Address and Contact Information

Department of Physics, Montana State University (MSU) 434-249-6844
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Bozeman, MT 59717 https://www.amyreines.com

Education

The University of Virginia, Charlottesville, VA, USA
- Ph.D. Astronomy 2011
- M.S. Astronomy 2007

San Francisco State University, San Francisco, CA, USA
- M.S. Physics 2002

The University of Maryland, College Park, MD, USA
- B.S. Astronomy 1998

Research Positions

Assistant Professor, Department of Physics, Montana State University Aug 2017 - present
Hubble Fellow, University of Michigan / National Optical Astronomy Observatory 2014-2017
Einstein Fellow, National Radio Astronomy Observatory 2011-2014
NASA Earth and Space Science Fellow, University of Virginia 2009-2011
Graduate Research Associate, University of Virginia 2005-2009
Graduate Research Associate, San Francisco State University 1998-2001

Awards and Honors

NASA EPSCoR Research Award 2020
Outstanding Faculty Colleague Award, Department of Physics, Montana State University 2019
NASA Hubble Postdoctoral Fellowship 2014-2017
University of Michigan Society of Fellows offer (8 offers, 1027 applications) 2014
NSF Astronomy & Astrophysics Postdoctoral Fellowship offer 2014
NASA Einstein Postdoctoral Fellowship 2011-2014
Graduate NASA Earth and Space Science Fellowship 2009-2011
Z Society Edgar F. Shannon Award for the most accomplished graduate student in the College of Arts and Sciences, University of Virginia 2011
Allan T. Gwathmey Memorial Award for the best graduate student paper written on a fundamental problem in the physical sciences. Won 2 years in a row for Reines et al. 2010 and Reines et al. 2011. University of Virginia 2010-2011
1st Place, Huskey Graduate Student Research Expedition, University of Virginia 2011
Dissertation Acceleration Fellowship, University of Virginia 2010

Governor's Graduate Fellowship, University of Virginia	2006, 2008
Virginia Space Grant Consortium Aerospace Graduate Fellowship	2006-2008
Burbank Scholarship, San Francisco State University	1998-2000
Graduate Equity Fellowship, San Francisco State University	1999-2000
Dr. Yvonne Cagle, Alumna of the Year Scholarship, San Francisco State University	1999
University Scholarship, San Francisco State University	1999-2000
Dean's List, University of Maryland	1995-1998
College Park Scholar Award, University of Maryland	1996

Research Interests

Supermassive black holes in dwarf galaxies and the origin of black hole seeds
The evolution of galaxies and supermassive black holes
Active galactic nuclei, impact on their host galaxies and star formation
Dwarf starburst galaxies, super star clusters and the formation of globular clusters

Current Research Group at MSU

Mr. John-Michael Eberhard	graduate student
Dr. Hansung Gim	postdoctoral researcher
Ms. Bayli Hayes	undergraduate student
Mr. Seth Kimbrell	graduate student
Mr. Colin Latimer	graduate student
Mr. Michael Mingyar	graduate student
Dr. Mallory Molina	postdoctoral researcher
Ms. Fatemeh Salehirad	graduate student
Mr. Adonis Sanchez	graduate student
Mr. Zachary Schutte	graduate student
Ms. Megan Sturm	graduate student

Previous Mentees

Dr. Vivienne Baldassare	graduate student at U. Michigan; now faculty at Washington State U.
Dr. Kevin Hainline	postdoctoral researcher at Steward Observatory
Ms. Deanta Kelly	undergraduate student at Montana State University
Ms. Erin Kimbro	undergrad at MSU; now grad student at Washington State University
Mr. Sean Lemons	undergraduate student at the University of Michigan

Scientific Impact (as of 1/18/22)

Total Publications	55
Total Publications (lead author)	13
Citations	2334
Citations (lead author)	1291
H-index	27
H-index (lead author)	12

Refereed Journal Articles

Underlined names indicate students and postdoctoral researchers mentored by Dr. Reines.

Nature	Nature
The Astrophysical Journal Letters	ApJ Letters
The Astrophysical Journal	ApJ
The Astronomical Journal	AJ
Publications of the Astronomical Society of Australia	PASA
Publications of the Astronomical Society of the Pacific	PASP
Bulletin of the American Astronomical Society	BAAS

48. Black-hole-triggered star formation in the dwarf galaxy Henize 2-10
Schutte, Z. & **Reines, A.E.** (2022), ***Nature***

47. The AGN Fraction in Dwarf Galaxies from eROSITA: First Results and Future Prospects
Latimer, C. J., **Reines, A. E.**, Bogdan, A., & Kraft, R. (2021), ApJL, 922, L40.

46. A Sample of Massive Black Holes in Dwarf Galaxies Detected via [Fe X] Coronal Line Emission: Active Galactic Nuclei and/or Tidal Disruption Events
Molina, M., **Reines, A. E.**, Latimer, C. J., Baldassare, V., & Salehirad, S. (2021), ApJ, 922, 155.

45. Toward a More Complex Understanding of Natal Super Star Clusters with Multiwavelength Observations
Costa, A. H., Johnson, K. E., Indebetouw, R., Finn, M. K., Brogan, C. L., & **Reines, A.** (2021), ApJ, 918, 76.

44. A Chandra and HST View of WISE-selected AGN Candidates in Dwarf Galaxies
Latimer, C. J., **Reines, A. E.**, Hainline, K. N., Greene, J. E., & Stern, D. (2021), ApJ, 914, 133.

43. Supermassive black holes in cosmological simulations I: M_{BH}- M.relation and black hole mass function

Habouzit, M., Li, Y., Somerville, R. S., Genel, S., Pillepich, A., Volonteri, M., Davé, R., Rosas-Guevara, Y., McAlpine, S., Peirani, S., Hernquist, L., Anglés-Alcázar, D., **Reines, A**., Bower, R., Dubois, Y., Nelson, D., Pichon, C., & Vogelsberger, M. (2021), MNRAS, 503, 1940.

42. Clumpy Star Formation and AGN Activity in the Dwarf-Dwarf Galaxy Merger Mrk 709
Kimbro, E., **Reines, A. E.**, Molina, M., Deller, A. T., & Stern, D. (2021), ApJ, 912, 89.

41. The Diverse Morphologies and Structures of Dwarf Galaxies Hosting Optically Selected Active Massive Black Holes
Kimbrell, S. J., **Reines, A. E.**, Schutte, Z., Greene, J. E., & Geha, M. (2021), ApJ, 911, 134.

40. Outflows, Shocks, and Coronal Line Emission in a Radio-selected AGN in a Dwarf Galaxy
Molina, M., **Reines, A. E.**, Greene, J. E., Darling, J., & Condon, J. J. (2021), ApJ, 910, 5.

39. Reionization with galaxies and active galactic nuclei
Dayal, P., Volonteri, M., Choudhury, T. R., Schneider, R., Trebitsch, M., Gnedin, N. Y., Atek, H., Hirschmann, M., & **Reines, A.** (2020), MNRAS, 495, 3065.

38. Populating the Low-mass End of the M_{BH}-sigma Relation
Baldassare, V., Dickey, C., Geha, M. & **Reines, A. E.** (2020), ApJ Letters, 898, 3.

37. Supermassive black holes in cosmological simulations I: M_{BH}-M_{star} relation and black hole mass function
Habouzit, M., et al. including **Reines, A. E.** (2020), eprint arXiv:2006.10094

36. Reionization with galaxies and active galactic nuclei
Dayal, P., Volonteri, M., Choudhury, T., Schneider, R., Trebitsch, M., Gnedin, N.,. Atek, H., Hirschmann, M., **Reines, A.E.** (2020), MNRAS 495, 3065

35. High-mass X-ray binaries in nearby metal-poor galaxies: on the contribution to nebular He II emission
Senchyna, P., Stark, D., Mirocha, J., **Reines, A. E.**, Charlot, S., Jones, T., Mulchaey, J. (2020), MNRAS, 494, 941.

34. The Habitable Exoplanet Observatory (HabEx) Mission Concept Study Final Report
Gaudi, S. et al. including **Reines, A. E.** (2020), eprint arXiv:2001.06683.

33. A New Sample of (Wandering) Massive Black Holes in Dwarf Galaxies from High Resolution Radio Observations
Reines, A. E., Condon, J., Darling, J. & Greene, J. (2019), ApJ, 888,36

32. The Black Hole - Bulge Mass Relation Including Dwarf Galaxies Hosting Active Galactic Nuclei

Schutte, Z., **Reines, A. E.** & Greene, J. (2019), ApJ, 887, 245

31. An X-ray + Radio Search for Massive Black Holes in Blue Compact Dwarf Galaxies
Latimer, C., **Reines, A. E.**, Plotkin, R. M., Russell, T. D., & Condon, J. J. (2019), ApJ, 884, 78

30. The Effect of AGNs on the Global H I Content of Isolated Low-mass Galaxies
Bradford, J. D., Geha, M. C., Greene, J. E., **Reines, A. E.**, & Dickey, C. M. (2018), The Astrophysical Journal, 861, 50.

29. The Association of Molecular Gas and Natal Super Star Clusters in Henize 2-10
Johnson, K. E., Brogan, C. L., Indebetouw, R., Testi, L., Wilner, D. J., **Reines, A. E.**, Chen, C.-H. R., & Vanzi, L. (2018), The Astrophysical Journal, 853, 125.

28. Hubble Space Telescope Imaging of the Active Dwarf Galaxy RGG 118
Baldassare, V. F., **Reines, A. E.**, Gallo, E., & Greene, J. E. (2017), The Astrophysical Journal, 850, 196.

27. High-redshift Galaxies and Black Holes Detectable with the JWST: A Population Synthesis Model from Infrared to X-Rays
Volonteri, M., **Reines, A. E.**, Atek, H., Stark, D. P., & Trebitsch, M. (2017), The Astrophysical Journal, 849, 155.

26. Hard X-Ray-selected AGNs in Low-mass Galaxies from the NuSTAR Serendipitous Survey
Chen, C.-T. J., Brandt, W. N., **Reines, A. E.**, Lansbury, G., Stern, D., Alexander, D. M., Bauer, F., Del Moro, A., Gandhi, P., Harrison, F. A., Hickox, R. C., Koss, M. J., Lanz, L., Luo, B., Mullaney, J. R., Ricci, C., & Trump, J. R. (2017), The Astrophysical Journal, 837, 48.

25. X-ray and Ultraviolet Properties of AGNs in Nearby Dwarf Galaxies
Baldassare, V. F., **Reines, A. E.**, Gallo, E., & Greene, J. E. (2017), The Astrophysical Journal, 836, 20.

24. Mid-infrared Colors of Dwarf Galaxies: Young Starbursts Mimicking Active Galactic Nuclei
Hainline, K. N., **Reines, A. E.**, Greene, J. E., & Stern, D. (2016), The Astrophysical Journal, 832, 119.

23. X-Ray Detected Active Galactic Nuclei in Dwarf Galaxies at $0 < z < 1$
Pardo, K., Goulding, A. D., Greene, J. E., Somerville, R. S., Gallo, E., Hickox, R. C., Miller, B. P., **Reines, A. E.**, & Silverman, J. D. (2016), The Astrophysical Journal, 831, 203.

22. Deep Chandra Observations of the Compact Starburst Galaxy Henize 2-10: X-Rays from the Massive Black Hole
Reines, A. E., Reynolds, M. T., Miller, J. M., Sivakoff, G. R., Greene, J. E., Hickox, R. C., & Johnson, K. E. (2016), The Astrophysical Journal, 830, L35.

21. Multi-epoch Spectroscopy of Dwarf Galaxies with AGN Signatures: Identifying Sources with Persistent Broad Hα Emission
Baldassare, V. F., **Reines, A. E.**, Gallo, E., Greene, J. E., Graur, O., Geha, M., Hainline, K., Carroll, C. M., & Hickox, R. C. (2016), The Astrophysical Journal, 829, 57.

20. The X-Ray Properties of Million Solar Mass Black Holes
Plotkin, R. M., Gallo, E., Haardt, F., Miller, B. P., Wood, C. J. L., **Reines, A. E.**, Wu, J., & Greene, J. E. (2016), The Astrophysical Journal, 825, 139.
19. Inferences on the Relations Between Central Black Hole Mass and Total Galaxy Stellar Mass in the High-redshift Universe
Volonteri, M., & **Reines, A. E.** (2016), The Astrophysical Journal, 820, L6.

18. Relations between Central Black Hole Mass and Total Galaxy Stellar Mass in the Local Universe
Reines, A. E., & Volonteri, M. (2015), The Astrophysical Journal, 813, 82.

17. A ~50,000 $M_\odot$ Solar Mass Black Hole in the Nucleus of RGG 118
Baldassare, V. F., **Reines, A. E.**, Gallo, E., & Greene, J. E. (2015), The Astrophysical Journal, 809, L14.

16. Variable Hard-X-Ray Emission from the Candidate Accreting Black Hole in Dwarf Galaxy Henize 2-10
Whalen, T. J., Hickox, R. C., **Reines, A. E.**, Greene, J. E., Sivakoff, G. R., Johnson, K. E., Alexander, D. M., & Goulding, A. D. (2015), The Astrophysical Journal, 806, 37.

15. An X-Ray Selected Sample of Candidate Black Holes in Dwarf Galaxies
Lemons, S. M., **Reines, A. E.**, Plotkin, R. M., Gallo, E., & Greene, J. E. (2015), The Astrophysical Journal, 805, 12.

14. An Emerging Wolf-Rayet Massive Star Cluster in NGC 4449
Sokal, K. R., Johnson, K. E., Indebetouw, R., & **Reines, A. E.** (2015), The Astronomical Journal, 149, 115.

13. Extended Structure and Fate of the Nucleus in Henize 2-10
Nguyen, D. D., Seth, A. C., **Reines, A. E.**, den Brok, M., Sand, D., & McLeod, B. (2014), The Astrophysical Journal, 794, 34.

12. A Candidate Massive Black Hole in the Low-metallicity Dwarf Galaxy Pair Mrk 709
Reines, A. E., Plotkin, R. M., Russell, T. D., Mezcua, M., Condon, J. J., Sivakoff, G. R., & Johnson, K. E. (2014), The Astrophysical Journal, 787, L30.

11. High Resolution Radio and Optical Observations of the Central Starburst in the Low-metallicity Dwarf Galaxy II Zw 40

Kepley, A. A., **Reines, A. E.**, Johnson, K. E., & Walker, L. M. (2014), The Astronomical Journal, 147, 43.

10. Dwarf Galaxies with Optical Signatures of Active Massive Black Holes
Reines, A. E., Greene, J. E., & Geha, M. (2013), The Astrophysical Journal, 775, 116.

9. Parsec-scale Radio Emission from the Low-luminosity Active Galactic Nucleus in the Dwarf Starburst Galaxy Henize 2-10
Reines, A. E., & Deller, A. T. (2012), The Astrophysical Journal, 750, L24.

8. An actively accreting massive black hole in the dwarf starburst galaxy Henize2-10
Reines, A. E., Sivakoff, G. R., Johnson, K. E., & Brogan, C. L. (2011), ***Nature***, 470, 66.

7. Ultraviolet+Infrared Star Formation Rates: Hickson Compact Groups with Swift and Spitzer
Tzanavaris, P., Hornschemeier, A. E., Gallagher, S. C., Johnson, K. E., Gronwall, C., Immler, S., **Reines, A. E.**, Hoversten, E., & Charlton, J. C. (2010), The Astrophysical Journal, 716, 556.

6. The Importance of Nebular Continuum and Line Emission in Observations of Young Massive Star Clusters
Reines, A. E., Nidever, D. L., Whelan, D. G., & Johnson, K. E. (2010), The Astrophysical Journal, 708, 26.

5. Probing Star Formation at Low Metallicity: The Radio Emission of Super Star Clusters in SBS 0335-052
Johnson, K. E., Hunt, L. K., & **Reines, A. E.** (2009), The Astronomical Journal, 137, 3788.

4. A New View of the Super Star Clusters in the Low-Metallicity Galaxy SBS 0335-052
Reines, A. E., Johnson, K. E., & Hunt, L. K. (2008), The Astronomical Journal, 136, 1415.

3. Emerging Massive Star Clusters Revealed: High-Resolution Imaging of NGC 4449 from the Radio to the Ultraviolet
Reines, A. E., Johnson, K. E., & Goss, W. M. (2008), The Astronomical Journal, 135, 2222.

2. The Infrared Properties of Hickson Compact Groups
Johnson, K. E., Hibbard, J. E., Gallagher, S. C., Charlton, J. C., Hornschemeier, A. E., Jarrett, T. H., & **Reines, A. E.** (2007), The Astronomical Journal, 134, 1522.

1. Optical Search for Extraterrestrial Intelligence: A Spectroscopic Search for Laser Emission from Nearby Stars
Reines, A. E., & Marcy, G. W. (2002), Publications of the Astronomical Society of the Pacific, 114, 416.

Invited Articles and Book Chapters

4. Hunting for massive black holes in dwarf galaxies
Reines, A.E. (2022), ***Nature Astronomy***, invited Perspective

3. Book Chapter: Science with an ngVLA: Local Constraints on Supermassive Black Hole Seeds
Plotkin, R. & **Reines, A.** 2018, "Science with a Next-Generation VLA", ed. E. J. Murphy (ASP, San Francisco, CA)

2. Review Article: Observational Signatures of High-Redshift Quasars and Local Relics of Black Hole Seeds
Reines, A. and Comastri, A. 2016, Publications of the Astronomical Society of Australia, 33, 54

1. News and Views: Astrophysics: Giant black hole in a stripped galaxy
Reines, A. 2014, ***Nature***, 513, 322

Unrefereed Publications

3. Local Constraints on Supermassive Black Hole Seeds
Plotkin, R., **Reines, A. E.**, Nyland, K., Darling, J., Gallo, E., & Greene, J. E. (2019), BAAS, 51, 3, 315
Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers

2. The Local Relics of of Supermassive Black Hole Seeds
Greene, J., Barth, A., Bellini, A., Bellovary, J., Holley-Bockelmann, K., Do, T., Gallo, E., Gebhardt, K., Gultekin, K., Haiman, Z., Hosek, M., Kim, D., Libralato, M., Lu, J., Nyland, K., Malkan, M., **Reines, A. E.**, Seth, A., Treu, T., Walsh, J., & Wrobel, J. (2019), BAAS, 51, 3, 83
Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers

1. Towards a high accuracy measurement of the local black hole occupation fraction in low mass galaxies
Gallo, E., Hodges-Kluck, E., Treu, T., Greene, J., Wilkes, B., Seth, A., **Reines, A. E.**, Baldassare, V., Plotkin, R., & Chandar, R. 2019, BAAS, 51, 3, 35
Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers

Invited Conference Presentations

Review Talk: *"Growing Black Holes: Accretion and Mergers"*, Kathmandu, Nepal — postponed due to COVID

"Black Holes at All Scales", Giant magellan Telescope Community Science Meeting, Sedona, AZ — postponed due to COVID

"Formation and Growth of Supermassive Black Holes", Chile, remote format — Dec 2020

Press Conference: *"Wandering Massive Black Holes in Dwarf Galaxies"*, American Astronomical Society Meeting, Honolulu, HI — Jan 2020

"The Scientific Quest for High Angular Resolution", American Astronomical Society Meeting, Honolulu, HI — Jan 2020

"Black Hole Initiative Conference 2019", Harvard University — May 2019

"The Accretion Signatures of the Earliest Black Holes in the Universe", Princeton Center for Theoretical Science, Princeton, NJ — Apr 2019

"Science with HabEx: UV to Near-IR Space Astronomy in the 2030s", Flatiron Institute, Center for Computational Astrophysics, NY — Oct 2018

"Unsolved Problems in Astrophysics and Cosmology", Budapest, Hungary — Jul 2018

"The Early Growth of Supermassive Black Holes", Sexten, Italy — Jul 2018

"Massive Black Holes in Evolving Galaxies", IAP, Paris, France — Jun 2018

"Annual Meeting of the American Physical Society Northwest Section", Tacoma, WA — Jun 2018

"Multi Messenger Observations of IMBHs with LISA", American Astronomical Society Meeting, Washington, D.C. — Jan 2018

"AGN in Dwarf Galaxies", American Astronomical Society High Energy Astrophysics Division Meeting, Sun Valley, ID — Aug 2017

"Elusive AGN in the Next Era", George Mason University — Jun 2017

"Breakthrough Discuss", Stanford University — Apr 2016

"Supermassive Black Hole Formation and Feedback", Annapolis, MD — Oct 2015

Review Talk: *"First Stars, Galaxies and Black Holes"*, Groningen, Netherlands — Jun 2015

"The Growth of the First Supermassive Black Holes", Tenerife, Spain — Jun 2015

"Unveiling the AGN/Galaxy Evolution Connection", Puerto Varas, Chile — Mar 2015

Press Conference: *"Giant Black Holes Found in Dwarf Galaxies"*, American Astronomical Society Meeting, Washington D.C. — Jan 2014

"Astronomy Fellows at the Frontiers of Science", Northwestern University — Sep 2011

Press Conference: *"A Supermassive Black Hole in the Dwarf Starburst Galaxy Henize 2-10",* American Astronomical Society Meeting, Seattle, WA — Jan 2011

Contributed Conference Presentations

"Shining from the Heart of Darkness: Black Hole Accretion and Jets", Kathmandu — Oct 2016

"Cosmic Dawn of Galaxy Formation", IAP, Paris, France — Jun 2016

"Hubble Fellows Symposium", Baltimore, MD — May 2016

"AGN vs. Star Formation: The Fate of the Gas in Galaxies", Durham, UK — Jul 2014

"The X-ray Universe 2014", Dublin, Ireland — Jun 2014

"Multiwavelength AGN Surveys and Studies", Byurakan, Armenia — Oct 2013

"Black Hole (g)Astronomy - Exploring the Different Flavors of Accretion", Italy — Sep 2013

"Massive Black Holes: Birth, Growth and Impact", KITP, Santa Barbara — Aug 2013

"Black Hole Fingerprints: Dynamics, Disruptions and Demographics", Utah — Mar 2013

"Black Holes by the Black Sea", Istanbul, Turkey	Jun 2012
"Near-Field Cosmology as a Probe of Early Universe, Dark Matter and Gravity", MD	Nov 2011
"Single and Double Black Holes in Galaxies", University of Michigan	Aug 2011
"National Radio Astronomy Observatory Postdoc Symposium", NRAO	2012, 2013, 2014
"Einstein Fellows Symposium", Harvard Center for Astrophysics	2011, 2012, 2013
"American Astronomical Society Winter Meeting", various locations	2011-2020

Invited Seminars and Colloquia

University of Kentucky (remote)	Feb 2022
Washington State University (remote)	Oct 2021
University of Sheffield (remote)	May 2021
Idaho State University (remote)	Oct 2020
University of Arizona (remote)	Oct 2020
University of Connecticut (remote)	Oct 2020
Texas A&M	Feb 2020
Leibniz Institute for Astrophysics Potsdam, Germany	May 2019
Louisiana State University	May 2019
University of Utah	Mar 2019
University of Arkansas	Feb 2019
Northwestern University	Mar 2018
University of Colorado, Boulder	Oct 2017
University of Maryland, College Park	Mar 2017
Montana State University	Mar 2017
University of Toledo	Feb 2017
Space Telescope Science Institute, Baltimore, MD	Feb 2017
University of Victoria	Jan 2017
University of California, Santa Cruz	Mar 2016
Steward Observatory	Nov 2015
University of Illinois Urbana-Champaign	Dec 2014
California Institute of Technology	Nov 2014
Johns Hopkins University	Oct 2014
University of Wisconsin, Madison	Sep 2014
University of California, Los Angeles	Apr 2014
Georgia Institute of Technology	Feb 2014
Michigan State University	Jan 2013
University of Michigan	Jan 2013

Princeton University	Oct 2012
University of Texas at Austin	Sep 2011
Yale University	May 2011

Other Invited Talks

Public Talk: Science Inquiry Series, Museum of the Rockies, Bozeman, MT	May 2021
Guest Speaker, Honors College Freshman Research Symposium, MSU	Sep 2019
Guest Speaker, Honors College Freshman Research Symposium, MSU	Oct 2018
Public Talk: Rising Stars in the College of Letters and Science, Bozeman, MT	Apr 2018
Public Talk: Astronomy on Tap, Bozeman, MT	Feb 2018
Guest Speaker: Women in Science and Engineering Seminar Series, MSU	Dec 2017
Guest Speaker, Honors College Freshman Research Symposium, MSU	Oct 2017

Grants Funded as Principle Investigator (~$2.3 million total)

18. *"Dwarf Galaxies with Radio-Selected (and Sometimes Wandering)Massive Black Holes"*	**TBD**
Hubble Space Telescope, Cycle 29	2022
17. *"Dwarf Galaxies with Radio-Selected Massive Black Holes"*	**$79,751**
Hubble Space Telescope, Cycle 29	2022
16. *"Dwarf Irregular Galaxies with Candidate AGN"*	**$75,660**
Chandra X-ray Observatory, Cycle 23	2022
15. *"Dwarf Galaxies with Radio-Selected (and Sometimes Wandering) Massive Black Holes"*	**$93,050**
Chandra X-ray Observatory, Cycle 23	2022
14. *"The Origin of Supermassive Black Holes"*	**$750,000**
NASA EPSCoR Research Award	2020
13. *"Testing mid-IR AGN Selection in Dwarf Galaxies with Chandra and HST"*	**$104,856**
Hubble Space Telescope, Cycle 26	2019
12. *"Testing mid-IR AGN Selection in Dwarf Galaxies with Chandra and HST"*	**$103,460**
Chandra X-ray Observatory, Cycle 20	2019
11. *"The Origin of Supermassive Black Holes"*	**$383,394**
NASA Hubble Postdoctoral Fellowship	2014-2017
10. *"The Structures of Dwarf Galaxies Hosting Massive Black Holes"*	**$86,391**
Hubble Space Telescope, Cycle 23	2016

9. *"Probing the Growth of Massive Black Holes in Dwarf Galaxies with Chandra and HST"* **$57,013**
Hubble Space Telescope, Cycle 22 2016

8. *"AGN-Triggered Star Formation in the Dwarf Galaxy Henize 2-10?* **$70,912**
Chandra X-ray Observatory, Cycle 15 2015

7. *"Probing the Growth of Massive Black Holes in Dwarf Galaxies with Chandra and HST"* **$62,963**
Chandra X-ray Observatory, Cycle 16 2015

6. *"Confirming the AGN in a Low-Metallicity Dwarf Galaxy with the HSA and HST"* **$11,625**
Hubble Space Telescope, Cycle 22 2015

5. *"Probing the Early Evolution of Galaxies and Massive Black Holes with Nearby Star-Forming Dwarfs"* **$309,754**
NASA Einstein Postdoctoral Fellowship 2011-2014

4. *"Confirming the First Supermassive Black Hole in a Dwarf Starburst Galaxy"* **$36,526**
Hubble Space Telescope, Cycle 19 2013

3. *"Probing the Early Evolution of Galaxies and Massive Black Holes with Nearby Star-Forming Dwarfs"* **$52,611**
Chandra X-ray Observatory, Cycle 13 2011

2. *"The Birth of Super Star Clusters"* **$60,000**
NASA Earth and Space Science Graduate Fellowship 2009-2011

1. *"Unveiling the Early Evolution of Super Star Clusters through Multi-wavelength Observations of Starburst Galaxies"* **$15,000**
Virginia Space Grant Graduate Fellowship 2006-2008

Grants Funded as Co-Investigator (~$75,000 total)

2. *"X-ray Ionized Nebulae in Nearby Dwarf Galaxies"* **$40,219**
Chandra X-ray Observatory, Cycle 19 2018

1. *"Searching for Intermediate-Mass Black Holes in Extremely Metal-Poor Galaxies"* **$34,460**
Chandra X-ray Observatory, Cycle 18 2017

Student/Postdoc-led Grants Funded as Faculty Advisor (~$140,000 total)

10. *"The First Wandering Black Holes",* Mallory Molina (postdoc) **$50,000**
Ford Foundation Postdoctoral Fellowship 2021

9. *"Searching for Massive Black Holes in Dwarf Galaxies",* Colin Latimer (grad) **$9,000**
Montana Space Grant Consortium Graduate Fellowship 2020

8. *"Variable Sources in Dwarf Galaxies",* Erin Kimbro (post-bac.) **$6,000**

Montana Space Grant Consortium Summer Internship 2021

7. *"A Statistical Approach to Star Formation and Quenching in the Local Universe"* **$40,000**
Mallory Molina (postdoc), NASA's Swift Observatory, Cycle 16 2020

6. *"The Structures of Dwarf Galaxies Hosting AGNs",* Seth Kimbrell (grad) **$9,000**
Montana Space Grant Consortium Graduate Fellowship 2020

5. *"Hubble Space Telescope Observations of Mrk 709",* Erin Kimbro (undergrad) **$7,300**
Montana Space Grant Consortium Summer Internship 2020

4. *"The Origin and Evolution of Supermassive Black Holes",* Zachary Schutte (grad) **$9,000**
Montana Space Grant Consortium Graduate Fellowship 2019

3. *"Hubble Space Telescope Observations of Mrk 709",* Erin Kimbro (undergrad) **$7,300**
Montana Space Grant Consortium Summer Internship 2019

2. *"A Survey of AGNs in the NSC Using Optical Variability",* Erin Kimbro (undergrad) **$1,800**
MSU Undergraduate Scholars Program Scholarship 2018

1. MSU Women in Physics Grant, Madian Nelson and Demi St John (grads) **$400**
American Physical Society 2018

Selected Press

Hubble Finds a Black Hole Igniting Star Formation in a Dwarf Galaxy 2022
Hubblesite: https://hubblesite.org/contents/news-releases/2022/news-2022-002

Dwarf Galaxies Shed Light on Black Hole Origins 2022
Sky & Telescope: https://skyandtelescope.org/astronomy-news/dwarf-galaxies-shed-light-on-black-hole-origins/

Wandering Black Holes Found in Dwarf Galaxies Less Than Billion Light Years from Earth 2020
Newsweek: https://www.newsweek.com/wandering-black-holes-found-dwarf-galaxies-billion-light-years-earth-1480523

More big black holes found in small galaxies 2020
Sky & Telescope: https://skyandtelescope.org/astronomy-news/more-big-black-holes-found-in-small-galaxies/

The Smallest Galaxies Have Off-Kilter Black Holes, But Astronomers Know Why 2020
Forbes: https://www.forbes.com/sites/startswithabang/2020/01/06/the-smallest-galaxies-have-off-kilter-black-holes-but-astronomers-know-why/#18541fa54d2c

Astronomers discover dwarf galaxies with massive black holes 2020
The Week: https://www.theweek.in/news/sci-tech/2020/01/08/Astronomers-discover-dwarf-galaxies-with-massive-black-holes.html

Astronomers Find Wandering Massive Black Holes in Dwarf Galaxies 2020
National Radio Astronomy Observatory: https://public.nrao.edu/news/wandering-black-holes-dwarf-galaxies/

Big black holes can settle in the outskirts of small galaxies 2019
Science News: https://www.sciencenews.org/article/big-black-holes-can-settle-outskirts-small-galaxies

Not all Black Holes that Wander are Lost 2019
Astrobites: https://astrobites.org/2019/10/24/not-all-black-holes-that-wander-are-lost/

Astronomers find 'teeny supermassive black hole' 2015
The Telegraph: https://www.telegraph.co.uk/news/science/space/11797938/Astronomers-find-teeny-supermassive-black-hole.html

Oxymoronic Black Hole Provides Clues to Growth 2015
NASA: https://www.nasa.gov/press-release/oxymoronic-black-hole-provides-clues-to-growth

Astronomers find a teeny-tiny supermassive black hole 2015
Washington Post: https://www.washingtonpost.com/news/speaking-of-science/wp/2015/08/11/astronomers-find-a-teeny-tiny-supermassive-black-hole/

What are Dwarf Galaxies Teaching us about Black Holes? May 2014
Astronomy Magazine, print edition

Dwarf Galaxies Give Clues to Origin of Supermassive Black Holes 2014
National Radio Astronomy Observatory: https://public.nrao.edu/news/dwarf-galaxies-give-clues-to-black-hole-origins/

Galactic Runts Carry Beefy Black Holes 2014
Sky & Telescope: https://www.skyandtelescope.com/astronomy-news/galactic-runts-carry-beefy-black-holes/

'Missing link' black holes could be hiding in dwarf galaxies 2014
Christian Science Monitor: https://www.csmonitor.com/Science/2014/0108/Missing-link-black-holes-could-be-hiding-in-dwarf-galaxies

Hole's on First? New Evidence Shows Black Hole Growth Preceding Galactic Formation 2011
Scientific American: https://www.scientificamerican.com/article/dwarf-galaxy-black-hole/

Huge Black Hole Found in Dwarf Galaxy 2011
National Geographic: https://news.nationalgeographic.com/news/2011/01/110110-dwarf-galaxy-black-holes-universe-science-space/

Surprise: Dwarf Galaxy Harbors Supermassive Black Hole 2011
Chandra X-ray Observatory: http://chandra.harvard.edu/press/11_releases/press_011011.html

Astrophysics: Big black hole found in tiny galaxy 2011
Nature News & Views: https://www.nature.com/articles/470045a

Montana State University News Stories

Ford Fellow Mallory Molina pioneering method to search for black holes Jan 2022
https://www.montana.edu/news/21763/ford-fellow-mallory-molina-pioneering-method-to-search-for-black-holes

Mallory Molina awarded Ford Fellowship for astrophysics research, diversity efforts July 2021
https://www.montana.edu/news/21323/mallory-molina-awarded-ford-fellowship-for-astrophysics-research-diversity-efforts

Staring into the abyss May 2021
https://www.montana.edu/news/mountainsandminds/21172/staring-into-the-abyss

Montana State receives NASA grant to aid search for origin of supermassive black holes
https://www.montana.edu/news/20457/montana-state-receives-nasa-grant-to-aid-search-for-origin-of-supermassive-black-holes Sept 2020

Montana State astrophysicist finds massive black holes wandering around dwarf galaxies
https://www.montana.edu/news/19511/montana-state-astrophysicist-finds-massive-black-holes-wandering-around-dwarf-galaxies Jan 2020

Telescope Usage

Hubble Space Telescope	HST
Chandra X-ray Observatory	CXO
Very Large Array	VLA
Atacama Large Millimeter/submillimeter Array	ALMA
Very Long Baseline Array	VLBA
Long Baseline Array	LBA
Spitzer Space Telescope	Spitzer
Apache Point Observatory	APO

Accepted Telescope Proposals as Principle Investigator

Dwarf Galaxies with Radio-Selected Massive Black Holes	HST
The Structures of Dwarf Galaxies Hosting Massive Black Holes	HST
Confirming the First Supermassive Black Hole in a Dwarf Starburst Galaxy	HST
Dwarf Galaxies with Radio-Selected (& Sometimes Wandering) Massive Black Holes	CXO/HST
Testing Mid-Infrared AGN Selection in Dwarf Galaxies with Chandra & HST	CXO/HST
Probing the Growth of Massive Black Holes in Dwarf Galaxies with Chandra & HST	CXO/HST
Dwarf Irregular Galaxies with Candidate AGN	CXO
AGN-Triggered Star Formation in the Dwarf Galaxy Henize 2-10?	CXO
Probing the Early Evolution of Galaxies and Massive Black Holes	CXO/VLA

A Radio Search for Massive Black Holes in Dwarf Galaxies	VLA
Supermassive Black Holes in Dwarf Galaxies	VLA
Feeding the Massive Black Hole in the Dwarf Starburst Galaxy Henize 2-10	ALMA
Confirming the AGN in a Low-Metallicity Dwarf Galaxy with the HSA and HST	VLBA/HST
Probing the Enigmatic Nuclear Source in the Dwarf Galaxy He 2-10 with the LBA	LBA
Emerging Massive Star Clusters in NGC 4449	APO

Accepted Telescope Proposals as Co-Investigator

Studying the nuclear morphology of a dwarf galaxy with a 50,000 solar mass black hole	HST
Probing the Birth of Super Star Clusters with NICMOS	HST
Multiwavelength Characterization of Candidate Black Holes in Dwarf Galaxies	CXO/HST/VLA
Searching for intermediate-mass black holes in extremely metal-poor galaxies	CXO
A candidate 30,000 solar mass black hole	CXO
Searching for radio emission in variability-selected AGN in low-mass galaxies	VLA
Very Small AGN and the Fundamental Plane of Black Hole Activity	VLA
The Physical Environment of Nascent Super Star Clusters	ALMA
A Statistical Approach to Star Formation and Quenching in the Local Universe	Swift
The Formation and Early Evolution of Star Clusters	Spitzer
The Search for Low-Mass Black Holes	APO

Teaching Activities

Physics 435: Astrophysics, Montana State University	Spring 2018-2022
Astronomy 371: Solar System Astronomy, Montana State University	Fall 2018-2021
Center for Astronomy Education Teaching Excellence Workshop (participant)	2015
Teaching Assistant, astronomy night labs, University of Virginia	2005-2006
Math Advantage Tutoring, owner and tutor, Washington DC area	2003-2005
English Teacher in Hungary and Austria	2002-2003
Physics 122: Electricity and Magnetism Lab, San Francisco State University	1998
Astronomy 116: Astronomy Lab, San Francisco State University	1998

University and Departmental Service (Montana State University, Department of Physics)

Graduate Student Committees (chair of 8)	2017-present
Women+ in Physics, Chair	2017-present
Committee on Environment and Inclusion	2020-present
Faculty Search Committee	2021-2022
Graduate Curriculum Committee	2020-2021

Graduate Admissions Committee	2019-2021
Colloquium Committee	2018-2021
Physics Degree with Astronomy Option Committee, member/Chair	2018-2021
Faculty Search Committee	2019-2020
Graduate Curriculum Committee	2018-2019
Art of Physics and Physics of Art, Faculty Mentor	2018-2019

Diversity, Equity and Inclusion Efforts

Member of the Committee on Environment and Inclusion, Physics, MSU	2020-present
Towards a More Inclusive Astronomy, MSU chapter, faculty participant	2020-present
Women in Physics Group, Creator and Organizer, Montana State University	2017-present
Made "Beyond Curie" Poster Exhibit featuring notable women in physics, astronomy and engineering; displayed near large physics lecture room at Montana State U.	2018
Women in Science and Engineering Seminar Series, Guest Speaker, Montana State U.	2017
Career Day at Irving Elementary School in Bozeman, Guest Speaker	2017
"How the Universe Works", Featured scientist on TV show (season 3, episode 7)	2014
"Beyond the Visible: The Story of the Very Large Array", Featured scientist in film shown at the visitor center and online (narrated by Jodie Foster)	2013

Professional Service and Activities

External Reviewer for James Webb Space Telescope Large Proposals	2021
Equity in Graduate Admissions Workshop at Montana State University (participant)	2020
Discussion with Gender Minorities at Steward (GEMS) group at Steward Observatory	2020
Virtual Graduate School Recruitment Fair (presenter for MSU Physics)	2020
Reviewer for North Carolina Space Grant Proposals	2020
Organizing Committee, "James Webb Space Telescope Master Class", MSU	2020
Scientific Organizing Committee, "Accretion Signatures onto the Earliest Black Holes in the Universe", Workshop at Princeton University	2019
Scientific Organizing Committee for Special Session, "Dwarf Galaxies Near and Far", European Week of Astronomy & Space Science Meeting, Lyon, France	2019
Reviewer of Astro2020 Science White Paper, "Where are the Intermediate Mass Black Holes", Bellovary et al.	2019
External Reviewer for Hubble Space Telescope Large Proposals	2018
Proposal Reviewer for Gemini Observatory	2017
Program Organizer for Special Session on "AGN in Dwarf Galaxies", American Astronomical Society High Energy Astrophysics Division Meeting	2017
Member of the Hubble Fellowship Selection Committee	2016

Reviewer for the NASA Earth and Space Science Fellowship	2015
Science Review Panel Member for the National Radio Astronomy Observatory	2015-2016
Professional Skills Development Workshop, American Physical Society (participant)	2015
Aspen Center for Physics Program, "Dwarf Galaxies as Cosmological Probes"	2014
Peer Review Panel Member for the Chandra X-ray Observatory	2013
Kavli Institute for Theoretical Physics Program, "A Universe of Black Holes"	2013
Local Organizing Committee, "Transformational Science with ALMA: The Birth and Feedback of Massive Stars, Within and Beyond the Galaxy", NRAO	2008
Referee for various journals including *Nature, The Astrophysical Journal, Monthly Notices of the Royal Astronomical Society*	ongoing