

# William O. Balmer

PHOTON HUNTER · FRINGE TRACKER · EXOPLANETEER

3400 N. Charles Street, Baltimore, MD 21218

✉ wbalmer@stsci.edu | 🏠 wbalmer.github.io | 📷 wbalmer

## Work Experience

---

### Space Telescope Science Institute

Baltimore, MD

#### GRADUATE RESEARCH ASSISTANT

Jun. 2021 - present

- Investigating the atmospheres and formation of Brown Dwarfs and exoplanets using space and ground based telescopes
- Member of the ExoGRAVITY collaboration, working on data reduction, spectral characterization, and observations
- adv. Dr. Laurent Pueyo and Dr. David Sing

### Follette Lab, Amherst College

Amherst, MA

#### UNDERGRADUATE RESEARCH ASSISTANT

Jun. 2018 - present

- Conducted angular and spectral differential imaging to search transitional disks for forming exoplanets
- Calibrated absolute astrometric solution for the Visible Light Adaptive Optics (VisAO) instrument
- Transition Disk Database Project Lead: coordinated and managed junior researchers in aggregating data and developing a platform for a centralized, public record of the properties of over 200 transition disks
- Contributed to the Giant Accreting Protoplanet Survey (Follette et al. 2021, in prep.) project code and data reduction
- adv. Dr. Kate Follette

### SIOS Lab, Cornell University

Ithaca, NY

#### UNDERGRADUATE RESEARCH ASSISTANT

Jun. 2020 - Aug. 2020

- Performed space telescope mission yield simulations for Miniaturized Distributed Occulture/Telescope (mDOT) mission
- Contributed to EXOSIMS project code (Savransky et al. 2017)
- adv. Dr. Dmitry Savransky

### Physics and Astronomy Department, Amherst College

Amherst, MA

#### TEACHING ASSISTANT, GRADING ASSISTANT, AMHERST COLLEGE OBSERVATORY (ACO) OPERATOR

Sept. 2019 - May. 2021

- TA for ASTR112 (2019F), ASTR337 (2020F), ASTR341 (2021S)
- Conducted data collection/reduction, telescope setup/operation, grading/rubric construction, and assisted students with coding challenges. Led a lecture on the implementation of fourier domain image filtering.

## Education

---

### Johns Hopkins University

Baltimore, MD

#### PH.D STUDENT IN ASTRONOMY & ASTROPHYSICS

Aug. 2021 - present

- Current courseload: *Interstellar Medium and Astrophysical Fluid Dynamics* and *Exoplanets and Planet Formation*
- Previous courses: *Fourier Optics and Interferometry in Astronomy*, *Astrophysical Dynamics*

### Amherst College

Amherst, MA

#### BACHELORS OF ARTS *cum laude*

Aug. 2017 - May. 2021

- Physics and Astronomy double major
- A- average
- Honors thesis in Astronomy was unanimously nominated by the department for summa cum laude honors

## Grants & Awards

---

\$18,000	<b>Owen Scholars Fellowship</b> , Krieger School of Arts and Sciences, JHU	2021-2024
\$4,300	<b>Amherst Memorial Fellowship</b> , Amherst College Board of Trustees	2021-2022
Award	<b>Chambliss Student Poster Award Honorable Mention</b> , AAS 237th meeting	2021
\$4,500	<b>Charles Hamilton Houston Award</b> , Charles Hamilton Houston Internship Program	2020
\$3,500	<b>Gregory S. Call Student Researcher Award</b> , Gregory S. Call Student Research Program	2019
\$3,500	<b>Sarles Fellow Award</b> , The Sarles Science Fund	2018

# Conference Proceedings

---

**W. O. Balmer, L. Pueyo, S. Lacour, A-L. Maire, M. Nowak**

American Astronomical Society  
meeting 239, id. 362.14

VLTI/GRAVITY OBSERVATIONS OF THE BENCHMARK L-DWARF HD 72946B: 100  $\mu$ AS ASTROMETRY AND K-BAND SPECTROSCOPY

Jan. 2022

- We present observations of HD 72946B from VLTI/GRAVITY as part of the ExoGRAVITY Large Program, including the first ever K-band spectrum of the object and the most precise relative astrometry for a benchmark BD to date. We also present the best fit orbital solution and atmosphere based on our new observations.

**Follette, K. ; Close, L. ; Males, J. ; Adams, J. ; Treiber, H. ; Balmer, W. O.**

American Astronomical Society  
meeting 238, id. 115.04

THE GIANT ACCRETING PROTOPLANET SURVEY (GAPLANETS) — FINAL RESULTS AND NEXT STEPS

Jun. 2021

- The GAPlanetS survey leveraged the reduced contrast between accreting protoplanets and their host stars at the wavelength of the H-alpha accretion emission line to detect three accreting companions at just 0.1-0.25 arcsec separation from their host stars.

**Balmer, W. O. ; Follette, K. B. ; Males, J. ; Close, L. ; Morzinski, K. ; Weinberger, A.**

American Astronomical Society  
meeting 237, id. 332.03.

DRUMS IN THE DEEP: CONSTRAINING THE ORBIT AND PHOTOMETRIC VARIABILITY OF THE CHASM-CARVING M-DWARF HD

Jan. 2021

142527B

- With multi-epoch H $\alpha$  and continuum detections of HD 142527B from the visible light Magellan Adaptive Optics camera VisAO, we present monitoring of orbital motion and photometric variability of HD142527B over 5 years.

**Balmer, W. O. ; Jain, A. ; Follette, K.**

American Astronomical Society  
meeting 235, id. 281.04

EXPLORING THE TRANSITION DISK POPULATION WITH A PUBLIC FACING DATABASE

Jan. 2020

- The Transition Disk Database is an online web tool intended to help centralize published information on known transition disks for consumption and analysis by the community. In its first iteration we present comprehensive data on 15 objects and NIR magnitudes, positions, and cavity extents for a total population of 30 objects.

## Accepted Proposals

---

PI hrs: 79.8 • Co-I hrs: 0

<b>PI</b>	VLTI/GRAVITY   ESO TAC, “ <i>Characterizing the target of a novel JWST Cycle 1 GO observation with VLTI/GRAVITY,</i> ” Co-I: J. Kammerer, L. Pueyo, A. Sivaramakrishnan, S. Lacour ( <b>3 hours</b> )	P109
<b>PI</b>	WIYN3.5m   NNExplore TAC, “ <i>A precision mass measurement of the most inflated hot-Saturn HAT-P-67 b,</i> ” Co-I: Z. Rustamkulov, D. Sing ( <b>2.4 nights</b> )	2022A
<b>PI</b>	SOAR4.1m   NOIRLAB TAC, “ <i>Characterization of exoGRAVITY Host Stars (GHOSTS): in the Southern Hemisphere,</i> ” Co-I: L. Pueyo, D. Sing ( <b>2 nights</b> )	2022A
<b>PI</b>	ARC3.5m   Apache Point Observatory TAC, “ <i>Characterization of exoGRAVITY Host Stars (GHOSTS): Northern Hemisphere,</i> ” ( <b>24 hrs</b> )	2021, Q4

## Outreach & Service

---

<b>Sci-Comm</b> — Author, <i>Astrobit</i> s	2019 - 2021
<b>Sci-Comm</b> — Astronomy Editor, <i>The Amherst STEM Network</i>	2019 - 2021
<b>Volunteer</b> — Observatory Operator, <i>Amherst College Observatory</i>	2021
<b>Presenter</b> — Invited talk, <i>UMass Amherst Astronomy Club</i>	Apr. 2021