Wednesday, June 13, 2012
HUMAN EXPLORATION AND PRECURSORS:
METEOROLOGICAL AND ATMOSPHERIC INVESTIGATIONS
1:00 p.m. Hess Room

Amzajerdian F. * Busch G. E. Edwards W. C. Dwyer Cianciolo A. M. Munk M. M.
Multi-Functional Lidar Instrument for Global Measurement of Mars Atmosphere **[#4293]**
This paper describes an orbiting lidar instrument concept capable of providing Mars atmospheric parameters critical to design of future robotic and manned missions requiring advanced aerocapture, precision landing, and launch from Mars surface.

Abshire J. B. * Smith M. D. Riris H. Sun X.
Mars Orbital Lidar for Global Atmospheric and Topographic Measurements **[#4202]**
We describe a Mars orbital atmospheric lidar that continuously measures vertically resolved atmospheric backscatter profiles, depolarization profiles, wind profiles and column water vapor and that addresses important science needs and knowledge gaps.

Kursinski E. R. * McCormick C. C. Folkner W. M.
An Orbiting Mars Atmosphere, Gravity, Navigation and Telecommunications System **[#4357]**
We describe a small constellation of orbiters that would yield (1) a global atmosphere observing system including wind and density for EDL, (2) radio nav. for EDL and rendezvous with sample return canisters, (3) hi-res gravity mapping, and (4) telecom relay.

Schofield J. T. * Kass D. M. Kleinböhl A. Foote M. C.
Mars Climate Sounder II (MCSII): A Global, 4-D, Atmospheric Temperature, Aerosol and Water Vapor Profiler for a Mars Orbit Mission **[#4166]**
This abstract describes the Mars Climate Sounder II (MCSII), a mature, low-cost, low-risk atmospheric sounder investigation ideally suited to a 2018 Mars orbiter opportunity.

Titus T. N. * Prettyman T. H. Brown A. Colaprete A. Byrne S.
Mars Mission Concept: Mars Ice Condensation and Density Orbiter **[#4167]**
We propose an instrument package to study CO_2 ice condensation modes, seasonal ice composition and density, and seasonal cloud and aerosol properties by combining an altimetry instrument, imaging LIDAR, microwave sounder and neutron detector.

Schumacher D. M. * Dorney D. J. McGrath M. A.
Radiosondes for Characterizing the Martian Atmosphere **[#4132]**
Atmospheric data are vital to understanding martian weather and to the design of landers for larger payloads. Radiosondes could be added as secondary payloads on Mars missions and used to map properties in different regions of the martian atmosphere.

Abedin M. N. * Bradley A. T. Ismail S. Sharma S. K. Lucey P. G. Misra A. K. Sandford S. P.
Miniature and Cost-Effective Remote Raman, Fluorescence, and Lidar Multi-Spectral Instrument for Characterization of Planetary Surfaces and Atmosphere from Robotic Platform **[#4254]**
The objective of this study is to develop a remote Raman-fluorescence spectroscopy and lidar multi-sensor instrument capable of investigation and identification of minerals, organics, and biogenic materials, as well as atmospheric studies of Mars.

Webster C. R. * Flesch G. J. Christensen L. Keymeulen D. Forouhar S.
Miniature Tunable Laser Spectrometers for Quantifying Atmospheric Trace Gases, Water Resources, Earth Back-Contamination, and In Situ Resource Utilization **[#4229]**
We describe a variety of implementations of tunable laser spectrometers that offer a wide diversity of capability for highly sensitive measurement of atmospheric gases or those evolved (pyrolysis heating, laser ablation, etc.) from solid samples.

Sellers W. A. Jr. *
A Mars Atmospheric Sensor System for Entry, Descent and Landing **[#4057]**
This paper outlines a concept for Mars exploration that demonstrates enabling technologies for the human exploration of Mars. A sensor system is presented to collect the low atmosphere data on Mars and demonstrate EDL technologies.

Streetman B. * George S. Singh L.
ChipSat Mars Atmosphere Explorer (Chip-Sat-MAX) **[#4067]**
Chip-Scale Satellites (ChipSats) present a novel technology that can revolutionize *in situ* atmospheric surveys. Exploiting ChipSat reentry dynamics enables high-density *in situ* measurements of the Mars atmosphere during descent and landing.

Tinker M. L. *
Micro/Nanosatellite Mars Network for Global Lower Atmosphere Characterization **[#4316]**
A microsatellite design is discussed that can operate in tandem with another microsat or as a "mother-ship" to deploy a network of nanosatellites. Either configuration of the network would perform radio occultation-based Mars atmospheric wind/density measurements.

Davoodi F. D. * Hajimiri A. H. Murphy N. M. Nikzad S. H. Nesnas I. N. Mischna M. M. Nesmith B. N.
GOne with the Wind ON_Mars (GOWON): A Wind-Driven Networked System of Mobile Sensors on Mars **[#4238]**
A revolutionary way of studying the surface of Mars using a wind-driven network of mobile sensors. GOWON could achieve NASA's scientific objectives on Mars in a cost-effective way, leaving a long lasting sensing and searching infrastructure on Mars.

Guzewich S. D. * Yee J. H. Talaat E. R. Boldt J. D.
Measurement of Mars Atmospheric Winds with Interferometry **[#4138]**
Space-based optical spectroscopic interferometry is a proven technique that could take global observations of Mars atmospheric winds from the surface to ~80 km. This dataset would answer key scientific questions and constrain spacecraft EDL hazards.

Banfield D. Dissly R. W. * Rafkin S. C. R.
Mars Surface Wind Measurements Using an Acoustic Anemometer **[#4308]**
The Mars Acoustic Anemometer is a mature *in situ* instrument for surface wind measurements to increase our understanding of boundary layer and aeolian processes, and to increase the predictive capability for planning EDL and surface operations.

Justh H. L. Spann J. F. *
Mars Meteorological Network **[#4366]**
This abstract puts forth a concept for a Mars Meteorological Network that will be used to investigate the behavior of the atmosphere of Mars, explore the surface environment, and prepare for operational activities.

PANEL DISCUSSION