IAN C. WEAVER

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EDUCATION

Harvard University, Cambridge, MA — *June 2018 - May 2022 (expected)*
Ph.D. (*In progress), Astronomy and Astrophysics*
Advisor: *Mercedes López-Morales*
Secondary Degree, *Computer Science and Engineering*

Harvard University, Cambridge, MA — *September 2016 - May 2018*
A.M., *Astronomy and Astrophysics*

UC Santa Cruz, Santa Cruz, CA — *September 2012 - June 2016*
B.S., *Astronomy and Astrophysics, with general and departmental honors*
Senior Thesis: *Modeling Accretion Stream and Disk Evolution in WASP-12/b*
Advisor: *Enrico Ramirez-Ruiz*

RESEARCH INTERESTS

I am interested in detecting and characterizing exoplanetary atmospheres via ground and space-based spectroscopy. My current work places particular emphasis on collecting and analyzing data for the large, ground-based spectroscopic survey, ACCESS.

RESEARCH EXPERIENCE

Graduate Student Researcher — September 2016 - Present
Advisor: Mercedes López-Morales — *Harvard University*

Providing a novel dataset for the characterization of the high-gravity, hot Jupiters WASP-43b, HAT-P-23b, and WASP-50b.

CAMP, UC LEADS, and Lamat Summer REUs — Summer 2014 - Summer 2016
Advisor: Enrico Ramirez-Ruiz — *UC Santa Cruz*

Implemented the Adaptive Mesh Refinement code FLASH to apply a full hydrodynamical treatment of accretion stream and disk formation in WASP-12/b

Undergraduate Student Researcher — Spring 2013 - Summer 2014
Advisor: Enrico Ramirez-Ruiz — *UC Santa Cruz*

Developed a novel code for modeling mass transfer in WASP-12/b and other binary exoplanetary systems by calculating massless particle trajectories in a non-inertial reference frame

TEACHING

Co-leader — Summer 2019
Banneker Institute Stars Workshop — *Harvard University*

Assisted in the planning and teaching of a week long workshop on stellar evolution for the Banneker Institute, as part of the ISEE Professional Development Program (PDP).

Teaching Fellow — Spring 2019
Astronomy 16, Stellar and Planetary Astronomy — *Harvard University*

Awarded Certificate of Teaching Excellence.

Workshop Leader Summer 2018
BI, Stellar Evolution *Harvard University*

Led week-long course in stellar evolution for Banneker Institute scholars.

Teaching Fellow Summer 2018
Astronomy S35, Fundamentals of Contemporary Astronomy *Harvard University*

Summer astronomy course offered to high school and college students in the Boston area.

Teaching Fellow Fall 2017
Astronomy 110, Exoplanets *Harvard University*

Awarded Certificate of Teaching Excellence.

Undergraduate Physics Co-leader Fall 2013 - Spring 2016
UCSC Academic Excellence (ACE) Program *UC Santa Cruz*

Assisted physics section leader in mentoring and tutoring introductory physics students in large 25-30 person sessions for 1 hour and 45 minutes twice a week, and personally five times a week in smaller 4-6 person one hour sessions.

PUBLICATIONS

[ADS]

First author refereed papers

1) **Weaver**, López-Morales+, "ACCESS: An optical transmission spectrum of the high-gravity, hot Jupiter WASP-50b," 2021 (in prep.)

2) **Weaver**, López-Morales, Alam, Espinoza, Rackham, Goyal, MacDonald, Lewis, Apai, Bixel, Jordán, Kirk, McGruder, Osip, "ACCESS: An optical transmission spectrum of the high-gravity, hot Jupiter HAT-P-23b," 2021, *AJ*, 161, 278

3) **Weaver**, López-Morales, Espinoza, Rackham, Osip, Apai, Jordán, Bixel, Lewis, Alam, Kirk, McGruder, Rodler, Fienco, "ACCESS: A Visual to Near-infrared Spectrum of the Hot Jupiter WASP-43b with Evidence of H2O, but no evidence of Na or K," 2020, *AJ*, 159, 13

Second+ author refereed papers

4) McGruder, López-Morales, Kirk, Espinoza, Rackham, Alam, Allen, Nikolov, **Weaver**, Ceballos, Osip, Apai, Jordán, Fortney, "ACCESS: Confirmation of a Clear Atmosphere for WASP-96b and a Comparison of Light Curve Detrending Techniques" (submitted)

5) Kirk, Rackham, MacDonald, López-Morales, Espinoza, Lendl, Wilson, Osip, Wheatley, Skillen, Apai, Bixel, Gibson, Jordán, Lewis, Louden, McGruder, Nikolov, Rodler, **Weaver**, "ACCESS & LRG-BEASTS: a precise new optical transmission spectrum of the ultrahot Jupiter WASP-103b," 2021, *AJ*, 162, 34

6) **McGruder**, López-Morales, Espinoza, Rackham, Apai, Jordán, Osip, Alam, Bixel, Fortney, Henry, Kirk, Lewis, Rodler, **Weaver**, "ACCESS: Confirmation of no potassium in the atmosphere of WASP-31b," 2020, *AJ*, 160, 230

7) Kirk, López-Morales, Wheatley, **Weaver**, Skillen, Louden, McCormac, Espinoza, "LRG-BEASTS: Transmission Spectroscopy and Retrieval Analysis of the Highly Inflated Saturn-mass Planet WASP-39b," 2019, *AJ*, 158, 144

8) Bixel, Rackham, Apai, Espinoza, López-Morales, Osip, Jordán, McGruder, **Weaver**, 2019, "ACCESS: Ground-based Optical Transmission Spectroscopy of the Hot Jupiter WASP-4b," *AJ*, 157, 68

9) Espinoza, Rackham, Jordán, Apai, López-Morales, Osip, Grimm, Hoeijmakers, Wilson, Bixel, McGruder, Rodler, **Weaver**, Lewis, Fortney, Fraine, "ACCESS: a featureless optical transmission spectrum for WASP-19b from Magellan/IMACS," 2019, *MNRAS*, 482, 2065

PRESENTATIONS

Selected Talks

1) *ACCESS: An optical transmission spectrum of the high-gravity, hot Jupiter HAT-P-23b*, Exoplanet Journal Club, University of Chicago, Spring 2021 – Invited

2) *ACCESS: A Flat Visual Spectrum of the Hot Jupiter WASP-43b without evidence for Na or K*, Exoplanetary Science Initiative (ESI) Lecture Series: Exoplanet Journal Club, JPL, Fall 2020 – Invited

3) *A New Optical to near-IR Transmission Spectrum of WASP-43b*, Planetary Astrophysics Seminar Series, Yale, Winter 2019 – Invited

4) *A New Optical to near-IR Transmission Spectrum of WASP-43b*, Boston Area Exoplanet Science Meeting, MIT, Fall 2018

5) *ACCESS on Magellan: A survey of Optical Transmission Spectra of Exoplanetary Atmospheres*, Conference on Transiting Exoplanets, Keele University, Summer 2017

Selected Posters

1) *A New Optical to near-IR Transmission Spectrum of WASP-43b*, **Ian C. Weaver (CfA)**, Mercedes López-Morales (CfA), Néstor Espinoza (MPIA), Benjamin V. Rackham (UA), David J. Osip (OCIW), Dániel Apai (UA), Andrés Jordán (PUC), Alex Bixel (UA), Jonathan J. Fortney (UCSC), Nikole K. Lewis (STScI), Chima McGruder (CfA), Florian Rodler (ESO), Jonathan Fraine (STScI), Exoplanets II, Summer 2018

2) *Applying a Hydrodynamical Treatment of Stream Flow and Accretion Disk Formation in WASP 12/b Exoplanetary System*, **Ian Weaver**, Phil Macias, Enrico Ramirez-Ruiz, Aaron Lopez, AAS 227th Meeting, Winter 2016, The University of California's Leadership Excellence through Advanced DegreeS (UC LEADS) Conference, UC Merced, Spring 2015, Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Conference, Fall 2014, Lamat Research Symposium, Summer 2014

3) *Particle Trajectory Calculations in WASP-12/b*, **Ian Weaver**, Rodolfo Navarrete Perez, Enrico Ramirez-Ruiz, National Society of Black Engineers (NSBE) National Convention, Spring 2014

4) *Mass Transfer in WASP-12 System*, **Ian Weaver**, Rodolfo Navarrete Perez, Enrico Ramirez-Ruiz, California Alliance for Minority Participation (CAMP) Symposium UC Irvine, Winter 2014, UCSC Poster Symposium, Summer 2013

HONORS AND AWARDS

Certificate of Distinction in Teaching – Derek Bok Center for Teaching and Learning. Awarded for Spring 2019 teaching of Harvard Astro 16. (Spring 2019)

Certificate of Distinction in Teaching – Derek Bok Center for Teaching and Learning. Awarded for Fall 2017 teaching of Harvard Astro 110. (Fall 2017)

Chancellor's Award. Awarded to three students from each division that have received the Dean's Award for outstanding work on their senior undergraduate thesis project. (Spring 2017)

Dean's Award. Granted to 50 undergraduate projects, 10 from each of the academic divisions. Submissions are an outstanding senior thesis or project completed during the current academic year. (Spring 2017)

SACNAS (Society for the Advancement of Chicanos and Native Americans in Science) Symposium Honorable Mention. Awarded for presentation of Disk Structure in WASP-12 System, (Fall 2014)

Acceptance into the University of California's Leadership Excellence through Advanced DegreeS (UC LEADS) program. Prepares upper-division students for advanced education in the science, technology, mathematics and engineering (STEM) fields, (Summer 2014)

National Science Foundation LAMAT Fellowship. Program designed for giving students the opportunity to use high performance computing to solve astrophysical problems, (Summer 2014)

Ron Ruby Scholarship. For demonstrating potential for leadership in promoting cross-cultural understanding, (Spring 2014)

California Space Grant Consortium Undergraduate Research Opportunity Program (CaSGC) scholarship. California's implementation arm of NASAs National Space Grant College and Fellowship Program, (Spring 2014)

CAMP (California Alliance for Minority Participation in Science, Engineering and Mathematics) Symposium Honorable Mention. Awarded for presentation of Mass Transfer in WASP-12 system, (Winter 2013)

Acceptance into the California Alliance for Minority Participation (CAMP) program, a statewide initiative that aims to support and retain underrepresented undergraduates to achieve their degrees in the physical sciences and engineering, (Summer 2013)

ACCEPTED OBSERVING PROPOSALS AND EXPERIENCE

Accepted observing proposals (as PI):

"ACCESS: Probing Exoplanet Atmospheres and Enabling TESS Follow-Up with MMT/Binospec"
5 nights | 6.5m Magellan Telescopes | IMACS | 2021A
1 nights | 6.5m Magellan Telescopes | IMACS | 2020B
4 nights | 6.5m Magellan Telescopes | IMACS | 2020A

"ACCESS-North: Probing Exoplanet Atmospheres and Enabling TESS Follow-Up with MMT/Binospec"
3 nights | 6.5m MMT | Binospec | 2019A
3 nights | 6.5m MMT | Binospec | 2018C
2 nights | 6.5m MMT | Binospec | 2018B

Observing experience:

Magellan/IMACS, 5 nights	2017-2019
MDM/OSMOS, 8 nights	2018B
Lick/Kast, 1 night	2015B

TECHNICAL BACKGROUND

Proficient languages/Software: Julia, Python, Fortran, LaTeX, MESA, IRAF.

General: Proficient with SSH, git, GitHub Actions, navigating in *nix terminals, and writing up Python, Julia and bash scripts to automate common tasks such as plotting files, compiling/executing code, and generating animated data visualizations. Knowledgeable in running parallel supercomputing jobs (OpenMPI, PBS).

OPEN-SOURCE SOFTWARE

Developed:

- `ExoCalc.jl` — Tool written in Julia for computing self-consistent exoplanet and host star parameters. Pluto notebook
- `spacejam` — Python package for fast automatic differentiation and implicit integration of a wide array of dynamic systems. spacejam.readthedocs.io

Contributed:

- `Transits.jl`: Flexible and powerful occultation curves with limb darkening. Pull requests.
- `juliet`: A versatile modelling tool for transiting and non-transiting exoplanetary systems. Pull requests.
- `DustExtinction.jl`: Empirical dust measurements tool for use in astronomy. Pull requests.

OUTREACH

Harvard Observing Project (HOP) Spring 2017 - Present
Lead Observer *Harvard University*

Led team of undergraduate students in observing RW Aurigae using the 0.4m Clay Telescope and also operated the telescope for weekly star parties open to the public

Harvard ComSciCon Fall 2016 - Present
Team Coordinator *Harvard Univsersity*

Read and ranked over 200 applications. Handled dining logisitics with a multi-thousand dollar budget for conference attendees.

GSAS - Open Labs at Harvard (GSAS-OLAH) Fall 2016 - Present
Co-Director *Harvard University*

Co-founded Graduate School of Arts and Sciences (GSAS) Harvard chapter of Open Labs, a science outreach program devoted to sharing graduate student research to 6th-12th grade students through fun, TED style like talks

Smithsonian Astrophysical Observatory
Latino Initiative Program (SAO/LIP) Summer 2017
Python Workshop Instructor *Harvard University*

Guided Latino Initiative Program scholars through a workshop dedicated to learning important Python based tools in the astronomy community to processes and visualise different types of data.