Kristen Dage

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Research Interests

machine learning, surveys, globular clusters, X-ray binaries, accretion physics & high energy phenomena

Appointments

2020 - present **Postdoctoral Fellow**
McGill University/McGill Space Institute
Montréal, Québec, Canada

2020 **Postdoctoral Research Associate**
Michigan State University
East Lansing, Michigan, USA

Education

2015 - 2020 **Michigan State University**, East Lansing, Michigan, USA
Ph.D. Astronomy & Astrophysics

2015 - 2017 **Michigan State University**, East Lansing, Michigan, USA
M.Sc. Astronomy & Astrophysics

2012 - 2014 **University of Michigan-Dearborn**, Dearborn Michigan, USA
B.Sc. Physics

Accepted Telescope Proposals

2021 **Gemini South Fast Turnaround**: Confirming the Decline of [NII] Emission in Globular Cluster Ultraluminous X-ray Source GCU7, 5.5 hours **PI: K. Dage**

2021 ***Chandra* Cycle 23**: The Hunt for a new ultra-compact X-ray binary in M87's globular cluster system, 40ks and $21,520 USD **PI: K. Dage**

2021 ***Chandra* Cycle 23**: The Next Breakthroughs Community Program: Chandra-VLA Observations of Compact-Object Mergers, PIs: D. Haggard, J. Neilsen

2021 ***NuSTAR* Cycle 7**: Investigating pulsation transience in SMC X-1 during superorbital period excursion, PI: M. Brumback

2021 ***JWST* Cycle 1**: Do Massive Black Holes Come in Small Packages? A census of black holes in compact stellar systems in the Virgo cluster, 41.2 Primary Spacecraft Hours, PI: M. Taylor

2021 ***NICER* Cycle 3**: Monitoring SMC X-1's reprocessed emission during an epoch of superorbital period excursion, 120ks, **PI: K. Dage**

2020 **Gemini South 2021A**: Searching for evidence of outflows in globular cluster X-ray binary M87-GCULX1, 7.2 hours, **PI: K. Dage**

2020 **Chandra Cycle 22**: The LMXB population of NGC 3998: Testing for an extreme IMF, PI: S. Zepf

2020 ***HST* Cycle 28**: Far-ultraviolet insights into multiple populations in extragalactic globular clusters, PI: S. Zepf

2020 ***NuSTAR* Cycle 6**: Complete spectral characterisation of a newly discovered ULX, 40ks and $20,000 USD, **PI: K. Dage**

2019 **Niels Gehrels Swift Observatory** Target of Opportunity, 24ks, **PI: K. Dage**

2019 **Chandra Cycle 21**: A high spatial resolution X-ray survey of the halo of M87, PI: M. Peacock

2018 **Chandra Cycle 20**: The nature of the two globular cluster ULXs in the galaxy NGC 4472, PI: S. Zepf

Awards, Honours and Grants

2022 **Bourses de recherche postdoctorale**, Fonds de recherche du Québec – Nature et technologies (FRQNT)

2022 **Durand Travel Fund**, Aspen Center for Physics $500 USD

2020 **Sherwood K. Haynes Graduate Physics Award for Outstanding Graduate Student**, Dept. Physics & Astronomy, Michigan State University

2020 **MSI Postdoctoral Fellowship Prize**, Montreal, QC

2019 **MSU College of Natural Science Dissertation Completion Fellowship**, $7500 USD

2019 **AAS International Travel Grant**, National Sciences Foundation, $2000 USD

2014 **Outstanding Physics Student**, Dept. Natural Sciences, University of Michigan-Dearborn

2014 **Outstanding Math Tutor**, Academic Support Center, Oakland Community College

Teaching Experience

2021 **Guest Lecturer**
Graduate High Energy Astrophysics & Undergraduate Modern Physics and Relativity
McGill University, Québec, Canada

2018 **Certificate in Inclusive Inquiry STEM Education**
Institute for Scientist & Engineer Educators Professional Development
University of Santa Cruz, California, USA

2018 **Astronomy Instructor**
Gifted and Talented Education program
Michigan State University, Michigan, USA

2015 - 2018 **Teaching Assistant**
Visions of the Universe Laboratory
Michigan State University, Michigan, USA

2011 - 2014 **German, Math, Physical Sciences Tutor**
Academic Support Center
Oakland Community College, Michigan, USA

2011 **Teaching Assistant**
Physical Science
Oakland Community College, Michigan, USA

International Collaborations and Professional Societies

2022 - present ngEHT - Transient Science Working Group

2022 - present AXIS Probe Mission Concept Science Working Group

2022 - present Athena Science Study Team - Physics of Accretion Subgroup

2022 - present CASTOR Time Domain Science Working Group

2022 - present STROBE-X Science Working Group

2021 - present The Legacy Survey of Space & Time - Stars, Milky Way and Local Volume Working Group

2021 - present International Astrostatistics Association

2021 - present Astrostatistics Interest Group of the American Statistical Association

2021 - present Canadian Astronomical Society/Société Canadienne d'Astronomie

2020 - present LISA Consortium, ESA L3 Approved Mission

2020 - present	Centre de recherche en astrophysique du Québec
2016 - present	American Astronomical Society

Student Research Supervision

2022 - present	Rawan Karam, B.Sc., McGill University, Canada
2021 - 2022	Yifan Sun, B.Sc. (Honours), McGill University, Canada
2021 - 2022	Jeff Huang, B.Sc (Honours)., McGill University, Canada
2020 - 2022	Sneha Nair, B.Sc. (Honours), McGill University, Canada
2020 - 2022	Emma Barbisan, B.Sc., McGill University, Canada
2020 - 2021	Jade Ducharme, B.Sc., McGill University, Canada
2020 - present	Wasundara Athukoralalage, B.Sc., Michigan State University, USA
2019 - 2021	Erica Thygesen (w/ Zepf), M.Sc., Michigan State University, USA
2019	Noah Vowell, B.Sc., University of Michigan-Dearborn, USA
2018	Omid Noroozi, B.Sc., Michigan State University, USA

Analysis, Software and Skills

- X-ray spectroscopy, imaging and timing analysis (*Chandra*, *MAXI*, *NICER*,*NuSTAR*, *RXTE*, *Swift*, *XMM*)
- Optical spectroscopy (*SOAR/GHTS*, *Gemini/GMOS*, *VLT/FORS2*)
- Ultraviolet imaging and photometry (*Swift/UVOT*, *GALEX*)
- Infrared imaging (*Spitzer/IRAC*)
- Gamma-ray binned likelihood analysis (*Fermi/LAT*)
- Conducting optical observations at *SOAR* observatory, with over 300 hours experience
- Programming: Python (astropy, numpy, scipy, scikit-learn, matplotlib, Keras), Mathematica
- Major astronomical packages: AstroPy, CIAO, HEASoft (XSpec, FTools), IRAF, Fermitools

Academic Service

2022	Rubin Observatory Data Preview 2 Delegate
2022-	NICER User's Group
2022-	co-Chair, Star Clusters Science Subgroup for Rubin Observatory
2022	Canadian Space Agency High Energy Astrophysics Topical Team
2022	Executive Secretary in NASA Astrophysics Senior Review
2021-	Publication referee: Monthly Notices of the Royal Astronomical Society
2021-	Time/Funding Allocation Committees: Chandra, NICER, ADAP, Swift, NuSTAR, NSF AAG
2021-	External Reviewer: CanTAC, Indian Space Research Organisation, Hubble Space Telescope
2021	McGill Space Institute Undergrad Awards Committee
2020-2022	Postdoc Liaison, McGill Physics Equity, Diversity, and Inclusion
2016-2020	MSU Astronomy Journal Discussion Organizer

Mentoring

2021	Physics & MSI Summer Student Program, McGill University, Québec, Canada
2021-2022	Mentoring for Women in Physics, Supernova Foundation
2020	Undergraduate Professional Development Seminars, Michigan State University and University of Michigan-Dearborn, Michigan, USA
2019-2020	Co-founder, Stellar Mentoring Program, Michigan State University, Michigan, USA
2017-2018	Women and Minorities in Physical Sciences, Michigan, USA

Invited Talks

2021 Oct	Howard University, D.C., USA
2021 May	University of California Santa Cruz, California, USA
2021 Mar	American Museum of Natural History, New York, USA
2021 Feb	Texas Tech University, Texas, USA
2021 Jan	Institute of Astrophysics-FORTH, Heraklion, Crete
2020 Dec	Science Briefing, NASA Universe of Learning, Maryland, USA
2020 Feb	McGill Space Institute, Québec, Canada

Selected Conference and Seminar Talks

– 18 talks in four countries since April, 2014.

2022 May	Intermediate Mass Black Holes: New Science From Stellar Evolution to Cosmology, San Juan, Puerto Rico
2021 Aug	Rubin Observatory Project & Community Workshop, Seattle, WA, USA
2021 Apr	LISA Canada Workshop, British Columbia, Canada
2019 Mar	17th High Energy Astrophysics Division Meeting, California, USA
2018 Aug	International Centre for Radio Astronomy Research, Western Aus., Australia
2017 Feb	Gemini South Observatory, Coquimbo, Chile
2014 Apr	Compact Objects in Michigan 2, Michigan, USA

Selected Public Talks

– 12 public talks since September, 2017.

2021	STEM Week, Vanier College, Québec, Canada
2021	Abrams Planetarium Night Sky Chat, Michigan, USA
2020	Quiet Adventures Symposium, Michigan, USA
2017	Capitol Area Astronomy Association, Michigan, USA

Selected Outreach and Volunteer Activities

– Involved in 16 different outreach events since April, 2014.

2021	Co-organizer, McGill Space Institute Astronomy Trivia Night, Québec, Canada
2020	Presenter, 2020 STEM Pathways for Girls conference, New Mexico, USA
2019	Event Supervisor, Science Olympiad State Level Astronomy division, Michigan, USA
2019	Organizer, IAU Women and Girls in Astronomy Month, Abrams Planetarium, Michigan, USA
2018	Primary Astronomy Organizer, MSU Science Festival Expo Days, Michigan, USA

Publications

† *indicates students under my supervision*

Refereed

19. **K. Dage**, M. Brumback, J. Neilsen, C.-P. Hu, D. Altamirano, A. Bahramian, P. A. Charles, W. I. Clarkson, D. Haggard, R. C. Hickox, J. Kennea, "Monitoring Observations of SMC X-1's Excursions (MOOSE) I: Program Description and Initial High-State Spectral Results", 2022, MNRAS, (submitted)

18. E. Barbisan†, J. Huang† et al (including **K. Dage**), "Using Machine Learning to Identify Extragalactic Globular Cluster Candidates from Ground-Based Photometric Surveys of M87", 2022, MNRAS

17. S. J. Swihart, et al (including **K. Dage**), "4FGL J1120.0-2204: A Unique Gamma-ray Bright Neutron Star Binary with an Extremely Low Mass Proto-White Dwarf", 2022, The Astrophysical Journal

16. D. L. Tucker et al (including **K. Dage**), "SOAR/Goodman Spectroscopic Assessment of Candidate Counterparts of the LIGO–Virgo Event GW190814", 2022, The Astrophysical Journal

15. C. Kilpatrick et al (including **K. Dage**), " The Gravity Collective: A Search for the Electromagnetic Counterpart to the Neutron Star-Black Hole Merger GW190814", 2021, The Astrophysical Journal

14. **K. C. Dage**, N. Vowell†, E. Thygesen†, A. Bahramian, D. Haggard, K. Kovlakas, A. Kundu, T. J. Maccarone, J. Strader, R. Urquhart, S. E. Zepf, "Ultraluminous X-ray Sources in Seven Edge-On Spiral Galaxies", 2021, Monthly Notices of the Royal Astronomical Society

13. T. Jayasinghe et al (including **K. Dage**), "The Loudest Stellar Heartbeat: Characterizing the Most Extreme Amplitude Heartbeat Star System", 2021, Monthly Notices of the Royal Astronomical Society

12. **K.C. Dage**, A. Kundu, E. Thygesen†, A. Bahramian, J.A. Irwin, D. Haggard, T.J. Maccarone, S. Nair†, M.B. Peacock, J. Strader, S.E. Zepf, "Three Ultraluminous X-ray Sources in NGC 1316", 2021, Monthly Notices of the Royal Astronomical Society

11. S. Swihart et al (including **K. Dage**), "Discovery of a New Redback Millisecond Pulsar Candidate: 4FGL J0940.3-7610", 2021, The Astrophysical Journal

10. J. M. Miller (including **K. Dage**), "A New Candidate Transitional Millisecond Pulsar in the Sub-luminous Disk State: 4FGL J0407.7–5702", 2020, The Astrophysical Journal

9. S. Swihart et al (including **K. Dage**),"A New Likely Redback Millisecond Pulsar Binary with a Massive Neutron Star: 4FGL J2333.1-5527", 2020, The Astrophysical Journal

8. **K.C. Dage**, S.E. Zepf, E. Thygesen†, A.Bahramian, A. Kundu, M.B. Peacock, T. J. Maccarone, J. Strader, "X-Ray Spectroscopy of Newly Identified ULXs Associated With M87's Globular Cluster Population", 2020, Monthly Notices of the Royal Astronomical Society

7. **K.C. Dage**, S.E. Zepf, A. Bahramian,J. Strader, Thomas J. Maccarone, M.B. Peacock, A. Kundu, M. Steele, C.Britt, "Slow Decline and Rise of the Broad [OIII] Emission Line in Globular Cluster Black Hole Candidate RZ2109", 2019, Monthly Notices of the Royal Astronomical Society

6. E. Aydi, et al (including **K. Dage**),"Flaring, Dust Formation, And Shocks In The Very Slow Nova ASASSN-17pf (LMCN 2017-11a), 2019, The Astrophysical Journal

5. **K.C. Dage**, S.E. Zepf, M.B. Peacock, A. Bahramian, O. Noroozi†, A.Kundu, T.J. Maccarone, "X-Ray Spectral Variability of Ultraluminous X-Ray Sources in Extragalactic Globular Clusters", 2019, Monthly Notices of the Royal Astronomical Society.

4. Strader, J., et al (including **K. Dage**),"Optical spectroscopy and demographics of redback millisecond pulsar binaries", 2018, The Astrophysical Journal

3. M. A. Tucker, et al (including **K. Dage**),"ASASSN-18ey: The Rise of a New Black-Hole X-ray Binary" 2018, The Astrophysical Journal

2. **K.C. Dage**, W.I. Clarkson, P.A. Charles, S. Laycock, I-C. Shih "*A Search for Spin-Superorbital Period Correlation in SMC X-1*", 2018, Monthly Notices of the Royal Astronomical Society.

1. **K. C. Dage**, S. E. Zepf, A. Bahramian, A. Kundu, T. J. Maccarone, M. B. Peacock, "X-Ray Variability from the Ultraluminous Black Hole Candidate X-ray Binary in the Globular Cluster RZ 2109", 2018, The Astrophysical Journal

Unrefereed

9. Amaro-Seoane et al (including **K. Dage**), "Astrophysics with the Laser Interferometer Space Antenna", Living Reviews In Relativity, 2022

8. J. Huang†, Y. Sun†, **K. Dage**, D. Haggard, "Probing M87 Globular Clusters for Flaring Ultraluminous X-Ray Sources", 2021, RNAAS, 5, 136

7. D. Tucker et al (including **K. Dage**), "LIGO/Virgo S190814bv: SOAR spectroscopy of DECam candidates AT2019npw and AT2019num", 2019, GCN 25484

6. E. Aydi et al (including **K. Dage**), "SOAR classification of ASASSN-19qv as a classical nova in the SMC", The Astronomer's Telegram, No. 12907

5. J. Strader, L. Chomiuk, **K. Dage**; J.L. Prieto, K. Z. Stanek, " Spectroscopic classification of ASASSN-19kz as a young Type II supernova in NGC 2207", The Astronomer's Telegram, No. 12706

4. K.V. Sokolovsky et al (including **K. Dage**), "ASAS-SN Discovery of a Bright Candidate Microlensing Event ASASSN-19cq", 2019, The Astronomer's Telegram, No. 12495

3. S.K. Sarbadhicary, et al (including **K. Dage**), "SOAR optical spectroscopy of the Wolf-Rayet star WR96 during the dimming event", The Astronomer's Telegram, No. 12511

2. **K. Dage,** et al, "Spectroscopic Classification of SN 2018agk with SOAR/Goodman", 2018, The Astronomer's Telegram, No. 11433

1. A. Bahramian, J. Strader, **K. Dage**, "SOAR/Goodman optical spectroscopy of MAXI J1820+070", 2018, The Astronomer's Telegram, No. 11424