

Space Physics Seminar

Thursday, October 5, 2017

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Is Mars alive? Testing Current and Past Habitability



We recently established that Mars lost an ocean's worth of water, while the Curiosity rover has recently detected organics on the Martian surface and in the atmosphere. If Mars had a rich chemical and diverse past, how much of these biomarkers were lost to space, and how much are currently stored in the sub-surface? Are sub-surface habitable niches connecting now with the atmosphere?

The answers to these fundamental questions of Mars evolution and habitability lie in robotic investigations of the planet's surface and atmosphere. For instance, in the last decade we have obtained the most comprehensive search for organic material in the Martian atmosphere, permitting us to test for regions of active release and their evolution over time.

We are preparing for the human exploration of Mars, and these recent insights about Mars' past habitability are greatly assisting us in identifying the most promising research sites. In this talk, I will present the current frontiers in the exploration of planetary atmospheres and how the synergies between future space (e.g., ExoMars 2016, JWST) and ground astronomical assets (e.g., TMT, E-ELT) will transform our understanding of the composition, stability and evolution of the atmospheres in the Solar System and beyond.

astrobiology.gsfc.nasa.gov/Villanueva

4:00pm in CAS 502. Refreshments served at 3:45pm in CAS 500.

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Next Week
Robyn Milan
Dartmouth