EAPS Planetary lunch Colloquium Series (PICS)

Sam Birch
Research Associate
Cornell University

Tuesday, Apr. 17th[th]
12:30pm
54-517

Sediment Transport and Landscape Evolution on Comet 67P/Churyumov-Gerasimenko

Comets are the oldest objects in our solar system and typify the remnant, unprocessed materials from which all the larger planets and moons were constructed. Consequently, they represent a window into the initial conditions that proved favorable for the formation of the Earth and life as we know it. With Rosettas rendezvous of 67P in the summer of 2014, we now have a dataset that permits access to the spatial scales where the processes relevant to small body evolution can be directly observed. These observations have allowed for detailed analyses of morphologies down to the meter scale across the entire nucleus, and have provided a long temporal data set with which to search for changes on the surface, important observations that have given us the opportunity to watch how a comet erodes. Numerical landscape evolution modeling offers the possibility to tie Rosettas many observations to the fundamental physics that drives the observed changes, and ultimately determine whether 67P evolves gradually, through its jets, or stochastically through large outburst events. In this talk, I will detail our work on 67P, including our discovery and analysis of observed surface transients, and our associated numerical simulations. Using observed transients to tune our simulation, we can constrain the rates of landscape evolution and the total erosional exhumation on 67P. This allows us to directly answer the question as to how its surface evolved despite the current apparent low levels of observed activity.

For more information, contact Jason Soderblom (jms4@mit.edu)

EAPS
Earth, Atmospheric and Planetary Sciences