

Tuesday, March 24, 2009

**POSTER SESSION I: PHOENIX LANDING SITE: PERCHLORATE AND OTHER TASTY TREATS  
6:30 p.m. Town Center Exhibit Area**

Sykulska H. M. Pike W. T. Vijendran S.

[Microscopy Analysis of the Salt Content of Soil and Dust at the Phoenix Landing Site](#) [#2366]

Colour and spatial information of the material in the soil is combined to give a measure of the salt concentration. Analysis of various samples allows lateral and vertical comparison of salt content of the soil.

Sutter B. Lauer H. V. Golden D. C. Boynton W. V. Morris R. V. Niles P. B. Ming D. W.

[Thermal and Evolved Gas Behavior of Calcite Under Mars Phoenix TEGA Operating Conditions](#) [#1843]

Calcite may have been detected by the Thermal Evolved Gas Analyzer (TEGA) at the Phoenix lander site. Laboratory thermal analyses of calcite under TEGA operating conditions will be presented to aid the interpretation of calcite detection by TEGA.

Niles P. B. Boynton W. V. Hoffman J. H. Ming D. W. Phoenix Science Team

[A First Look at Carbon and Oxygen Stable Isotope Measurements of Martian Atmospheric CO<sub>2</sub> by the Phoenix Lander](#) [#1806]

The TEGA instrument on the Mars Phoenix Lander has measured the stable isotope composition of martian atmospheric CO<sub>2</sub>. The results indicate that martian atmospheric CO<sub>2</sub> is slightly depleted in both <sup>13</sup>C and <sup>18</sup>O compared to atmospheric CO<sub>2</sub> on Earth.

Catling D. C. Claire M. W. Quinn R. C. Zahnle K. J. Clark B. C. Kounaves S. Hecht M. H.

[Possible Atmospheric Origins of Perchlorate on Mars](#) [#1567]

The Phoenix Mars lander measured perchlorate as a key soluble anion in the soil at an abundance of ~1wt%. Here, we discuss how the perchlorate was likely formed from atmospheric oxidants acting on chlorine-bearing species in Mars' arid environment.

Fisher D. A. Hecht M. Kounaves S. Catling D.

[Perchlorate Found by Phoenix Could Provide a Mobile Brine Sludge at the Bed of Mars Northern Ice Cap that Would Allow Flow with Very Low Basal Temperatures: Possible Mechanism for Water Table Re-Charge](#) [#2281]

The north cap of Mars has basal temperature that precludes the flow of ice. Phoenix discovered polar soils contain perchlorate salts. These salts depress the melting point so it could form a sludge that provides a mobile bed that moves the ice outwards.

Ming D. W. Lauer H. V. Jr. Archer P. D. Jr. Sutter B. Golden D. C. Morris R. V.

Niles P. B. Boynton W. V.

[Combustion of Organic Molecules by the Thermal Decomposition of Perchlorate Salts: Implications for Organics at the Mars Phoenix Scout Landing Site](#) [#2241]

The presence of a strong oxidizer (i.e., perchlorate salt) in the soils at the Phoenix landing site will most likely combust organic materials during pyrolysis by the Thermal and Evolved Gas Analyzer.

Lauer H. V. Ming D. W. Sutter B. Golden D. C. Morris R. V. Boynton W. V.

[Thermal and Evolved Gas Analysis of Magnesium Perchlorate: Implications for Perchlorates in Soils at the Mars Phoenix Landing Site](#) [#2196]

Perchlorate salts were discovered in the soils around the Phoenix landing site on the northern plains of Mars. The purpose of this paper is to evaluate the thermal and evolved gas behavior of perchlorate salts using TEGA-like laboratory testbed instruments.

Marion G. M. Catling D. C. Claire M. Zahnle K. J.

[Modeling Aqueous Perchlorate Chemistries with Applications to Mars](#) [#1959]

The paper will examine thermodynamic modeling of perchlorate chemistries with applications to the Phoenix mission site.

Morris R. V. Golden D. C. Ming D. W. Graff T. G. Arvidson R. E. Wiseman S. M.  
Lichtenberg K. A. Cull S.

[Visible and Near-IR Reflectance Spectra for Smectite, Sulfate, and Perchlorate Under Dry Conditions for Interpretation of Martian Surface Mineralogy](#) [#2317]

Visible and near-IR reflectance spectra were acquired under dry conditions for smectite and for sulfate- and perchlorate-bearing phases. The spectra are used for interpretation of martian surface mineralogy.

Pike W. T. Sykulska H. Vijendran S. Phoenix Microscopy Team

[Fractal Analysis of the Microstructure of the Martian Soil at the Phoenix Landing Site](#) [#1909]

A fractal analysis of the Mars soil at the Phoenix site is presented. It indicates that the primary particles of the soil are up to 15  $\mu\text{m}$  in size with larger particles formed by agglomeration resistant to fracture.

Shaw A. Arvidson R. E. Keller H. U. Lemmon M. Mellon M. T. Trebi-Ollennu A. Robinson M.  
Siebach K. Volpe R.

[Phoenix Mission Trenching in Arctic Mars](#) [#2097]

The Phoenix Mars Lander dug twelve trenches in polygonal terrain of the high northern latitudes. Forces measured while digging trenches help compare the properties of the soils in which the trenches were dug. The trenches sample polygons and troughs.

Markiewicz W. J. Kossacki K. J. Keller H. U. Hviid S. F. Goetz W. El Maarry M. R. Bos B. J.  
Woida R. Drube L. Leer K. Madsen M. B. Mellon M. T. Smith P.

[Sublimation of Exposed Snow Queen Surface Water Ice as Observed by the Phoenix Mars Lander](#) [#1667]

From the rate of sublimation of Snow Queen as imaged by the RAC we infer that the soil grain size is of the order of 1 micron which is consistent with atmospheric dust and Phoenix imaging at all scales.

Saraiva J. Antunes J. Bandeira L. Pina P.

[Identification and Characterization of Small-Scale Polygons Around the Phoenix Landing Site](#) [#1323]

This work presents a study of small-scale polygons in the area where the Phoenix probe landed. Large numbers of polygons are automatically identified and briefly characterized in geometric and topological terms, illustrating the potential of the methodology employed.

Cull S. C. Arvidson R. Mellon M. Wiseman S. McGuire P. Clark R. Titus T. Searls M.

[Seasonal Ices at the Mars Phoenix Landing Site: Observations from HiRISE and CRISM](#) [#1814]

CRISM spectra are used to determine when ices appear at the Phoenix landing site, how their grain sizes and relative abundances evolve through time, and what controls sublimation patterns during the spring defrosting period.

Searls M. L. Mellon M. T. Cull S. Hansen C. J.

[Seasonal Frost at the Phoenix Landing Site](#) [#2402]

This work provides a spatial and temporal characterization and analysis of the seasonal frost at the Phoenix landing site.

Levy J. S. Head J. W. III Marchant D. R.

[Phoenix Landing Site Geomorphology: Surface Stability and Implications for the Martian Latitude-dependent Mantle](#) [#1625]

Geomorphological observations of the Phoenix landing site suggest a history for local permafrost recently dominated by excess ice removal through sublimation, ongoing thermal contraction cracking, and limited cryoturbation by wet or dry processes.

Davis J. A. Lange C. F. Taylor P. A.

[Numerical Study of the Effect of the Phoenix Mars Lander on the Temperature Sensors](#) [#2135]

A numerical study of the effect of the Phoenix Mars lander on the temperature sensors show that under certain conditions, the heat produced by the lander can influence the temperature sensors.

Taylor P. A. Weng W. Cook C. Dickinson C. Akingunola A. Polkko J. Kahanpää H.

[Pressure Data from the Phoenix Landing Site](#) [#1868]

During the Phoenix mission surface pressures were measured at a frequency of 2 Hz for 150 sols. Seasonal and diurnal features of these data will be discussed. Short time scale features associated with convective vortices were also observed.

Nelli S. M. Renno N. O. Feldman W. C. Murphy J. R. Kahre M. A.

[Reproducing Meteorological Observations at the Mars Phoenix Lander Site Using the](#)

[NASA Ames GCM V.2.1](#) [#1732]

Using the NASA Ames General Circulation Model (GCM) v2.1, we reproduce atmospheric conditions at the Mars Phoenix Lander site in an effort to explain the measured atmospheric phenomena (water ice clouds, ground frosts, dust devils, etc.).

Bean K. M. Lemmon M. T. Phoenix Science Team

[Surface Stereo Imager Observations of Dust Devils at the Phoenix Landing Site](#) [#1799]

The Surface Stereo Imager observed 76 wind events during Phoenix's surface operations. There were 37 unique dust devils, and 11 strong gusts of wind. Dust devils were not observed until the last third of the mission.

Ellehøj M. D. Gunnlaugsson H. P. Taylor P. A. Gheynani B. T. Whiteway J. Lemmon M. T. Bean K. M.

Tamppari L. K. Drube L. Von Holstein-Rathlou C. Madsen M. B. Fisher D. Smith P.

[Dust Devils and Vortices at the Phoenix Landing Site on Mars](#) [#1558]

Near continuous measurements of pressure and temperature by the MET instrumentation on the Phoenix Mars lander are used to identify the passage of vertically oriented vortex structures at the Phoenix landing site (126W, 68N) on Mars.

Leer K. Drube L. Goetz W. Gunnlaugsson H. P. Lemmon M. Madsen M. B. Morris R. V.

Smith P. Phoenix Science Team

[Optical Study of Particles On Mars Phoenix Magnets](#) [#1923]

Particles collected by magnets on the Phoenix Lander on Mars are compared to data from orbiter missions.

Drube L. Leer K. Madsen M. B. Goetz W. Morris R. V. Lemmon M.

[Airborne Dust Experiment \(iSweep\) on the Phoenix Mars Lander](#) [#2266]

The calibration targets for Phoenix also act as an experiment (called iSweep) looking at the airborne dust that is magnetically attracted to settle on its surface. Some results of which will be shown here.

Stein T. C. Arvidson R. E. Scholes D. M. Heil-Chapdelaine V. M.

[Phoenix Analyst's Notebook: A Holistic Tool for Accessing Integrated Mission Data and Documents](#) [#1079]

The Phoenix Analyst's Notebook (<http://an.rsl.wustl.edu>) provides access to the Mars Phoenix Lander mission data archives by integrating engineering and science data, observation planning and targeting, and documentation into web-accessible pages.