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Although H_2O is certainly the most common ice material in the Solar System, other molecules are present and of interest. Our laboratory work has shown that space weathering, by vacuum-UV photons and MeV ions, will result in a very rich chemistry among known ice components, such as H_2O, N_2, CO, and CH_4. Acid-base reactions, electron transfer, and free-radical chemistry will all play a role in transforming icy surfaces into active regions of organic and pre-biological chemistry. In this presentation I will review some of our recent results concerning the radiation chemistry and photochemistry of known ice molecules, emphasizing organic materials as opposed to H_2O-dominated chemistry. Comparisons will be made among known surface ices and a few predictions of new molecules and ions will be made. Similarities in chemical reactions among families of molecules will be presented. Finally, some suggestions will be made for data needed to better understand the nature and extent of weathering and its role in astrobiology.

P61B MCC: Hall D Saturday 0830h

Fundamental Discoveries in Planetary Science: The Color of Worlds II Posters *(joint with V)*

Presiding: **C R Chapman,** Southwest Research Institute**; J M Sunshine,** Science Application International Corporation

P61B-0347 0830h POSTER

Dawn Discovery Mission: A Journey to the Beginning of the Solar System

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In December 2001, NASA announced the selection of the Dawn mission to Vesta and Ceres as the next mission to be undertaken in the Discovery series. Dawn examines the role of size and water content in planetary evolution, contrasting the primitive and apparently wet protoplanet, Ceres, with its dry and highly evolved neighbor, Vesta. Dawn maps the surface in visible and infrared wavelengths to determine its mineralogical composition and crustal properties, uses gamma ray and neutron spectroscopy to determine its elemental composition and magnetometry and radio science to probe the interior and laser altimetry to provide precise topography. Dawn is a partnership between UCLA, representing the science team members, the Jet Propulsion Laboratory, Orbital Sciences Corporation, the German Aerospace Center, DLR and the Italian Institute for Space Astrophysics, IAS. The mission uses ion propulsion to fly to Vesta, orbit it at a variety of altitudes for close to a year, leave Vesta orbit, fly to Ceres and orbit it similarly. The spacecraft carries a framing camera provided by DLR's Institute of Space Sensor Technology and Planetary Exploration in Berlin; a mapping spectrometer provided by the Istituto di Astrofisica Spaziale in Roma, a gamma ray and neutron spectrometer provided by the Los Alamos National Laboratory, a laser altimeter provided by NASA's Goddard Space Flight Center and a magnetometer provided by UCLA. This paper summarizes the mission goals, and the trajectory, orbits, and instruments that enable the mission to attain those goals.

P61B-0348 0830h POSTER

Searching for Evidence of Aqueous Processes on Mars Through Spectral Identification of Alteration Minerals

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The surface mineralogy on Mars holds information about the environmental and geochemical records on that planet and may provide clues to past aqueous processes there. Analysis of the kind of chemical alteration that has taken place on Mars provides insights into major climate and environmental factors such as when and how much water was present on the surface of Mars. Surface images taken by Odyssey-THEMIS and MGS-MOC have introduced the possibility that aqueous processes have occurred in recent martian history and evidence from GRS on Odyssey for H2O-ice and/or hydrated minerals supports this as well. However, little evidence for alteration minerals on Mars is available from the spectral images to date. Work is underway in the lab and in the field in order to characterize the spectral properties and formation conditions of these minerals in volcanic and hydrothermal sources on Earth so that these minerals may be revealed in future spectral datasets of Mars if present. Determining whether or not hydrated iron oxides and sheet silicates are present in the dust on Mars is important for assessing potential aqueous and hydrothermal processes that may have occurred there. Sheet silicates and hydrated iron oxides typically require water for formation and specific sheet silicates are favored depending on the degree of moisture, temperature and other conditions. These minerals are frequently observed in altered volcanic material and hydrothermal springs on the Earth and would be expected on Mars if water was present. The motivation for this study is to gain information about possible aqueous processes on Mars through analysis of the chemical alteration that has taken place there. Identification of aqueous alteration on Mars would imply the presence of water and, thus, would have important implications for astrobiology, climate, and geoscience on Mars.

P61B-0349 0830h POSTER

The Lunar Crash of 1953: A Crater is Identified

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In 1953 an amateur astronomer observed and photographed a flash on the Moon (Stuart, 1956). This event is the only unambiguous record of the rare crash of an asteroid-sized body onto the lunar surface. We estimate that the energy of the event was about 0.5 megatons, resulting in a 1-2 km sized impact feature, and that the radius of the impacting body was about 20 m. Such an event occurs every 10-50 years. Although below the resolution limit of ground-based telescopes, this crater should be visible on space-based images of the Moon obtained by the Lunar Orbiter and Clementine missions. A search of images from the Clementine mission reveals a 1.5 km feature with a high-albedo, blue, fresh-appearing ejecta blanket at the location of the flash. Spectral analysis of the crater reveals it to be bluer and fresher than other young craters. Our results suggest that the effects of space weathering occur rapidly on the Moon.

Work performed in part at the Jet Propulsion Laboratory California Institute of Technology under contract to the National Aeronautics and Space Administration. Funded in part from NSF grant AST-0074555.

Stuart, L. (1956). The Strolling Astronomer. Vol 10, 42-43.

P61C MCC: Hall D Saturday 0830h

Planetary Atmospheres Posters *(joint with A)*

Presiding: **A Toigo,** Cornell University**; D A Brain,** Laboratory for Atmospheric and Space Physics, University of Colorado

P61C-0350 0830h POSTER

Fractionation of the Early Terrestrial Atmospheres: Dynamical Escape

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Hydrodynamic escape may have played a significant role in the early fractionation of the atmospheres of the terrestrial planets. This possibility has been demonstrated in the last two decades by numerous models that show radial, transonic flow of hydrogen can occur in the presence of sufficient solar EUV flux, thought to exist in the first few 100 Myr. The models show that the larger the solar flux the greater the mass of the fractionating species, which are accelerated to escape speeds by the hydrogen wind through drag processes. As the atmospheres evolve and the solar EUV flux wanes, the maximum mass of flowing gas constituents decreases until all gases become static. We show that fractionation can continue beyond this point when non-radial flow and dynamically enhanced Jeans escape are considered. For example, the early terrestrial atmospheres are thought to have had large hydrogen contents, resulting in exobase altitudes of a planetary radius or more. In this case, rotational speeds at the exobases of Earth and Mars would be large enough for light constituents to "spin" off and fractionate, especially at equatorial latitudes. Also, in the presence of transonic flow of hydrogen only, non-radial expansion throws heavier gases to high altitudes in the exosphere, accompanied by strong bulk speeds at the exobase, which results in enhanced thermal escape fluxes and fractionation.

P61C-0351 0830h POSTER

A Cold Jovian Arctic Polar Vortex: Evidence from Infrared Imaging

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A prominent cold arctic airmass in Jupiter is revealed by thermal images taken at NASA's Infrared Telescope Facility (IRTF) during Jupiter's northern summer in 1999. This cold airmass is well defined by a sharp 4-degree thermal gradient in both the stratosphere and the upper troposphere and tropopause regions. The latitude boundary of the cold airmass oscillates in longitude with principal wavenumber 5–6. This longitudinal oscillation is coincident with the oscillation of the boundary of the thick polar hood that is detectable in reflected sunlight that is sensitive to particles around Jupiter's tropopause (∼100 mbar pressure), using IRTF 2.3-μm and HST WFPC2 890-nm images. The sinusoidal boundaries slowly rotate prograde with respect to the interior. The proximity and similarity of the thermal and particle boundaries suggests that the phenomenon is a classical polar vortex of the same type as seen in the Earth's antarctic. Testing of possible gaseous entrainment within the vortex' area would verify or refute similarities with polar vortices in the Earth, Venus, Mars and possibly Titan. This phenomenon is relevant to studies of terrestrial meteorology by measuring the extent to which stratospheric phenomena can drive tropospheric properties. Detailed

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studies of Jupiter's polar regions might be most easily accomplished from appropriate remote sensing instrumentation on a polar orbiter mission as a result of optimized spatial resolution.

The work reported here was supported by funds from NASA to the Jet Propulsion Laboratory, California Institute of Technology. Ori Fox was supported by the Undergraduate Student Researcher Program (USRP).

P61C-0352 0830h POSTER

Structure and seasonal variations of martian bore wave systems

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The Mars Regional Atmospheric Modeling System (MRAMS) is used to study atmospheric bores originating along the slopes of the Tharsis volcanoes. The existence of bores in this region has been known since Viking I imaged linear cloud features in the early morning during late spring and early summer. Four MRAMS simulations at Ls 90, 180, 262, and 360 were conducted with an emphasis on Olympus Mons. Results show strong downslope flows during the night, with near-surface winds exceeding 30 m/s. A bore wave forms along the narrow katabatic front, and travels at approximately 20-25 m/s. The simulations also show differences in the bore structure, speed and strength from season to season. It is deepest and fastest during summer and weakest during winter. Results are compared with Viking observations and theoretical treatments of atmospheric bores. This research was supported by the NASA Planetary Atmosphere Program and the NASA Mars Data Analysis Program.

P61C-0353 0830h POSTER

Winds in the martian upper atmosphere from MGS aerobraking density profiles

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We have used a novel technique to measure the zonal wind in the martian upper atmosphere using MGS Accelerometer aerobraking density profiles. Typical results for the northern hemisphere (NH) at about Ls=40, 115 km altitude and midafternoon local solar times (LSTs) show a westward speed of 50 to 100 m/s; those for the southern hemisphere (SH) at about Ls=80, 110 km altitude show an eastward speed of 0 to 50 m/s. Solar activity is moderate for both periods with an F10.7 index of about 140 units.

In the NH, wind speed shows no dependence on longitude, decreases as latitude increases poleward, and increases as altitude increases. In the SH, repeated measurements of wind speed at fixed latitude, altitude, LST, and longitude during the 8:1 resonance between MGS's orbit and Mars' rotation show a significant dependence of wind speed on longitude. At 20E longitude the typical wind speed is 50 m/s westward, whereas at 335E it is 120 m/s eastward. The dependence of wind speed on latitude and altitude is difficult to examine, because periapsis altitude steadily decreased as periapsis precessed poleward. The two variables are strongly correlated. In some longitude regions, eastward wind speeds increase as periapsis moves poleward and downward, but in others the eastward wind speeds stay constant. At 60S latitude and nighttime LSTs, wind speeds differ from their daytime values. Nighttime wind speeds at a given longitude show much less variability than their daytime counterparts. These results will be compared to MTGCM simulations. Other applications of this technique will be suggested.

URL: http://www.lpl.arizona.edu/~withers

P61C-0354 0830h POSTER

The Mars Thermospheric LMD General Circulation Model

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The LMD-AOPP Mars General Circulation Model developed jointly by LMD (Paris), AOPP (Oxford) and IAA (Granada) has been extended into the thermosphere. The model reaches a height of approximately 400 km and includes the effects of thermal conduction, molecular viscosity and EUV absorption which are relevant processes at high altitudes. The model also includes non-LTE effects in the upper atmosphere. This is the first model to be able to simulate the planet's atmosphere from the ground up to thermospheric heights. This full coupling of the various atmospheric regions yields an excellent tool to study the effects of lower atmospheric processes on the upper atmosphere. Results of the improved Mars LMD TGCM will be shown.

P61C-0355 0830h POSTER

cyclones, tides, and the origin of major dust storms on Mars

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The Martian dust storm provides one of the most spectacular examples of transient meteorological phenomena in the solar system. While most Martian dust lifting events are local in scale, tens to hundreds of kilometers, some are regional storms thousands of kilometers in size, and a few have been observed to initiate global dust storms that shroud the entire planet. Large dust storms represent the most dramatic component of the Martian dust cycle - one of the three main cycles determining the climate on Mars. They can generate significant perturbations of the global climate, increasing mid-level air temperatures by tens of degrees Kelvin. These storms can be categorized as major storms. Observations before Mars Global Surveyor (MGS) indicate that classical major dust storms originate in the southern hemisphere during the "dust storm season" of southern spring and summer (Ls=180-360). It was suspected that the dynamics of major dust storms involve feedback between the atmospheric circulation and radiative heating of lofted dust. However, there has been little success in providing mechanisms to explain the origin and/or transience of major storms. Recently, a new category of major dust storm has been identified, with dust lifting initially associated with northern-hemisphere fronts, and involving flushing of dust from the northern to southern hemisphere. Such "flushing" dust storms are mainly observed in mid northern fall and mid northern winter. We present a mechanism for the development of these storms, including natural explanations for diurnal, seasonal, and interannual variability of the storms. Dust flushing from the northern hemisphere requires coherence and cooperation between three major dynamical systems: baroclinic storms, thermal tides, and the Hadley circulation. Once dust is flushed into the southern hemisphere, accumulation of dust in the Hadley convergence zone will greatly increase the strength of the circulation, leading to major dust storm. These results provide not only a coherent picture of major storm development and transience, but also an example of cooperative interaction of Mars' major dynamical systems over planetary length-scales.

P61C-0356 0830h POSTER

Implications of Martian Crustal Magnetic Sources for Past and Present Atmospheric Escape

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The magnetic environment near Mars plays a critical role in the escape of atmosphere to space. It is therefore possible that crustal magnetic sources have an effect on atmospheric escape rates, both presently and in the past.

Using simple models of the Martian magnetic morphology (constrained by data from MGS MAG) we will explore the quantitative effect that the presence of crustal sources might have on the three main loss processes believed to be important at Mars in the present epoch: photochemical escape, ion pickup from the solar wind, and sputtering. Crustal sources should affect loss via the two latter processes in two different ways - by shielding regions of Mars' atmosphere locally from solar wind-related ionization processes and by trapping photoions on closed magnetic field lines associated with the crust. Additionally, reconnection of closed magnetic field lines to the passing solar wind magnetic field should allow direct access of the solar wind to lower regions of Mars' atmosphere.

The presence and strength of crustal sources at Mars has major implications for atmospheric loss rates over Martian history. First, we now know that a Martian dynamo once existed. An active dynamo would have prevented the access of the solar wind to the Martian atmosphere. Additionally, if crustal sources were much stronger in the past and occurred over a large fraction of the Martian subsurface then these sources would have acted as an effective global magnetosphere, preventing access of the solar wind to the Martian atmosphere. We will discuss the current constraints on atmospheric loss rates over Martian history indicated by crustal sources, and suggest future observations that might address this important question.

P61C-0357 0830h POSTER

Resolving Sub-Fresnel-scale Atmospheric Structure Near the Martian Surface

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In planetary radio occultation, Abel inversion is typically used to recover atmospheric refractivity curves from which temperature and pressure can also be derived. But being based in geometrical optics, the Abel inversion is diffraction-limited, yielding profiles with vertical resolutions no better than the diameter of the first Fresnel zone, $\sim 2\sqrt{\lambda D}$ where D is the distance between the spacecraft and the observed ray periapse. Consequently, Abel inversion alone cannot resolve sub-Fresnel-scale atmospheric features such as sharp temperature inversions. Further, limb diffraction (as commonly observed in occultation data from Mars Global Surveyor) can aggravate profile reconstruction by masking near-surface atmospheric structure. By itself, Abel inversion cannot uncover near-surface features in the presence of limb diffraction since this is a wave optics phenomenon.

This research addresses the resolution limit in Abel inversion by manipulating the angular spectrum of occultation data to reverse propagate the observed fields. In doing so, this technique, called back propagation, effectively reduces the size of the first Fresnel zone. Therefore, when applied to back-propagated data, the Abel inversion can achieve vertical resolutions better than the Fresnel scale. In an occultation simulation mimicking Mars Global Surveyor radio science experiments, back propagation allows Abel inversion to resolve simultaneously both the planet limb to within 10 m as well as a smooth, 40 m refractivity perturbation of magnitude 10^{-7} superposed over the refractivity profile for a Mars-like atmosphere. The simulated atmosphere has a refractivity of $\sim 4 \times 10^{-6}$ and a scale height of $\sim$9 km. The diameter of the first Fresnel zone in this simulation is approximately 500 m - greater than ten times the scale of the refractivity feature used in the simulation. Early application of back propagation to real occultation data from Mars Global Surveyor demonstrates similarly promising results for resolving near-surface atmospheric structure at Mars.

P61C-0358 0830h POSTER

Daily to Interannual Variability of Mars' Surface Pressure

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We present an empirical orthogonal function decomposition of Mars' Northern Hemisphere surface pressure variability on daily to interannual timescales using the output of the GFDL Mars model. Using bidaily averages, we show that the first two EOFs comprise a zonal wavenumber 1 baroclinic wave which is active throughout northern winter, concentrated at 70N latitude, accounts for 53% of northern surface pressure variability, and moves eastward with a period of 6 to 8 sols. The third EOF is annular about the north pole, is active only at the onset and demise of the baroclinic wavenumber 1 wave, and accounts for 7% of the northern hemisphere surface pressure variability. It is reminiscent of the Arctic Oscillation in the Earth's atmosphere. It can reside in pseudo-stationary states for 20 to 30 sols, and since its activity coincides with the activity of wavenumber 2, 3, and 4 waves, we speculate that it is these waves which act as a pump for the annular mode. We will also discuss the modal variability of other Mars GCMs.

P61D MCC: 131 Saturday 0830h

Terrestrial Analogues for Planetary Studies I *(joint with A, B, H, OS, T, V, GC, MR)*

Presiding: **D Burr,** University of Arizona**; P Lanagan,** University of Arizona

P61D-01 0840h INVITED

Sub-Ice Processes at Hlodufell Basaltic Tuya, Iceland: Geomorphic Clues for the Recognition of Sub-Ice Volcanism on Mars

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Hlodufell is a 1186m high, 12km2, basaltic tuya volcano, located about 9km south of the Langkjokull icecap in south-west Iceland, that preserves a 650m-thick sub-ice to emergent succession. The basal exposures of the main edifice and peripheral areas provide important evidence for sub-ice processes at basaltic tuya volcanoes. This includes at least seven, overlapping, fissure-fed pillow mounds, which are <100m to 1km across and 40-300m high. They are steep-sided, slightly elongate and have convex upper surfaces with local crests of steep narrow ridges of pillow lava.

Pillow lavas along the margins of the mounds commonly display ice-contact features, including steeply-oriented flat chill surfaces that are common to several pillow lobes, and distinctive open cavities to several metres across. Some of these cavities contain partial infills of in-situ and fluvially-redeposited hyaloclastite. The cavities are interpreted as due to melt-out of ice-blocks incorporated in the margins of pillow lobes during sub-ice construction of the mounds. The mounds are commonly draped by Surtseyan tephra, which was deposited by meltwater stream flows in (probable) sub-ice drainage channels. The ice-contact features and associated meltwater-deposited tephra indicate that sub-ice construction of the tuya involved a leaky water vault. Numerous dike, sill-like and irregular intrusive bodies, many of which display evidence of interaction with wet unconsolidated sediment at their margins, indicate that endogenous construction and modification of the edifice was important during subice growth.

Recognition of elongate resistant mounds peripheral to larger edifices will aid recognition of putative tuyas and other areas of sub-ice volcanism on Mars. Recognition of cavities within these edifices and magma-sediment mixing textures associated with sub-ice construction will have to await higher-resolution imagery.

P61D-02 0900h

Terrestrial Analogs of Martian Radar Targets From the Dry Valleys, Antarctica

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Mapping water in its various forms is perhaps the most fundamental of the various Mars exploration objectives, and the most critical in the search for signs of present or past life. Upcoming missions to Mars will employ radar sounding from orbital platforms and surface rovers in order to map subsurface ice and liquid water. The recent identification of features on Mars which exhibit morphologies consistent with ice/rock mixtures, near-surface ice bodies and near-surface liquid water point to the need for appropriate terrestrial analogs. Radar propagation models for similar features on Earth where the important physical properties can be readily determined will be crucial for interpreting data from Mars. Climatic, hydrological, and geological conditions in the McMurdo Dry Valleys of Antarctica are analogous in many ways to those on Mars, and many ice-related features in the Dry Valleys may have direct morphologic and compositional counterparts on Mars.

We collected roughly 1,000 line-km of airborne radar data over permafrost, subsurface ice bodies, rock/ice glaciers, frozen saline lakes, and glacial deposits in the Dry Valleys, primarily in Taylor and Beacon Valleys. These features have direct relevance to future Mars missions. The data were collected with multiple systems including a chirped 52.5 67.5 MHz coherent radar operating at 750 W and 8 kW peak power (with multiple receivers) and 1 - 2 microsecond pulse length, and a 60 MHz pulsed continuous-wave, incoherent radar operating at 8 kW peak power with 60 ns and 250 ns pulse lengths. These data are suitable for the implementation of advanced pulse compression algorithms and SAR focusing. Preliminary results indicate penetration of permafrost and massive subsurface ice bodies in Taylor Valley, and a rock glacier in Beacon Valley. The comparison of different radar configurations and parallel tracks where they are available will be utilized to further constrain our interpretations and to develop radar propagation models.

P61D-03 0915h

Masaya Volcano, Nicaragua: A Terrestrial Analog for the Evolution of Martian Calderas

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Like their terrestrial counterparts, Martian calderas are believed to be the surface products of the partial evacuation of a magma chamber at a few kilometers depth. Mars Orbiter Laser Altimeter (MOLA) data show that sagging of the caldera center may exceed 1.6 km at Biblis Patera, 1.3 km at Olympus Mons, and 300 m at Alba Patera, suggesting post-eruption deflation of the magma chamber. In order to understand the physical structure of Martian volcanoes, we are conducting a detailed morphologic and topographic comparison of Olympus Mons caldera, Mars, and the Nindiri pit crater of Masaya volcano, Nicaragua. Masaya volcano, Nicaragua, is a persistently active basaltic volcano that comprises four main pit craters, which are named (from east to west) Masaya, Santiago, Nindiri, and San Pedro. Nindiri crater is partially filled by frozen lava lakes that formed between 1570 and 1670. The lava surface in the crater subsequently sagged downward plastically before failure in a brittle fashion along circular bounding faults, producing fractures that are morphologically similar to the circumferential fractures seen around the perimeter of the floor of Olympus Mons caldera. The walls of San Pedro and Santiago pit craters that formed following lava lake emplacement now cut these Nindiri features. Exposure of the lava lake pile in the pit crater wall allows a vertical section in excess of 300 m to be studied. Lava flows preserved in the eastern wall of Nindiri have sagged about 50 meters. A more recent lava lake was also erupted onto the sagged crater floor in 1852 where it ponded within the sag-structure. Our on-going study of Nindiri as a terrestrial analog to Martian calderas is focused on analysis of the structural features and on the timing of the eruptions and deformation events. Numerous features are common to both calderas, including extensional fractures around the perimeter of their floors, compressional ridges near the center of collapse, and ponded lava flows that have now been dissected by more recent collapse events. If we can show that one collapse event deformed plastically (as at Nindiri), then this suggests that the subsidence took place within a few years of lava lake emplacement so that the lava was still at a high enough temperature to allow plastic deformation. Brittle deformation is more likely to imply a longer time period between lava lake emplacement and collapse. In either case, extrapolation of these ideas to Mars has significance for inferring magma supply rates at the summit of Olympus Mons and other Martian volcanoes.

P61D-04 0930h

The Effects of Martian Conditions on Lava Flowing in a Channel

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Using the thermo-rheological model FLOWGO, we have considered the effects of Martian gravitational and environmental conditions on the cooling of lava flowing in a channel. Atmospheric temperature and density differences have only minor effects and the most significant effects are due to the differences in gravity between Earth and Mars: 1) the lower gravitational acceleration on Mars means that lava flows more slowly in a channel of a given size than it would on Earth; 2) this slower flow means that a more extensive insulating crust can form; 3) this more extensive crust reduces the cooling rate; and 4) slower flow also means a smaller volumetric flow rate (width x depth x velocity) if channel dimensions are equal.

FLOWGO allows us to compare both temporally and spatially two flows of equal volumetric flow rate (but with the Martian channel necessarily larger than the Terrestrial one). If compared at the same time since leaving the vent, the more extensive crust on the Martian flow means that its core temperature will be higher. At the same distance from the vent, the Martian lava will have a more extensive surface crust but its core temperature will be lower. This is because it has taken longer to get there and therefore been cooling for a longer period of time.

This means that if a Martian flow and a Terrestrial flow have the same length, the Martian flow was emplaced at a higher volumetric flow rate. That Martian flows are typically longer than Terrestrial flows means that their volumetric flow rates are considerably higher.

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Sabkha Environments on Earth and Mars: Implications for the Martian Hydrological System

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Sabkha (playa) lakes and their deposits are well known in arid zones on the Earth. Their presence indicates the existence of a water table and strong evaporative processes influencing the shallow subsurface. A large number of sediments and facies are produced by these environments and related processes. The main lithotype produced in these environments are evaporites, consisting of several salts such as halite, gypsum, carbonate. Their deposition may occur at the surface, but most time they are accumulated in the near subsurface at the contact between the water table and the overlying dry sediments. High-albedo areas have been recognised on the Martian surface. Several of them consists of superficial deposits, others have been identified in layered deposits within craters or basins. One of the interpretations for these high-albedo zones suggests they are the remnant of sabkha, because evaporitic deposits usually display a very high albedo. The presence of these purported Martian sabkha is also consistent with some hydrological models and they are the natural companion of the probable deep standing bodies of waters that have been possibly identifies in other location on the surface of Mars. However, the presence of sabkha on Mars would have profound implications in the geological analysis. A first requirement to have sabkha lakes is the presence of an active water table and consequently a large hydrological cycle. Sabkha are far to be simple sinks filled by superficial water which quickly evaporates. They are rather complex basins

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