# Dr. Abigail L. **Stevens**


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## Appointments

**NSF Astronomy & Astrophysics Postdoctoral Fellow**, Michigan State U. and U. Michigan — MI, USA
Sponsoring scientists: J. Strader (MSU) and J.M. Miller (UMich) — **2018–present**

**Postdoctoral research associate**, Michigan State University — East Lansing, MI, USA
Worked on spectral-timing analysis of X-ray binaries in *NICER* data (Advisor: J. Strader) — **2018**

## Education

**Ph.D. in Astronomy**, Universiteit van Amsterdam (Advisor: P. Uttley) — Amsterdam, Netherlands, **2013 – 2018**
**M.Sc. in Physics**, University of Alberta (Advisor: S.M. Morsink) — Edmonton, AB, Canada, **2011 – 2013**
**B.A. in Physics**, Bard College (Advisor: P. Skiff) — Annandale-on-Hudson, NY, USA, **2007 – 2011**

## Accepted Observing Proposals

**Co-I** (PI: P. Gandhi, Co-PIs: T. Maccarone, A. Shaw), *JWST* Cycle 1 General Observer Program — **2021**
*Black Hole Jet Launching Physics with MIRI*

**Co-I** (PI: P. Gandhi, Co-PIs: T. Maccarone, A. Shaw), *JWST* Cycle 1 General Observer Program — **2021**
*Validating JWST's In-orbit Clock Accuracy*

**PI**, *NICER* Cycle 1 joint with *NuSTAR* Cycle 5 Guest Observer Facilities — **2019**
*Comparing emission mechanisms of low-frequency QPOs in black holes and neutron stars* — $60,000 to MSU

**Co-I** (PI: J. Steiner), *NuSTAR* Cycle 5 joint with *NICER* Cycle 1 Guest Observer Facilities — **2019**
*A continued NuSTAR & NICER look at reflection and thermal emission in Cygnus X-1*

**Co-I** (PI: J. Homan), *NICER* Cycle 1 Guest Observer Facilities — **2019**
*A spectral-timing study of GX 5–1*

**Co-I** (PI: J. Homan), *NICER* Cycle 1 Guest Observer Facilities — **2019**
*Jet-launching in Sco X–1*

## Honors & Awards

**Accepted ISSI Bern center proposal co-author**, High-mass X-ray binaries workshop — 2021
**NSF Astronomy & Astrophysics Postdoctoral Fellowship**, Michigan State U. and U. Michigan — 2018 – present
**Accepted Lorentz Center proposal co-author**, Python in Astronomy 2017 workshop — 2016
**Travel grants (5)**, LKBF (Leids Kerkhoven-Bosscha Fonds) — 2015, 2016, 2017
**Best Student Talk**, Canadian Astronomical Society Graduate Student Committee — 2013
**Travel grants (2)**, U. Alberta — 2012, 2013
**Alden Trust Scholar**, Bard College — 2010 – 2011
**Excellence and Equal Cost Scholarship**, Bard College — 2007 – 2011

## Publications

ADS publication link | ORCID: 0000-0002-5041-3079

## Refereed

13. V.A. Cúneo, K. Alabarta, L. Zhang, et al. (18 more co-authors including **A.L. Stevens**) 2020. *A* NICER *look at the state transitions of the black hole candidate MAXI J1535-571 during its reflares,* MNRAS, 496,1001, 11pp.
12. G. Vasilopoulos, P.S Ray, K.C. Gendreau, et al. (10 more co-authors including **A.L. Stevens**) 2020. *The 2019 super-Eddington outburst of RX J0209.6-7427: detection of pulsations and constraints on the magnetic field strength,* MNRAS, 494, 5350, 9pp.
11. J. Homan, J. Bright, S.E. Motta, et al. (13 more co-authors including **A.L. Stevens**) 2020. *A Rapid Change in X-ray Variability and a Jet Ejection in the Black Hole Transient MAXI J1820+070*, ApJL, 891, L29, 6pp.
10. S. Mumford, N. Freij, S. Christe, et a.l (50+ more co-authors including **A.L. Stevens**) 2020. *SunPy: A Python package for Solar Physics,* JOSS, 5, 1832
9. D. Huppenkothen, M. Bachetti, **A.L. Stevens**, et al. 2019. *Stingray: A modern Python library for spectral timing,* JOSS, 4, 1393
8. G. Jaisawal, C.A. Wilson-Hodge, A. C. Fabian, et al. (15 more co-authors including **A.L. Stevens**) 2019. *An Evolving Broad Iron Line from the First Galactic Ultraluminous X-Ray Pulsar Swift J0243.6+6124,* ApJ, 885, 18, 9pp.
7. D. Huppenkothen, M. Bachetti, **A.L. Stevens**, et al. 2019. *Stingray: A Modern Python Library For Spectral Timing,* ApJ, 881, 39, 14pp.
6. E. Kara, J.F. Steiner, A.C. Fabian, et al. (13 more co-authors including **A.L. Stevens**) 2019. *The corona contracts in a new black hole transient,* Nature, 565, 198, 4pp. (cover, News & Views)
5. A. De Rosa, P. Uttley, L. Gou, et al. (101 more co-authors including **A.L. Stevens**) 2019. *Accretion in Strong Field Gravity with* eXTP*,* Sci. China-Phys. Mech. Astron., 62, 029504, 22pp.
4. **A.L. Stevens**, P. Uttley, D. Altamirano, et al. 2018. *A* NICER *Discovery of a Low-Frequency Quasi-Periodic Oscillation in the Soft-Intermediate State of MAXI J1535–571,* ApJL, 865, L15, 7pp.
3. **A.L. Stevens**, J.D. Fiege., D.A. Leahy, and S.M. Morsink 2016. *Neutron Star Mass-Radius Constraints using Evolutionary Optimization,* ApJ, 833,244, 13pp.
2. **A.L. Stevens** and P. Uttley 2016. *Phase-Resolved Spectroscopy of Type B QPOs in GX 339–4,* MNRAS, 460, 2796, 14pp.
1. K.G. Elshamouty, C.O. Heinke, S.M. Morsink, S. Bogdanov, and **A.L. Stevens** 2016. *The Impact of Surface Temperature Inhomogeneities on Quiescent Neutron Star Radius Measurements,* ApJ, 826, 162, 13pp.

## Unrefereed

17. M.C. Davis and **A.L. Stevens** 2020. *Spectral Variability of a Soft-intermediate State QPO from MAXI J1820+070,* RNAAS, 4, 95
16. J. Steiner et al. (11 more co-authors including **A.L. Stevens**) 2019. *Accretion Physics with Fast X-ray Spectral Timing,* Astro2020 science white paper, 51, 3, 359, 9pp.
15. A. Siemiginowska et al. (51 more co-authors including **A.L. Stevens**) 2019. *The Next Decade of Astroinformatics and Astrostatistics,* Astro2020 science white paper, 51, 3, 355, 15pp.
14. P.S. Ray et al. (158 more co-authors including **A.L. Stevens**) 2019. STROBE-X*: X-ray Timing and Spectroscopy onDynamical Timescales from Microseconds to Years,* Astro2020 mission concept white paper, arXiv:1903.03035, 66pp.
13. J. Homan, **A.L. Stevens**, D. Altamirano, et al. 2018. *MAXI J1820+070 continuing its rapid evolution toward the hard state,* ATel, 12068
12. P.S. Ray et al. (33 more co-authors including **A.L. Stevens**) 2018. STROBE-X: *A Probe-Class Mission for X-ray Spectroscopy and Timing on Timescales from Microseconds to Years,* Proc. SPIE, 10699, 1069919
11. J. Homan et al. (11 more co-authors including **A.L. Stevens**) 2018. *Continuing* NICER *Observations of the State Transition in ASASSN-18ey/MAXI J1820+070,* ATel, 11823
10. M.F. Corcoran et al. (7 more co-authors including **A.L. Stevens**) 2018. NICER *X-ray Observations of Cyg X-3 During the Recent Gamma-Ray Bright State,* ATel, 11821
9. J. Homan et al. (10 more co-authors including **A.L. Stevens**) 2018. *A Rapid State Transition in MAXI J1820+070,* ATel, 11820
8. J. Neilsen, **A.L. Stevens**, J.F. Steiner, et al. 2018. NICER *Observation of Strong Wind Absorption in the Soft Outburst of 4U 1630–47,* ATel, 11771
7. R.M. Ludlam et al. (17 more co-authors including **A.L. Stevens**) 2018. NICER *Detection of the New X-ray Transient*

*MAXI J1727–203,* ATel, 11689

6. **A.L. Stevens** 2018. *New Techniques for Understanding X-ray Variability from Compact Objects* (Doctoral thesis), U. Amsterdam Digital Academic Repository (11245.1/2d439f87-5fe6-439f-bea4-ce20a421ef4a)
5. D. Muna et al. (153 more co-authors including **A.L. Stevens**) 2016. *The Astropy Problem*, arXiv:1610.03159
4. D. Huppenkothen, M. Bachetti, **A.L. Stevens**, S. Migliari, and P. Balm 2016. *Stingray: Spectral-timing software,* Astrophysics Source Code Library, ascl:1608.001
3. M. Feroci, et al. (464 more co-authors including **A.L. Stevens**) 2016. *The* LOFT *Mission Concept: A Status Update,* Proc. SPIE, 9905, 99051R
2. **A.L. Stevens** 2013. *Understanding Parameter Degeneracies in Neutron Star X-ray Light Curves* (Masters thesis), U. Alberta Library Education & Research Archive (neos.6504112)
1. **A.L. Stevens** 2011. *A Mathematical Exploration of Low-Dimensional Black Holes* (Bachelors thesis), Bard Digital Commons, Senior Projects Spring 2011 (Paper no. 28)

## Collaboration Memberships

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|---|---|
| ***NICER*** **(NASA Explorer mission)**, Observatory Science working group, Bursts & Accretion working group | **2018 – present** |
| ***eXTP*** **(proposed Chinese Acad. Sci. mission)**, Accretion in strong gravity working group | **2018 – present** |
| **Astropy**, contributor | **2018 – present** |
| ***STROBE-X*** **(proposed NASA Probe in concept study)**, Stellar-mass compact objects working group | **2016 – present** |

## Presentations

### Invited Colloquia, Seminars, and Talks

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| Western U. Institute for Earth and Space Exploration | London, ON, Canada, **2021** |
| U. Washington Department of Astronomy colloquium | Seattle, WA, **2020** |
| Western U. Department of Physics & Astronomy colloquium | London, ON, Canada, **2020** |
| U. Rochester Department of Physics & Astronomy colloquium | Rochester, NY, **2020** |
| Bard College Physics colloquium | Annandale-on-Hudson, NY, **2019** |
| Howard U. Department of Physics & Astronomy colloquium | Washington, DC, USA, **2019** |
| Women in Physics Canada 2019 conference | Montreal, QC, Canada, **2019** |
| Northwestern CIERA theory seminar | Evanston, IL, USA, **2019** |
| AAS 17th High Energy Astrophysics Division meeting (3 invited talks) | Monterey, CA, USA, **2019** |
| Wayne State U. Particle, Astro-, and Nuclear Physics seminar | Detroit, MI, USA, **2019** |
| AAS 233 *NICER* special session | Seattle, WA, USA, **2019** |
| McGill Space Institute astrophysics seminar | Montreal, QC, Canada, **2018** |
| Wayne State U. Undergraduate Research Fair keynote | Detroit, MI, USA, **2018** |
| Monitoring the Non-Thermal Universe 2018 conference | Cochem, Germany, **2018** |
| U. Tübingen Astronomy group seminar | Tübingen, Germany, **2018** |
| AAS 16th Higher Energy Astrophysics Division meeting | Sun Valley, ID, USA, **2017** |
| Czech Academy of Sciences Relativistic Astrophysics seminar | Prague, Czech Republic, **2017** |
| Erlangen Center for Astroparticle Physics seminar | Erlangen, Germany, **2017** |
| Joint Institute for Nuclear Astrophysics lunch seminar | East Lansing, MI, USA, **2017** |
| MPE High-energy astrophysics group seminar | Garching, Germany, **2017** |
| MIT X-ray group seminar | Cambridge, MA, USA, **2017** |
| Harvard/CfA guest seminar | Cambridge, MA, USA, **2017** |
| KITP program on accretion disks seminar | Santa Barbara, CA, USA, **2017** |
| U. Alberta Astrophysics group seminar | Edmonton, AB, Canada, **2016** |

NASA Goddard X-ray astrophysics group seminar — Greenbelt, MD, USA, **2015**
Naval Research Laboratory Astrophysics group seminar — Washington, DC, USA, **2015**
U. Maryland Department of Astronomy seminar — College Park, MD, USA, **2015**

### Contributed talks

AAS 233 — Seattle, WA, USA, **2019**
Breaking the Limits II: Super-Eddington Accretion (2 talks) — Castiadas, Italy, **2018**
43rd COSPAR Scientific Assembly (3 talks) — Pasadena, CA, USA, **2018**
AAS 16th Higher Energy Astrophysics Division meeting — Sun Valley, ID, USA, **2017**
High-throughput X-ray astronomy in the *eXTP* era — Rome, Italy, **2017**
AAS 229 (Dissertation talk) — Grapevine, TX, USA, **2017**
71st Netherlands Astronomy Conference — Nunspeet, Netherlands, **2016**
AAS 15th High Energy Astrophysics Division meeting — Naples, FL, USA, **2016**
Python in Astronomy 2016 — Seattle, WA, USA, **2016**
The X-ray Spectral Timing Revolution workshop — Leiden, Netherlands, **2016**
European Week of Astronomy and Space Science 2015 — Santa Cruz de Tenerife, Spain, **2015**
*XMM-Newton* Workshop: The Extremes of Black Hole Accretion — Madrid, Spain, **2015**
Canadian Astronomical Society 2013 — Vancouver, BC, Canada, **2013**

## Mentoring Experience

**Megan Davis**, Post-baccalaureate research assistant — East Lansing, MI, **2019-2020**
Year-long research project on phase-resolved spectroscopy of black holes and neutron stars with *NICER* data

**Swapnil Sharma**, Google Summer of Code student — Remote, **2018**
Stingray library development under the Open Astronomy organization

## Teaching Experience

**LSST Data Science Fellowship Program**, Invited instructor — Pittsburgh, PA, **2019**
Time-domain analysis, periodic and quasi-periodic signals, noise processes

**Anton Pannekoek Institute, U. Amsterdam**, Teaching Assistant — Amsterdam, **2013 – 2015**
Open Problems in Modern Astrophysics (MSc level), Observatory practicum (BSc level)

**Department of Physics, U. Alberta**, Teaching Assistant — Edmonton, AB, **2011 – 2013**
Observatory (3rd & 6th grade, and general public), Intro physics lab, High school physics experiments

**Johns Hopkins Center for Talented Youth**, Teaching Assistant — Palo Alto, CA, **2011**
Science and Engineering (5th & 6th grade)

**Bard College Learning Commons**, Tutor — Annandale-on-Hudson, NY, **2009 – 2011**
Light and Color, Acoustics, Calculus 1, Intro to Mathematical Modelling, Math study room

## Outreach Experience

Art and science:

- Science consultant, Inquiry Arts virtual residency (2021)
- Writer and presenter, REO Town Reading Series in Lansing, MI (2021)
- Presenter, Schrodinger's Cat Is In Town II, MSU Broad Museum Art Lab (2020)
- Invited presenter at *Science-Art Slam* in Amsterdam (2017)

Public talks and panels:

- Finalist in the Skype A Scientist "No Time Like The Presentation!" competition (2021)
- Virtual talks for families for the Abrams Planetarium and MSU Science Festival (2020–present)

- Invited panelist for "Adler After Dark: Out in Space" at the Adler Planetarium in Chicago (2019)
- Invited speaker at *Astronomy On Tap Lansing* (2018, 2019, 2020)
- Invited speaker at *LogiCON* in Edmonton, AB (2013)
- Presenter at *Nerd Nite Edmonton* (2012)

Leadership:

- Boss of communications and public relations for *Nerd Nite Amsterdam* (2014–2016)
- Interim Education and Public Outreach officer on the *Canadian Astronomical Society Graduate Student Committee* (2013)
- Teaching Assistant/Manager of the *U. Alberta Observatory* (2012–2013)

Science Day events:

- Activity leader for Make Your Own Pulsar! for multiple school groups at *MSU Science Festival* school program day (2020)
- Activity leader for Make Your Own Pulsar! for ∼300 kids grades K-8 over 6 hours at *MSU Science Festival* Expo Day (2019)
- Volunteer at *Science Park Open Day* in Dutch and English at U. Amsterdam (2013, 2014, 2015)
- Activity leader for 6th grade girls at the *Women in Scholarship, Engineering, Science, and Technology (WISEST) Choices Conference* at U. Alberta (2012, 2013)
- Presenter and activity leader for grades 2-7 at *Science FUNday* at U. Alberta (2012, 2013)
- Science fair judge at Belgravia Elementary School in Edmonton, AB (2013)
- Volunteer at the Department of Physics Open House at U. Alberta (2012)
- Assistant presenter at *Young Science Day* in Rhinebeck, NY (2010)

Public observatory nights:

- Volunteer at the *MSU Observatory* (2018–2019)
- Volunteer at the *Anton Pannekoek Observatory* in Amsterdam (2014)
- Volunteer at the *U. Alberta Observatory* (2011–2012)

Classroom lessons:

- *Skype A Scientist* discussing astronomy and space science for all grades, virtual (2020–present)
- *MSU Science Festival* discussing black holes and gravity for grades 6-8 in East Lansing, MI (2019–present)
- *Introduction to the Solar System* for grades 3-6 in Dutch and English in Amsterdam (2017)
- *From sunspots to the aurora borealis* with solar observing for grades 3 and 6 in Edmonton, AB (2012–2013)

Mental wellbeing in academia:

- Invited speaker at the *MSU JINA Science Cafe* (2019)
- Invited panelist at the *Women in Physics Canada* conference (2019)
- Lunch discussion at the *LSST Data Science Fellowship program* (2019)
- Invited workshop co-leader at the *Conference for Undergraduate Women in Physics* at MSU (2019)
- Soft-skills astronomy and physics seminar at MSU (2018)

Social media:

- Social media manager for proposed Probe-class mission *STROBE-X* (2017–present)
- Guest writer at the *AstroBetter* blog on MScs and PhDs outside the US and Twitter at conferences (2016, 2018)
- *Astrotweeps* host (2017)
- Twitter co-manager for the *71st Netherlands Astronomy Conference* (2016)

## Academic Service

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| **Steering committee** | *STROBE-X* (proposed NASA Probe for Astro2020 Decadal) |
| **Time allocation committee** | *NuSTAR*, *Swift*, *Chandra*, NASA Astrophysics Data Analysis Program |
| **Referee** | Nature Astronomy, MNRAS, SciPy Conference |
| **Scientific organizing committee** | Chandra Data Science 2021 workshop, The Future of X-ray Timing, Python in Astronomy 2019, Python in Astronomy 2017 |
| **Co-organizer** | EWASS 2017 session on research software and hack day, AAS 229 Hack Together Day |

## Local Leadership Roles

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|---|---|---|
| **MSU Dept. of Physics & Astronomy**, Astro seminar committee | East Lansing, MI, | **2020 – 2021** |
| **Anton Pannekoek Institute PhD and PD Council**, Founding member and chairperson | Amsterdam, | **2015 – 2016** |
| **Journal club**, Organizer | Amsterdam, | **2014 – 2015** |
| **"Timing Club" X-ray group meeting**, Founder and organizer | Amsterdam, | **2014 – 2015** |
| **Canadian Astronomical Society Graduate Student Committee**, U. Alberta representative | Edmonton, AB, | **2013** |
| **U. Alberta Graduate Physics Student Association**, Astrophysics representative | Edmonton, AB, | **2012 – 2013** |