PAUL DRAGHIS

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RESEARCH INTERESTS

Origin and evolution of compact objects, physics of accretion, probes of relativity in the vicinity of black holes, active galactic nuclei, tidal disruption events, origin of gravitational wave events, massive star evolution, supernovae, origin of spin in black holes, X-ray spectroscopy, and High Energy Astrophysics in general.

EDUCATION

08/2019-05/2024	**Ph.D. in Astronomy** University of Michigan, Ann Arbor, MI, USA
09/2015-06/2019	**B.Sc. studies with Honors in Physics** (Concentration: Astrophysics, Minor: Mathematics), Stanford University, Stanford, CA, USA

RESEARCH EXPERIENCE

08/2019-present	Independent research with Prof. Miller, University of Michigan, focusing on measuring spin of stellar mass black holes in X-ray binaries through X-ray spectroscopy as a probe into understanding the nature of GW events, origin and evolution of black holes, and supernovae.
09/2018-06/2019	Bachelor Thesis Research with Prof. Romani, Stanford University Title: "Heating Mechanisms of Black Widow Pulsars " Modeling the expected gamma-ray flux from several Black Widow Pulsar systems and comparing predictions with data from Fermi Space Telescope.
6-8/2018	Stanford Summer Research Program with Prof. Kuo, Stanford University Building a star-camera and writing software that will be used to calibrate the pointing mechanism of BICEP Array and AliCPT.
6/2016-6/2018	Stanford Summer Research Program with Prof. Romani, Stanford University (continued during the academic year) Observations and modeling of the light curves of Black Widow Pulsar systems J1124-3653 and J0636+5128.

SELECTED PRESENTATIONS

- Conference talks: APS April Meeting 2024 (Sacramento, CA), AAS 243 (New Orleans, LA), AAS 241 (Seattle, WA), AAS 240 (Pasadena, CA), Compact Objects in Michigan and Ontario meeting 2021, Ten Years of High-Energy Universe in Focus: NuSTAR 2022 (Cagliari, Italy)
- Invited talks: Northwestern University, Stanford University, University of California, Berkeley, University of Maryland, Goddard Space Flight Center
- Poster Presentations: HEAD 20 (Waikōloa, HI), HEAD 19 (Pittsburgh, PA), HEAD 17 (Monterey, CA)

PUBLICATIONS

Peer reviewed, first author:

1. **Draghis, P.**, Miller, J. M., et al. 2024, *"Systematically Revisiting All NuSTAR Spins of Black Holes in X-Ray Binaries,"* ApJ, 969, 40.
2. **Draghis, P.**, Miller, J. M., et al. 2023, *"An Extreme Black Hole in the Recurrent X-Ray Transient XTE J2012+381,"* ApJ, 954, 62.
3. **Draghis, P.**, Balakrishnan, M., Miller, J. M., et al. 2023, *"The Spin of a Newborn Black Hole: Swift J1728.9-3613,"* ApJ, 947, 39.
4. **Draghis, P.**, Miller, J. M., et al. 2023, *"A Systematic View of Ten New Black Hole Spins,"* ApJ, 946, 19.
5. **Draghis, P.**, Miller, J. M., Zoghbi, A., et al. 2021, *"The Spin and Orientation of the Black Hole in XTE J1908+094,"* ApJ, 920, 88.
6. **Draghis, P.**, Miller, J. M., Cackett, E. M., et al. 2020, *"A New Spin on an Old Black Hole: NuSTAR Spectroscopy of EXO 1846–031,"* ApJ, 900, 78.
7. **Draghis, P**., Romani, R.W., Filippenko, A.V., et al. 2019, "*Multiband Optical Light Curves of Black-widow Pulsars*", ApJ, 883, 108.
8. **Draghis, P.** & Romani, R.W. 2018, "*PSR J0636+5128: A Heated Companion in a Tight Orbit,*" ApJL, 862, L6.

Peer reviewed, contributing author:

1. Connors, R., Tomsick, J., **Draghis, P.**, et al. 2024, *"The High Energy X-ray Probe (HEX-P): Probing Accretion onto Stellar Mass Black Holes*," Front. Astron. Space Sci., 10, 1292682.
2. Zak, M., et al. incl. **Draghis, P.**, 2024, "*Fierce Feedback in an Obscured, Sub-Eddington State of the Seyfert 1.2 Markarian 817,"* ApJL, 962,1.
3. Gediman, B.., et al. incl. **Draghis, P.**, 2024, *"Test for Echo: X-Ray Reflection Variability in the Seyfert-2 Active Galactic Nucleus NGC 4388,"* ApJ, 966, 57.
4. Xiang, X., et al. Incl. **Draghis, P.**, 2024, "*Investigating the Mass of the Black Hole and Possible Wind Outflow of the Accretion Disk in the Tidal Disruption Event AT2021ehb",* ApJ, 972, 106.
5. Miller, J. M., et al. incl. **Draghis, P.**, 2023, "*Evidence of a Massive Stellar Disruption in the X-ray Spectrum of ASASSN-14li,"* ApJL, 953, L23.
6. Balakrishnan, M., **Draghis, P.**, Miller, J. M., et al. 2023, "*The Black Hole Candidate Swift J1728.9-3613 and the Supernova Remnant G351.9-0.9,"* ApJ, 947, 38.
7. Krawczynski, H., et al. incl. **Draghis P**., 2022, "*Polarized x-rays constrain the disk-jet geometry in the black hole x-ray binary Cygnus X-1,"* Science, 378, 6620.
8. Yun, S. B., et al. incl. **Draghis, P.**, 2022, "*Extreme X-Ray Reflection in the Nucleus of the Seyfert Galaxy NGC 5033,"* ApJ, 935, 12.
9. Miller, J. M., et al. incl. **Draghis, P.**, 2021, "*The Inner Accretion Flow in the Resurgent Seyfert-1.2 AGN Mrk 817,*" ApJ, 911, 12.
10. Miller, J. M., et al. incl. **Draghis, P.**, 2020, "*An Obscured, Seyfert 2-like State of the Stellar-mass Black Hole GRS 1915+105 Caused by Failed Disk Winds,"* ApJ, 904, 30.

Other:

1. **Draghis, P.**, Miller, J. M., 2023, "*Preliminary spectral fitting and QPO evolution in NICER observations of black hole candidate Swift J1727.8-1613,"* The Astronomer's Telegram, 16219.
2. **Draghis, P.**, Miller, J. M., 2023, "*A NuSTAR Observation of the Rapid Outburst of X-ray Binary XTE J1901+014,"* The Astronomer's Telegram, 15958.
3. **Draghis, P.**, Miller, J. M., Balakrishnan, M., et al. 2021, "*A NuSTAR Observation of the black hole candidate XTE J1859+226 at a low Eddington fraction,*" The Astronomer's Telegram, 14512.
4. **Draghis, P.**, Miller, J. M., Balakrishnan, M., et al. 2020, "*A NuSTAR Observation of the Black Hole Candidate 4U 1755-338,*" The Astronomer's Telegram, 13665.

OBSERVING TIME AWARDED AS PI

Instrument	Proposal Title	Time	Funding	Year
NuSTAR (Cycle 8)	"Measuring The Spin Of Future Black Hole Transients"	180 ks.	$110851	2022
NuSTAR (Cycle 9)	"Joint XRISM And NuSTAR Observations Of Cygnus X-1"	30 ks.	$55669	2023
NICER (Cycle 5, joint with NuSTAR)	"Tracking Two Future Black Hole Outburst with NICER and NuSTAR"	90 ks. (+60 ks. NuSTAR)	$43000	2023
NuSTAR (DDT)	XTE J1859+226	40 ks.		2021
NuSTAR (DDT)	4U 1755-338	30 ks.		2022
NuSTAR (DDT)	GRS 1739-278	40 ks.		2023

AWARDS

International Astronomy Competitions	First Prize and Gold Medal (2012 & 2013), Second Prize and Silver Medal (2011) - *International Astronomy Olympiad* First Prize and Gold Medal (2014), Second Prize and Silver Medal (2013), Third Prize and Bronze Medal (2015), Third Prize in the Team Competition (2012), Honorable Mention (2012) - *International Olympiad on Astronomy and Astrophysics*
Other	The Rackham International Students Fellowship (2023) The Craig and Susan McCaw Scholarship Fund for International Students (2015-2019) Stanford UAR Major Grant (2018) HEAD Travel Grant (2023) Rackham Travel Grant (2022,2023) The Summer Research Program Grant offered by the Stanford Departments of Physics, Applied Physics and SLAC (2016, 2017)

TEACHING & SERVICE

Team Membership, Service, and Teaching	Member of NuSTAR and NICER working groups Member of XRISM PV phase team Member of HEX-P collaboration, an Astrophysics Probe Explorer mission concept Peer Reviewer for the Astrophysical Journal (ApJ – 2021-2024) Peer Reviewer for MNRAS (2023-2024) Peer Reviewer for A&A (2023-2024) Organizing the "Extreme Astrophysics Group" meetings at the University of Michigan (2022-2023) Graduate Student Instructor for Astronomy 201: Introduction to Astrophysics at University of Michigan (2 semesters in 2020) Preparing students for participation to the International Olympiad on Astronomy and Astrophysics (2015-2016)
DEI and Outreach	Organizing weekly community-building social events for the Astronomy graduate student body (2019-2023) Mentor and speaker for "Romania Science Festival" (2021-2023) Volunteer at outreach events hosted by the Climate and Space Sciences and Engineering department at the University of Michigan (2023) Graduate student liaison for Astronomy involvement in the M-Sci Academy program (2022-2023) Member of the team organizing and preparing the exams for the Romanian National Astronomy Olympiad (2020-2023) Speaker at Q&A sessions for international students for admission to US universities and for advice about pursuing a STEM career (2020) Organizing science outreach events in local high schools with the Stanford Astronomical Society (2018-2019) Hosting public observing sessions and stargazing events with the Stanford Astronomical Society at the Stanford Student Observatory (2016-2019) Outreach events and public observing sessions at the Baia Mare Planetarium, Romania (2011-2015)
Mentoring	Sol Bin (Hazel) Yun - undergraduate researcher Ben Gediman - undergraduate researcher Miranda Zak - undergraduate researcher

SCIENTIFIC, TECHNICAL, AND MANAGEMENT EXPERIENCE

Telescope expertise	X-ray spectroscopy (NuSTAR, Swift, NICER, XRISM), Optical imaging and spectroscopy (W. M. Keck Observatory, Gemini Observatory, Southern Astrophysical Research Telescope, Las Cumbres Observatory), Gamma ray imaging (Fermi Gamma-ray Space Telescope)
Computer tools	Python (numpy, astropy, pandas, matplotlib, emcee), Xspec, Mathematica, C/C++, Java, UNIX systems, LaTeX