

Dr. Vivienne Baldassare

Updated July 1, 2022

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Research interests Active galactic nuclei in dwarf galaxies, supermassive black hole variability, nuclear star clusters

Academic Positions **Washington State University** Pullman, WA
William Band Distinguished Assistant Professor 08/2020 – present
Department of Physics and Astronomy

Yale University New Haven, CT
NASA Einstein Postdoctoral Fellow 09/2017-08/2020
Department of Astronomy
Advisor: Marla Geha

Education **University of Michigan** Ann Arbor, MI
PhD in Astronomy & Astrophysics 08/2012 - 08/2017
Advisor: Elena Gallo

Hunter College New York, NY
BA in Physics with honors 08/2008 – 06/2012

Awards and grants

Hubble Space Telescope Cycle 28 (ID 16423, PI, 9 orbits; \$59k)	2020
Chandra Cycle 22 (GO-22700333, PI, 205ks; \$109k)	2020
NASA Einstein Postdoctoral Fellowship (\$350k)	2017-2020
Chandra Cycle 20 (ID GO9-20102X, PI, 91ks; \$101.5k)	2018
NSF Astronomy & Astrophysics Postdoctoral Fellowship (declined)	2017
AAS Rodger Doxsey Travel Prize (\$700)	2017
Rackham Predoctoral Fellowship, University of Michigan (\$32k)	2016-2017
Hubble Space Telescope Cycle 23 (ID HST-GO-14187.001-A, PI; \$38.7k)	2016
Rackham Conference Travel Grants (3; \$2400 total)	2013-2016
Rackham Research Grants, University of Michigan (2; \$3800 total)	2013, 2016
NSF Graduate Research Fellowship (\$125k)	2012-2015
Joseph A. Gillet Award in Physics, Hunter College	2012
John P. McNulty Scholar, Hunter College	2011-2012
Full merit scholarship, Macaulay Honors College at Hunter College	2008-2012

Publications
h-index: 14

First author publications

9. **Baldassare, V. F.**; Stone, N. C.; Foord, A.; Gallo, E. (2022) “*Massive black hole formation in dense stellar environments: Enhanced X-ray detection rates in high velocity dispersion nuclear star clusters*”. *Astrophysical Journal*, 929, 84
8. **Baldassare, V. F.**; Dickey, C.; Geha, M.; Reines, A. E. (2020) “*Populating the low-mass end of the M-sigma relation*”. *Astrophysical Journal Letters*, 898, 1.
7. **Baldassare, V. F.**; Geha, M.; Greene, J. E. (2020), “*A search for optical AGN variability in 35,000 low-mass galaxies with the Palomar Transient Factory*”. *Astrophysical Journal*, 896, 10.
6. **Baldassare, V. F.**; Geha, M.; Greene, J. E. (2018), “*Identifying AGNs in low-mass galaxies via long-term optical variability*”. *Astrophysical Journal*, 868, 152.
5. **Baldassare, V. F.**; Reines, A. E.; Gallo, E.; Greene, J. E. (2017). “*Hubble Space Telescope imaging of the active dwarf galaxy RGG 118*”. *Astrophysical Journal* 850, 196.
4. **Baldassare, V. F.**; Reines, A. E.; Gallo, E.; Greene, J. E. (2017). “*X-ray and Ultraviolet properties of AGN in nearby dwarf galaxies*”. *Astrophysical Journal* 836, 20.
3. **Baldassare, V. F.**; Reines, A. E.; Gallo, E.; Greene, J. E.; Graur, O.; Geha, M.; Hainline, K.; Carroll, C. M.; Hickox, R. C. (2016). “*Multi-epoch spectroscopy of dwarf galaxies with AGN signatures: identifying sources with persistent broad H-alpha*”. *Astrophysical Journal*, 829, 1.
2. **Baldassare, V. F.**; Reines, A. E.; Gallo, E.; Greene, J. E. (2015). “*A ~ 50,000 solar mass black hole in the nucleus of RGG 118*”. *Astrophysical Journal Letters*, 809, L14.
1. **Baldassare, V. F.**; Gallo, E.; Miller, B. P.; Plotkin, R. M.; Treu, T.; Valluri, M.; Woo, J. (2014). “*AMUSE-Field II: Nucleation fraction in field vs. cluster environment*”. *Astrophysical Journal*, 791, 133.

Co-authored publications

16. Angus, C; **Baldassare, V. F.**; et al. (2022) “*AT 2020neh: A fast rising tidal disruption event from an intermediate mass black hole*”. Submitted to *Nature Astronomy*.
15. Kehoe, E.; **Baldassare, V. F.**; Geha, M.; Wasleske, E.; Reines, A. E.; Hainline, K. (2022) “*Active galactic nuclei in two star-forming dwarf galaxies with persistent broad lines*”. Submitted to the *Astrophysical Journal*.
14. Wasleske, E.; **Baldassare, V. F.**; Carroll, C. M. (2022) “*Variable AGN in the GALEX Time Domain Survey*”. *Astrophysical Journal*, 933, 37.
13. Molina, M.; Reines, A. E.; Latimer, C. J.; **Baldassare, V.F.**; Salehirad, S. (2021) “*A Sample of Massive Black Holes in Dwarf Galaxies Detected via [Fe X] Coronal Line Emission: Active Galactic Nuclei and/or Tidal Disruption Events*”. *The Astrophysical Journal*, 922, 155.
12. Jones, D. O.; Foley, R. J.; Narayan, G.; Hjorth, J.; Huber, M. E.; Aleo, P. D.; Alexander, K. D.; Angus, C. R.; Auchettl, K.; **Baldassare, V. F.**; et al. (2021) “*The Young Supernova Experiment: Survey Goals, Overview, and Operations*”. *Astrophysical Journal*, 908, 143.

11. Nyland, K.; Dong, D. Z.; Patil, P.; Lacy, M.; van Velzen, S.; Kimball, A. E.; Sarbadhary, S. K.; Hallinan, G.; **Baldassare, V. F.**; et al. (2020). “*Quasars That Have Transitioned from Radio-quiet to Radio-loud on Decadal Timescales Revealed by VLASS and FIRST.*” *Astrophysical Journal*, 905, 74.
10. Hodges-Kluck, E. J.; Gallo, E.; Seth, A. C.; Greene, J. E.; **Baldassare, V. F.** (2020). “*Nuclear X-Ray Activity in Low-surface-brightness Galaxies: Prospects for Constraining the Local Black Hole Occupation Fraction with a Chandra Successor Mission.*” *Astrophysical Journal*, 898, 2.
9. Burke, C. J.; **Baldassare, V. F.**; Liu, X.; Foley, R. J.; Shen, Y.; Palmese, A.; Guo, H.; and the DES Collaboration (2020). “*The Curious Case of PHL 293B: A Long-Lived Transient in a Metal-Poor Blue Compact Dwarf Galaxy.*” *Astrophysical Journal Letters*, 894, 1.
8. Rakshit, S.; Woo, J.; Gallo, E.; Hodges-Kluck, E.; Shin, J.; Jeon, Y.; Bae, H.; **Baldassare, V. F.** + 15 co-authors (2019). “*The Seoul National University AGN monitoring project. II. BLR size and black hole mass of two AGNs.*”, accepted to the *Astrophysical Journal*.
7. Lee, N.; Gallo, E.; Hodges-Kluck, E.; Cotè, P.; Ferrarese, L.; Miller, B. P.; **Baldassare, V. F.**; Plotkin, R. M.; Treu, T. (2019) “*Sub-Eddington super-massive hole activity in Fornax early-types.*” *Astrophysical Journal*, 874, 77.
6. Foord, A.; Gallo, E.; Hodges-Kluck, E.; Miller, B. P.; **Baldassare, V. F.**; Gnedin, O. (2017). “*AGN Activity in Nucleated Galaxies As Measured by Chandra.*” *Astrophysical Journal*, 841, 51.
5. Faherty, J. K. + 9 co-authors; **Baldassare, V. F.**, Lemonier, E.; Rice, E. L. (2016). “*Population properties of brown dwarf analogs to exoplanets.*” *Astrophysical Journal Supplements*, 225, 10F.
4. Hiranaka, K.; Cruz, K. L.; Marley, M. S.; Douglas, S. T.; **Baldassare, V. F.** (2016). “*Demonstrating the existence of sub-micron size dust grains in the atmospheres of red L dwarfs.*” *Astrophysical Journal*, 830, 96.
3. Miller, B. P.; Gallo, E.; Greene, J. E.; Kelly, B. C.; Treu, T.; Woo, J.; **Baldassare, V. F.** (2015). “*X-ray constraints on the local supermassive black hole occupation fraction.*” *Astrophysical Journal*, 799, 98.
2. Plotkin, R. M.; Gallo, E.; Miller, B. P.; **Baldassare, V. F.**; Treu, T.; Woo, J. (2014). “*An Environmental Study of the Ultraluminous X-Ray Source Population in Early-type Galaxies.*” *Astrophysical Journal*, 780, 6.
1. Kartaltepe, J. S. + 26 co-authors; **Baldassare, V. F.**; Fiorenza, S. L. (2010). “*A Multiwavelength Study of a Sample of 70 μm Selected Galaxies in the COSMOS Field. II. The Role of Mergers in Galaxy Evolution.*” *Astrophysical Journal*, 721, 98.

PI Observing
Proposals

2020A Chandra X-ray Observatory, Cycle 22, 205 ks

“A Chandra look at variability-selected low-mass AGN candidates”

Joint with *Hubble Space Telescope*, 9 orbits

2020A Keck Observatory, Keck II/ESI, 3 nights

“Spatially resolved spectroscopy of changing-look active galactic nuclei”

2019 Karl G. Jansky Very Large Array, 4.25 hours

“Searching for radio emission in variability-selected AGNs in low-mass galaxies”
2019B *Keck Observatory*, Keck II/ESI, 2 nights

“High spatial resolution spectroscopy of low-mass variability selected AGNs”
2019A *Keck Observatory*, Keck II/ESI, 1 night

“The role of AGN feedback in quenching dwarf galaxies”
2019A *Keck Observatory*, Keck II/NIRES, 1 night

“NIR coronal line ratios as a mass estimator for intermediate-mass black holes”
2019A *Palomar Observatory*, Hale/WASP, 6 nights

“Long term optical variability of low-mass active galactic nuclei”
2018 *Chandra X-ray Observatory*, Cycle 20, 91 ks

“Runaway tidal capture in nuclear star clusters as a formation pathway for massive black holes”
2019B *Palomar Observatory*, Hale/DBSP, 3 nights

“Spectroscopic follow-up of variable AGN candidates in low-mass galaxies”
2018A *Keck Observatory*, Keck II/ESI, 1 night

“The low-mass end of the $M_{BH} - \sigma$ relation”
2016B *Gemini*, Gemini North/GMOS, 4 hours

“Optical spectroscopy of dwarf galaxies with active galactic nuclei”
2016A *Magellan*, Baade/MagE, 3 nights

“Optical spectroscopy of dwarf galaxies with candidate active galactic nuclei”
2015 *Hubble Space Telescope*, Cycle 23, 3 orbits

“Studying the nuclear morphology of a dwarf galaxy with a 50,000 solar mass black hole”

Teaching

Washington State University

ASTR 450: Life in the Universe

Spring 2021

ASTR 345: Principles of Astronomy

Fall 2020

Selected talks

Conferences

09/2020 Invited Review, “Origin, growth and feedback of black holes in dwarf galaxies” Virtual Meeting

06/2019 Invited Review, “Dwarf Galaxies Near and Far” Special Session European Week of Space Science, Lyon, France

04/2019 Invited, “Accretion Signatures of the Earliest Black Holes in the Universe” Princeton Center for Theoretical Science, Princeton, NJ

11/2018 Invited, “Young Astronomers on Galactic Nuclei”, Budapest, Hungary

07/2018 Invited, “Early Growth of Supermassive Black Holes”, Sexten Institute for Astrophysics, Sexten, Italy

06/2018 Contributed, “From Quasars to Quiescence” Institut D’Astrophysique de Paris, Paris, France

01/2018 Contributed, AAS Meeting 231, National Harbor, MD

08/2017 Contributed, Special Session on AGN in Dwarf Galaxies 16th AAS High Energy Astrophysics Division Meeting, Sun Valley, ID.

06/2017 Contributed, “Elusive AGN”, George Mason University, Fairfax, VA

01/2017 Contributed, AAS Meeting 229, Grapevine, TX
09/2016 Contributed, “MODEST 16 NYC: Gas and Gravitational Dynamics”, New York, NY
10/2015 Contributed, “Physics of SMBH Formation and Feedback” JSI Workshop, Annapolis, MD

Colloquia and Seminars

11/2021 Colloquium, Massachusetts Institute of Technology
10/2021 Colloquium, Stanford University
06/2021 Colloquium, Aspen Center for Physics
05/2021 Astrophysics Lunch Seminar, University of Washington
03/2021 Physics and Astronomy Colloquium, Williams College
02/2021 Astrophysics Seminar, Michigan State University
12/2020 High Energy Astro Seminar, Harvard Center for Astrophysics
11/2020 Astronomy Seminar, University of Connecticut
10/2020 Physics and Astronomy Colloquium, Dartmouth University
10/2020 Physics and Astronomy Colloquium, University of Idaho
02/2020 Astronomy Colloquium, University of Illinois Urbana-Champaign
02/2020 Astronomy Colloquium, Carnegie Observatories
10/2019 Astronomy Colloquium, UC Santa Cruz
09/2019 Astrophysics Seminar, University of Utah
09/2019 Astronomy Colloquium, Black Hole Initiative
04/2019 Astrophysics Seminar, Rutgers University
03/2019 Extragalactic Seminar, University of Hawaii at Manoa
02/2019 Astrophysics Seminar, Stony Brook University
09/2018 Astrophysics Seminar, Texas A&M University
09/2018 Physics & Astronomy Colloquium, George Mason University
09/2018 Astronomy Colloquium, U.S. Naval Observatory
04/2018 Physics & Astronomy Colloquium, Montana State University
03/2018 Astrophysics Seminar, UCLA
02/2018 Astronomy Colloquium, Yale University
11/2017 Astronomy Colloquium, American Museum of Natural History
11/2017 Astronomy Colloquium, University of Massachusetts Amherst
12/2016 Astronomy Seminar, University of Maryland

Professional Activities

ongoing Referee for AAS Journals, Nature, MNRAS
2020 External Reviewer, NASA Astrophysics Data Analysis Program
2018-2020 Astronomy Climate and Diversity Committee Member, Yale University
2019 Hubble Space Telescope Time Allocation Committee
2019 Chandra X-ray Observatory Time Allocation Committee
2018-2019 Yale Astronomy Department Colloquium Co-organizer
2018 External Reviewer, NASA Earth and Space Sciences Fellowship
2016-2017 Graduate Admissions Committee, University of Michigan Department of Astronomy

2015-2016 Organizer, Graduate student lunch seminar, University of Michigan

2014-2015 Organizer, Extreme Astrophysics Seminar, University of Michigan

Outreach

2021-present Faculty advisor, WSU Physicists for Inclusion in Science

2020 WSU Ask Dr. Universe contributor

2020 ATHENA Women in STEM Podcast

2019 Astronomy on Tap New Haven speaker

2017, 2018 Participant, AAS Congressional Visits Day

2016 Presenter, Harvey-Swanson Elementary School Earth Science Festival

2016 Invited lecturer, Birmingham Next

2016 Invited lecturer, University of Michigan Lowbrow Astronomers

2015-2016 Co-founder/organizer, Peer mentoring group, University of Michigan

2015 Invited lecturer, Astronomical Society of Long Island

2012 Co-organizer, Physics Demo Day for Girl Scouts