

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 Science, Bard College (Advisor: P. Skiff) Annandale-on-Hudson, NY, USA, 2007 – 2011

Accepted Observing Proposals

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. Homan), *NICER* Cycle 1 joint with *NuSTAR* Cycle 5 Guest Observer Facilities 2019
A spectral-timing study of GX 5–1

Co-I (PI: J. Homan), *NICER* Cycle 1 joint with *NuSTAR* Cycle 5 Guest Observer Facilities 2019
Jet-launching in Sco X–1

Honors & Awards

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

Collaboration Memberships

***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

***STROBE-X* (proposed NASA Probe in concept study)**, Stellar-mass compact objects working group 2016 – present

Research Interests

Topics: X-ray binaries, compact objects, transients, time-domain astronomy, accretion, quasi-periodic oscillations (QPOs), X-ray burst oscillations, general relativity

Techniques: X-ray time series analysis, spectral-timing, signal processing with Fourier techniques, optimization algorithms

Publications

[ADS publication link](#) | ORCID: [0000-0002-5041-3079](#)

REFEREED

7. D. Huppenkothen, M. Bachetti, **A.L. Stevens**, et al. 2019. *Stingray: A Modern Python Library For Spectral Timing*, ApJ, in press.
6. E. Kara, J.F. Steiner, A.C. Fabian, et al. (13 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 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

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 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 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 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 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 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 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 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](#))

Presentations

INVITED TALKS AND SEMINARS

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 <i>NICER</i> 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

Academic Service

Steering committee [STROBE-X](#) (proposed NASA Probe in concept study)

Time allocation committee *NuSTAR*

Referee MNRAS, SciPy Conference

Scientific organizing committee [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

Teaching Experience

- LSST Data Science Fellowship Program, Invited instructor Pittsburgh, PA, 2019
[Session 9](#) instructor on time-domain analysis, periodic and quasi-periodic signals, noise processes
- Google Summer of Code, Mentor East Lansing, MI, 2018
Stingray Software library development under the [Open Astronomy organization](#)
- 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)

Science Outreach

Mental wellbeing in academia: 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).

Classroom lessons: “Gravity! In Black Holes and in Our Solar System” for grades 6-8 in East Lansing, MI (2019); *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).

Science Day events: Activity leader for Make Your Own Pulsar! for ~300 kids grades K-8 over 6 hours at *MSU Science Festival* (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); Volunteer at the *Department of Physics Open House* at U. Alberta (2012); Assistant presenter at *Young Science Day* in Rhinebeck, NY (2010).

Public talks and panels: Invited panelist for “Adler After Dark: Out in Space” at the Adler Planetarium in Chicago (2019); Invited speaker on “Science in Spaaaaace” at *Astronomy On Tap Lansing* (2018); Invited speaker on “Neutron stars, black holes, and the extreme environments around them” at *Science-Art Slam* in Amsterdam (2017); Invited speaker, “Exo-lent Planets!” at *LogiCON* in Edmonton, AB (2013); Presenter on “Exo-lent Planets!” at *Nerd Nite Edmonton* (2012).

Public observatory nights: Volunteer at the *MSU Observatory* (2018); Volunteer at the *Anton Pannekoek Observatory in Amsterdam* (2014); Volunteer at the *U. Alberta Observatory* (2011–2012).

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).

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 at the *U. Alberta Observatory* (2012–2013).

Miscellaneous: Judge at the *Belgravia Elementary School science fair* in Edmonton, AB (2013).

Local Leadership Roles

- 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