



Juliana García-Mejía

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RESEARCH AREAS	<ul style="list-style-type: none"> • Principal Investigator of the <i>Tierras</i> Observatory, an ultra-precise ground-based M-Dwarf photometer to search for temperate terrestrial planets, exo-moons and exo-rings. • Co-Investigator in the FIOS project, a Fabry-perot instrument designed for use on the Giant Magellan Telescope to detect oxygen in exoplanet atmospheres. 	
APPOINTMENTS	51 Pegasi b Postdoctoral Fellow Department of Physics, Massachusetts Institute of Technology	2023-2026
	Pappalardo Postdoctoral Fellow Department of Physics, Massachusetts Institute of Technology	2026-2028
EDUCATION	Harvard University , Cambridge, MA Ph.D. in Astronomy & Astrophysics Dissertation: <i>The Tierras Observatory</i> Advisor: David Charbonneau A.M. in Astronomy & Astrophysics Harvard College , Cambridge, MA	May 2023 (Expected) May 2020 May 2017
FELLOWSHIPS & AWARDS	<i>Graduate School Fellowships</i> <ul style="list-style-type: none"> • Ford Foundation Graduate Research Fellowship (\$27k/year, 3 years) • NSF Graduate Research Fellowship (\$37k/year, 3 years) <i>Awards & Honors</i> <ul style="list-style-type: none"> • Rodger Doxsey Travel Prize, 241st American Astronomical Society Meeting • Consortium Member, Harvard Origins of Life Initiative • GSAS Professional Development Fund Award (\$2.5k), Harvard University • Harvard Horizons Scholar, Harvard University • Derek Bok Center Certificate of Distinction in Teaching, Harvard University <ul style="list-style-type: none"> – Astronomy 1 (The Big Questions of Astronomy) – Astronomy 17 (Galactic & Extragalactic Astronomy) • T.T. Hoopes Prize for Outstanding Undergraduate Thesis, Harvard College • Chambliss Astronomy Achievement Award, 229th AAS Meeting 	2017-2023 2017-2022 2023 2021-2023 2022 2022 2020 2019 2017 2017
PUBLICATIONS	<ol style="list-style-type: none"> 6. García-Mejía, J., Charbonneau, D., Fabricant, D., Irwin, J., Fata, R., Zajac, J. M., Doherty P.E. “The Tierras Observatory: An Ultra-Precise Photometer to Characterize Nearby Terrestrial Exoplanets,” 2020, <i>Proc. SPIE</i> 11445, Ground-based and Airborne Telescopes VIII, 114457R. 5. Rukdee, S., Ben-Ami, S., Szentgyorgyi, A., López-Morales, M., Charbonneau, D., García-Mejía, J., “Characterization of a multi-etalon array for ultra-high resolution spectroscopy,” 2020, <i>Proc. SPIE</i> 11447, Ground-based and Airborne Telescopes VIII, 114471N. 4. Giovinnazzi, Mark R., Blake C. H., Eastman J. D., et al [incl. García-Mejía, J.] “The HD217107 planetary system: Twenty years of radial velocity measurements,” 2020, <i>Astronomische Nachrichten</i>, 341, 870. 3. Wilson, M. L., Eastman, J. D., Cornachione, M. A. et al [incl. García-Mejía, J.] “First Radial Velocity Results From the MINiature Exoplanet Radial Velocity Array (MINERVA),” 2019, <i>PASP</i>, 131, 1005, pp. 115001-115019. 	

- ⇒ Precision-aligned and bonded the *Tierras* Observatory optics, filter, and bezels, including the CCD dewar window. 1000+ hour effort.
- Custom Filter Designer
 - ⇒ Carried out trade study to determine filter parameters that minimize precipitable water vapor error in photometric data. Simulation included realistic telescope and instrument specifications, and filter parameterization accounted for manufacturing limitations. Collaborated with vendor to manufacture filter.
- Zemax OpticStudio User
 - ⇒ Designed, optimized, and carried out element, surface, and ghost tolerance analyses of a four-element focal reducer and field flattener for the *Tierras* Observatory. Modelled effect of self-weight deformation on optical performance.

Other Facilities/Training

- The Clay Telescope Maintenance Volunteer – Astronomy Undergraduate Teaching Lab, Harvard University
 - ⇒ Collaborated with laboratory manager to adapt lab, telescope, and dome for remote observing and teaching during the COVID-19 pandemic. Led re-design, fabrication and installation of adaptor plate for new CCD.
- MINERVA Commissioning/Upkeep Team Member – FLWO, Arizona.
 - ⇒ 2015-2017: Traveled to the MINiature Exoplanet Radial Velocity Array (MINERVA) twice per semester. Installed KiwiSpec, a 1 m/s single-shot spectrograph. Led snow-protection plan for domes. Routed 50-m science fibers from the spectrograph underground to each of the four telescopes (2x).
- TRES (Tillinghast Reflector Echelle Spectrograph) Intern – FLWO, Arizona.
 - ⇒ 2015-2016: Carried out a design study to install an Iodine cell onto the TRES Front End. Designed and built a new thermal enclosure for the front end.
- 11 GHz Antenna Builder – Smithsonian Astrophysical Observatory
 - ⇒ Spring 2016: Built 11 GHz radiometer in collaboration with SAO's CMB lab. Used it to carry out first-ever measurements of the CMB temperature at 11 GHz.
- Certified Machinist – Instructional Machine Shop, Physics Department, Harvard University
 - ⇒ Awarded GREEN machining certification after demonstrating proficiency operating and programming mills, lathes, band saws, and 3D printers. 100 hours completed.

OBSERVING EXPERIENCE

- *Tierras* Observatory (1.3 m) – F.L. Whipple Observatory, Arizona (150+ nights)
- The Clay Telescope (0.4 m) – Harvard AstroLab, Massachusetts (32 nights)
- MINERVA (0.7 m, array of 4) – F.L. Whipple Observatory, Arizona (10 nights)
- The SMA (6 m, array of 8) – Mauna Kea Observatory, Hawaii (7 nights)
- 11 GHz Antenna – SAO, Massachusetts (1 night)
- Millimeter Wave Telescope (1.2 m) – SAO, Massachusetts (2 nights)

SELECTED SCIENCE TALKS & POSTERS

Invited Talks & Seminars

MIT Planetary Lunch Seminar (<i>Cambridge, MA</i>)	April 2023
University of Chicago Astro Lunch Talk (<i>Chicago, IL</i>)	Jan 2023
CfA Special Colloquium (<i>Cambridge, MA</i>)	Jan 2023
The Ohio State University Astronomy Colloquium (<i>Columbus, OH</i>)	Dec 2022
MIT Brown Bag Seminar (<i>Cambridge, MA</i>)	Oct 2022
Carnegie EPL Astronomy Seminar (<i>webinar</i>)	Sep 2022
Boston University Special Seminar (<i>Cambridge, MA</i>)	Sep 2022
Caltech Planetary Sciences Group Luncheon (<i>webinar</i>)	Aug 2022
CfA ITC Luncheon Series (<i>Cambridge, MA</i>)	March 2022
SAO Central Engineering Division Meeting (<i>webinar</i>)	Sep 2021
CfA Solar, Stellar, and Planetary Sciences Division Meeting (<i>webinar</i>)	Aug 2021
Harvard Origins of Life Initiative Chalk Talk Lecture (<i>Cambridge, MA</i>)	March 2021
Harvard Astronomy Department Research Forum (<i>webinar</i>)	March 2021
The Ohio State University Exoplanet Talk Series (<i>webinar</i>)	Feb 2021
SAO Advisory Board Meeting (<i>webinar</i>)	Oct 2020
Exoplanet Summer Student Seminar Series (<i>webinar</i>)	July 2020
CfA Exoplanet Pizza Lunch Series (<i>Cambridge, MA</i>)	Sep 2019

	Dr. Thomas Zurbuchen Visit to the CfA (<i>Cambridge, MA</i>)	Dec 2018
	<i>Contributed Talks</i>	
	American Astronomical Society Meeting #241, Dissertation talk (<i>Seattle, WA</i>)	Jan 2023
	American Astronomical Society Meeting #240 (<i>Pasadena, CA</i>)	June 2022
	Colombian Conf. of Astronomy & Astrophysics (<i>Medellín – Colombia</i>)	Oct 2019
	TESS Science Conference I (<i>Cambridge, MA</i>)	Aug 2019
	High-Resolution Spectroscopy for Exo-Atmospheres Conf. (<i>Nice – France</i>)	Oct 2018
	<i>Posters</i>	
	Rocky Worlds II (<i>Oxford – UK</i>)	July 2022
	Exoplanets IV (<i>Las Vegas, NV</i>)	May 2022
	SPIE Astronomical Telescopes & Instrumentation Digital Forum (<i>webinar</i>)	Dec 2020
	Extreme Solar Systems IV (<i>Reykjavík – Iceland</i>)	Aug 2019
	WiSTEM Conference (<i>Cambridge, MA</i>)	Jan 2017
	American Astronomical Society Meeting #229 (<i>Grapevine, TX</i>)	Jan 2017
SELECTED PUBLIC TALKS	Exploring Exoplanets with NASA’s Universe of Learning (<i>Webinar</i>) Talk title: “How Do We Find Exoplanets” (20 min).	April 2022
	Harvard Horizons Symposium (<i>Cambridge, MA</i>) Talk title: “The <i>Tierras</i> Observatory” (7 min).	April 2022
	University of Antioquia Astronomy Club (<i>Medellín – Colombia</i>) Talk title: “The Search for Exoplanets” (1 hr).	Nov 2021
	Chelsea High School Visiting Speaker (<i>Chelsea, MA</i>) Talk title: “How to Find an Exoplanet” (20 min).	Nov 2019
	Susan B. Anthony Middle School Guest Lecture (<i>Revere, MA</i>) Talk title: “Stars, Exoplanets, & My Journey to Astronomy” (30 min).	Dec 2018
	Girls in STEM Summer Camp Symposium Keynote (<i>Allston, MA</i>) Talk title: “The TESS Satellite & the Search for Life in the Universe” (20 min).	Aug 2018
SELECTED OUTREACH	The <i>Tierras</i> Observatory Bilingual YouTube Channel – Founder/Editor Created bilingual (Spanish & English) YouTube channel to showcase the process of building an observatory and a new instrument, as well as to teach students about exoplanet science. Filmed, edited, and posted multiple 5-10 min videos.	2019-2023
	The <i>Tierras</i> Official Logo Contest – Creator/Organizer Organized country-wide contest for students in Colombia to design the official logo of the <i>Tierras</i> Observatory. Parsed through 150 submissions, and selected winning logo. Collaborated with Colombian graphic designers and the contest winner to improve the logo. Collaborated with Colombian government to promote the competition and announce the winners via educational YouTube live webinars. Raised funding to gift branded paraphernalia to participants.	2020-2022
	Project Teach @ The Harvard Ed Portal – Recurring Instructor Harvard’s official college and career awareness program for Cambridge & Boston middle school students. Developed and taught 2-hr workshops at the Harvard Astronomy Lab. ~2 workshops/yr. Titles: “The Sun and Its Properties”, “How to Detect an Exoplanet”.	2018-2022
	Belmont Day Middle School STEM Capstones – Inaugural Instructor Established a partnership for Harvard graduate students to advise middle school students in laboratory-based capstone workshops related to astronomy. Developed and taught first 2-hour capstone workshop at the Harvard Astronomy Lab. Title: “How to Detect an Exoplanet Atmosphere”.	Spring 2022
	WorldWide Telescope Ambassadors Program – Ambassador/Contributor Free, open-source AAS-managed online visualization platform offering immersive views of the cosmos. Contributed custom virtual tours in English and Spanish. Led WWTa outreach booths at the Cambridge Science Festival (April 2015-2019), The New York Science Festival (May 2015) and the AAS meeting #227 (Jan 2016).	2015-2019
	DIY Planet Search Website – Translator/Contributor Official CfA website for students to program observations, analyze data, and discover exoplanets with the MicroObservatory Robotic Telescope Network. Translated the website’s contents to Spanish. Led interactive hour-long workshops in Physics/AP Physics classrooms at predominantly Spanish-speaking high schools in MA. Led webinars introducing exoplanets to DIY users and educators.	2018-2022

Girls in STEM Summer Camp @ Harvard — Organizer/Instructor	Aug 2018
Designed and led free week-long summer camp to empower middle school girls from underserved neighborhoods in Boston and Allston (MA) to pursue careers in STEM. Developed and taught a 40-hr curriculum centered around the search for life in the Universe. Coordinated and hosted summer camp at the Harvard Ed Portal.	
Clubes de Ciencia Colombia (Science Clubs Colombia) — Instructor	June 2018
Free week-long summer camp designed to empower under-served high school students in Colombia to pursue careers in STEM. Developed and taught a hands-on 40-hr curriculum (in Spanish) centered around the search for exoplanets using robotic telescopes.	

ADVISING & MENTORSHIP

Víctor Samuel Pérez Díaz , Universidad del Rosario (<i>Colombia</i>) (currently a CfA intern, applying to PhD programs)	2022-
Mentored through the Harvard Colombian Society Grad Application Mentorship Program	
Sebastian Morales , McGill University (<i>Canada</i>) (now incoming PhD student, Harvard Biology)	2021-2022
Mentored through the Harvard Colombian Society Grad Application Mentorship Program	
Ana Humphrey , Harvard College	2021-2022
Mentored through the Harvard Women in Science, Technology, Engineering, and Math (WiSTEM) Mentorship Program	
Michelle Lin , Harvard College	2020-2021
Mentored through the Harvard WiSTEM Mentorship Program	
Sebastian Ruiz-Lopera , Universidad EAFIT (<i>Colombia</i>) (now PhD student, MIT Electrical Engineering & Computer Science)	2020-2021
Mentored independently	
Sideena Grace , Hamline University (now S.M. student, MIT Aeronautics & Astronautics)	2020
Mentored through the Women+ of Color Project (W+OCP)	
Juan Sebastian Aguiar Castrillón , Universidad EAFIT (<i>Colombia</i>)	2020
Mentored through <i>Clubes de Ciencia Colombia</i>	
Keysha Rosado , UMass Lowell	Summer 2020
Mentored through the CfA Latino Initiative Program	
Jordan Sanchez , Harvard College	2019-2020
Mentored through the Harvard WiSTEM Mentorship Program	
Mma Ikwut-Ukwa , Harvard College (now incoming PhD student, Caltech Planetary Sciences)	2019-2020
Mentored through the Harvard WiSTEM Mentorship Program	
Mahlet Shiferaw , Harvard College (now PhD student, Stanford Astrophysics)	2018-2020
Mentored through the Harvard WiSTEM Mentorship Program	
Elias Aguirre Contreras , UMass Lowell (now Mechanical Engineer, CfA Harvard & Smithsonian)	Summer 2019
Mentored through the CfA Latino Initiative Program	

SELECTED INVITED PANELS

Harvard Undergraduate AstroSoc: Applying to Graduate School	Oct 2022
Harvard University: Applying to Harvard Horizons	Oct 2022
CfA Summer REU Symposium: Winning the NSF Research Fellowship	Aug 2022
Harvard University: Expanded Horizons	May 2022
CfA: First Girl to the Moon!	March 2021
W+OCP Grad School 101 Workshop: Choosing a Graduate School	Oct 2020
Jesus College, Oxford: Are we alone in the Universe?	Sep 2020
Wellesley College: Equity, Inclusion & WOC in STEM	April 2020
Latina Empowerment and Development Conf. : Navigating Grad School	Feb 2020
CfA Latino Initiative Program: Making an Effective Poster	July 2019
Harvard-Radcliffe Women's Leadership Conference: Life after Undergrad	Jan 2019

LEADERSHIP & SERVICE

Department Leadership & Service

CfA ECA Workshop Series – Board Member/Contributor 2022-2023

Founding board member of the CfA Early Career Astronomer's (ECA) Workshop Series, offering practical resources and trainings to empower ECAs to build successful careers and cultivate a healthy work/life balance. Helped lead ~ 2 – 3 workshops/semester.

CfA DEI Committee – Co-Founder/Graduate Student Representative 2020-2023

Co-founded the CfA Diversity, Equity & Inclusion (DEI) Committee to address climate-related concerns and promote community-building. Contributed to the CfA's official Statement of Shared Values and DEI resource website. Led CfA-wide town hall (200 participants) to discuss 2020 climate survey report and brainstorm community-building strategies. ~ 2 meetings/semester.

Graduate Student Mentorship Program – Recurring Peer Mentor 2019-2022

Served as peer mentor to first-year graduate student WOC and women interested in astronomical instrumentation. Mentees: Marissa Maney (2021-2022), Osase Omoruyi (2020-2021), Miranda Eiben (2019-2020).

Harvard Physics W+OCP Grad School 101 Workshop – Consultant Fall 2019

Primary consultant and advisor to LaNell Williams, founder of the Women+ of Color Project 101 Workshop at the Harvard Physics Department. Provided feedback on workshop trainings, schedule, logistics, and application reviews. 35 hours.

The Banneker Institute REU – Public Speaking Instructor Summer 2019

The Banneker Institute Research Experience for Undergraduates targets students historically marginalized from STEM fields. Prepared cohort of eight students for end-of-summer research symposium via weekly public speaking lessons. 1-hr/wk, 10 weeks.

CfA EIJC – Co-organizer Spring 2019

The CfA Equity and Inclusion Journal Club (EIJC). Selected weekly discussion topics, identified discussion leaders, led breakout sessions, and arranged lunch catering with minority-owned businesses. 6-hr/wk, 12 weeks.

Dr. Thomas Zurbuchen Visit to the CfA – Invited Speaker Dec 2018

CfA Visit by the Associate Administrator for the Science Mission Directorate at NASA, Dr. Thomas Zurbuchen. Invited by former CfA director, Charles Alcock, to present in front of Dr. Zurbuchen on upcoming oxygen searches with GMT-GCLEF & FIOS.

Institutional Service

Harvard Graduate School of Arts & Sciences – Featured University Scholar 2022-

Collaborated with GSAS to record media and host events for Harvard's leadership.

Selected examples include:

- ⇒ Invited by GSAS Dean Emma Dench to present on *Tierras* and STEM DEIB efforts at Harvard's Board of Overseers Meeting (Dec 3, 2022).
- ⇒ Featured scholar in celebratory materials for GSAS's 150th anniversary, including printed and email correspondence, as well as social media channels and pole banners.

EAFIT University – Undergraduate Thesis Committee Member June 2020

Served in student Daniela Cadavid Henao's Senior undergraduate thesis committee. Revised 62-page written thesis. Planned and executed student's oral examination. Recommended student for honors. Thesis Title: Development of an Algorithm for Photometric Data Analysis.

Conference Service

241st AAS Meeting Chambliss Competition – Poster Judge Jan 2023

FUNDRAISING EXPERIENCE

Harvard University Donor Relations & Engagement Office – Invited Scholar 2022

Guest scholar at the Global Advisory Council meeting kick-off event, at Harvard's new Science & Engineering Complex. Spoke to donors about *Tierras* and exoplanet instrumentation over breakfast.

Harvard Alumni Affairs & Development Office – Featured University Scholar 2022

Featured in printed and email correspondence for alumni and donors of the Graduate School of Arts & Sciences (GSAS) and the Faculty of Arts & Sciences (FAS). Recurringly featured in GSAS and FAS social media channels.

CfA Office of Advancement & External Affairs – Guest Scientist 2019-2022

Collaborated with the CfA Office of Advancement & External Affairs to record media and host events for potential donors. Selected examples:

- ⇒ Donor Symposium Talk: The *Tierras* Observatory
- ⇒ Official Mission Video: [The CfA: Answering Humanity's Greatest Questions](#)
- ⇒ Harvard Business School [DIALOGUE @ Nite](#)
Exhibit: *Unlocking the Mysteries of the Universe* (approx. 200 attendees).
- ⇒ John F. Kennedy Museum [Space Summit](#)
Exhibit: *The Giant Magellan Telescope* (approx. 1000 attendees).

SELECTED MEDIA FEATURES	Full Page Spread – Harvard GSAS Colloquy Magazine <i>150 Year Anniversary Edition - Out of This World, Page 3</i>	Summer 2022
	Podcast – Harvard GSAS Website <i>Harvard Horizons Podcast: The Search for Other Earths</i>	June 2022
	Article – Harvard Magazine <i>Harvard Horizons Spotlights Seven Scholars</i> by Jacob Sweet.	April 2022
	Article – Harvard GSAS Website <i>Final Frontier: Harvard Horizons Scholars advance the boundaries of knowledge—and imagination—in search for new worlds</i> by Paul Massari.	April 2022
	Webinar (<i>Spanish</i>) – Ruta-N YouTube Channel <i>Let's Talk Astrophysics!</i> hosted by Alejandro Roldán. Ruta N is the Center for Education, Business, and Innovation of Medellín (Colombia), sponsored by the Mayor's office.	Jan 2022
	Article – The Harvard Gazette <i>Quick, hand me my worm pick</i> by Juan Siliezar.	Sep 2021
	News Segment & Article – CBS Boston Evening News & Website <i>Melrose High School Senior Organizes Webinar To Highlight Women Role Models In The Space Industry</i> by Sarah Wroblewski.	March 2021
	Webinar (<i>Spanish</i>) – Ruta-N YouTube Channel <i>What does an Astrophysicist do?</i> hosted by Alejandro Roldán.	Nov 2020
	Webinar – 24 Hours of Harvard - Worldwide at Harvard 2020 <i>Are We Alone in the Universe? The Giant Magellan Telescope in Las Campanas, Chile.</i>	Oct 2020
	Webinar (<i>Spanish</i>) – Mayor's Office, City of Medellín (Colombia) <i>Talented Women Contest: Conversations with Talented Women</i> hosted by Juliana Martinez Londoño, Medellín's Secretary for Women's Issues.	July 2020
	Podcast (<i>Spanish</i>) – AMEBAS Talk Science <i>The Search for other Earths Continues</i> hosted by Dr. Jorge Zuluaga, Astronomy Professor at the University of Antioquia (Colombia).	July 2020
	Article (<i>Spanish</i>) – <i>El Colombiano</i> Newspaper <i>Harvard Grad Teaches Astronomy to Colombian Students</i> by Daniel Quintero Mesa.	June 2018
PROFESSIONAL SOCIETIES & GROUPS	TESS Follow-Up Observing Program, Sug-Group 1 (TFOP-SG1) American Astronomical Society (AAS; divisions DPS and LAD) Harvard Women in Physics (WiP) Harvard Graduate Women in Science and Engineering (HGWISE) Harvard-Radcliffe Society of Physics Students	2022- 2017- 2017-2023 2017-2023 2013-2017
WORKSHOPS	ComSciCon 2018 National Workshop (<i>Boston, MA</i>) Dunlap Instrumentation Summer School (<i>Toronto – Canada</i>)	July 2018 July 2017
OTHER SKILLS & TRAINING	<i>Software Tools & Packages</i> • Zemax OpticStudio, GSolver, SOLIDWORKS, Github , ds9, MIR, Miriad, MESA, CASA, LaTeX. <i>Programming Languages</i> • Python, MATLAB, Mathematica, IDL, C. <i>OS Proficiency</i> • Linux, Mac OS X, Windows. <i>Languages</i> • Spanish (Native Proficiency), English (Native Proficiency), German (Limited Working Proficiency). <i>References available upon request.</i> <i>Last updated: February 25, 2023.</i>	