

# MASON V. TEA

☎ 740-751-7714    ✉ mtea@wesleyan.edu    🌐 mvtea.github.io    🐦 @masonvtea

## PROFILE

---

My name is Mason Tea, and I'm a senior astronomy & physics major at Wesleyan University. I've been involved in research in the Wesleyan astronomy department since my second week here, and I'm drawing on that accumulated experience as I approach my senior thesis this spring. Broadly speaking, I'm interested in gravity, both in theory and observation. In particular, I look forward to pursuing opportunities dealing with both astrophysical and theoretical black hole physics, multi-messenger / gravitational wave astronomy, and the role compact objects can play in constraining a theory of quantum gravity. I am also particularly enthusiastic about outreach and education in astrophysics; I feel that teaching is one of my strong suits, and I enjoy it immensely.

## EDUCATION

---

**Wesleyan University** 2017-2021  
B.A. Astronomy & B.A. Physics  
Overall GPA: 86.3/100.0 (3.13/4.0)

## RESEARCH

---

**Classification of X-ray binaries in the local universe** February 2020 - Present  
*Wesleyan University, Department of Astronomy* *Advisor: Dr. Roy E. Kilgard*

· My current research is focused on determining spectral fits for a select sample of ultraluminous X-ray binaries in the local universe, with the following goals: (a) determine X-ray spectral state, which is related to accretion rate, (b) use timing analysis to search for source variability, (c) perform optical follow-up of transient source outbursts with Van Vleck Observatory's new 24" research telescope. This work will culminate in my honors thesis this spring.

**Simulating the Solar Gravitational Lens** August 2017 - February 2020  
*Wesleyan University, Department of Astronomy* *Advisor: Dr. Seth Redfield*

· For the first three years of my undergraduate career, I worked on image deconvolution techniques for the Solar Gravitational Lens (SGL), a theoretical space telescope which will utilize the gravity of the Sun to image the surface of distant exoplanets. This work culminated in a relativistic raytracer which simulated the data that the SGL might collect, the first step in generating a training set for a machine learning algorithm to be used for deconvolution.

## TEACHING

---

**Course assistant for *Introduction to Astrophysics*** August 2020 - December 2020  
*Wesleyan University, Department of Astronomy* *Professor: Dr. Meredith Hughes*

· Due to the pandemic, this course is taking place online, and in-class time is primarily used for discussion- and collaboration-based activities. Alongside the other teaching assistants, I'm responsible for facilitating these discussions and being available to answer questions. Additionally, I conduct weekly TA sessions and anticipate leading social-distanced observational activities with the observatory's many telescopes.

**Teaching assistant for *The Universe***  
*Wesleyan University, Department of Astronomy*

August 2019 - December 2019  
*Professor: Dr. William Herbst*

- I was responsible for conducting weekly homework help sessions for students, leading laboratory exercises in class, and grading labs & weekly homework for 50 students.

## OUTREACH & ACTIVITIES

---

**Student Director of Van Vleck Observatory**  
*Wesleyan University, Department of Astronomy*

August 2019 - Present

- As student director, I'm responsible for maintaining the facilities for the observatory's 24" research telescope, scheduling and selecting targets to be observed by students, and training new students on the telescope. I've made a point of being able to operate all the telescopes in the observatory and being present & available for any events that may need an extra hand, as well as being involved in the installation of VVO's new 24" PlaneWave research telescope. More information can be found on [my website](#).

**Wesleyan Astronomy Club**  
*Wesleyan University, Department of Astronomy*

August 2018 - Present  
*Co-Founder*

- WesAstro was created as an opportunity for those outside of the astronomy major at Wesleyan to get involved with astronomy. We held bi-weekly meetings during which a presentation on a topic in astronomy was given by some combination of myself and my co-founders, Ben C.O. Martinez (B.A. 2021) and Gil Garcia (B.A. 2020).

**STEM Diversity Journal Club**  
*Wesleyan University, Department of Astronomy*

August 2020 - Present  
*Member*

- The astronomy department at Wesleyan, in light of the events surrounding the murder of George Floyd at the hands of racist police, has chosen to reinstitute the DJC, an initiative started by Dr. Kevin Flaherty as a postdoc here at Wes. The DJC is comprised of both students and faculty and meets bi-weekly to discuss an article related to diversity in astronomy, STEM or in general, with the goal of reflecting on the department's own shortcomings and organizing to improve.

**Telescope Operator**  
*Wesleyan University, Department of Astronomy*

August 2017 - Present

**Kids' Nights & Public Nights @ VVO**  
*Wesleyan University, Department of Astronomy*

August 2019 - Present  
*Volunteer*

## SKILLS

---

**Teaching**

**Data science**

**Programming**

Python, C, Mathematica, SQL, HTML, CSS

**Tools & frameworks**

L<sup>A</sup>T<sub>E</sub>X, Unix (terminal), Git

## PUBLICATIONS

---

**First publication**  
*Co-authors*

Date of publication  
*Reference*

## PRESENTATIONS

---

- Bright Meals for Light Eaters: Analysis and Characterization of Ultraluminous Accreting X-Ray Binaries in the Local Universe** July 26, 2020  
*Wesleyan University* *Poster*
- If You Give the Sun a Telescope: Imaging Alien Earths with the Solar Gravitational Lens** October 5, 2019  
*Keck Northeast Astronomy Consortium Undergraduate Research Symposium* *Talk*
- If You Give the Sun a Telescope: Imaging Alien Earths with the Solar Gravitational Lens** July 25, 2019  
*Wesleyan University* *Poster*

## HONORS & AWARDS

---

- Connecticut Space Grant Consortium Undergraduate Scholarship** Fall 2019
- CIS Summer Research Fellow** Summer 2020  
*Wesleyan University, Department of Astronomy* *Advisor: Dr. Roy E. Kilgard*
- CIS Summer Research Fellow** Summer 2019  
*Wesleyan University, Department of Astronomy* *Advisor: Dr. Seth Redfield*

## REFERENCES

---

- Seth Redfield, PhD**  
Associate Professor of Astronomy  
Wesleyan University, Department of Astronomy  
sredfield@wesleyan.edu
- Roy E. Kilgard, PhD**  
Associate Professor of the Practice in Astronomy  
Wesleyan University, Department of Astronomy  
rkilgard@wesleyan.edu
- A. Meredith Hughes, PhD**  
Associate Professor of Astronomy  
Wesleyan University, Department of Astronomy  
amhughes@wesleyan.edu
- George M. Paily, PhD**  
Associate Professor of the Practice in Physics  
Wesleyan University, Department of Physics  
gpaily@wesleyan.edu