Mittelman Observatory* • Advisor: Jonathan Kemp

**Tutor at the Center for Teaching, Learning, and Research**, Middlebury, VT 2014–2017  
*Newtonian Physics, Electricity and Magnetism*

**Teaching Assistant for Applied Mathematics to Physical Sciences**, Middlebury, VT 2016  
*Complex numbers and functions, sequences and series, ODE’s, Fourier analysis, multi-variable calculus, special functions, and vector calculus* • Instructor: Prof. Stephen J. Ratcliff

**Laboratory Assistant for Newtonian Physics**, Middlebury, VT 2015  
*Demonstrating techniques and instruments used in the experiments pertaining to classical mechanics: inertia, force, Newton’s laws of motion, work and energy, linear momentum, collisions, gravitation, rotational motion, torque, angular momentum, and oscillatory motion* • Instructor: Prof. Richard Wolfson

**Teaching Assistant for Electricity and Magnetism**, Middlebury, VT 2014–2015

Practical topics from electricity and magnetism, voltage, current, resistance, capacitance, inductance, and AC and DC circuits • Instructor: Prof. Noah Graham

Teaching Assistant for Newtonian Physics, Middlebury, VT  
Introductory level classical mechanics • Instructor: Prof. Anne Goodsell

2014

## IN THE NEWS

- > Early-career Scientist Spotlight at NASA Goddard: Milena Crnogorčević

## OUTREACH

- > **Mentoring Program founder & organizer**, *Fermi-LAT/GBM Collaborations* 2020–
- > **DEI Committee Member**, *Fermi-LAT* 2020–
- > **GRAD-MAP Team co-lead**, University of Maryland 2019–2022
- Member** 2017–
- > **BANG! Seminar lead organizer**, University of Maryland 2019–2021
- > **EDI Committee member**, Department of Astronomy, University of Maryland 2017–2021
- > **Fermi-LAT Reddit Ask Me Anything** August 2020
- > **ACE** (formerly known as AGN) **mentor to undergraduate students**, University of Maryland 2018–2019
- > **Equity Constellation, The Access Network member**, University of Maryland 2017–2018
- > **Women in Physics luncheon co-founder**, Middlebury College 2016–2017

*I served on a number short-term initiatives, including but not limited to: conducting graduate student interviews, participating in faculty searches, organizing and participating in a number of panels (e.g. applying to graduate school, GSFC/UMD connection, writing workshops, etc.), organizing visits to GSFC for prospective students, acting as a point person for the Department of Astronomy Mental Health Survey, organizing virtual check-in spaces during the Covid-19 pandemic, etc.*

## SUMMER SCHOOLS, WORKSHOPS, AND COMPETITIONS

- > Summer School in Astrostatistics and Astroinformatics, Center for Astrostatistics at the Pennsylvania State University (June, 2022)
- > SSI 2020 - SLAC Summer Institute 2020: “The Almost Invisibles: Exploring the Weakly Coupled Universe,” Online ZOOM video-conference (August 2020)
- > *Fermi* Summer School, Lewes, DE (June, 2018)
- > The Access Network Assembly, Denver, CO (May, 2018)
- > Four-time participant of the Mathematics Program at Petnica Scientific Center, Petnica, Serbia (2010)
- > Member of the Montenegrin National Team and a two-time participant of the Junior Balkan Mathematical Olympiad (JMBO)

## GENERAL INFORMATION

MEMBERSHIP: American Astronomical Society (AAS), American Physical Society (APS)  
LANGUAGES: Serbian (native), English (bilingual proficiency), Italian (professional working proficiency), Spanish (elementary proficiency)  
HOBBIES: 2022 US Masters Swimming (USMS) National Champion (200 m breaststroke), 6-time USMS medalist (2022), 9-time USMS Top Ten fastest times in the U.S., IM volleyball (member of the departmental team *Dirty Snowballs*), spoken-word poetry, creative writing, chess, fencing, crossword puzzles.

## REFERENCES

### Dr. Regina Caputo

*Research Astrophysicist*

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regina.caputo at nasa dot gov

### Dr. Manuel Meyer

*Research Group Leader*

UNIVERSITY OF HAMBURG  
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### Dr. Massimo Ricotti

*Professor*

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