

# Phillip H. Phipps, PhD

## *Curriculum Vitae*

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University of Maryland, Baltimore County	email: phhipps at umbc dot edu
Planetary Magnetospheres Lab Code 695	website: philliphipps.space
at NASA's Goddard Space Flight Center	orcid: <a href="http://orcid.org/0000-0002-4323-4400">http://orcid.org/0000-0002-4323-4400</a>

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## Education

Ph.D. Astronomy, Department of Astronomy, Boston University	2019
M.A. Astronomy, Department of Astronomy, Boston University	2015
B.S. Physics with Honors, North Carolina State University	2013
B.S. Applied Mathematics with Honors, North Carolina State University	

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## Research Experience

- Postdoctoral Research Associate May 11, 2020 – present  
 Advisor: Dr. Timothy Stubbs  
 University of Maryland, Baltimore County, with the Center for Research and Exploration in Space Science and Technology (CRESST II) at NASA Goddard Space Flight Center Planetary Magnetospheres Lab Code 695  
 Radiation environment of the Lunar surface and the effect of topography.
  - Postdoctoral Research Associate May 2019 – May 10, 2020  
 Advisor: Prof. Paul Withers  
 Center for Space Physics, Boston University, Boston, MA  
 Juno radio occultations of the Io plasma torus around Jupiter.
  - Graduate Researcher Summer 2015 – April 2019  
 Advisor: Prof. Paul Withers  
 Department of Astronomy, Boston University, Boston, MA  
 Research on the Io Plasma Torus around Jupiter.
  - JPL Summer 2017 Internship Summer 2017  
 Advisor: Dr. Kamal Oudrhiri and Dustin Buccino  
 Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA  
 Worked with Juno radio science instrument team to analyze Juno radio occultations.
  - Graduate Researcher Summer 2014 – May 2015  
 Advisor: Prof. John T. Clarke  
 Department of Astronomy, Boston University, Boston, MA  
 Image analysis of Jupiter and Saturn aurora.
  - Undergraduate Researcher Fall 2010 – Spring 2013  
 Advisor: Prof. John M. Blondin  
 Department of Physics, NC State University, Raleigh, NC  
 Simulations of white dwarf accretion disks using parallelized Astrophysics hydrodynamic FORTRAN
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## Teaching Experience

1. Lecturer, AS 102 – The Astronomical Universe Summer 2019  
 Department of Astronomy, Boston University, Boston, MA  
 Taught introductory Astronomy to summer students during Boston University's Summer Session II.

For the following Teaching Fellow positions, I led discussion sessions and labs, graded homework and exams, and led night labs during the evenings.

2. Teaching Fellow, AS202 – Principles of Astronomy I Fall 2015  
Department of Astronomy, Boston University, Boston, MA
3. Teaching Fellow, AS203 – Principles of Astronomy II Spring 2015  
Department of Astronomy, Boston University, Boston, MA
4. Teaching Fellow, AS202 – Principles of Astronomy I Fall 2014  
Department of Astronomy, Boston University, Boston, MA
5. Teaching Fellow, AS109 – Cosmology Spring 2014  
Department of Astronomy, Boston University, Boston, MA
6. Teaching Fellow, AS 105 – Alien Worlds Fall 2013  
Department of Astronomy, Boston University, Boston, MA
7. Physics Tutor Spring 2012 – Spring 2013  
Department of Physics, NC State University, Raleigh, NC  
Tutored undergraduate physics for Engineers and non-majors

## Outreach

1. Boston University Open Nights Spring 2015 – May 2020  
Helped run BU public open nights at Judson B. Coit Observatory
2. Science for kids June 15, 2018  
Helped run a science event run by the Center for Space Physics, Boston University
3. Science by the pint January 2016  
Event put on by Harvard Universities Science in the news to discuss science with the general public over a pint.  
<http://sitn.hms.harvard.edu/science-by-the-pint/>
4. Open night for Metropolitan College group December 2015  
Managed an open night for the Boston University honor society of metropolitan college.
5. Lunar eclipse viewing September 2015  
Managed a BU public event for the viewing of the Lunar eclipse at Boston University's Coit Observatory.

## Observational Experience

*Lowell Observatory, Happy Jack, Arizona, Discovery Channel Telescope, 4.3m Telescope*  
*Judson B. Coit Observatory, Boston University, Boston, MA, 14", 10", 8" reflectors and 6" refractor*

## Computer Experience

*Languages:* Python, MatLab, IDL, some Fortran  
*Research tools:* NAIF/SPICE, DS9, MaximDL  
*Document Preparation:* LaTeX, Windows Office  
*Operating Systems:* Linux (Ubuntu), Windows, Mac

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## Professional Society Memberships

American Geophysical Union, Member	2016 – present
American Astronomical Society, Member	2010 - present
Sigma Pi Sigma honor society member	2013 - present
Society of Physics Students	2009-2016

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## Awards/Grants

Principal Investigator on NASA Juno-PSP award (\$246K)	November 2021
Co-Investigator on NASA NFDAP award (PI: Marissa Vogt, \$316K)	November 2019
Co-Investigator on NASA NFDAP award (PI: Paul Withers, \$289K)	March 2019
AAS International Travel Grant (\$2535)	March 2019
For travel to MOP 2019 in Sendai, Japan	
Magnetospheres of Outer Planets (MOP) Travel Grant (\$1500)	April 2017
For Travel to MOP 2017 meeting in Uppsala, Sweden	
JPL Summer 2017 Internship, June 26 <sup>th</sup> - Sept 2 <sup>nd</sup> (\$8000)	March 2017
Astronomy Department Teaching Award (\$250)	April 2016
Massachusetts Space Grant Consortium Grant (\$1800)	January 2016
AAS International Travel Grant (\$983)	April 2015
For travel to IAU meeting in Honolulu, Hawaii, August 2015	

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## Publications

1. **Phipps, Phillip H.**, Withers, Paul, Buccino, Dustin R., Yang, Yu-Ming, and Parisi, Marzia (2021), Two years of observations of the Io plasma torus by Juno radio occultations: Results from Perijoves 1 to 15, J. Geophys. Res. Space Physics, 126, e2020JA028710
  2. **Phipps, Phillip H.**, and Bagenal, Frances (2021), Centrifugal Equator in Jupiter's Plasma Sheet, J. Geophys. Res. Space Physics, 126, e2020JA028713
  3. **Phipps, Phillip H.**, Withers, Paul, Vogt, Marissa, Buccino, Dustin R., Yang, Yu-Ming, Parisi, Marzia, Ranquist, Drake, Kollmann, Peter, and Bolton, Scott (2020), Where is the Io plasma torus? A comparison of observations by Juno radio occultations to predictions from Jovian Magnetic field models, J. Geophys. Res. Space Physics, DOI: 10.1029/2019JA027633
  4. **Phipps, Phillip H.**, Withers, Paul, Buccino, Dustin R., Yang, Yu-Ming, and Parisi, Marzia (2019), Variations in the density distribution of the Io plasma torus as seen by radio occultations on Juno Perijoves 3, 6, and 8, J. Geophys. Res. Space Physics, 124, DOI: 10.1029/2018JA026297
  5. **Phipps, Phillip H.**, Withers, Paul, Buccino, Dustin R., and Yang, Yu-Ming (2018), Distribution of plasma in the Io plasma torus during *Juno* Perijove 1, J. Geophys. Res. Space Physics, 123, DOI:10.1029/2017JA025113
  6. **Phipps, Phillip H.** and Withers, Paul (2017), Radio occultations of the Io plasma torus by *Juno* are feasible, J. Geophys. Res. Space Physics, 122, DOI: 10.1002/2016JA023447
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## Abstracts

My name is written in bold font (e.g., **Phipps, P. H.**).

1. **Phipps, P.H.**, Stubbs, T. J., Looper, M. D., Spence, H.E., and Townsend, L. W. (2021), Solar Energetic Particle Radiation Dosage in Biological Systems Around a Lunar Crater , AGU Fall Meeting 2021, New Orleans, Dec 13 – Dec 17

2. **Phipps, P.H.**, Stubbs, T. J., Looper, M. D., Spence, H.E., and Townsend, L. W. (2021), Radiation Dosage from Solar Energetic Particles Around a Lunar Crater , LEAG 2021, Virtual, Aug 31 – Sept. 2
3. **Phipps, P.H.**, Stubbs, T. J., Looper, M. D., Spence, H.E., and Townsend, L. W. (2021), Solar Energetic Particle Radiation Dosage Near a Simple Lunar Crater, NESF 2021, Virtual, Jul 20-23
4. **Phipps, P.H.**, Stubbs, T. J., Looper, M. D., and Spence, H.E. (2021), Galactic Cosmic Ray Proton Radiation Dosage Near a Simple Lunar Crater, LPSC 2021, Virtual, Mar 15-19
5. **Phipps, P.H.**, Stubbs, T. J., Looper, M. D., and Spence, H.E. (2020), Radiation Exposure in the Vicinity of a Simple Crater on the Moon, 2020 AGU Fall Meeting, Virtual, Dec 1-17
6. Yang, Y-M, Buccino, D., Parisi, M., **Phipps, P. H.**, Folkner, W. M., Kahan, D. S., Withers, P., & Oudrhiri, K., (2020) Recent Advances in the Io Plasma Torus Calibrations for Galileo, Juno, and Europa Clipper Radio Science Measurements, 2020 AGU Fall meeting, Virtual, Dec. 1-17
7. **Phipps, P.H.**, Stubbs, T. J., Looper, M. D., and Spence, H.E. (2020), Variations in Radiation Exposure Near a Simple Lunar Crater, Annual Meeting of the Lunar Exploration and Analysis Group 2020 Meeting, Virtual, Sept. 14-16
8. **Phipps, P.H.**, Withers, P., Buccino, D. R., Yang, Y-M., Parisi, M., Hinton, P. C., & Bagenal, F. (2019), Io Plasma Torus Variability During the Juno Mission, 2019 AGU Fall meeting abstracts, San Francisco, CA, Dec. 9 - 13
9. Yang, Y-M, Buccino, D., Parisi, M., Folkner, W. M., **Phipps, P. H.**, Kahan, D. S., Withers, P., & Oudrhiri, K., (2019) Juno Radio Science Observations and Gravity Science Calibrations of Io plasma torus: IPT impacts to Europa Gravity Science, 2019 AGU Fall meeting abstracts, San Francisco, CA, Dec. 9 - 13
10. **Phipps, P.H.**, Withers, P., Buccino, D. R., Yang, Y-M., Parisi, M., Hinton, P. C., & Bagenal, F. (2019), Juno Radio Occultations of the Io Plasma Torus, NEROC Symposium, MIT Haystack Observatory, Westford, MA, Nov 1
11. Molrano, A., Zannoni, M., Gomez Casajus, L., Tortora, P., Withers, P., **Phipps, P. H.**, Buccino, D., & Oudrhiri, K. Morphology of the Io Plasma Torus inferred from Dual Uplink-Dual Downlink calibration during Juno Mission, EPSC-DPS Joint Meeting 2019, Geneva, Switzerland, 15-20 Sept.
12. **Phipps, P.H.**, Withers, P., Hinton, P. C., Bagenal, F., Buccino, D. R., Yang, Y-M., & Parisi, M. (2019), The Centrifugal Equator as Seen by Juno Radio Occultations of the Io Plasma Torus, Magnetospheres of the Outer Planets meeting, Sendai, Japan, 3-7 June.
13. Zannoni, M., Gomez Casajus, L., Molrano, A., Tortora, P., **Phipps, P. H.**, Withers, P., Buccino, D., Oudrhiri, K., Durante, D., & Iess, L., (2019), Observations of the Io Plasma Torus with Juno radio science experiment, 21<sup>st</sup> EGU General Assembly, Vienna, Austria, 7-12 Apr.
14. **Phipps, P.H.**, Withers, P., Buccino, D. R., Yang, Y-M., Hinton, P. C., & Bagenal, F. (2018), Variability in the Io Plasma Torus as Seen by Juno Radio Occultations, Abstract 438966 presented at 2018 Fall Meeting, AGU, Washington, DC, 10-14 Dec.
15. Yang, Y-M, Buccino, D., Parisi, M., Folkner, W. M., **Phipps, P. H.**, Withers, P., Kahan, D. S., & Oudrhiri, K., (2018) Juno Radio Science Observations and Gravity Science Calibrations of Io Plasma Torus and its Impact on Telecommunications Links for Future Missions, 2018 AGU Fall meeting abstracts, Washington, DC, 10-14 Dec.
16. **Phipps, P.H.**, Withers, P., Buccino, D. R., Yang, Y-M., Hinton, P. C., & Bagenal, F. (2018), Io plasma torus geometry from *Juno* radio occultations, Magnetospheres of Outer Planets meeting, Boulder, CO, 9-13 Jul
17. **Phipps, P. H.**, Withers, P., Buccino, D. R., Yang, Y-M., & Hinton, P. C. (2017). Juno Perijove 1 radio occultation of the Io plasma torus, Abstract 279802 presented at 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.

18. Yang, Y-M, Buccino, D., Folkner, W. M., Oudrhiri, K., **Phipps, P. H.**, Parisi, M., & Kahan, D. S. (2017), Juno Radio Science Observations and Gravity Science Calibrations of Plasma Electron Content in Io Plasma Torus, 2017 AGU Fall Meeting Abstracts, New Orleans, LA, 11-15 Dec.
19. **Phipps, P.H.** & Withers, P. (2017), Radio occultations of the Io plasma torus with the *Juno* Spacecraft: A study of feasibility, Magnetospheres of Outer Planets meeting, Uppsala, Sweden, 12-16 June
20. **Phipps, P.H.** & Withers, P. (2016). Feasibility of Juno radio occultations of the Io plasma torus, Abstract 178300 presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
21. **Phipps, P.H.** & Clarke, J.T. (2015). Calculation of the Auroral Color Ratio of the Gas Giants Using Images, IAU General Assembly, Meeting #29, #2258018

## Seminars

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| 1. Mapping Radiation Dose around a Lunar Crater During Solar Energetic Particle Events,<br>GSFC Solar System Exploration Spring Seminar Series | April 20, 2022   |
| 2. Juno Observations of the Io plasma torus,<br>GSFC Solar System Exploration Spring Seminar Series  | April 17, 2019   |
| 3. Juno Observations of the Io plasma torus, JPL seminar   | October 15, 2018 |

## Spacecraft Mission Involvement

- Lunar Reconnaissance Orbiter (as CRESST II Post-Doc with the CRaTER team)
- Juno Science Team (as NFDAP Co-I, Juno Participating Scientist)
- Juno Magnetospheric Working Group (as NFDAP Co-I, Juno Participating Scientist)
- Juno Gravity Science team (2017 JPL summer intern with Radio Science team)

## Professional Service

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| 1. Proposal Review Panel  |      |
| • Executive Secretary on NASA review panel                                | 2020 |
| 2. Review responsibilities for articles submitted to scientific journals. |      |
| • Journal of Geophysical Research: Space Physics                          | 2022 |
| • Journal of Geophysical Research: Space Physics                          | 2021 |
| • Geophysical Research Letters  | 2020 |
| • Journal of Geophysical Research: Space Physics                          | 2019 |