Adam Leah W. **Harvey**

PhD Candidate in Applied Physics | University of Maryland, Baltimore County

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Also known as Adam W. Harvey

Passionate about data science and statistics, particularly in application to observations of high-energy astrophysical phenomena. Experienced in empirical spectral energy distribution modeling. Currently researching proper motions of optical-UV jets in active galactic nuclei using Hubble Space Telescope observations.

Education

Expected 2021	PhD in Applied Physics, University of Maryland, Baltimore County (UMBC)
2017	MS in Applied Physics, UMBC
2013	BA in Physics, Lewis & Clark College (LC)
2013	BA in Mathematics, LC

Professional Affiliations

- American Astronomical Society

Special Positions

December 2019-Present	Member of the UMBC Community Equity Advisory Committee
September 2019-December 2019	Member of the UMBC Director of Equity and Inclusion Search Committee
September 2018-September 2019	Chair of the UMBC University Steering Committee
March 2019	Lunch Leader for UMBC Physics Department Prospective Graduate Student Visit Day
September 2017-September 2018	Member of the UMBC University Steering Committee
August 2017-August 2018	Chair of the UMBC Physics Graduate Student Association Student Seminar Series
August 2017-September 2017	Member of the UMBC Graduate School Assistant Dean Search Committee
February 2017-May 2017	Chair of the UMBC Graduate Student Association Treasury Committee
November 2016-February 2017	Chair of the UMBC Graduate Student Association Grants Committee
September 2016-June 2017	Senator of the UMBC Graduate Student Association

Skills

Technical Skills	C/C++, R, Fortran, Python, Perl, Git, Visual Basic Script, Visual Basic .NET, Mathematica, SQL, Bash, CMD, Power Shell, Android Studio and SDK, Windows Management Instrumentation, Dexter, Fermi Science Tools, HTML, CSS, Hubble Space Telescope image registration
Publishing and Design	LaTeX, Microsoft Office (Word, Excel, PowerPoint), Adobe Creative Cloud (Photoshop, Illustrator, InDesign)
Languages	English, Japanese
Other	Classical guitar, photography

Publications

- Powerful extragalactic jets dissipate their kinetic energy far from the central black hole (submitted to Nature Communications)

Oral Presentations

NASA Goddard VLBI Seminar
September 19, 2019
NASA GSFC, Greenbelt, Maryland, USA

"Powerful blazar jets dissipate their kinetic power to radiation from a single location : the molecular torus"
1 hour
Invited

A Centenary of Astrophysical Jets : Observation, Theory, and Future Prospects
July 23, 2019
SKA Global Headquarters, Cheshire, UK

"Powerful blazar jets dissipate their kinetic power to radiation from a single location : the molecular torus"
15 (10+5) minutes
Contributed

Mid-Atlantic Radio-Loud AGN Meeting
October 25, 2018
Baltimore, Maryland, USA

"The seed factor : how a combination of four observables can unveil the location of the blazar GeV emission."
10 (7+3) minutes
Contributed

Boston University AGN Group Meeting
October 5, 2018
Boston, Massachusetts, USA

"The seed factor : how a combination of four observables can unveil the location of the blazar GeV emission"
15 (10+5) minutes
Invited

Fermi Summer School
June 5, 2018
Lewes, Delaware, USA

"The seed factor : how a combination of four observables can unveil the location of the blazar GeV emission"
15 minutes
Contributed

Mid-Atlantic Radio-Loud AGN Meeting
October 6, 2017
Washington, DC, USA

"Surveying blazar constraints of the extragalactic background light"
15 (10+5) minutes
Contributed

Poster Presentations

American Astronomical Society 233rd Meeting
January 8, 2019
Seattle, Washington, USA

"The seed factor : how a combination of four observables can unveil the location of the blazar GeV emission."

8th International Fermi Symposium
October 16-19, 2018

"The seed factor : how a combination of four observables can unveil the location of the blazar GeV emission"

Baltimore, Maryland, USA

American Astronomical Society 231st Meeting
January 12, 2018
Washington, DC, USA

"The seed factor : how a combination of four observables can unveil the location of blazar GeV emission."

Attendee Experiences

- **Making Inclusive Workplaces**, *workshop*, October 15, 2019, Baltimore, Maryland, USA
- **Inclusive Astronomy 2**, *conference*, October 14-15, 2019, Baltimore, Maryland, USA
- **UMBC Graduate Student Mental Wellness Symposium**, *symposium*, September 27, 2019, Baltimore, Maryland, USA
- **NRAO Community Days**, *workshop*, June 13-14, 2019, Baltimore, Maryland, USA
- **Fermi Summer School**, *summer school*, May 29-June 8, 2018, Lewes, Delaware, USA
- **São Paulo School of Advanced Science on High Energy and Plasma Astrophysics in the CTA Era**, *summer school*, May 21-31, 2017, São Paulo, Brazil
- **Mid-Atlantic Radio-Loud AGN Meeting**, *conference*, October 14, 2016, Baltimore, Maryland, USA

Research Experience

2017-Present | *Graduate Research Assistant* UMBC

Proper motions of optical-UV AGN jets using Hubble Space Telescope data.

- Registered images of AGN jets using background globular clusters to achieve an astrometric accuracy of 0.1 pixels.
- Developed a utility to locate globular clusters in an image to a high precision with filters for which a well-modeled point-spread function was either not available or the photon counts too low to fit with a detailed point-spread function.
- Debugged legacy code to fix errors in photon counts in stacked images.
- Modeled bright host galaxy light for subtraction to be able to measure the relatively faint jet.

Constraining the dominant location of kinetic energy dissipation in powerful blazars.

- Used a diagnostic (the seed factor) dependent on only observables of a blazar SED to constrain the dominant location of energy dissipation.
- Fit blazar SEDs with empirical models using maximum likelihood estimation with a simulated annealing algorithm.
- Developed a method of error estimation for the peak frequencies and peak fluxes of these SEDs using Wilk's theorem, the profile-likelihood method, and a modified non-parametric bootstrapping.
- Developed a kernel density estimation technique using a modified non-parametric bootstrapping technique.
- Used bootstrapping to test the median value of the observed distribution of the seed factor against the expected values for the broad-line region and the molecular torus, finding that the broad-line region is significantly rejected, and the the molecular torus is compatible with the distribution median.

Teaching Experience

UMBC Physics Department
April 2-4 2019
Baltimore, Maryland, USA

Substitute Teaching, Cosmology (PHYS 416)
2 class periods
Developed lesson plan and problem set

UMBC Physics Department
August 2015-August 2017
Baltimore, Maryland, USA

Teaching Assistant
Physics 111 Lab (3 semester), 112 Lab (1 semester),121 Discussion (2 semesters)

UMBC Physics Department
April 14 2017
Baltimore, Maryland, USA

Substitute Teaching, Introductory Physics I (PHYS 121)
Substituted for lecture section
Class size of about 250 students

LC Student Support Services
September 2011-May 2012
Portland, Oregon, USA

Physics Tutor

LC Physics Department
August 2010-December 2010
Portland, Oregon, USA

Physics Help Desk Tutor

Miscellaneous Achievements

- Placed first in the First Annual UMBC Graduate Student Association Pi-Day Pi-K running event
- Invited speaker at the UMBC 2018 PhD Candidacy Ceremony
- Invited panelist at UMBC Women's Center 2018 symposium "Critical Social Justice : Ignite" on the panel "Igniting Change as a Graduate Student Activist"
- Invited speaker at the UMBC 2018 Graduate School Orientation
- Panelist on the Graduate Student Success etc. (look up name)
- Invited participant in the UMBC 2018 University Retreat
- Contributed code to pythonFermi.
- Contributed code to enrico.
- Invited speaker at the UMBC 2017 Graduate School Orientation
- Invited participant in the UMBC 2017 University Retreat

References

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