

Jonathan Mercedes-Feliz

Department of Physics, University of Connecticut, 196 Auditorium Road, U-3046, Storrs, CT 06269, USA

✉ jonathan.mercedes_feliz@uconn.edu | 🌐 github.com/JonMer1198 | 🔗 linkedin.com/in/jonathanmercedesfeliz | 📞 0000-0002-8390-6726

Personal Profile

A PhD candidate at the University of Connecticut under Professor Daniel Anglés-Alcázar. His current work is using state-of-the-art simulations from the Feedback In Realistic Environments (FIRE) project, to study the growth and impact of massive black holes in galaxies at cosmic noon ($z \sim 2$), focusing on massive galaxies near the peak of cosmic star formation and active galactic nuclei (AGN) activity.

Education

University of Connecticut

Storrs, CT

PhD in Physics

Aug 2018 - Current

- **Field of Study:** Astronomy
- Cosmological hyper-refinement simulations of quasar fueling and feedback at cosmic noon

University of Connecticut

Storrs, CT

MS in Physics

Aug 2018 - Dec 2020

- **Courses:** Mathematical Physics, Thermodynamics & Statistical Mechanics, Electricity & Magnetism, Classical and Quantum Mechanics, Particle and Nuclear Physics, Stars and Compact Objects

The City University of New York at Lehman College

New York, NY

BS in Physics

Aug 2013 - May 2018

- Graduated Cum Laude

Work Experience

University of Connecticut

Storrs, CT

Graduate Research Assistant

Jan 2020 - Current

- Analyzed the effects of black hole feedback, in the form of fast accretion-driven winds, on a massive galaxy in high resolution cosmological hydrodynamic simulations with resolved multi-phase interstellar medium.
- **Technical Skills:** Python, NumPy, Matplotlib, Pandas, Ubuntu Linux, Linux tools, Scripting, Git.
- **Soft Skills:** Teamwork, Time Management, Communication, Presentation skills.

University of Connecticut

Storrs, CT

Graduate Teaching Assistant

Aug 2018 - Jan 2020

- Instructing introductory astronomy labs, grading lab reports and assignments, providing feedback to students, as well as helping students achieve a higher understanding of Physics and Astronomy.
- Assisted in redesign of the introductory astronomy lab assignments to promote smoother course work flow.
- **Technical Skills:** DS9
- **Soft Skills:** Leadership, Time Management, Communication, Logical Thinking.

American Museum of Natural History/ Center for Computational Astrophysics

New York, NY

Undergraduate Student Researcher

Jun 2017 - Aug 2018

- Identified black holes in several high resolution cosmological simulations. Analyzed simulation outputs for signatures that are potentially observable using current technology.
- Wrote iterative code to record properties of black holes and host galaxies at various points throughout their evolution, with a focus on black holes within dwarf galaxies.
- **Technical Skills:** Python, Numpy, Matplotlib, Git
- **Soft Skills:** Time Management, Logical Thinking.

Publications

- First Author** *Local Positive Feedback in the Overall Negative: The impact of quasar winds on star formation in the FIRE cosmological simulations.* **Mercedes-Feliz, J.**, Anglés-Alcázar, D., et al. 2023, submitted to MNRAS (arXiv:2301.01784).
- First Author** *Dense stellar clump formation driven by strong quasar winds in the FIRE cosmological simulations.* **Mercedes-Feliz, J.**, Anglés-Alcázar, D., et al. 2023, in preparation.
- Co Author** *The impact of AGN-driven winds on physical and observable galaxy sizes.* Cochrane, R., Anglés-Alcázar, D., **Mercedes-Feliz, J.**, et al. 2023, submitted to MNRAS (arxiv:2303.12858).

Skills

- Programming** Python (Pandas, Matplotlib, NumPy, Scipy, Astropy, etc.), Java, Mathematica.
- Miscellaneous** Linux, Shell (Bash/Zsh), \LaTeX (Overleaf/R Markdown), Microsoft Office, Git.
- Soft Skills** Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements

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| 2020 | Connecticut Space Grant , Graduate Fellowship | CT |
| 2017-18 | AstroCom NYC , Fellowship | NY |
| 2017 | Presidential Scholar , Lehman College | NY |
| 2016 | Dean's List , Lehman College | NY |

Presentations

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| Oral | "Investigating Positive and Negative AGN Feedback in the FIRE cosmological simulations". AGN Winds on the Chesapeake. Easton, MD. June 2023. |
| Oral | "Shaping Massive Galaxies at Cosmic Noon: Probing AGN Feedback in the FIRE Simulations". 31st Annual New England Regional Quasar and AGN Meeting. South Kingston, RI. May 2023. |
| Oral | "Local Positive Feedback in the Overall Negative: The impact of quasar winds on star formation in the FIRE cosmological simulations". Invited Talk at the University of Southampton. Southampton, England. February 2023. |
| Oral | "Local Positive Feedback in the Overall Negative: The impact of quasar winds on star formation in the FIRE cosmological simulations". 241st Meeting of the American Astronomical Society. Seattle, WA. January 2023. |
| Oral | "Quantifying the Cosmic Web in CAMELS". Cosmic and Astrophysics with Machine Learning Simulations Workshop. New York, NY. November 2022. |
| Oral | "Local Positive Feedback in the Overall Negative: The impact of quasar winds on star formation in the FIRE simulations". 30th Annual New England Regional Quasar and AGN Meeting. Storrs, CT. May 2022. |
| Oral | "Local Positive Feedback in the Overall Negative: The impact of quasar winds on star formation in the FIRE simulations". American Museum of Natural History Virtual Astro Seminar. New York, NY. May 2022. |
| ePoster | "Local Positive Feedback in the Overall Negative: The impact of quasar winds on galactic star formation in the FIRE simulations". European Astronomical Society Annual Meeting. Leiden, Netherlands. July 2021. |
| Poster | "Black Holes and Dwarf Galaxy Mergers". 231st Meeting of the American Astronomical Society. Washington, DC. January 2018. |
| Poster | "Black Holes and Dwarf Galaxy Mergers". Society for Advancement of Chicanos/Hispanics and Native Americans in Science. Salt Lake City, Utah. October 2017. |
| Oral | "Black Holes and Dwarf Galaxy Mergers". Center for Computational Astrophysics/Flatiron Institute Symposium. New York, NY. August 2017. |

Languages

English	Native proficiency
Spanish	Bilingual proficiency
Japanese	Elementary proficiency