Thursday, April 29, 2010
HABITABILITY POTENTIAL OF MARS
8:00 a.m. Crystal Salon A

This session explores the habitability of Mars, past and present.
The session will shed light on the possible presence of life on the Red Planet based on latest mission results, relevant analog studies, and promising localities on Mars.

Chairs: **Dirk Schulze-Makuch**
Alfonso Davila

8:00 a.m. Gibson E. K. * McKay D. S. Thomas-Keprta K. L. Clemett S. J.
Early Mars: A Warm Wet Niche for Life **[#5062]**
The first 600 My of martian history were ripe for life to develop. Standing bodies of water, precipitation and flowing surface and subsurface water and possibly abundant hydrothermal energy would favor the formation of early life.

8:15 a.m. Fernández-Remolar D. C. * Sánchez-Román M. Hill A. Amils R. Prieto-Ballesteros O. Gómez-Ortíz D. Fernández-Sampedro F. Martín-Redondo M. P.
Global Formation of Carbonates as Indicators of Habitability Emergence on Early Earth and its Implications for Mars **[#5324]**
Carbonate occurrence on Earth is used to characterize the possible potential habitats and its associated microbial life on early Mars.

8:30 a.m. McCubbin F. M. * Glamoclija M. Steele A. Smirnov A.
Active Igneous and Hydrothermal Activity During the Early-Middle Amazonian: Inferences from the Chassignite and Nakhlite Meteorites and Implications for Astrobiology **[#5604]**
We have combined observations of SNC meteorites and those made by remote sensing to identify potential regions of habitability at the martian subsurface during the Amazonian epoch.

8:45 a.m. Devila A. F. * Duport L. G. Melchiorri R. Jänchen J. Valea S. de los Rios A. Fairén A. G. Möhlmann D. McKay C. P. Ascaso C. Wierzchos J.
Hygroscopic Salts: A Habitat for Microorganisms on Mars **[#5049]**
Hygroscopic salts provide habitable conditions in the driest deserts on Earth. Similar deposits have been identified on Mars and could represent present day habitats.

9:00 a.m. Houtkooper J. M. * Schulze-Makuch D.
Xerophiles on Mars: Possible Evolutionary Strategies Using Hydrogen Peroxide and Perchlorates **[#5382]**
The Phoenix Lander found surprising amounts of perchlorate salts in the Martian arctic soil. The low water activity and low freezing temperature of a saturated solution of these salts are compatible with putative H_2O_2-H_2O based xerophiles.

9:15 a.m. Renno N. O. * Zorzano M.-P.
Do Brines make the Viking 2 Landing Site Habitable? **[#5092]**
Renno et al. showed direct evidence that brines are present on Mars' Arctic. Here we show that brines are also present on mid-latitudes and that this implies that the Viking 2 landing site might have liquid water, one of the key ingredients for life.

9:30 a.m. Navarro-González R. * Vargas E. de la Rosa J. McKay C. P.
Pyrolysis of Atacama Soils with Added Perchlorates: Implications for the Viking Results **[#5072]**
We report here results from the characterization of major gases and volatiles released by thermal volatilization of Mars-like soils from the Atacama Desert which have been enriched with 1 wt% magnesium perchlorate, and processed using the Viking Lander heating protocol.

9:45 a.m. Archer P. D. Jr * Imanaka H. Smith M. A. Boynton W. V. Smith P. H.
Pyrolysis of UV-Irradiated Organic Molecules — Investigating Potential Martian Organics **[#5600]**
We show that certain types of organic molecules that might exist on Mars are resistant to UV photolysis. Data obtained by thermal decomposition of irradiated organic molecules could help constrain the chemical composition of Martian organics.

10:00 a.m. BREAK

10:30 a.m. Stoker C. R. *
The Habitability of the Phoenix Landing Site: An Evaluation of Mission Results **[#5553]**
A key objective of the Phoenix mission was to search for a habitable zone. Mission results are used to evaluate the Phoenix site habitability that compares favorably to other sites on Mars. Results show a follow on mission to search for evidence of life is warranted.

10:45 a.m. Chevrier V. F. *
Phyllosilicates, Carbonates, Methane and the Habitability of Nili Fossae on Early Mars **[#5180]**
Mineral transformations with temperature and CO_2 fugacity show that serpentinization affected the primitive crust in the Nili Fossae region, and was accompanied by carbonation and early methane release, making this active environment ideal for life.

11:00 a.m. Wang A. * Freeman J. J. Bell J. F. III Jolliff B. L.
Potential Habitable Zone Within the Subsurface of Equatorial Regions on Mars **[#5400]**
Spectral changes of salty soils at Gusev suggested a RH gradient within the subsurface, while lab experiments reveal wide stability fields for highly hydrated sulfates at low T-P_{H_2O}. A potentially habitable zone may exist in the subsurface on Mars.

11:15 a.m. Jones E. G. Lineweaver C. H. *
The Habitability Potential of Mars **[#5178]**
We are developing a pressure-temperature model for Mars to identify where the environments are on Mars that may have liquid water and be able to support terrestrial life.

11:30 a.m. Ivarsson M. * Lindgren P.
The Search for Sustainable Subsurface Habitats on Mars **[#5123]**
Subsurface environments have been targeted as plausible settings for the search for a present or a fossil record of life on Mars, since the current conditions on the martian surface are extremely hostile to life.

11:45 a.m. Boston P. J. * Spilde M. N. Northup D. E. Curry M. D. Melim L. A. Rosales-Lagarde L.
Seekers of Life Below the Surface of Mars **[#5346]**
Biologically influenced speleothems (biothems) and microbial breakdown products (speleosols) display a set of important unifying properties with predictive power for the subsurface systems of unknown worlds.

12:00 p.m. Vago J. L. * ExoMars Project Team
The ExoMars Rover Mission to Search for Signs of Life **[#5318]**
This paper will present the latest configuration for the joint 2018 NASA-ESA twin rover mission, concentrating on the ExoMars rover, its instrument payload, and reference surface mission.

12:15 p.m. Des Marais D. J. * Allwood A. C. MEPAG MRR-SAG Team
The Proposed 2018 MAX-C Rover: Exploring for Signs of Life and Caching Samples for Potential Return **[#5532]**
The Mars Astrobiology Explorer-Cacher (MAX-C) is envisioned as a potential mission to the surface of Mars in 2018 to explore a formerly habitable environment and to collect samples for potential return to Earth by a subsequent mission.

12:30 p.m. LUNCH