

# Tristan D. Weber

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## EDUCATION

### University of Colorado, Boulder, CO

Entry Date: Fall 2014

- Ph.D. Candidate in Astrophysics and Planetary Science
- Research Focus: Plasma processes and magnetic topology in the Martian ionosphere
- GPA: 3.85

### University of Michigan, Ann Arbor, MI

Graduated: Spring 2014

- Bachelor of Science (B.S.) in Earth Systems Science and Engineering
- Minor in Computer Science
- Research Focus: Non-thermal heating mechanisms in the solar corona.
- GPA: 3.85

## RESEARCH EXPERIENCE

### Laboratory for Atmospheric and Space Physics, University of Colorado

- Graduate Research Assistant Fall 2014 - Present
  - Project 1: Characterization of magnetic topology at Mars using electron pitch-angle distributions. Performed analysis of topological structure and variability with a focus on implications for ion escape processes.
  - Project 2: Analysis of first in-situ detections of interplanetary dust at Mars. Developed algorithm for identification of dust impacts on the Langmuir Probe and Waves (LPW) instrument.
  - Supervisors: David Brain, Laila Andersson, Robert Ergun
- REU in Solar and Space Physics Summer 2013
  - Project: Study of the plasma environment of Europa in preparation for the *JUNO* mission to Jupiter. Data from the *Galileo* spacecraft were reanalyzed and compared to a hybrid-MHD model of the moon's plasma environment.
  - Supervisor: Fran Bagenal

### University of Michigan

- Undergraduate Research Assistant Fall 2013 - Summer 2014
  - Project: Analysis of data from the *WIND* spacecraft to study the heating of the solar wind. Helped construct a model of the plasma's thermal balance that constrains the driving processes and radial extent of solar wind heating.
  - Supervisor: Justin Kasper

## SELECTED PUBLICATIONS

- [1] **Weber, T.**, Brain, D., Mitchell, D., Xu, S., Connerney, J., Halekas, J. (2017). "Characterization of Low-Altitude Nightside Martian Magnetic Topology Using Electron Pitch Angle Distributions". *Journal of Geophysical Research: Space Physics*, 122(10), 9777-9789.
- [2] L. Andersson, **T. D. Weber**, D. Malaspina, F. Crary, R. E. Ergun, G. T. Delory, C. M. Fowler, M. W. Morooka, T. McEnulty, A. I. Eriksson, D. J. Andrews, M. Horanyi, A. Collette, R. Yelle, and B. M. Jakosky. (2015) "Dust Observations at Orbital Altitudes Surrounding Mars", *Science*, 350.6261
- [3] Kasper, J. C., Klein, K. G., **Weber, T.**, Maksimovic, M., Zaslavsky, A., Bale, S. D., Case, A. W. (2017). "A Zone of Preferential Ion Heating Extends Tens of Solar Radii from the Sun". *The Astrophysical Journal*, 849(2), 126.
- [4] Xu, S., Mitchell, D., Luhmann, J., Ma, Y., Fang, X., Harada, Y., Hara, T., Brain, D., **Weber, T.**, Mazelle, C. and DiBraccio, G.A., (2017). "High-Altitude Closed Magnetic Loops at Mars Observed by MAVEN". *Geophysical Research Letters*, 44(22).
- [5] Ergun, R. E., Andersson, L. A., Fowler, C. M., Woodson, A. K., **Weber, T. D.**, Delory, G.T., Andrews, D.J., Eriksson, A.I., McEnulty, T., Morooka, M.W. and Stewart, A.I.F., (2016). "Enhanced O<sup>2+</sup> loss at Mars due to an ambipolar electric field from electron heating". *Journal of Geophysical Research: Space Physics*, 121(5), 4668-4678.

**PROGRAMMING  
SKILLS**

- Expertise in MATLAB, IDL, and C++. Large research projects conducted in each language.
- Experienced with Python, Mathematica, Maple, JavaScript, PHP, SQL, and Prolog
- Research experience using large-scale simulation codes including the Space Weather Modeling Framework (SWMF), the Global Ionosphere Thermosphere Model (GITM), and the Dedalus framework.

**TEACHING  
EXPERIENCE**

- **Instructor of Record** for ASTR 2040 – The Search for Life in the Universe, *Summer 2017*
- **Teaching Assistant** for AOSS 380 – Radiative and Dynamical Processes, *Fall 2013*
- **Private Tutoring** in Physics, Math, and C++ Programming, *2010 - 2014*

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