MAREK SLIPSKI

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EDUCATION

University of Colorado Boulder Sep 2012 – Jan 2019
PhD in Geophysics
Advisor: Bruce Jaksoky
Department of Astrophysical and Planetary Sciences

University of Rochester Sep 2007 – Dec 2011
Bachelor of Science in Physics and Astronomy
Department of Physics and Astronomy

RESEARCH EXPERIENCE

NASA Postdoctoral Program Fellow September 2019 – Present
Jet Propulsion Laboratory
Advisor: Armin Kleinböhl

· Identifying Martian mesospheric clouds in MRO MCS limb observations to create a comprehensive climatology.
· Characterizing the thermal structure in the middle and upper atmosphere using MCS and MAVEN instruments to determine the role waves and tides play in mesospheric cloud formation.

Research Scientist Feb 2019 – May 2019
Laboratory for Atmospheric and Space Physics, University of Colorado Boulder
Advisor: Bruce Jakosky

· Investigated variability of Mars' homopause/turbopause and exobase altitudes during the 2018 planet-encircling dust event neutral densities from MAVEN's NGIMS instrument and temperatures from MRO's MCS.

Graduate Research Assistant Jan 2013 – Feb 2019
Laboratory for Atmospheric and Space Physics, University of Colorado Boulder
Advisor: Bruce Jaksoky

· Compared Mars' thermal structure in the lower atmosphere using MRO MCS temperature profiles and upper atmosphere using MAVEN NGIMS densities to investigate the physical processes setting the turbopause level and causing its observed variability.
· Derived scale heights and homopause and exobase altitudes from MAVEN NGIMS neutral densities to determine the fractionation of Ar isotopes and integrated Ar escape.
· Modeled the effects of volcanic outgassing, sputtering, crustal degassing, and impacts on Ar isotope ratios throughout Mars' history to assess total atmospheric loss.

NASA Undergraduate Student Research Assistant Jan 2010 – May 2010
NASA Marshall Space Flight Center, NASA Undergraduate Student Research Program
Advisor: James Adams

· Began development of a model to predict worst-case solar proton environments for spacecraft missions by analyzing spectral energy distributions of solar particle events.

Undergraduate Research Assistant Sep 2008 – Dec 2011
University of Rochester
Advisor: Eric Mamajek

· Searched for nearby candidate dwarf stars using photometry and astrometry in the All-Sky Compiled Catalogue.
· Derived ages for exoplanet host stars using chromospheric activity measurements and empirical activity-rotation-age calibrations.

HONORS AND AWARDS

Participant in NASA JPL Planetary Science Summer School	2016
Participant in NAI Summer School in Astrobiology	2014
Recipient of NASA MEPAG Student Travel Grant	2014
University of Rochester Cum Laude with Highest Distinction	2011
Participant in NASA Undergraduate Student Research Program	2010
Sigma Pi Sigma Inductee, National Physics Honors Society	2010
Participant in University of Rochester Summer REU program	2009, 2010, 2011
Recipient Iota Book Award, Iota Chapter of Phi Beta Kappa	2008
University of Rochester Dean's List	2007 – 2011
Wilder Trustee Scholarship	2007 – 2011

PUBLICATIONS

Slipski, M., Jakosky, B., Benna, M., Elrod, M., Mahaffy, P., Kass, D., Stone, S., Yelle, R. (2018). Variability of Martian Turbopause Altitudes. *Journal of Geophysical Research - Planets*, 123, 2939-2957.

Jakosky, B. M., Brain, D., Chaffin, M., Curry, S., Deighan, J., Grebowsky, J., ... **Slipski, M.**, ... & Zurek, R. (2018). Loss of the Martian atmosphere to space: Present-day loss rates determined from MAVEN observations and integrated loss through time. *Icarus*, 315, 146-157.

Elder, C., Bramson, A., Blum, L., Chilton, H., Chopra, A., Chu, C., Das, A., Davis, A., Delgado, A., Fulton, J., Jozwiak, L., Khayat, A., Landis, M., Molaro, J., **Slipski, M.**, Valencia, S., Watkins, J., Young, C., Budney, C., Mitchell K. (2017). OCEANUS: A high science return Uranus orbiter with a low-cost instrument suite. *Acta Astronautica*.

Jakosky, B. M., **Slipski, M.**, Benna, M., Mahaffy, P., Elrod, M., Yelle, R., Stone, S., Alsaeed, N. (2017). Mars atmospheric history derived from upper-atmosphere measurements of $^{38}Ar/^{36}Ar$. *Science*, 355(6332), 1408-1410.

Slipski, M., and Jakosky, B. M. (2016). Argon isotopes as tracers for martian atmospheric loss. *Icarus*, 272, 212-227.

ACADEMIC SERVICE

Referee for *JGR-Planets*, *JGR-Atmospheres*
Proposal Reviewer for NASA
Judge for Fall AGU Student Posters
Served as **Executive Secretary** for NASA Review Panel

AbGradCon Local Organizing Committee Member	2016
"Life" Synthesis Team member for the 8th International Conference on Mars	2014
Graduate student concerns committee representative	2013

MENTORING EXPERIENCE

Co-mentor to Alex Scatena, *Fairview High School student*	Summer 2018
Co-mentor to Hind Saeed, *LASP REU student*	Summer 2017
Co-mentor to Noora Alsaeed, *LASP REU student*	Summers 2015 & 2016
Physics tutor, *University of Rochester*	2009 – 2011

TEACHING EXPERIENCE

Planets and Their Atmospheres Spring 2015
Teaching Assistant to Jean-Michel Desert
Guest Lecture: Climate and Evolution of Atmospheres
University of Colorado Boulder

Introduction to Geology Spring 2015
Guest Lecture: Climates of the Terrestrial Planets
Front Range Community College

Introduction to Astronomy Fall 2012
Laboratory Teaching Assistant to Seth Hornstein
University of Colorado Boulder

Elementary Astrophysics Spring 2011
Undergraduate Teaching Assistant to Dan Watson
University of Rochester

The Solar System and Its Origins Fall 2010
Undergraduate Teaching Assistant to Dan Watson
University of Rochester

PUBLIC OUTREACH

Public lecture on Planetary Atmospheres, Rotary Club, *Longmont, CO*	2015
Organized public lectures on astronomy, Rotary Club, *Longmont, CO*	2015 & 2016
Co-organized MAVEN demonstrations, CU Boulder Astronomy Day, *Boulder, CO*	2014 & 2015
Public lecture on MAVEN mission, Boardman High School, *Boardman, OH*	2013
Observing night lead, Sommers-Bausch Observatory, *Boulder, CO*	2012 – 2016
Science Fair Judge, *Kansas City, MO*	2012
Observing night lead, Mees Observatory, *Bristol Hills, NY*	2009 – 2011

TALKS AND PRESENTATIONS

Conference Talk July 2019
Slipski, M., Jakosky, B., Kleinböhl, A. "Turbopause levels and mesospheric cloud formation." *Ninth International Conference on Mars*, abstract 6313.

Conference Talk Dec 2018
Slipski, M., Jakosky, B., Benna, M., Elrod, M., Mahaffy, P., Kass, D., Stone, S., Yelle, R. "Variability of Mars' Turbopause Altitudes." *American Geophysical Union, Fall Meeting*, abstract #P32B-02.

Poster Sep 2018
Slipski, M., Jakosky, B., Benna, M., Elrod, M., Mahaffy, P., Kass, D., Stone, S., Yelle, R., Scatena, A. "Variability of Homopause and Turbopause Altitudes and Implications for Ar loss." *MAVEN Project Science Group Meeting.*

Poster Mar 2018
Slipski, M., Jakosky, B., Benna, M., Mahaffy, P., Elrod, M., Gonzalez-Galindo, F. "Variability and Control of the Homopause Level." *MAVEN Project Science Group Meeting.*

Conference Talk Oct 2017
Slipski, M., Jakosky, B., Benna, M., Mahaffy, P., Elrod, M., Kass, D., Gonzalez-Galindo, F. "Variability of Martian Turbopause Altitudes." *American Astronomical Society, DPS meeting #49*, #510.08.

Poster Oct 2017
Slipski, M., Jakosky, B., Benna, M., Mahaffy, P., Elrod, M., Gonzalez-Galindo, F. "Variability of Mars' homopause and 'wave-turbopause.'" *MAVEN Project Science Group Meeting.*

Conference Poster Oct 2017
Slipski, M., Jakosky, B., Benna, M., Mahaffy, P., Elrod, M. K. "Atmospheric Argon Isotope Evolution Informed by MAVEN Results." *Fourth International Conference on Early Mars*, LPI Contribution No. 2014, id. 3027.

Conference Poster May 2017

Slipski, M., Jakosky, B., Benna, M., Mahaffy, P., Elrod, M., Yelle R., Stone S., Alsaeed N., Vals M. "Homopause Variability as Observed by MAVEN." *International Conference on Mars Aeronomy.*

Conference Talk Jan 2017

Slipski, M., Jakosky, B., Benna, M., Mahaffy, P., Elrod, M., Yelle, R., Stone, S., Alsaeed, N. "Total Atmospheric Loss from Upper-Atmospheric Structure of $^{36}Ar/^{38}Ar$ Observed by MAVEN." *The Sixth International Workshop on the Mars Atmosphere*, p.3316.

Talk Nov 2016

Slipski M. "Variability of the homopause." *MAVEN Project Science Group Meeting.*

Conference Talk Mar 2016

Slipski, M., Jakosky, B., Alsaeed, N., Mahaffy, P., Benna, M., Elrod, M. "Characterizing Mars' Atmospheric Loss Through Argon Isotopic Fractionation Observed with MAVEN." *47th Lunar and Planetary Science Conference*, LPI Contribution No. 1903, p.2422.

Talk Oct 2015

Slipski, M. "Exobase and Homopause altitudes." *MAVEN Project Science Group Meeting.*

Conference Poster July 2014

Slipski, M., Jakosky, B. "Evolution of Argon Isotopes in the Martian Atmosphere." *Eighth International Conference on Mars*, LPI Contribution No. 1791, p.1021.

Talk Jan 2014

Slipski, M. "Argon Isotopic Evolution in the Martian Atmosphere." *MAVEN Project Science Group Meeting.*

Conference Poster Dec 2013

Slipski, M., Jakosky, B. "Effects of outgassing, sputtering, and erosion on the evolution of argon isotopes in the Martian atmosphere." *American Geophysical Union, Fall Meeting*, abstract #P21B-1717.

Conference Poster Jan 2010

Slipski, M., Mamajek, E. "Improved Ages Estimates for Extrasolar Planet Host Stars" *American Astronomical Society, AAS Meeting #215*, 423.01.

(Talks and posters contributed to available upon request)

TECHNICAL STRENGTHS

Programming	UNIX, Python, IDL, FORTRAN, Mathematica, awk
Data processing	dask, Excel, pandas, sklearn, numpy, scipy
Plotting and Visualization	bokeh, dash, matplotlib, plotly, Vega-Lite
Writing and Presentation	LaTeX, Powerpoint, Prezi, Word
Workflow	git, Jupyter, Make, pydoit
Development	Docker
Web scraping	beautifulsoup