

# Planetary Lunch Seminar (PLS)

Open to the EAPS community and beyond

**Dr. Alejandro Soto**  
Senior Research Scientist  
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Tuesday, September 21<sup>st</sup>

12:30

54-915

Zoom: <https://mit.zoom.us/j/92653636868>

Password: PLSF2021

## The Martian Atmosphere Through Thick and Thin



Global energy balance models of the Martian atmosphere have predicted that throughout Martian history, for a range of initial total carbon dioxide inventories, the Martian atmosphere may be unstable relative to surface deposition. This is commonly referred to as atmospheric collapse. Since a collapsed state may limit the amount of time available for physical and chemical weathering, understanding the conditions for collapse is a critical step to understanding the possible history of the Martian atmosphere. Using a general circulation model (GCM), I investigated the details of the three-dimensional, time varying climate dynamics at the threshold for atmospheric collapse. In this talk, I will explore how meridional heat transport and topography interact to create the conditions of collapse from the Noachian era Mars to the current era Mars. I will also discuss how the atmospheric collapse process provides limits to any potential warm wet Mars.

Calendar of the semester		
9/14	MIT Planetary Group	Meet & Greet
9/21	Alejandro Soto (SwRI)	The Martian Atmosphere Through Thick and Thin
9/28	Andrew Vanderburg (MIT)	A Song of Ice & Fire: the Fate of Planetary Systems After Stellar Death
10/5	No PLS	DPS
10/12	Saverio Cambioni (MIT)	TBD
10/19	Tajana Schneiderman (MIT)	TBD
10/26	Amir Siraj (Harvard)	TBD
11/2	Rick Binzel (MIT)	Mission Updates: New Horizons, OSIRIS-REx, Lucy, Psyche, +
11/9	Zoe Todd (MIT)	What can the planetary environment tell us about the origins of life?
11/16	Mike Volk (Harvard)	Nahklites
11/23	No PLS	Thanksgiving week
11/30	Yamila Miguel (Leiden U.)	Jupiter's inhomogeneous envelope
12/7	TBD	TBD

For more information, contact Jason Soderblom ([jms4@mit.edu](mailto:jms4@mit.edu))