

Briley L. Lewis

Graduate Student and NSF Fellow, Astronomy and Astrophysics
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Education

- **University of California, Los Angeles** Los Angeles, CA, USA
Ph.D Astronomy and Astrophysics 2020 - Present
- **University of California, Los Angeles** Los Angeles, CA, USA
Graduate Certificate in Writing Pedagogy 2020 - Present
- **University of California, Los Angeles** Los Angeles, CA, USA
M.S. Astronomy and Astrophysics 2018 - 2020
- **Columbia University (Columbia College)** New York, NY, USA
B.A. Astrophysics 2014 - 2018
 - Cumulative GPA: 3.70
 - Senior Thesis: Direct Imaging of Exoplanets with Project 1640

Research Experience

- **University of California, Los Angeles** Los Angeles, CA, USA
Graduate Student Researcher 2018 - Present
 - Advisor: Dr. Michael Fitzgerald
 - Investigating a theoretical framework for statistics of speckle noise in the high-contrast imaging regime, and using models to explore how we can exploit these statistics to improve contrast in observations.
 - Modeling and characterization of debris disks observed with the Gemini Planet Imager.
- **American Museum of Natural History** New York, NY, USA
REU Student and Undergraduate Researcher 2016 - 2018
 - Advisor: Dr. Rebecca Oppenheimer
 - Worked as a part of Project 1640 focused on direct imaging of exoplanets as a part of the AMNH Summer 2016 National Science Foundation Research Experience for Undergraduates program.
 - Participated in three observing runs with the Project 1640 team at Palomar Observatory in California.
 - Processed infrared images using Python to suppress speckles and detect exoplanets, created lists of targets and assisted in planning for observing runs, and assisted in confirmation of new companion discoveries using astrometry and spectral modeling.
- **Space Telescope Science Institute** Baltimore, MD, USA
Summer Student and Undergraduate Researcher 2017 - 2018
 - Advisors: Drs. John Stansberry and Bryan Holler
 - Analyzed hyperspectral images and other data products from the New Horizons missions 2015 flyby of Pluto, with the goal of investigating the relationship between topographic factors (albedo, elevation) and the distribution of volatiles on its surface.

- Created insolation models and maps of surface slopes/gradients for Pluto, based on data from New Horizons MVIC and LEISA instruments.

Awards, Grants & Honours

Joan and Arnold Seidel Griffith Observer Science Writing Contest (3rd place) . . . 2020
 UCLA Department Outstanding Teaching Award 2019
 National Science Foundation (NSF) Graduate Research Fellow 2018
 UCLA Graduate Dean’s Fellowship 2018
 AAS Chambliss Undergraduate Honorable Mention 2018
 Astronomical Society of New York (ASNY) Undergraduate Research Prize . . . 2017
 Universities Space Research Association (USRA) Scholarship Honorable Mention 2017
 Division for Planetary Sciences Hartmann Student Travel Grant Recipient . . . 2017

Professional Memberships

American Astronomical Society, AAS Division for Planetary Sciences, American Physical Society, Massive Science Consortium Certified Member, National Association of Science Writers

Languages

English (fluent, native speaker), Spanish (intermediate/conversational), Russian (beginner)

Computational Experience

LaTeX, Git, Bash (command line), Python, IDL, Mathematica, SQL, Microsoft Office Products

Teaching Experience and Outreach

- **Massive Science** Online
Certified Author 2021-Present
- **University of California, Los Angeles** Los Angeles, CA, USA
Teaching Assistant Coordinator (ENGCAMP 495M and 495N) 2021-Present
- **UCLA Planetarium** Los Angeles, CA, USA
Planetarium Coordinator 2019 - Present
- **Astrobites** Online
Author, Ombudsperson, SciBites Chair, Education Committee 2018 - Present
- **Letters to a Pre-Scientist** USA
Scientist Pen-Pal/Mentor 2018 - Present
- **Skype a Scientist** Online
Scientist Volunteer 2019 - Present
- **University of California, Los Angeles** Los Angeles, CA, USA
Instructor (Cluster 70 Seminar – Astrobiology in Science Journalism) 2021

- **University of California, Los Angeles** Los Angeles, CA, USA
Teaching Fellow (Cluster 70) 2020-2021
- **University of California, Los Angeles** Los Angeles, CA, USA
TA Training Leader (Active Learning in Labs, Teaching Scientific Writing) 2020
- **BiteScis** Online
Lesson Author - Newton's 2nd Law And Acceleration: Finding Planets Using Physics 2020
- **Canyon High School Science Olympiad** Anaheim, CA, USA
Divisions B/C Physical Science Event Coach 2018 - 2020
- **University of California, Los Angeles** Los Angeles, CA, USA
Teaching Assistant Coordinator (PHYS 495) 2019
- **University of California, Los Angeles** Los Angeles, CA, USA
Teaching Assistant (ASTR 3, ASTR 5, PHYS 5AL) 2018 - 2019
- **Columbia University, Department of Astronomy** New York, NY, USA
Grader, Public Outreach Volunteer 2016 - 2018

Other Community Activities

- **STARtorialist** New York City, USA
Designer and Marketing Assistant 2019 - Present
- **ComSciCon Leadership Team** National
Regional Liaison 2021 - Present
- **Astrobriles** Los Angeles, CA, USA
Artist / Shop Owner 2018 - Present
- **ComSciCon-Los Angeles** Los Angeles, CA, USA
Organizing Committee Chair / Founder 2020 - 2021
- **UC Analytical Writing Placement Exam** Virtual
Grader 2021
- **Icarus (Elsevier Journal, Planetary Science)** Virtual
Reviewer 2020
- **ComSciCon National Flagship 2020** Virtual
Program Organizing Committee Member 2019 - 2020
- **UCLA Womxn in Physics and Astronomy (WiPA)** Los Angeles, CA, USA
Co-Chair 2019 - 2020
- **Columbia Alumni Representative Committee** Los Angeles, CA, USA
Prospective Student Interviewer 2018 - 2019
- **Columbia University Undergraduate Astronomy Club (BlueShift)** New York, NY, USA
Co-founder, President, and Senior Advisor 2015 - 2018

Publications

Research Publications:

B.L. Lewis, M.P. Fitzgerald, R. Dodkins, et al. "Speckle Space-Time Covariances in High Contrast Imaging." In prep.

B.L. Lewis, M.P. Fitzgerald, T. Esposito, et al. “GPI Observations of a Face-On Debris Disk.” In prep.

B.L. Lewis, J. Stansberry, B. Holler, et al. and the New Horizons Science Team. “Distribution and Energy Balance of Pluto’s Nitrogen Ice, as seen by New Horizons in 2015.” *Icarus* Special Issue (2021): 113633.

R. Dodkins, K. Davis, **B.L. Lewis**, et al. “First Principle Simulator of a Stochastically Varying Image Plane for Photon-Counting High Contrast Applications.” *Publications of the Astronomical Society of the Pacific* (2020): 132 (1016), 104503.

P. Johnson, K. Mandt, J. Stansberry, L. Young, S. Protopapa, **B.L. Lewis**, et. al. “Modeling Pluto’s Minimum Pressure: Implications for Haze Production.” *Icarus* (2020): 114070.

C. Lisse, L.A. Young, D.P. Cruikshank, S.A. Sandford, S.A. Stern, **B.L. Lewis**, et. al. “On the Stability of KBO 2014 MU69s and Plutos Ices.” *Icarus* (2020): 114072.

M. Vidaurri, et al. “Environmental Considerations in the Age of Space Exploration: The Conservation and Protection of Non-Earth Environments.” [Planetary Science Decadal White Paper, Co-Signer]

M. Vidaurri, et al. “Absolute Prioritization of Planetary Protection, Ethics, and Avoiding Imperialism in All Future Science Missions: A Policy Perspective.” [Astro2020 and Planetary Decadal White Paper, Co-Signer]

G. Khullar, et al. “Astrobites as a Community-led Model for Education, Science Communication, and Accessibility in Astrophysics.” arXiv preprint arXiv:1907.09496 (2019). [Astro2020 White Paper]

J.L. Margot, et al. “A Search for Technosignatures Around 31 Sun-like Stars with the Green Bank Telescope at 1.151.73 GHz.” *Astronomical Journal* (2020): 161 55.

J. Aguilar, R. Nilsson, R. Oppenheimer, **B.L. Lewis**, L. Pueyo, et. al. “Discovery of a New Companion Object through High-Contrast Imaging.” Submitted to *ApJ*.

B.L. Lewis, R. Oppenheimer (2017). “Direct Imaging of Exoplanets with Project 1640.” *Columbia Undergraduate Science Journal*, Volume 11, Spring 2017. New York, NY.

Popular Science Publications:

B.L. Lewis. “Virtual reality boosts and retunes brain rhythms crucial for learning and memory.” *UCLA Physical Sciences*. July 2021.

B.L. Lewis. “Rocks on Venus’s surface are on the move.” *Massive Science*. 31 July 2021.

B.L. Lewis. “12 Astronomical Artists You Should Know.” *Science and Art, Medium*. 22 July 2021.

B.L. Lewis. “12 Ways to Get More Involved with SciComm” *The Particle, Medium*. 19 July 2021.

B.L. Lewis. “Dust is the surprisingly ordinary culprit behind a supergiant stars unusual dimming.” *Massive Science*. 17 July 2021.

B.L. Lewis. “The Hubble Space Telescope: 1996-2021?” *The Particle, Medium*. 14 July 2021.

B.L. Lewis. “Richard Branson is officially the first billionaire to take off for space.” Massive Science. 13 July 2021.

B.L. Lewis. “NASA releases the most detailed photo of Jupiters largest moon to date.” Massive Science. 10 July 2021.

★ **B.L. Lewis.** “A SciGal Guide to the NSF GRFP.” SciGal Collective. 1 July 2021.

★ **B.L. Lewis.** “Finding Life in the Universe (Within Our Lifetimes)” Griffith Observer - 3rd Prize Piece for the Eighth Annual Joan and Arnold Seidel Griffith Observer Science Writing Contest. July 2021.

B.L. Lewis. “Let’s Go to Venus!” Massive Science. 21 June 2021.

★ **B.L. Lewis.** “The Last Stargazer takes an intimate view of the world through telescopes.” Massive Science. 14 June 2021.

B.L. Lewis. “China lands its first rover on Mars, becoming the second country to do so.” Massive Science. 21 May 2021.

B.L. Lewis. “It’s not just Gamestop: Elon Musk wants to send Dogecoin to the moon.” Massive Science. 21 May 2021.

B.L. Lewis. “Community scientists have discovered an unusual brown dwarf star.” Massive Science. 20 May 2021.

B.L. Lewis. “NASAs Perseverance rover can make oxygen out of Martian air.” Massive Science. 13 May 2021.

B.L. Lewis. “The first ever image of a black holes swirling magnetic field is released.” Massive Science. 14 Apr 2021.

B.L. Lewis. “Uranus emits extra x-rays, and scientists dont know why.” Massive Science. 4 Apr 2021.

B.L. Lewis. “Space travel is now open to the public.” Massive Science. 2 Apr 2021.

B.L. Lewis. “Radical Futures Reading List.” Medium. 19 Mar 2021.

B.L. Lewis. “How dark is outer space? The New Horizons spacecraft is helping astronomers find out.” Massive Science. 9 Mar 2021.

B.L. Lewis. “A new tweak to an old model explains the existence of primordial black holes.” Massive Science. 3 Mar 2021.

B.L. Lewis. “The Perseverance rover sends back the first photos and sounds from Mars.” Massive Science. 25 Feb 2021.

★ **B.L. Lewis.** “NASA’s Perseverance Rover has landed on Mars.” Massive Science. 18 Feb 2021.

B.L. Lewis. “#BlackInAstro founder Ashley Walker is fighting for equality in the space sciences.” Massive Science. 16 Feb 2021.

B.L. Lewis. “Meet Your Friendly Neighborhood Astronomer.” The Particle, Medium. 27 Jan 2021.

E. Avallone, M. de los Reyes, M. Hammer, S. Kohler, G. Khullar, T. Konchady, **B.L. Lewis**, H. Wahl, A. Waggoner, J. Weaver, L. Zagorac. “Astrobites at AAS 237: Daily Liveblogging Coverage.” Astrobites. 11-15 January 2021.

B.L. Lewis. “Meet the AAS Keynote Speakers: Dr. Caroline Morley” Astrobites. 11 Jan 2021.

★ **B.L. Lewis.** “Meet the AAS Keynote Speakers: Dr. Smadar Naoz” Astrobites. 8 Jan 2021.

B.L. Lewis. “The Very Hungry White Dwarf.” Astrobites. 7 Jan 2021.

B.L. Lewis. “Taking better astronomical images, with machine learning!” Astrobites. 2 Dec 2020.

B.L. Lewis. “Another Strike Against the Physics GRE.” Astrobites. 27 Nov 2020.

B.L. Lewis. “Getting to Know the Neighborhood: Who Can See Earth Transit?” Astrobites. 31 Oct 2020.

B.L. Lewis. “#BlackInAstro Experiences: Dr. Sian Proctor.” Astrobites. 28 Oct 2020.

B.L. Lewis. “#BlackInAstro Experiences: Dr. Greg Mosby.” Astrobites. 26 Oct 2020.

B.L. Lewis. “Whats it like to be an astronomer? A comedy set from ReclaimingSTEM 2020.” Medium. 15 Oct 2020.

★ **B.L. Lewis.** “The Nobel Prize in Physics 2020: Prof. Andrea Ghez and the Mysteries of the Galactic Center.” Astrobites. 13 October 2020.

B.L. Lewis. “Life Finds a Way (Even on M Dwarfs?).” Astrobites. 17 September 2020.

★ **B.L. Lewis.** “#BlackInAstro: A Glimpse Into African Cultural Astronomy.” Astrobites. 28 August 2020. (Translated into Spanish on Astrobites)

★ **B.L. Lewis.** “COVID-19 in Fall 2020: A Concerning Situation for Students.” Astrobites. 17 July 2020.

B.L. Lewis. “Todays forecast? Gusty winds on a brown dwarf.” Astrobites. 2 July 2020.

★ **B.L. Lewis.** “Home is Wherever I Am.” The Xylom. 28 May 2020.

B.L. Lewis. “Outreach for Astronomers: Letters to a Pre-Scientist and MIT Astrogazers.” Astrobites. 6 March 2020.

B.L. Lewis. “Making a Mega-Telescope for Exoplanets.” Astrobites. 17 February 2020.

B.L. Lewis. “What happens when you throw a satellite at the Sun?” Astrobites. 13 February 2020.

B.L. Lewis. “Where the Solar System Ends.” Astrobites. 6 February 2020.

B.L. Lewis. “You should get Twitter for science!” Astrobites. 17 January 2020.

E. Avallone, M. de los Reyes, S. Kohler, T. Konchady, **B.L. Lewis**, A. Pearlman, K. Storey-Fisher, M. Zevin. “Astrobites at AAS 235: Daily Liveblogging Coverage.” Astrobites. 5-9 January 2020.

B.L. Lewis. “Meet the AAS Keynote Speakers: Dr. Ted Bergin.” Astrobites. 31 December 2019.

B.L. Lewis. “Meet the AAS Keynote Speakers: Dr. Brian Metzger.” Astrobites. 31 December 2019.

B.L. Lewis. “Another interstellar interloper.” Astrobites. 12 December 2019.

B.L. Lewis. “Where is Everyone?” Orbiter Magazine Online. 8 November 2019.

★ **B.L. Lewis.** “All Genders Are Statistically Significant: Expanding Gender Equity Studies in Astronomy.” Astrobites. 7 November 2019.

B.L. Lewis. “The Nobel-Winning Discovery of 51 Pegasi b.” Astrobites. 16 October 2019.

B.L. Lewis. “How TAs Make a Difference in the Classroom.” PERBites. 16 October 2019.

B.L. Lewis. “Adventure to an Asteroid: JAXAs Hayabusa2 visits Ryugu.” Astrobites. 5 August 2019.

B.L. Lewis. “Thinking Beyond ADA Compliance: How to Make Astronomy Accessible.” PERBites. 29 July 2019.

B.L. Lewis. “First Photos of a Baby Planet.” Astrobites. 26 July 2019.

B.L. Lewis, J. Marcinik, A. Desai. “Op-ed: The physical sciences curriculum at UCLA needs to be revamped.” UCLA Daily Bruin. 14 July 2019.

B.L. Lewis. “Meet the AAS Keynote Speakers: Dr. Philip Scherrer.” Astrobites. 9 June 2019.

B.L. Lewis. “How to Find Exoplanet Oceans.” Astrobites. 10 May 2019.

B.L. Lewis. “A Study in Stereotypes: What People Think of Physicists vs. Biologists.” Astrobites. 5 April 2019.

B.L. Lewis. “A New Job for a Neural Net: Identifying Craters.” Astrobites. 25 February 2019.

B.L. Lewis. “Wheres Lucy Going? Studying Asteroid Mission Targets.” Astrobites. 16 January 2019.

B.L. Lewis, H. Yang, A. Seetharaman. (2015). “Our Future in the Stars.” Columbia Undergraduate Science Journal, Volume 9, Spring 2015. New York, NY.

Student Publications:

These publications were written by students under my advisement as part of my Spring 2021 course, CLUSTER 70S Astrobiology in Science Journalism.

Ashleigh Chase. “Does This Mean War? Ruminations from an Astronaut of the Future” SciGal Collective. 8 July 2021.

Presentations

Invited Talks:

- *Nitrogen ice on Pluto, as seen by New Horizons* (IPAC Science Talk, invited seminar, Pasadena, CA, March 2019)
- *Direct Imaging of Exoplanets with Project 1640* (Astronomical Society of New York meeting invited prize lecture, November 2017)

Contributed Research Talks:

- *Science Communication Through the Lens of Astrobites* (AAS 235 workshop, Honolulu, HI, January 2020)
- *Topographic Influences on Plutos Nitrogen Ice* (New Horizons Science Team Meeting (STM) invited talk, JHU APL, Laurel, MD, January 2018)
- *Topographic and other influences on Pluto’s volatile ices.* (Space Astronomy Summer Program Symposium, Space Telescope Science Institute, August 2017)
- *Direct Imaging of Exoplanets with Project 1640* (Summer 2016 REU Symposium Presentation, American Museum of Natural History, August 2016)

Poster Presentations:

- **B.L. Lewis**, A. Gautam, P. Arriaga, J. Salas, P. Williams, R. Lopez, M. MacDougall, A. Gibbs, R. Bentley (2020) *Local Outreach with the UCLA Planetarium* September 2020, ExSoCal, Virtual.
- **B.L. Lewis**, A. Gautam, P. Arriaga, J. Salas, P. Williams, R. Lopez, M. MacDougall (2019) *The UCLA Planetarium: Educating the West Los Angeles Community about the Universe* July 2019, ComSciCon Flagship, San Diego, CA.
- **B.L. Lewis**, J. Stansberry, W. Grundy, B. Schmitt, S. Protopapa, L. Trafton, B. Holler, W.B. McKinnon, L. Young, A. Stern, H. Weaver, C. Olkin, K. Ennico, and the New Horizons Science Team. (2019) *Distribution and Energy Balance of Plutos Nitrogen Ice, as seen by New Horizons in 2015.* January 2019, American Astronomical Society Winter Meeting, Seattle, WA.
- **B.L. Lewis**, J. Stansberry, W. Grundy, B. Schmitt, S. Protopapa, L. Trafton, B. Holler, W.B. McKinnon, L. Young, A. Stern, H. Weaver, C. Olkin, K. Ennico, P. Schenk and the New Horizons Science Team. (2018) *Topographic and other influences on Pluto’s volatile ices.* January 2018, American Astronomical Society Winter Meeting, National Harbor, MD.
- **B.L. Lewis**, J. Stansberry, W. Grundy, B. Schmitt, S. Protopapa, L. Trafton, B. Holler, W.B. McKinnon, L. Young, A. Stern, H. Weaver, C. Olkin, K. Ennico, P. Schenk and the New Horizons Science Team. (2017) *Topographic and other influences on Pluto’s volatile ices.* October 2017, Division for Planetary Sciences, Provo, UT.
- **B.L. Lewis**, R. Oppenheimer (2017). *Direct Imaging of Exoplanets with Project 1640.* January 2017, Conference for Undergraduate Women in Physics, Princeton University, Princeton, NJ.

- **B.L. Lewis**, R. Oppenheimer (2016). *Direct Imaging of Exoplanets with Project 1640*. AstroFest 2016, Columbia University Department of Astronomy, New York, NY.

Outreach Talks:

- *How to Image an Exoplanet* (Riverside Astronomical Society, Virtual, April 2021)
- *How to Image an Exoplanet* (Los Angeles Astronomical Society, Virtual, February 2021)
- *How to Image an Exoplanet* (UCLA Planetarium, Virtual, February 2021)
- *New Horizons and Pluto: Adventures to the Outer Solar System* (Astronomy on Tap outreach event, Los Angeles, CA, October 2020)
- *ReclaimingSTEM2020 Comedy Show* (ReclaimingSTEM Virtual Conference, October 2020)
- *Zines and Comics in SciComm* (ComSciCon Virtual Flagship workshop, June 2020)
- Astronomy research panel (Conference for Undergraduate Women in Physics (CUWiP) at UC Irvine, invited panelist, January 2020)
- *Finding Life in the Universe (in our Lifetimes)* (Santa Barbara Astronomical Unit (SBAU) Monthly Meeting, Santa Barbara, CA, October 2019)
- *Summer Vacation Spots (in Space): Real Exoplanets and their Stories* (Astronomy on Tap outreach event, Los Angeles, CA, June 2019)
- *New Horizons: Understanding Pluto* (Columbia University Public Outreach, invited public lecture, April 2018)
- Undergraduate research panel (Conference for Undergraduate Women in Physics (CUWiP) at Columbia/CCNY/Barnard, invited panelist, January 2018)
- *Direct Imaging of Exoplanets with Project 1640* (Columbia Undergraduate Science Journal Speaker Series, Columbia University, April 2017)
- *Direct Imaging of Exoplanets: Extreme Astrophotography* (Arts and Astro outreach event, Columbia University, March 2017)

Conferences and Workshops Attended:

- 2021 AAS Division for Planetary Sciences Meeting, October 2021, Virtual.
- Center for Adaptive Optics (CfAO) Summer School, August 2021, Virtual.
- Sagan Summer School (Circumstellar Disks and Young Planets), July 2021, Virtual.
- Code/Astro Workshop, June 2021, Virtual.
- ComSciCon-Los Angeles, April 2021, Virtual. (Organizing Committee Chair)
- 237th American Astronomical Society Meeting, January 2021, Virtual.
- ReclaimingSTEM 2020, September 2020, Virtual.
- ExSoCal, September 2020, Virtual.
- ComSciCon Flagship, June 2020, Virtual. (Program Organizing Committee)
- APS Conference for Undergraduate Women in Physics (CUWiP), UCI, Irvine, CA, January 2020.

- 235th American Astronomical Society Meeting, Honolulu, HI, January 2020.
- ComSciCon Flagship, June 2019, San Diego, CA.
- 233rd American Astronomical Society Meeting, January 2019, Seattle, WA.
- Center for Adaptive Optics Fall Science Retreat, Workshop on High Contrast Exoplanet Imaging Performance, November 2018.
- 2018 Dunlap Institute Summer School for Astronomical Instrumentation, Toronto, Canada, July 2018.
- APS Conference for Undergraduate Women in Physics (CUWiP), Columbia/Barnard/CCNY, New York, NY, January 2018.
- New Horizons Science Team Meeting, Johns Hopkins Applied Physics Laboratory, Laurel, MD, January 2018.
- 231st American Astronomical Society Meeting, January 2018, National Harbor, MD.
- Astronomical Society of New York (ASNY), Union College, Schenectady, NY, November 2017.
- 2017 AAS Division for Planetary Sciences Meeting, Provo, UT, October 2017.
- APS Conference for Undergraduate Women in Physics (CUWiP), Princeton University, Princeton, NJ, January 2017.
- SAMSI Astrostatistics Workshop for Undergraduates, Research Triangle Park, NC, October 2016
- CoolStars19, Uppsala, Sweden, June 2016.
- APS Conference for Undergraduate Women in Physics (CUWiP), Wesleyan College, Middletown, CT, January 2016.