Timothy B. Keebler

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Education:

Ph.D. Candidate, University of Michigan
College of Engineering
Department of Climate and Space Sciences and Engineering
Advisor: Gábor Tóth

Master of Science, University of Michigan, 2020
Climate and Space Sciences and Engineering
GPA: 4.00/4.00

Bachelor of Science, Millersville University of Pennsylvania, 2019
Major: Meteorology
Minors: Mathematics; Heliophysics and Space Weather
Magna Cum Laude, University Honors, Departmental Honors
Thesis: Statistical Characterization of Aircraft Static Pressure Defect
GPA: 3.98/4.00

Pennsylvania Governor's School for the Sciences, 2014
Carnegie Mellon University

Educator Experience:

Grader, University of Michigan   *January 2022 – April 2022*
   Course: SPACE 423 Data Analysis and Visualization for Geoscientists

Grader, University of Michigan   *August 2021 – December 2021*
   Course: SPACE 574 Introduction to Space Physics

Graduate Student Instructor, University of Michigan   *August 2021 – December 2021*
   Course: CLIMATE 102 Extreme Weather

Teaching Assistant, University of Michigan   *May 2020 – July 2021*
   Courses: CLIMATE 102 Extreme Weather
            CLIMATE 463 Air Pollution Meteorology

SEGUE Module Reviewer   *May 2020 – June 2020*
   Module: Instrumentation and Measurement
            of Surface Precipitation

Grader, University of Michigan   *September 2019 – December 2020*
   Courses: CLIMATE 102 Extreme Weather
            CLIMATE 401 Geophysical Fluid Dynamics

Teaching Assistant, Millersville University   *August 2017 – May 2019*
    Courses: ESCI 109 The Atmosphere
             ESCI 202 The Earth in Space

SEGUE Student Contributor, Millersville University   *June 2017 – December 2017*
    Developed content for meteorological instrumentation online educational modules as part of UCAR's
COMET/MetEd program (funded by NSF Grant #1642643)

Research Experience:

Graduate Student Research Assistant, Toth Research Group   *September 2019 – present*
    Running the BATS-R-US space weather model in the Outer Heliosphere physics domain to produce a
dataset from 1 AU to 75 AU of solar wind propagation in the ecliptic plane. Output is publicly
accessible via the MSWIM2D dataset at http://csem.engin.umich.edu/mswim2d/.

    Validating and extending the MHD-AEPIC adaptive PIC model for extreme space weather events.
This work is part of NSF PREEVENTS grant #1663800.

Temporary Assistant in Research, Liemohn Research Group   *July 2019 – September 2019*
    Continued work from the PICASSO REU to demonstrate curlometer technique uncertainty with
Cluster II mission spacecraft data in the ring current region, culminating in paper publication
(currently in preparation)

PICASSO NSF REU (NSF Grant #1659248)   *May 2018 – August 2018*
    Characterized errors in curlometer technique applied to the Earth's ring current in the inner
magnetosphere using Cluster II mission spacecraft data. This research was presented as posters at the
2018 AGU Fall Meeting and 2019 AMS Annual Meeting.

SEAR-MAR Educational Deployment of the UWKA   *November 4-18, 2017*
Research Aircraft
    Deployed a suite of meteorological ground instrumentation including stationary and mobile
rawinsondes, acoustic sodar, and flux tower. Designed, planned, or modified ten flight tracks, and
served as copilot for RF10: Static Pressure Calibration. The data from this flight was used for the
undergraduate senior thesis 'Statistical Characterization of Aircraft Static Pressure Defect.' Other
data in this project resulted in a talk at the 2018 Northeastern Storm Conference.

Presentations/Publications:

Keebler, T., Tóth, G., Zieger, B., and Opher, M. 2022. MSWIM2D: Two-dimensional Outer Heliosphere
    Solar Wind Modeling. *Astrophysical Journal Supplement Series*, 260:43. DOI: 10.3847/1538-
    4365/ac67eb.

Keebler, T., Tóth, G., and Wang, X. 2022: MHD with Adaptive Embedded PIC (MHD-AEPIC):
    Halloween 2003 Storm. Global System Modeling Poster Session, Geospace Environment
    Modeling Workshop (GEM), Honolulu, HI, 19-26 June 2022.

Keebler, T., Tóth, G., Opher, M., and Zieger, B. 2021: MSWIM2D: Two-Dimensional Data-Driven
    Michigan Solar Wind Model for the Outer Heliosphere, From the Sun to the Local Interstellar

Medium III Poster Session, American Geophysical Union Fall Meeting, New Orleans, LA, 13-17 December 2021.

Keebler, T., Tóth, G., Opher, M., and Zieger, B. 2021: MSWIM2D: Two-dimensional data-driven Michigan Solar WInd Model for the outer heliosphere, Working Group 2: Interplanetary and Heliosphere Poster Session, Solar Heliospheric and INterplanetary Environment Workshop (SHINE), virtual, 2-5 August 2021.

Keebler, T., Liemohn, M., and Ganushkina, N. 2021. Cluster curlometry limitations in the ring current region. Preprint on https://essoar.org (2021) DOI: 10.1002/essoar.10502307.2

Keebler, T. and Tóth, G. 2021: "MSWIM2D Outer Heliosphere Solar Wind Dataset" presented virtually at WHPI Show and Tell Tutorial Session, 15 April 2021. Recording available at https://whpi.hao.ucar.edu/whpi_showandtell.php.

Keebler, T. and Liemohn, M., 2019: Uncertainty in Curlometer Technique: Cluster Ring Current Observations. 10th Annual Graduate Student Symposium, Michigan Institute for Plasma Science and Engineering, University of Michigan, Ann Arbor, MI, 13 November 2019.

Keebler, T. and Liemohn, M., 2019: Uncertainty in Curlometer Technique: Cluster Ring Current Observations. Emerging Graduate Student Research Poster Session, Engineering Research Symposium, College of Engineering, University of Michigan, Ann Arbor, MI, 8 November 2019.

Keebler, T. and Liemohn, M., 2019: Ring Current Density Error Analysis Using Curlometry. 16th Conference on Space Weather, 99th American Meteorological Society Annual Meeting, Phoenix, AZ, 6-10 January 2019.

Keebler, T. and Liemohn, M., 2018: Ring Current Density Error Analysis Using Curlometry. Magnetospheric Physics, Understanding Earth's Ring Current: Measurements, Theory, and Modeling II Poster Session, American Geophysical Union Fall Meeting, Washington, D.C., 9-14 December 2018.

Keebler, T., Eberwein, C., Cook, M., and Clark, R., 2018: Space Weather Academic Network (SWAN). Ionosphere Research and Applications and General Space Weather Services and Education Poster Session, Space Weather Workshop, Westminster, CO, 16-20 April 2018.

Keebler, T. and Billings, B., 2018: "Gravity Waves Observed during the SEAR-MAR UW King Air Deployment" presented at Mesoscale Meteorology Session, 43rd Annual Northeastern Storm Conference, Saratoga Springs, NY, 9-11 March 2018.

Keebler, T. and Clark, R., 2018: Statistical Methods for Determination of Aircraft Static Pressure Defect. Student Poster Session, 17th Annual AMS Student Conference, 98th American Meteorological Society Annual Meeting, Austin, TX, 6-12 January 2018

Keebler, T., Stitely, N., and Clark, R., 2017: High Altitude Balloon Payload Design using Customizable Data Acquisition. Ionosphere Research and Applications and General Space Weather Services and Education Poster Session, Space Weather Workshop, Interlocken, CO, 1-5 May 2017.

Austin, J., Catalano, R., Finger, L., Haag, R., Huffman, N., **Keebler, T.**, and Kratzer, M., 2014: A Study of High Temperature Superconductivity with Chemical Substitutions in the 123 and 2223 Systems. Journal of the Pennsylvania Governor's School for the Sciences.

Grants and Fellowships:

University of Michigan College of Engineering Board of Reagents Fellowship, 2019

AMS Space Weather Student Travel Grant, 2019

NASA Pennsylvania Space Grant Consortium Undergraduate Scholarship, 2017-2018

Professional Memberships:

American Geophysical Union, student member