Milena Crnogorčević

PhD Candidate, Astronomy
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Research Interests

- Axion-like particles from core-collapse supernovae: observational signatures and indirect searches
- γ-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

Doctor of Philosophy, University of Maryland, College Park, MD — exp. January 2023
Department of Astronomy
Thesis: *Astrophysical Searches for Axion-like Particles in γ-ray Energies and Multimessenger Studies of the High-energy Universe*
Thesis Committee: *Dr. Regina Caputo (NASA/GSFC)*[†], Dr. Manuel Meyer (Univ. of Hamburg), Prof. Massimo Ricotti (Univ. of Maryland), Prof. Coleman Miller (Univ. of Maryland), Prof. Christopher Reynolds (Univ. of Cambridge)

Master of Science, University of Maryland, College Park, MD — December 2019
Department of Astronomy
Thesis: *Axion-like Particles and Where to Find Them: Searching for ALP-induced Core-collapse Supernovae with Fermi*
Advisors: *Dr. Regina Caputo (NASA/GSFC)*, Dr. Manuel Meyer (Stanford University/KIPAC), Prof. Massimo Ricotti (Univ. of Maryland)

Bachelor of Arts, Middlebury College, Middlebury, VT — May 2017
Major: Physics, with a minor in Mathematics, *magna cum laude* with high honors
Honors Thesis: Probing into the quasar/galaxy co-evolution using the OSIRIS data
Advisor: *Prof. Eilat Glikman*

Li Po Chun United World College, Hong Kong — May 2013
Bi-lingual International Baccalaureate Diploma

Research Experience

Department of Astronomy, University of Maryland & NASA Goddard Space Flight Center — 2018–
Research Assistant to Dr. Regina Caputo
Member of the *Fermi* Dark Matter & New Physics and Gamma-ray Burst Group. *Fermi*-LAT Burst Advocate

Department of Physics, Middlebury College — 2016–2017
Research Assistant to Prof. Eilat Glikman; Honors Thesis

Department of Physics, Middlebury College — Summer 2016
Research Assistant to Prof. Noah Graham
Computing edge-correction coefficients to the proximity force approximation for the Casimir energy of an oblate spheroid facing a plane

[†] Primary advisor noted in italic

Department of Physics, Middlebury College Summer 2015
Research Assistant to Prof. Eilat Glikman
Analyzing new selection criteria for red and obscured quasars in SDSS Stripe 82

Honors and Awards

Fermi GI Program Cycle 15: Principal Investigator 2022
Title: *Light at the end of the Tunnel: Search for ALP dark matter in precursor emission of long GRBs* (up to $50k)
Department Service Award, Department of Astronomy, University of Maryland 2022
The High Energy Astrophysics Division (HEAD): Best Poster Award, 19th Divisional Meeting of HEAD 2022
Outstanding Graduate Research Assistant Award, University of Maryland 2021–22
Kashiwa Dark Matter Symposium, Award for the best talk promotion video 2021
Price Prize, Center for Cosmology and Astroparticle Physics at The Ohio State University, *nomination* 2021
John Mather Nobel Scholar ($3k) 2020
College of Computer, Mathematical, and Natural Sciences Dean's Fellowship ($5k) 2019–20
Graduate School Dean's Fellowship ($10k) 2017–18
Davis UWC Scholar ($20k per annum) 2013–17
Li Po Chun UWC, full merit-based scholarship ($30k per annum) 2011–13
Junior Balkan Mathematical Olympiad, bronze medal 2009

Publications

[8] C. Fletcher, J. Wood, P. Veres, and R. Hamburg, *on behalf of the Fermi-GBM Team*, **M. Crnogorčević**, J. DeLaunay, and A. Tohuvavohu *for the Swift-BAT analysis*; and the LVK Collaboration, in prep. (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 $<$4 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 THEAPA seminar, IoA, Cambridge, UK (June, 2022)*[†]
- *"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)*
- "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)

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* Colaboration 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* Colaboration 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)

[†] Expected talks noted in italic

- "Hilbert's Theorem 90," publication in "Petničke sveske" and a presentation at the IX Conference of Scientific Research Center Petnica, Belgrade (September, 2010)

Work and 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 2014
Introductory level classical mechanics • Instructor: Prof. Anne Goodsell

Outreach

- *Fermi*-LAT Mentoring Program founder & organizer (August 2020–);
- *Fermi*-LAT DEI Committee Member (February 2020–)
- GRAD-MAP team co-lead, University of Maryland (September 2019–2022); Member (September 2017–)
- BANG! Seminar Organizing Committee coordinator, University of Maryland (June 2019–2021)
- EDI Committee member, University of Maryland. (September 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 (2017–2018)
- Women in Physics, luncheon co-founder, Middlebury College (2016–2017)

Summer Schools, Workshops, and Competitions

- SSI 2020 - SLAC Summer Institute 2020: "The Almost Invisibles: Exploring the Weakly Coupled Universe," Online ZOOM video-conference (August 2020)
- ISAPP School 2020: "Gamma rays to shed light on dark matter," Madrid, Spain (June 2020, *postponed due to the COVID-19 outbreak*)
- *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)

Computing Skills

Highly proficient in MATLAB, Python, XSPEC, *GtBurst*, Wolfram Mathematica, LaTeX; proficient in PyRAF, IDL, Adobe Illustrator, TOPCAT, DS9; beginner in Bash, C, Git, HTML/CSS

Operating Systems: macOS, Linux, Windows

Membership

American Astronomical Society (AAS), American Physical Society (APS)

General Information

Languages: Serbian (native), English (fluent), Italian (intermediate), Spanish (beginner)
Pronouns: she/her/hers

Hobbies: US Masters Swimming (San Antonio Nationals 2022 medalist, 9 USMS Top Ten fastest times in the U.S.), IM Volleyball player (member of the departmental team *Dirty Snowballs*), spoken-word poetry, creative writing, chess, fencing, crossword puzzles.

Curriculum Vitae last time updated on June 6, 2022.