Tuesday, March 2, 2010
POSTER SESSION I: PLANETARY AEOLIAN PROCESSES: DUNES, DUST, AND DEVILS
7:00 p.m. Town Center Exhibit Area

Hayward R. K.  Fenton L. K.  Tanaka K. L.  Titus T. N.  Christensen P. R.
*Mars Global Digital Dune Database: Dune Volume Estimates in the North Polar Region* [#1109]
We review methods used in selected previous estimates of north polar dune volume (1158 km$^3$ to 15,000 km$^3$) and present our preliminary estimates (1300 km$^3$ to 3600 km$^3$) and methods for comparison.

Coleman S. J.  Hayward R. K.  Barlow N. G.  Titus T. N.
*Age Estimate of Martian Dunes Based on Possible Impact Feature* [#1368]
We examine a suspected impact feature located on a dune field and utilize it to obtain an approximate age (1–10 Ma) for martian dune fields.

Savage C. J.  Radebaugh J.  Goodrich C.
*Titan Dune Populations from Pattern Analysis of Dune Field Parameters* [#2530]
Unlike many of Earth’s linear dunes this study finds only a single population of linear dunes on Titan indicating that either there has been only one period of dune formation or all others have been erased.

*Cohesion Under Reduced Gravity and Implications for Titan Aeolian Sediment Transport: Preliminary Model and Results* [#1483]
Reduced gravity influences angle of response via an increase in interparticle forces, with implications for aeolian sediment behavior on Titan. We present initial investigations modeling the effect of reduced gravity on cohesive forces.

Diniega S.  Byrne S.  Glasner K.
*Niveo-Aeolian Process Interactions and Resultant Martian Polar Dune Morphology* [#2192]
We hypothesize that the distinctive martian polar dune lee slope morphology is formed through a niveo-aeolian process. We will evaluate three formation hypotheses: ice-cementation of the dune core, seasonal frost sublimation, or reversing winds.

Cardinale M.  Komatsu G.  Pasculli A.
*Mare Tyrrenium Region: Analysis of Dark Sand Dunes and Wind Direction Interpretations* [#1610]
Our analysis of dune morphology in Mare Tyrrenium of Mars and GCM indicates that simple dunes are consistent with present wind conditions, but complex dunes reflect influences of local topography developing secondary wind flows not predicted by GCM.

Horgan B.  Bell J. F. III  Bourke M. C.
*Dry Flow, Surface Cementation, and Ice Induration Features on Dunes in the North Polar Region of Mars* [#1325]
In this study, we identify and map the distribution of features on dunes in the martian north polar erg, and show that many of these features are consistent with dunes that are ice-rich but still actively migrating.

Silvestro S.  Rossi A. P.  Flahaut J.  Fenton L. K.
*Active and Fossil Dunes as Evidences of Different Aeolian Constructional Events in Gale Crater (Mars)* [#1838]
We performed a geomorphological survey of Gale Crater (Mars). We identified different dune generations and a wide variety of aeolian features suggesting that several episodes of aeolian construction took place in this site.

Craddock R. A.  Howard A. D.  Tirsch D.  Zimbelman J. R.
Preliminary Analyses of Basaltic Dunes in the Ka’u Desert, Hawaii and Implications for Understanding Dunes on Mars* [#2164]
Here we report the general physical and chemical characteristics of basaltic dunes located in the Ka’u Desert of Hawaii.
Tirsch D. Craddock R. A. Jaumann R.
Dark Dunes in Ka’u Desert (Hawaii) as Terrestrial Analogs to Dark Dunes on Mars

In this work we compare spectra of sand samples of terrestrial dark dunes derived in Ka’u Desert (Hawaii) with that of dark martian dunes. We find indications for a similar origin of the dark sands.

Gardin E. Bourke M. C. Allemand P. Quantin C.
Bright Features Suggest Possible Dark Dune Migration on Mars

Observation of high albedo features in one dune field could be suggesting that liquid water was stable at equatorial area in the recent martian time.

Shockey K. M. Zimbelman J. R.
Transverse Aeolian Ridges as Seen in HiRise Images

Using Mars HiRise images, photoclinometry extracts profiles to characterize TARs geomorphologically.

Ramstad R. Appel M. Brown A. J. McKay C. P. Fredriksson S.
Mars in a Bulb: An Experimental Simulation of Martian Dark Dune Spots (DDSs)

The mechanics behind the formation and evolution of dark dune spots (DDSs) has still not reached scientific consensus. From studying the phenomenology of DDSs a model is formulated and an experimental design to test it is presented in this paper.

Merrison J. P. Gunnlaugsson H. P. Holstein-Rathlou C. Knak-Jensen S. Nørnberg P. Rasmussen K. R.
Sand Transport: a Source of Mineral Alteration on Mars

The reddish color characterising martian dust could have formed through mechanical activation during sand transport. This is demonstrated by laboratory simulation.

O’Donnell K. H. Howald T. V. Schieber J.
Eolian Adhesion Crusts Produced During Experimental Abrasion of Sedimentary Rock — An Alternative Process for Martian Rock Varnish Formation?

Iron-rich adhesion crusts resembling martian rock varnish are observed on rock surfaces during eolian abrasion experiments. These crusts seem to form in response to ambient humidity fluctuations and “impact sintering” of micron-sized particles.

Geissler P. E. Daubar I. J. McEwen A. S. Bridges N. T. Dundas C. M.
Eolian Degradation of Young Martian Craters

HiRISE images of young martian craters show that surprisingly few changes took place during the global dust storm of 2007.

Siebach K. Arvidson R. Cabrol N. Athena Science Team
Recent Spirit Results: Microscopic Imager Analysis of Particle Properties in Scamander Crater, West of Home Plate

Images taken with the Spirit Rover’s Microscopic Imager at its current location in Scamander Crater have been used to analyze particle properties of exposed subsurface soils. These data show angular sulfate-rich sand under eolian basaltic sand.

Time-dependent Dust Accumulation on the Mars Phoenix Wind Indicator

Time dependent dust accumulation on the Telltale fibers was observed during the Phoenix mission. Removal of dust seems coupled with dust devil passings at the Phoenix landing site and investigations are underway to determine the wind speeds needed for the dust removal.
On Dust Storms Observed at the Phoenix Landing Site

In this contribution we discuss two different origins of dust activity at the Mars Phoenix landing site using lander data and images taken of the North Polar region on Mars by the Mars Color Imager onboard Mars Reconnaissance Orbiter.

A New Field Study of Terrestrial Dust Devils with Application to Mars: Using a Stereo-Camera Survey and GIS to Calculate the Size-Frequency Distribution of Dust Devils in the Southwest USA

We describe a new series of terrestrial field studies aimed at characterising dust devil intensity as a function of ambient meteorology. We present results from stereo imaging of dust devils that allow their size-frequency distribution to be accurately determined.

Chasing Dust Devils in Chile’s Atacama Desert

We present field findings from Atacama Desert, Chile, of 35 dust devil encounters with three-dimensional sonic anemometry and thermal images.

Dust Devil Sediment Loading, Wind Speeds and Pressure Excursions

We present initial findings to directly sample dust devil vortices in Eldorado Valley, NV, June 2009 with over 130 direct (symmetrical, through the core) and nearby indirect encounters.

Field Observations of the Size-Frequency Distribution of Terrestrial Dust Devils: Assessing the Power Law Hypothesis of Dust Devil Diameters

Based on our recent new field observations of the size-frequency distribution of dust devils in Eloy, Arizona, and Eldorado Valley, Nevada, we assess the possible power law dependence of dust devil diameters.