

Dr. Abigail L. Stevens

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Current Position

NSF Astronomy & Astrophysics Postdoctoral Fellow, Michigan State U. and U. Michigan MI, USA
“Mapping Matter in Strong Gravity: Spectral-Timing of Black Holes and Neutron Stars” 2018–present

Education

Universiteit van Amsterdam, Ph.D. in Astronomy, Advisor: P. Uttley Amsterdam, Netherlands
[Thesis online at U. Amsterdam Digital Academic Repository](#) 2013 – 2018

University of Alberta, M.Sc. in Physics, Advisor: S. Morsink Edmonton, AB, Canada
[Thesis online at U. Alberta Library Education & Research Archive](#) 2011 – 2013

Bard College, B.A. in Science, Advisor: P. Skiff Annandale-on-Hudson, NY, USA
[Thesis online at Bard Digital Commons](#) 2007 – 2011

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

Work visit and conference travel grants (5), LKBF (Leids Kerkhoven-Bosscha Fonds) 2015, 2016, 2017

Best Student Talk, Canadian Astronomical Society Graduate Student Committee 2013

Work visit and conference travel grants (2), U. Alberta 2012, 2013

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

Collaboration Memberships

NICER, Observatory Science working group 2018 – present

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

Presentations

INVITED TALKS AND SEMINARS

Monitoring the Non-Thermal Universe 2018 Cochem, Germany, 2018

Astronomy group seminar U. Tübingen, Germany, 2018

AAS 16th Higher Energy Astrophysics Division meeting Sun Valley, ID, USA, 2017

Prague Relativistic Astrophysics seminar Czech Academy of Sciences, Czech Republic, 2017

Erlangen Center for Astroparticle Physics seminar U. Erlangen-Nuremberg, Germany, 2017

Joint Institute for Nuclear Astrophysics (JINA-CEE) lunch seminar Michigan State U., USA, 2017

High-energy astrophysics group seminar MPE, Germany, 2017

X-ray group seminar	MIT, USA, 2017
Guest seminar	Harvard/CfA, USA, 2017
KITP program on accretion disks	Santa Barbara, CA, USA, 2017
Astrophysics group seminar	U. Alberta, Canada, 2016
X-ray astrophysics group seminar	NASA Goddard, USA, 2015
Astrophysics group seminar	Naval Research Laboratory, USA, 2015
Department of Astronomy seminar	U. Maryland College Park, USA, 2015

CONTRIBUTED TALKS

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	U. Washington, USA, 2016
The X-ray Spectral Timing Revolution workshop	Lorentz Center, Netherlands, 2016
European Week of Astronomy and Space Science 2015	U. La Laguna, Spain, 2015
XMM-Newton Workshop: The Extremes of Black Hole Accretion	ESAC, Spain, 2015
Canadian Astronomical Society 2013	U. British Columbia, Canada, 2013

Academic Service

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

Referee Monthly Notices of the Royal Astronomical Society, SciPy Conference

Scientific organizing committee [Python in Astronomy 2019](#), [Python in Astronomy 2017](#)

Co-organizer EWASS 2017 session on research software and hack day, AAS 229 Hack Together Day

Leadership Roles

Anton Pannekoek Institute PhD and PD Council, Founding member and chairperson	Amsterdam, 2015 – 2016
Nerd Nite Amsterdam, Boss, communications and public relations	Amsterdam, 2014 – 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
Assiniboia Community Housing Co-operative, House representative and house treasurer	Edmonton, AB, 2012 – 2013
U. Alberta Graduate Physics Student Association, Astrophysics representative	Edmonton, AB, 2012 – 2013

Research Experience

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

Teaching Experience

Google Summer of Code, Primary 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

I am committed to science outreach for a variety of audiences and have pursued opportunities to connect with communities in upstate New York, Edmonton, Amsterdam, and mid-Michigan. I have also presented on [mental wellbeing for early career researchers](#). **Highlights include:** [presenter at Astronomy on Tap Lansing](#), [invited speaker at Science-Art Slam](#), [guest writer on AstroBetter](#), [speaker at Nerd Nite Edmonton](#), and activity leader at science events for grades K-8.

Skills

COMPUTING

- GitHub projects and contributions: github.com/abigailStev
- Advanced level: Python, Jupyter/iPython notebooks
- Intermediate level: bash scripts, git version control
- Beginner level: C, C++, Fortran, HTML

X-RAY DATA ANALYSIS

- Co-developer and coordinator of [Stingray](#), an X-ray spectral-timing library in Python
- XSPEC spectral fitting, including simultaneous fitting of 30+ spectra
- Developing and using bespoke spectral models like [SIMPLER](#) and [DISKFBB](#)

COMMUNICATION

- Languages: English (native fluency), Dutch (CEFR A2; ILR 1; elementary proficiency)
- Involved in many theatrical and musical productions throughout high school and college
- Social media manager for Nerd Nite Amsterdam; nearly doubled the number of Facebook followers to 900+ in 2015-2016
- Twitter co-manager for the 71st Netherlands Astronomy Conference in 2016; our conference hashtag was 'trending' in the Netherlands for the first day of the conference
- Social media manager for *STROBE-X*; 700+ Facebook followers

Publications

REFEREED

5. E. Kara et al. (13 co-authors including **A.L. Stevens**) 2018. *The corona contracts in a new black hole transient*, Nature Astronomy, in press
4. **A.L. Stevens**, P. Uttley, D. Altamirano, Z. Arzoumanian, P. Bult, et al. 2018. *A NICER Discovery of a Low-Frequency Quasi-Periodic Oscillation in the Soft-Intermediate State of MAXI J1535–571*, ApJL, in press
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, 2
2. **A.L. Stevens** and P. Uttley 2016. *Phase-Resolved Spectroscopy of Type B QPOs in GX 339–4*, MNRAS, 460, 2796
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

UNREFEREED

10. J. Homan, **A.L. Stevens**, D. Altamirano, K. Gendreau, Z. Arzoumanian, et al. 2018. *MAXI J1820+070 continuing its rapid evolution toward the hard state*, ATel, 12068
9. 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
8. 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
7. 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
6. J. Homan et al. (10 co-authors including **A.L. Stevens**) 2018. *A Rapid State Transition in MAXI J1820+070*, ATel, 11820
5. J. Neilsen, **A.L. Stevens**, J.F. Steiner, R. Remillard, D. Altamirano, et al. 2018. *NICER Observation of Strong Wind Absorption in the Soft Outburst of 4U 1630–47*, ATel, 11771
4. 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
3. D. Muna et al. (153 co-authors including **A.L. Stevens**) 2016. *The Astropy Problem*, [arXiv:1610.03159](https://arxiv.org/abs/1610.03159)
2. D. Huppenkothen, M. Bachetti, **A.L. Stevens**, S. Migliari, and P. Balm 2016. *Stingray: Spectral-timing software*, Astrophysics Source Code Library, [ascl:1608.001](https://ascl.net/1608.001)
1. M. Feroci, et al. (464 co-authors including **A.L. Stevens**) 2016. *The LOFT Mission Concept: A Status Update*, Proc. SPIE, 9905, 99051R