

# William R. Saunders

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725 Commonwealth Ave.  
Boston, MA 02215  
email: wsaund(at)bu.edu  
website: williamrsaunders.com

<b>EDUCATION</b>	<b>Boston University</b> , Boston, MA Ph.D. in Astronomy (anticipated) May 2023 Advisor: Paul Withers GPA: 3.93/4
	<b>Boston University</b> , Boston, MA M.A. in Astronomy May 2020
	<b>University of Pennsylvania</b> , Philadelphia, PA B.A. in Physics & Astronomy, <i>summa cum laude</i> with honors May 2018 Advisor: Gary Bernstein Senior Honors Thesis: <i>Development of Efficiency Simulator for Detecting Planet Nine using the Dark Energy Survey</i> Minors: Mathematics, History GPA: 3.81/4
<b>RESEARCH POSITIONS</b>	<b>Graduate Research Fellow</b> Sept. 2018 - Present Boston University, Boston MA Advisor: Paul Withers (BU), Michael Person (MIT) Topics: Stellar occultations, Mars atmosphere, Uranus atmosphere
	<b>Undergraduate Researcher</b> Sept. 2015 - May 2018 University of Pennsylvania, Philadelphia, PA Advisor: Gary Bernstein Topic: Transient search using the Dark Energy Survey
	<b>Summer Researcher</b> June 2017 - Aug. 2017 NASA Ames Research Center, Moffett Field, CA Advisor: Uma Gorti Topic: Protoplanetary disk simulations
	<b>High School &amp; Undergraduate Researcher</b> Aug. 2012 - June 2015 University of Pennsylvania, Philadelphia, PA Advisor: James Aguirre Topic: Supernova remnant search with PAPER radiotelescope
	<b>High School Summer Researcher</b> May 2014 - Aug. 2014 American Museum of Natural History, New York, NY Advisor: Emily Rice Topic: Brown dwarfs
	<b>Teaching Fellow</b> Jan. 2021 - May 2021 Boston University, Boston MA AS 100: Cosmic Controversies

**Teaching Fellow**  
Boston University, Boston MA  
AS 102: The Astronomical Universe

Sep. 2021 - Dec. 2021

**HONORS AND AWARDS**

Summer Professional Development Fellowship, Boston University	May - Aug. 2021
DPS Outreach and Education Grant, astro[sound]bites	2020 - 2021
Massachusetts Space Grant Consortium Graduate Fellowship	May - Aug. 2021
Massachusetts Space Grant Consortium Graduate Fellowship	May - Aug. 2020
NSF Graduate Research Fellowship Honorable Mention	April 2020
AGU Outstanding Student Presentation Award (awarded to top 3.5%)	Dec. 2019
Pennsylvania Space Grant Consortium Undergraduate Scholarship	2017 - 2018
University Scholar (For Advanced Undergraduate Researchers)	2015 - 2018
Dean's List	2014 - 2018
University Physics Competition Silver Medalist	Jan. 2016
National Merit Scholar	2014

**PEER-REVIEWED PUBLICATIONS**

First Author

2. **Saunders, W.**, Person, M., Withers, P., Sayanagi, K., Young, C., Randall, C., Valle, T.(in review). Assessment of the Feasibility of Space-Based Stellar Occultation Observations of Uranus and Neptune. *Planetary and Space Science*.
1. **Saunders, W.**, Person, M., Withers, P., (2021). Observations of Gravity Waves in the Middle Atmosphere of Mars. *The Astronomical Journal*.

Co-Author

2. Bernardinelli, P., Bernstein, G., Sako, M., Hamilton, S., Gerdes, D., Adams, F., **Saunders, W.**, ... (2021). Testing the Isotropy of the Dark Energy Survey's Extreme Trans-Neptunian Objects. *The Planetary Science Journal*.
1. Bernardinelli, P., Bernstein G., Sako, M., Liu, T., **Saunders, W.**, ... (2020). Trans-Neptunian Objects Found in the First Four Years of the Dark Energy Survey. *The Astrophysical Journal*.

**CONFERENCE PRESENTATIONS**

First Author, Research

8. (Poster, anticipated) *The Feasibility of Space-Based Stellar Occultation Observations of Uranus and Neptune* Dec. 2021  
AGU Winter Meeting, New Orleans, LA.
7. (Invited Talk) *Observations of Gravity Waves in the Middle Atmosphere of Mars* Dec. 2020  
AGU Winter Meeting, virtual
6. (Talk) *Measuring the Stratospheric Temperature of Uranus Using Archival Stellar Occultations* Dec. 2020  
AGU Winter Meeting, virtual.
5. (Talk) *Re-Analysis of the 1976 Mars Occultation of Epsilon Geminorum: Detection of Gravity (Buoyancy) Waves* Oct. 2020  
EPSC Meeting, virtual.
4. (Poster) *Re-Analysis of the 1976 Mars Occultation of Epsilon Geminorum* Dec. 2019  
AGU Winter Meeting, San Francisco, CA  
**Winner of the Outstanding Student Presentation Award**

3. (Poster) *Initial Results of a Re-Analysis of the 1976 Mars Occultation of Epsilon Geminorum* July 2019  
Ninth International Conference on Mars, Pasadena, CA
2. (Poster) *Impact of Ice on the Evolution of Protoplanetary Disks and Formation of Planetary Systems* Jan. 2018  
AAS Winter Meeting, Washington, D.C.
1. (Talk) *Optimizing Difference Imaging to Identify Trans-Neptunian Objects using the Dark Energy Survey* Aug. 2016  
Astrophilly Conference, Villanova, PA

#### Outreach

4. (Talk) *Astro[sound]bites: A new audio resource for emphinformal education* Nov. 2021  
Workshop on Astronomy Beyond the Common Senses, virtual.
3. (Talk) *Astro[sound]bites: A new audio resource for emphconveying recent astronomy research* May 2021  
Communicating Astronomy with the Public, virtual.
2. (iPoster and Talk) *Astro[sound]bites: A new audio resource for conveying recent astronomy research* Jan. 2021  
AAS Winter Meeting, virtual  
Conference proceeding in the Bulletin of the AAS
1. (Talk) *Astro[sound]bites: A new audio resource for conveying recent astronomy research* Oct. 2020  
DPS Annual Meeting, virtual.

#### **INVITED TALKS & COLLOQUIA**

8. *The Shadow Chaser: A Mission Concept to Observe Uranus and Neptune Stellar Occultations* (Jan. 2022)  
NASA Langley Research Center, Hampton, VA
7. *The Shadow Chaser: A Mission Concept to Observe Uranus and Neptune Stellar Occultations* (Nov. 2021)  
Hampton Univ., Hampton, VA
6. *The Shadow Chaser: A Mission Concept to Observe Uranus and Neptune Stellar Occultations* Oct. 2021  
Astronomy Dept. Seminar Series, Boston Univ., Boston, MA
5. *Review of Observations of Uranus and Neptune* Mar. 2021  
Astronomy Dept. Seminar Series, Boston Univ., Boston, MA
4. *Creating the astro[sound]bites Podcast* April 2020  
Astronomy Dept. Seminar Series, Boston Univ., Boston, MA
3. *Re-Analysis of a Stellar Occultation: Finding Waves in Ancient Data* Nov. 2019  
Astronomy Dept. Seminar Series, Boston Univ., Boston, MA
2. *Impact of Ice on the Evolution of Protoplanetary Disks and Formation of Planetary Systems* Aug. 2017  
Meeting of the National Astrobiology Institute,  
NASA Ames Research Center, CA
1. *Optimizing Difference Imaging to Identify Trans-Neptunian Objects using the Dark Energy Survey* (plenary talk) Feb. 2017  
Yale Undergraduate Research Conference, New Haven, CT

## OUTREACH TALKS

2. *Hey, You're in the Way: Measuring Planet Atmospheres When They Align with Stars* July 2020  
Astronomy on Tap – Lansing, MI
1. *Hey, You're in the Way: Measuring Planet Atmospheres When They Align with Stars* May 2020  
CAS Public Talks, Boston University, Boston, MA

## SCIENCE OUTREACH

**astro[sound]bites Podcast Founder and Co-Host** Nov. 2019 - Present

- Bi-weekly podcast companion to Astrobites.org.
- Co-hosted by Malena Rice, Alex Gagliano, and I.
- Each episode features two Astrobites posts, discussion, and a “space sound”.
- Episode 33 was about sonification: inclusivity and innovation for BLV astronomers; inspiration for the general public.
- Learned how to perform sonification using three popular sonification tools: **Astronify**, **TwoTone**, **Miditime**
- Available on astrosoundbites.com, Apple Podcasts, Google Play, SoundCloud, and Spotify.
- Over 10,000 total downloads in over 50 countries.

**Brainspace Magazine Astronomy Contributor** Aug. 2019 - Present

- *Brainspace* is a quarterly science magazine aimed at children ages nine to fourteen with a readership of approximately 40,000.

### Published Works

“Thinking Small: The CubeSat Revolution” Fall 2021  
“Cloudy with a Chance of Bacteria” Spring 2021  
“Where did the Moon Come From?” Fall 2020  
“Bringing Home a Piece of Mars” Winter 2019 - 2020  
“Solar Storms” Fall 2019

**ComSciCon Flagship** Aug. 2021

- Flagship science communication conference for graduate students.
- Selected as attendee in 2021.

**Astrobites Administrative Committee** Sep. 2021 - Present

- Developed the first Astrobites webinar panel event: “How to Find an Advisor” in March 2021.
- Panel attended and viewed by over 40 participants.

**Astrobites Undergraduate Chair** Sep. 2020 - Aug. 2021

- Developed the first Astrobites webinar panel event: “How to Find an Advisor” in March 2021.
- Panel attended and viewed by over 40 participants.

**Astrobites Writing Contributor** Jan. 2019 - Jan. 2021

- Astrobites is a graduate-student run website that summarizes recent astronomy research at an undergraduate level.
- Writers publish monthly, and peer-review others’ publications.

**Research Peer Advisor** Aug. 2016 - May 2018

- Center for Undergraduate Research and Fellowships, University of Pennsylvania
- Advise undergraduates on first steps to beginning original research.

**MEDIA APPEARANCES** **REACH, a Science Podcast for Kids** Anticipated late 2021  
Recorded a segment on artificial satellites and the CubeSat revolution. Listen to REACH: <https://podcasts.apple.com/us/podcast/id1513671470>.

**Guest Presenter on In Plain English podcast** Anticipated Nov. 2021  
Listen to In Plain English: [inplainenglishpod.org](http://inplainenglishpod.org).

**GBH Guest Appearance** Sep. 2021  
Helped explained the celestial origin of the phrase "dog days of summer" in a segment that aired on GBH. Watch the segment here: <https://youtu.be/CZerMXwQJxU>.

**TUTORING & MENTORSHIP** **Carnegie Prep** 2017 - Present  
Tutor for high school and college math and physics courses.

**Ben Connect** 2020 - 2021  
Mentoring two undergraduates as part of the University of Pennsylvania alumni mentorship program.

**Physics Unlimited** August 2020  
Hosted two "facilitator sessions" for international high school students in the Physics Unlimited summer program to discuss physics and learn about academia.

**Center for Undergraduate Research and Mentorship** 2016 - 2018  
Undergraduate Peer Research Mentor.

**Dept. of Physics & Astronomy, University of Pennsylvania** 2015 - 2018  
Tutor for introductory physics and astronomy courses.

**PROFESSIONAL MEMBERSHIP** American Astronomical Society  
Division of Planetary Sciences of the AAS  
American Geophysical Union  
National Association of Science Writers  
Sigma Xi Scientific Research Honor Society  
Sonification World Chat