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Research Interests

black holes, active galactic nuclei, X-ray binaries, X-ray astronomy, neutron stars

Education

- **University of California, Los Angeles** Los Angeles, CA
PhD Astronomy and Astrophysics 2019-2023
- **University of California, Los Angeles** Los Angeles, CA
M.S. Astronomy 2015-2017
- **Rice University** Houston, TX
B.S. Astrophysics 2011-2015

Awards, Grants & Honours

UCLA Graduate Division Fellowship 2015
Rice Physics & Astronomy Summer Research Fellowship 2014

Research Experience

- **Marshall Space Flight Center** Huntsville, AL
Postdoctoral Position 2023-Present
 - Advisor: P. Kaaret (MSFC)
 - X-ray spectropolarimetry of
 - * X-ray binaries (neutron stars and black holes)
 - * active galactic nuclei (blazars and radio-quiet)
- **University of California, Los Angeles** Los Angeles, CA
Thesis Research 2018 - 2023
 - Advisors: D. Stern (JPL), M. Brightman (Caltech), M. Malkan (UCLA)
 - X-ray observations of
 - * candidate binary supermassive black holes with subparsec separations
 - * candidate fading active galactic nuclei
- **University of California, Los Angeles** Los Angeles, CA
Second Year Project 2016 - 2018
 - Advisor: R. Michael Rich (UCLA)

– Measured the optical stellar halos of nearby galaxies

• **Rice University**

Senior Thesis

Houston, TX

2014 - 2015

– Advisor: I. Smith (Rice)

– Measured radio flux of microquasar GRS 1758-258

Publications

First Authored

- **Saade, M.L.**, Ehlert, S., Liodakis, I., Kaaret, P., and Tavecchio, F. “No Clear Correlation between X-ray Spectral Properties and Polarization for High Synchrotron Peaked Blazars”, 2025, arXiv:2506.15826
- **Saade, M. L.**, Kaaret, P., Liodakis, I., and Ehlert, S. R. “A Comparison of the X-ray Polarimetric Properties of Stellar and Supermassive Black Holes”, 2024c, *The Astrophysical Journal*, 974, 101
- **Saade, M. L.**, Kaaret, P., Gnarini, A., et al. “X-ray Polarimetry of the Dipping Accreting Neutron Star 4U 1624-49”, 2024b, *The Astrophysical Journal*, 963, 133
- **Saade, M. L.**, Brightman, Stern, D. M., et al. “*NuSTAR* Observations of Candidate Sub-Parsec Binary Supermassive Black Holes”, 2024a, *The Astrophysical Journal*, 966, 104
- **Saade, M. L.**, Brightman, M., Stern, D., Malkan, M. A., and García, J. “*NuSTAR* Observations of AGN with Low Observed X-ray to [OIII] Luminosity Ratios: Heavily Obscured AGN or Turned-Off AGN?”, 2022, *The Astrophysical Journal*, 936, 162
- **Saade, M. L.**, Stern, D., Brightman, M. et al. “*Chandra* Observations of Candidate Sub-Parsec Binary Supermassive Black Holes”, 2020, *The Astrophysical Journal*, 900, 148

Co-Authored

- Capecciacci, S., Liodakis, I., Middei, R., e al. (including **Saade, M. L.**). “Unveiling Blazar Synchrotron Emission: A Multiwavelength Polarimetric Study of HSP and LSP Populations”, 2025, arXiv:2508.14168
- Roberts, O. J., Kaaret, P., **Saade, M. L.**, et al. “NuSTAR Analysis of the 2024 Periastron Passage of TeV Binary PSR B1259-63”, 2025, *The Astrophysical Journal*, 988, 244
- MAGIC Collaboration, Abe, K., Abe, S., Abhir, J., et al. (including **Saade, M. L.**). “Insights from the first flaring activity of a high-synchrotron-peaked blazar with X-ray polarization and VHE gamma rays”, 2025, *Astronomy & Astrophysics*, 695, A217
- Maksym, W. P., Liodakis, I., **Saade, M. L.**, et al. “A Two Week *IXPE* Monitoring Campaign on Mrk 421”, 2025, *The Astrophysical Journal*, 986, 230
- Kaaret, P., Roberts, O.J., Swartz D. A., et al. (including **Saade, M. L.**) “Magnetic field geometry of the gamma-ray binary PSR B1259-63 revealed via X-ray polarization”, 2024, *The Astrophysical Journal*, 974, L1
- Ursini, F., Gnarini, A., Capitanio, F., et al. (including **Saade, M.L.**) “The *IXPE* View of Neutron Star Low-Mass X-ray Binaries”, 2024, *Galaxies*, 12(4), 45

- Gnarini, A., **Saade, M. L.**, Ursini, F., et al. “Constraining the geometry of the dipping atoll 4U 1624-49 with X-ray spectroscopy and polarimetry”, 2024, *Astronomy and Astrophysics*, 690, A230
- Guodong, L., Tsai, Chao-Wei, Stern, D., et al. (including **Saade, M. L.**). “Discovery of a Low-Redshift Hot Dust-Obscured Galaxy”, 2023, *The Astrophysical Journal*, 958, 162
- Rich, R.M., Mosenkov, A., Lee-Sauders, H. et al. (including **Saade, M.L.**). “The haloes and environments of nearby galaxies (HERON) – I. Imaging, sample characteristics, and envelope diameters”, 2019, *Monthly Notices of the Royal Astronomical Society*, 490, 1539

Service to the Community

NuSTAR TAC

IXPE TAC

Approved Observing Programs (P.I.)

NuSTAR Cycle 6 Program – *NuSTAR* Survey of Candidate Subparsec SMBH Binaries (53 ks, \$66,389)

Swift ToO Program – Transient activity in NGC 6890 (2 ks)

Swift ToO Program – GRS 1758-258 (7 observations, 500 s)

NICER DDT Observations of 4U 1624-49 (4 observations, 1-3 ks)

NuSTAR DDT Observation of 4U 1624-49 (41 ks)

Presentations

Invited Talks

“Constraining Supermassive Black Hole Growth and Feeding Using X-rays”, Virtual talk, University of California, San Diego, Mar 2022

Contributed Talks

- “Comparing the X-ray Polarization Properties of Stellar and Supermassive Black Holes”, Oral Presentation, International X-ray Polarization Symposium, September 2024
- “A First Look at the X-ray Polarization of 4U 1624-49 with *IXPE*”, Oral Presentation, American Astronomical Society Meeting 243, January 2024
- “Call of the Duty Cycle: Searching for Fading AGN in the 12 μ m Galaxies”, Oral Presentation, American Astronomical Society HEAD Meeting 19, Mar 2022
- “*Chandra* Observations of Candidate Binary Supermassive Black Holes”, Lightning Talk, *Chandra* Frontiers in Time Domain Science, Oct 2020

Posters

- “Recent Science Results from MSFC X-ray Astronomy Missions”, Marshall Space Flight Center annual Jamboree, May 2025
- “Chandra Observations of Candidate Binary Supermassive Black Holes”, American Astronomical Society Meeting 241, January 2023
- “Call of the Duty Cycle: Searching for Fading AGN in the 12 μm Galaxy Sample”, Ten years of High-Energy Universe in Focus: NuSTAR 2022, June 2022
- “Surveying the X-ray Properties of Candidate SMBH Binaries”, American Astronomical Society HEAD Meeting 17, March 2019

Outreach

- **USRA Black Hole Corona Press Release** Online
Press Release on My Research Nov 22, 2024
- **NASA Black Hole Corona Press Release** Online
Press Release on My Research Oct 17, 2024
- **NASA In the Park** In Person
Event Hosted by MSFC for the Public June 22, 2024
- **Alabama STEAMfest Volunteer** In Person
Annual Science Fair Held in Huntsville Oct 25, 2023
- **NASA’s Black Hole Week** Online
Answered Questions about Black Holes as one of NASA’s Black Hole Experts May 3, 2023
- **JPL Explore Black Hole/NuSTAR Booth Volunteer** In person
Annual JPL Open House April 29, 2023
- **Exploring Your Universe Ask an Astronomer Volunteer** In person
Annual UCLA K-12 Science Fair Nov 6, 2022
- **Astrobites** Online
Writer-11 articles published Jan 2022 - Feb 2024
- **Exploring Your Universe Ask an Astronomer Volunteer** Virtual
Annual UCLA K-12 Science Fair 2020
- **Personal Quora Account** Online
I answer people’s astronomy questions here 2015 - present

Teaching Experience

- **University of California, Los Angeles** Los Angeles, CA
Teaching Assistant 2015 - 2017, 2022
 - PHYS 5C Physics for Life Science Majors: Electricity, Magnetism, and Modern Physics lab 2017
 - ASTR 3: Nature of Universe lab 2016, 2022
 - ASTR 5: Life in the Universe 2015-2016
- **University of California, Los Angeles** Los Angeles, CA
Grader/Reader 2017-2020
 - ASTR 5: Life in the Universe 2017, 2020

- PHYS 1A: Mechanics 2019
- PHYS 140A: Introduction to Solid State Physics 2017-2018

IT Skills

Programming Languages

Python, MATLAB, tcl

Scientific Software

CIAO, HEASOFT, XMMSAS, DS9, IRAF, CASA, TOPCAT, ixpeobssim

Professional Memberships

- American Astronomical Society (AAS)
- AAS High Energy Astrophysics Division (HEAD)