Megan Christina Davis

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Education

2020 – Present University of Connecticut (UConn), Storrs, CT.
PhD in Physics, expected in 2025.
MSc in Physics, conferred in September 2022.

Advisor: Dr. Jon Trump

2015 – 2019 Michigan State University (MSU), East Lansing, MI.
Bachelors of Science in Astrophysics with a minor in Computational Mathematics, Science, and Engineering.

Thesis: Modeling the Radial Migration of Stars and Gas in the Milky Way
Advisors: Dr. Brian O'Shea (MSU/JINA-CEE) and Dr. Benoit Côté (MSU/Konkoly Observatory)

Work and Research Experience

2020 – Present **Graduate Research Fellow**
University of Connecticut with Dr. J. Trump

- Simulates and analyzes time-domain optical observations of binary supermassive black holes (SMBHs) as will be observed via the Vera Rubin Observatory (VRO/LSST)
- Created custom Sloan Digital Sky Survey (SDSS) observation designs for the SDSS-V Black Hole Mapper (BHM) Reverberation Mapping (RM) working group
- Created a multi-epoch, spectral visualization tool for SDSS observations

Undergraduate REUs and Internships

May – Aug. 2018 **National Aeronautics and Space Administration (NASA) Intern**
Jet Propulsion Laboratory in Pasadena, California with Dr. M. Bottom

- Built a fully-automated testbed model of a Starshade-Telescope System to test formation flying concepts to be used in direct exoplanet imaging with the WFIRST telescope

May – Aug. 2017 **IceCube International Research Experience for Students (IRES)**
Vrije Universiteit Brussel in Brussels, Belgium with Dr. K. Mulrey

- Worked on data reduction and analysis for the LOFAR Radio Telescope LORA scintillating detectors and made Monte Carlo simulations of cosmic ray showers

May – Aug. 2016 **IceCube Research Experience for Undergraduates (REU)**
University of Wisconsin in River Falls, Wisconsin with Dr. L. McCann

- Studied optical fibers and their properties for possible use in IceCube Gen2 photon detectors

Michigan State University

2019 – 2020 **Post-Baccalaureate Research Assistant**
With Dr. A. Stevens and Dr. J. Strader

- Studied compact objects and their spectral variability in the X-ray wavelength via *NICER* data
- Developed new features for the Stingray Python package that is used for astrophysical spectral-timing analysis (pull request #443)

2018 – 2019 **Undergraduate Research Assistant**
With Dr. B. W. O'Shea

- Used the NuPyCEE Galactic Chemical Evolution Python code to make simulations of the Milky Way
- Built new functionality to account for radial migration of gas and stars in the thin disk of the Milky Way

2017 – Present **Expert Observer at the Campus Observatory**

- Took calibration frames and images of various sources, like exoplanet candidates, cataclysmic variable stars, or microlensing events
- Reduced raw data and submitted it to the American Association of Variable Star Observers, KELT Collaboration, and Center for Backyard Astrophysics

Teaching and Outreach Experience

2022 – Present **Co-Organizer of Astronomy on Tap- Storrs, CT**

- Organizes monthly public outreach events comprising of astronomy-themed talks and trivia at local restaurants and bars

2019 – 2020 **Outreach Coordinator at the MSU Campus Observatory**
With Dr. L. Chomiuk

- Developed educational activities and displays for the Public Outreach Program, ran social media accounts, and recruited and organized volunteers for monthly outreach events

2017 – 2019 **Learning Assistant**

- ISP 205 (two semesters): an introductory astronomy course for non-science majors
- AST 207: an introductory course for astronomy majors
- AST 208: an introduction to exoplanets and observational techniques

2016 – 2017 **Resident Assistant in *Case Hall***

- Assisted fellow undergraduate students by providing resources and support to the building community

2015 – 2019 Abrams Planetarium and MSU Observatory Outreach Assistant

2017 – Present **Undergraduate Student Mentor**

2020 – Present	Kaylee Grace (UConn BSc '22) Nina Bolard (UConn BSc '24) Abena Adzenyah (UConn BEng '25)
2018 – 2020	Jessie Miller (Caltech '27, MSU BSc '21) Evan Zobel (MSU BSc'22) Caleb Rispler (MSU BSc'22) Trevor Fush (MSU BSc '22) Elizabeth Kowalczyk (MSU BSc '22)

Publications

Refereed

Zeltyn et al. 2022 **(incl. M. C. Davis)**. Astrophysical Journal Letters. doi: 10.3847/2041-8213/ac9a47

M. Bottom, S. Martin , E. Cady , **M. C. Davis**, et al., 2019. *Starshade formation flying I: optical sensing*, accepted in the **Journal for Astronomical Telecopes, Instruments, and Systems** on 3 February 2020.

In-Preparation & Submitted

Fries et al. 2023 **(incl. M. C. Davis)**, submitted. "Unusual Broad-Line Variability in a Luminous Quasar".

Davis, Trump, et al. 2023, in prep. "False-Positive BSMBH Detection Rates with LSST".

Trump, **Davis**, et al. 2023, in prep. "BHM-RM Overview Paper".

Blanton et al. 2023 **(incl. M. C. Davis)**, in prep. "Robostrategy".

SDSS-V Collaboration **(incl. M. C. Davis)** 2023, in prep. "Data Release 18, early SDSS-V Science".

Unrefereed/Contributions

M. C. Davis and A. L. Stevens, 2019. *Spectral Variability of a Soft-Intermediate State QPO from MAXI J1820+070*, accepted in the **Research Notes of the American Astronomical Society** on 24 June 2020.

T. Flinois, M. Bottom, S. Martin, D. Scharf, **M. Davis**, S. Shaklan, 2018. *S5: Starshade Technology to TRL5 Milestone 4 Final Report: Lateral Formation Sensing and Control*, published in the **Jet Propulsion Laboratory Publications** in 2018.

*Szegedi-Elek, E. et al., 2020 *Gaia 18dvy: A New FUor in the Cygnus OB3 Association*, accepted in the **Astrophysical Journal** in August 2020.

*Patterson et al., 2017. *OV Bootis: Forty Nights Of World-Wide Photometry* The Society for Astronomical Sciences 36th Annual Symposium on Telescope Science and AAVSO Spring 2017 Meeting, published by *Society for Astronomical Sciences* in Spring of 2017.

*contributed to data collection

Awards and Scholarships

2021	Department Poster Award- 3rd Place for a poster titled "False-Positive Binary Supermassive Black Hole Detection Rates for VRO/LSST"
2020	The Isaac S. and Lois W. Blonder Graduate Research Fellowship (UConn)
2020	NSF Graduate Research Fellowship
2019	1st Prize in the University Undergraduate Research and Arts Forum (UURAF) for presenting a poster titled "Modeling the Radial Migration of Stars and Gas in the Milky Way"
2019	Outstanding Teaching Assistant Award from the Department of Physics and Astronomy
2016 – 2017	"Most Compassionate Campus Resident Assistant"
2016	Alternate Student selected to be sent to the Amundsen-Scott South Pole Station in Antarctica due to excellent work done during [my] IceCube REU
2015 – 2019	The John F. and Edith L. Wilsterman Scholarship
2015 – 2019	Flint Kiwanis Educational Foundation Scholarship

Conferences Attended and Presentations

November 2022	SDSS Science Festival, Toronto, ON, Canada
October 2022	Astro Hack Week, Heidelberg, Germany
October 2022	SDSS Software Coding Week, Apache Point Observatory, Sunspot, New Mexico
May 2022	New England Regional Quasar and AGN Meeting (NERQUAM), Storrs, CT- Talk given
July 2021	SDSS 2021 Collaboration meeting , virtual- Talk given

April 2021	Physics Graduate Student Association annual poster session- Poster presented
January 2020	235th meeting of the American Astronomical Society (AAS) in Honolulu, Hawaii- Poster presented
May 2019	JINA-CEE Frontiers and the First Frontiers Summer School at MSU
April 2019	University Undergraduate Research and Arts Forum (UURAF)- Poster presented
January 2019	Conference for Undergraduate Women in Physics (CUWiP) at MSU

Committees

May 2022 Co-Lead of the Local Organizing Committee for NERQUAM 2022

- Organized the 30th annual, one-day New England Regional Quasar and AGN Meeting (NERQUAM) held in Storrs, CT in May 2023.

2019 – 2020 MSU Astronomy Department Reporting Task Force

- Developed the infrastructure for reporting harassment/bullying/bad behavior within the Astronomy group for students, faculty, and staff

2019 – 2020 Co-Lead of the Stellar Mentorship Program at MSU

- Oversaw the development and implementation of a mentor/mentee program for undergraduates, graduates, and post-doctoral researchers within the Astronomy group

Additional Skills

Software and Hardware:

- Competent in Python and familiar with C++, HTML, and bash scripting
- Regularly uses version control software, like Github, for academic and research work
- Proficient in using AstroImageJ, MaximDL, and XSPEC
- Regularly uses a DSLR and CCD cameras for astrophotography and photometry

Personal Development:

- Proficient in French with elementary German and Dutch language skills
- Trained in conflict resolution and emergency trauma response

Extracurricular Activities

2021 – Present	Physics Graduate Student Association, Vice President
2016 – 2019	Alpha Omicron Pi Sorority, Beta Gamma Chapter
2018 – 2019	Sigma Pi Sigma Physics Honors Society, President
2017 – 2019	Order of Omega Honors Society
2015 – 2019	MSU Astronomy Club
2015 – 2019	Society of Physics Students

2018 – 2019	President
2017 – 2018	Vice President
2016 – 2017	Treasurer