Ian C. Weaver, **Ph.D.**

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Education

Ph.D. in Astronomy & Astrophysics — *2020 Jun - 2022 May*
Center for Astrophysics | Harvard & Smithsonian [link] — *Cambridge, MA*

- **Advisor:** Dr. Mercedes López-Morales
- **Thesis:** Atmospheric characterization of high-gravity hot Jupiters with ACCESS

A.M. in Astronomy & Astrophysics — *2016 Sep - 2020 May*
Center for Astrophysics | Harvard & Smithsonian — *Cambridge, MA*

- **Advisor:** Dr. Mercedes López-Morales

B.S. in Astronomy & Astrophysics, with general and departmental honors — *2012 Sep - 2016 Jun*
University of California, Santa Cruz — *Santa Cruz, CA*

- **Advisor:** Dr. Enrico Ramirez-Ruiz
- **Honors Senior Thesis:** Modeling Accretion Stream and Disk Evolution in WASP-12/b

Research Experience

Astronomer, Education Program Lead — *2023 Aug - Present*
SETI - Unistellar [link] — *San Francisco, CA*

- Director of UCAN program, providing free telescopes and educational material to community colleges nationwide.
- Host star parties in national parks to increase public engagement in astronomy.

Doctoral Student Researcher — *2016 Sep - 2022 May*
Harvard University — *Cambridge, MA*

- Provided novel ground-based observations and atmospheric characterizations for the underrepresented class of high-gravity, hot Jupiters.

Undergraduate Student Researcher — *2012 - 2016*
UC Santa Cruz — *Santa Cruz, CA*

- Implemented the Adaptive Mesh Refinement code FLASH to apply a full hydrodynamical treatment of accretion stream and disk formation in WASP-12/b. Research performed as part of the CAMP, UC LEADS, and Lamat Scholars programs
- 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

Tutor Coordinator — *2022 May - Present*
Onaketa [link] — *Oakland, CA*

- Coordinate tutor-student matching, provide administrative support, and contribute to growth of nonprofit organization.
- Tutor and mentor black and brown students in STEM courses through 1-2-1 remote sessions.

Academic Tutor — *2022 Aug - 2023 Aug*
AJ Tutoring — *Palo Alto, CA*

- Provided in-person tutoring for high school physics and math courses including AP Calculus AB/BC, and AP Physics 1/2/C Mechanics/C E&M.
- Created custom study materials for students and communicated learning outcomes and progress reports to parents and guardians.

Summer Research Co-Leader — *Summer 2019*
Harvard Banneker Institute Stars Workshop — *Cambridge, MA*

- 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*

- Assisted in course planning, teaching, grading, and lab management for 20+ students.

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*

- Assisted in course planning, teaching, grading, and lab management for 30+ summer bridge high school students.

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

- Assisted in course planning, teaching, grading, and lab management for 15+ upper-division undergraduates.

Physics Co-leader *Fall 2013 - Spring 2016*
UCSC Academic Excellence Program *University of California, 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.

Outreach

Boys & Girls Clubs of the Peninsula [link] *Summer 2023*
Planetary ReaCH | SETI *East Palo Alto, CA*

- Designed and co-led hands-on science outreach activities for elementary – high school students in the community as part of the Culturally Inclusive Planetary Engagement Workshop.
- Children designed, built, and tested their own model lunar landers using household materials.

Onaketa's Dream Big Book Fair [link] *Spring 2023*
Organizing Team *Oakland, CA*

- Organized books, set-up tables, and cataloged inventory of 100+ books centered around black and brown scientists, engineers, mathematicians, and artists for free giveaway.

Harvard Observing Project [link] *Spring 2017 - Summer 2022*
Lead Observer *Cambridge, MA*

- 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.

ComSciCon [link] *Fall 2016 - Spring 2017*
Team Coordinator *Cambridge, MA*

- Read and ranked 200+ applications. Handled dining logistics with multi-thousand dollar budget for conference attendees.

GSAS - Open Labs at Harvard [link] *Fall 2016 - Spring 2017*
Co-Director *Cambridge, MA*

- 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 [link] *Summer 2017*
Python Workshop Instructor *Cambridge, CA*

- 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.

Open-source Software

Developed

- `Exocalc.jl` — Tool written in Julia for computing self-consistent exoplanet and host star parameters.
- `spacejam` — Python package for fast automatic differentiation.

Contributed

- `Transits.jl` — Flexible and powerful occultation curves with limb darkening.
- `PlutoUI.jl` – Convenience wrappers for HTML input in `Pluto.jl` notebooks.
- `juliet` — A versatile modelling tool for transiting and non-transiting exoplanetary systems.
- `DustExtinction.jl` — Empirical dust measurements tool for use in astronomy.

Presentations

Selected Talks

Spring 2021 – Invited	***ACCESS: An optical transmission spectrum of the high-gravity, hot Jupiter HAT-P-23b*** Exoplanet Journal Club, University of Chicago
Fall 2020 – Invited	***ACCESS: A Flat Visual Spectrum of the Hot Jupiter WASP-43b*** Exoplanetary Science Initiative (ESI) Lecture Series: Exoplanet Journal Club, JPL
Winter 2019 – Invited	***A New Optical to near-IR Transmission Spectrum of WASP-43b*** Planetary Astrophysics Seminar Series, Yale
Fall 2018	***A New Optical to near-IR Transmission Spectrum of WASP-43b*** Boston Area Exoplanet Science Meeting, MIT
Summer 2017	***ACCESS on Magellan: A survey of Optical Transmission Spectra of Exoplanetary Atmospheres*** Conference on Transiting Exoplanets, Keele University

Selected Posters

Summer 2018	***A New Optical to near-IR Transmission Spectrum of WASP-43b*** Exoplanets II, Cambridge University, UK
Winter 2016	***Applying a Hydrodynamical Treatment of Stream Flow and Accretion Disk Formation in WASP 12/b Exoplanetary System*** AAS 227th Meeting
Spring 2014	***Particle Trajectory Calculations in WASP-12/b*** National Society of Black Engineers (NSBE) National Convention
Winter 2014	***Mass Transfer in WASP-12 System*** California Alliance for Minority Participation (CAMP) Symposium UC Irvine

Honors & Awards

Spring 2019	**Certificate of Distinction in Teaching** Derek Bok Center for Teaching and Learning
Fall 2017	**Certificate of Distinction in Teaching** Derek Bok Center for Teaching and Learning
Spring 2017	**Chancellor's Award** UC Santa Cruz
Spring 2017	**Dean's Award** UC Santa Cruz
Fall 2014	**Symposium Honorable Mention** SACNAS (Society for the Advancement of Chicanos and Native Americans in Science)
Summer 2014	**University of California's Leadership Excellence through Advanced DegreeS (UC LEADS)** UC Santa Cruz
Summer 2014	**National Science Foundation LAMAT Fellowship** UC Santa Cruz
Spring 2014	**Ron Ruby Scholarship** UC Santa Cruz
Spring 2014	**California Space Grant Consortium Undergraduate Research Opportunity Program (CaSGC)** UC Santa Cruz
Winter 2013	**Symposium Honorable Mention** CAMP (California Alliance for Minority Participation in Science, Engineering and Mathematics

Observing Experience

Accepted Observing Proposals (PI)

ACCESS: Probing Exoplanet Atmospheres and Enabling TESS Follow-Up with MMT/Binospec

2021A	**5 nights	6.5m Magellan Telescope	IMACS**

2020B	**1 nights | 6.5m Magellan Telescope | IMACS**
2020A	**4 nights | 6.5m Magellan Telescope | IMACS**

ACCESS-North: Probing Exoplanet Atmospheres and Enabling TESS

2019A	**3 nights | 6.5m MMT Telescope | Binospec**
2018C	**3 nights | 6.5m MMT Telescope | Binospec**
2018B	**2 nights | 6.5m Magellan Telescope | IMACS**

On-site Observing

2017 – 2019	**5 nights | 6.5m Magellan Telescope | IMACS**
2018B	**2 nights | 2.4m MDM Telescope | OSMOS**
2015B	**1 nights | 3m Shane Telescope | Kast**

Publications

ADS [link]

Allen, N. H., Espinoza, N., Jordán, A., López-Morales, M., Apai, D., Rackham, B. V., Kirk, J., Osip, D. J., **Weaver, I. C.**, McGruder, C., Ceballos, K. O., Reggiani, H., Brahm, R., Rodler, F., Lewis, N. K., & Fraine, J. (2022). ACCESS: Tentative Detection of H_2O in the Ground-based Optical Transmission Spectrum of the Low-density Hot Saturn HATS-5b. \aj, *164*(4), 153. https://doi.org/10.3847/1538-3881/ac8b74

Bixel, A., Rackham, B. V., Apai, D., Espinoza, N., López-Morales, M., Osip, D., Jordán, A., McGruder, C., & **Weaver, I**. (2019). ACCESS: Ground-based Optical Transmission Spectroscopy of the Hot Jupiter WASP-4b. \aj, *157*(2), 68. https://doi.org/10.3847/1538-3881/aaf9a3

Espinoza, N., Rackham, B. V., Jordán, A., Apai, D., López-Morales, M., Osip, D. J., Grimm, S. L., Hoeijmakers, J., Wilson, P. A., Bixel, A., McGruder, C., Rodler, F., **Weaver, I**., Lewis, N. K., Fortney, J. J., & Fraine, J. (2019). ACCESS: a featureless optical transmission spectrum for WASP-19b from Magellan/IMACS. \mnras, *482*(2), 2065–2087. https://doi.org/10.1093/mnras/sty2691

Kirk, J., López-Morales, M., Wheatley, P. J., **Weaver, I. C.**, Skillen, I., Louden, T., McCormac, J., & Espinoza, N. (2019). LRG-BEASTS: Transmission Spectroscopy and Retrieval Analysis of the Highly Inflated Saturn-mass Planet WASP-39b. \aj, *158*(4), 144. https://doi.org/10.3847/1538-3881/ab397d

Kirk, J., Rackham, B. V., MacDonald, R. J., López-Morales, M., Espinoza, N., Lendl, M., Wilson, J., Osip, D. J., Wheatley, P. J., Skillen, I., Apai, D., Bixel, A., Gibson, N. P., Jordán, A., Lewis, N. K., Louden, T., McGruder, C. D., Nikolov, N., Rodler, F., & **Weaver, I**. C. (2021). ACCESS and LRG-BEASTS: A Precise New Optical Transmission Spectrum of the Ultrahot Jupiter WASP-103b. \aj, *162*(1), 34. https://doi.org/10.3847/1538-3881/abfcd2

McGruder, C. D., López-Morales, M., Espinoza, N., Rackham, B. V., Apai, D., Jordán, A., Osip, D. J., Alam, M. K., Bixel, A., Fortney, J. J., Henry, G. W., Kirk, J., Lewis, N. K., Rodler, F., & **Weaver, I**. C. (2020). ACCESS: Confirmation of No Potassium in the Atmosphere of WASP-31b. \aj, *160*(5), 230. https://doi.org/10.3847/1538-3881/abb806

McGruder, C. D., López-Morales, M., Kirk, J., Espinoza, N., Rackham, B. V., Alam, M. K., Allen, N., Nikolov, N., **Weaver, I. C.**, Ortiz Ceballos, K., Osip, D. J., Apai, D., Jordán, A., & Fortney, J. J. (2022). ACCESS: Confirmation of a Clear Atmosphere for WASP-96b and a Comparison of Light Curve Detrending Techniques. \aj, *164*(4), 134. https://doi.org/10.3847/1538-3881/ac7f2e

Weaver, I. C., López-Morales, M., Alam, M. K., Espinoza, N., Rackham, B. V., Goyal, J. M., MacDonald, R. J., Lewis, N. K., Apai, D., Bixel, A., Jordán, A., Kirk, J., McGruder, C., & Osip, D. J. (2021). ACCESS: An Optical Transmission Spectrum of the High-gravity Hot Jupiter HAT-P-23b. \aj, *161*(6), 278. https://doi.org/10.3847/1538-3881/abf652

Weaver, I. C., López-Morales, M., Espinoza, N., Rackham, B. V., Osip, D. J., Apai, D., Jordán, A., Bixel, A., Lewis, N. K., Alam, M. K., Kirk, J., McGruder, C., Rodler, F., & Fienco, J. (2020). ACCESS: A Visual to Near-infrared Spectrum of the Hot Jupiter WASP-43b with Evidence of H_2O, but No Evidence of Na or K. \aj, *159*(1), 13. https://doi.org/10.3847/1538-3881/ab55da