

# Planetary SETI craves scientific credibility

by Malcolm Smith

The Society for Planetary SETI Research (SPSR) has been examining images from Mars for over 25 years, focusing on surface features in the Cydonia region of the red planet. Whilst many now believe 'the Face' has clearly been shown to be a natural rock formation, SPSR's work continues with a wealth of new images produced by current Mars orbiters. With four new missions due to arrive in late 2003 and early 2004, the head of SPSR Dr Horace Crater is seeking to gain greater acceptance amongst the mainstream scientific community.

Based at the Physics Department, University of Tennessee Space Institute, Tullahoma, USA, Dr Horace Crater heads the Society for Planetary SETI Research (SPSR), a multi-disciplinary research group including space professionals, engineers, physicists, scholars and other specialists located around the USA and overseas.

Historically, SPSR is an organisation of scientists and scholars from varied disciplines, which formed around a common interest in the surface anomalies on planets and their satellites, the origins of which may result from intelligent activity. When assessing possible SPSR membership a variety of criteria are applied. These include long-term legitimate research efforts in the area of Planetary SETI and/or academic expertise in related fields. SPSR conducts its research mostly by individual efforts or in small groups and there



Dr Horace Crater.

are very few actions by the group as a whole. Exceptions are the 1997 meeting with NASA in Washington DC and the publication of a book in 1998, *The Case for the Face*.

SPSR research focuses primarily the surfaces of Mars and the Moon, characterised by investigation from both orbiters and landers. Stanley V. McDaniel (a former Sonoma State University professor of philosophy) founded the organisation in 1994, responding to a need he felt to bring the subject of Planetary SETI within the scientific mainstream - until then it had languished on the outskirts. Rather than focusing on speculation, SPSR has aimed to publish research findings in peer-reviewed scientific literature.

To date over 16 such articles have appeared and copies can be downloaded from

the SPSR website - <http://it.utsi.edu/~spsr/>

SPSR has contacted a number of the main proponents of radio SETI but to date they have chosen not to respond to the request for dialogue on areas of common interest, so as yet SPSR does not feel recognised by the "mainstream" SETI community.

Whilst many believed the whole Cydonia issue was settled by Mars Global Surveyor (MGS) imagery acquired in 1998, Crater believes most people simply do not take the time to read the peer-reviewed literature produced, instead being content with public (non peer-reviewed) comments by NASA contractors on the released images.

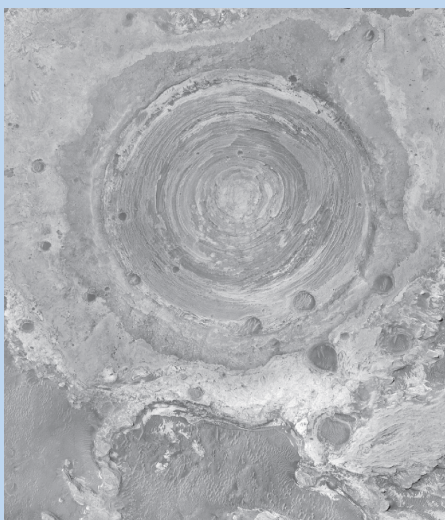
According to Crater, these comments tend to be slanted toward debunking the whole issue and cannot be considered serious scientific analyses.

"In the case of the April 1998 image, the initially released version, shot from a 45-degree angle under poor conditions, was so badly enhanced that it appeared flat and featureless (in spite of the 1/4 mile height of its midpoint)," he explained.

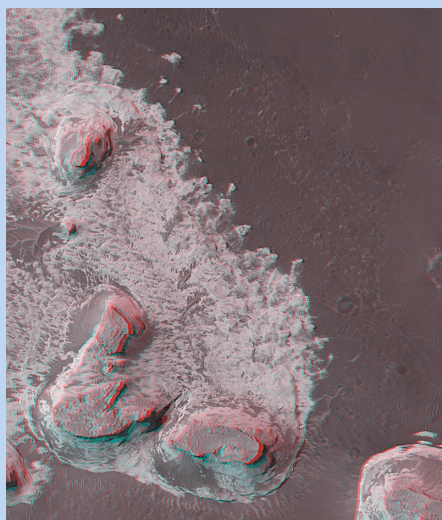
"Nevertheless, a later analysis of a more accurately enhanced version found a number of the unusual features (eg the 'eye') in the original showed more detail. Additionally, a later higher-resolution image shot from overhead, allowed the symmetry of the land form and its internal features to be more accurately documented. Unexpectedly they were shown to conform to a specific simple

## Mars Global Surveyor - latest images from the Mars Orbiter Camera

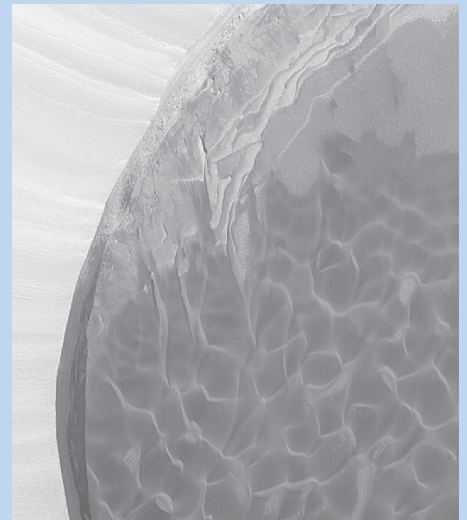
A partially-exhumed crater in Northern Terra Meridiani. NASA/JPL

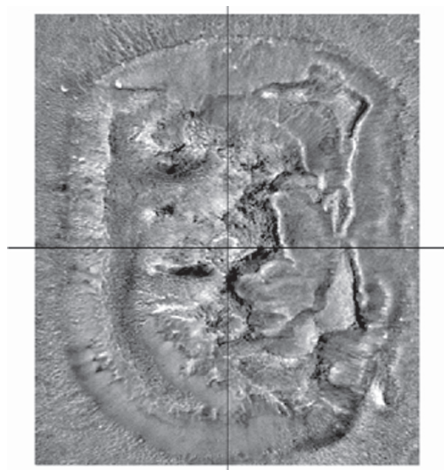


Near the intersection of the Martian equator and prime meridian is Northern Terra Meridiani 'Monument Valley'. NASA/JPL



Erosion of North Polar layers and genesis of nearby sand dunes. NASA/JPL





This orthorectified MGS image shows that the feature possesses a very high degree of symmetry in two directions. Shown are the intersecting horizontal and vertical axes of symmetry. Courtesy of Dr Mark Carlotto

geometrical pattern.

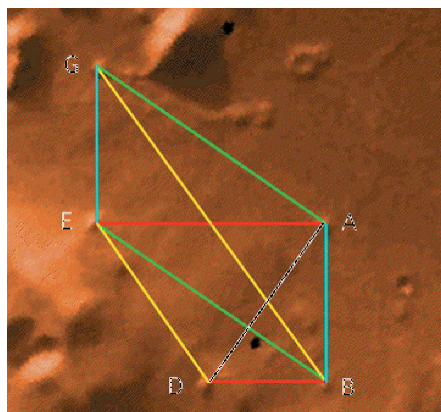
"So, as far as SPSR is concerned, there is still a debate, albeit somewhat one-sided. Strangely, the continued re-imaging of this feature by MSSS (the NASA subcontractor in charge of the MGS satellite) belies the point of the debate being over."

However, as a result of the initial imagery release, the attitude towards NASA now varies within the membership. Originally, NASA agreed to meet with SPSR before the MGS began imaging the planet and gave the group time to present the case for possible artefacts then.



The classic 35A72 face image from the Viking Mars missions of the 1970s.

Furthermore, Crater believes they have been less dismissive lately. In fact, a number of NASA administrators have encouraged SPSR to publish in peer-reviewed journals and present their results at conferences. When informed of the group's success along these lines individuals at NASA have said they would then like to see publication in more mainstream journals (such as *Science* or *Nature*) but according to Crater, they seem unaware of the



Primary mound image: the pentad.

Courtesy Dr Horace Crater, SPSR

institutional barriers these types of journals set up. Consequently SPSR has been forced to publish in less well-known – but rigorously refereed – journals, like the *Journal of Scientific Exploration* (JSE), *The Journal of the British Interplanetary Society* (JBIS) and more recently on-line journals like *New Frontiers in Science* and *Marsbugs*, the latter an astrobiology newsletter.

The current research the group is pursuing can be characterised as geometrical/statistical, geological, biological and anthropomorphic. Earlier work on the repeated angular placements of mound-like features has continued. In previous work (Crater and McDaniel) SPSR found that certain right and isosceles triangles drawn between the positions of mounds were not only repetitive but closely related to the geometry of a tetrahedron. Their work showed such redundancies are extremely unlikely to have occurred by chance. Now SPSR is investigating in a more thorough fashion all possible geometries to see if chance can be further ruled out or not.

In recent work published in *JBIS* two SPSR members (Ness and Orme) discovered that the branching of what NASA researchers have called "spider-like" features have signatures characteristic not of just geology at work, but also of biology.

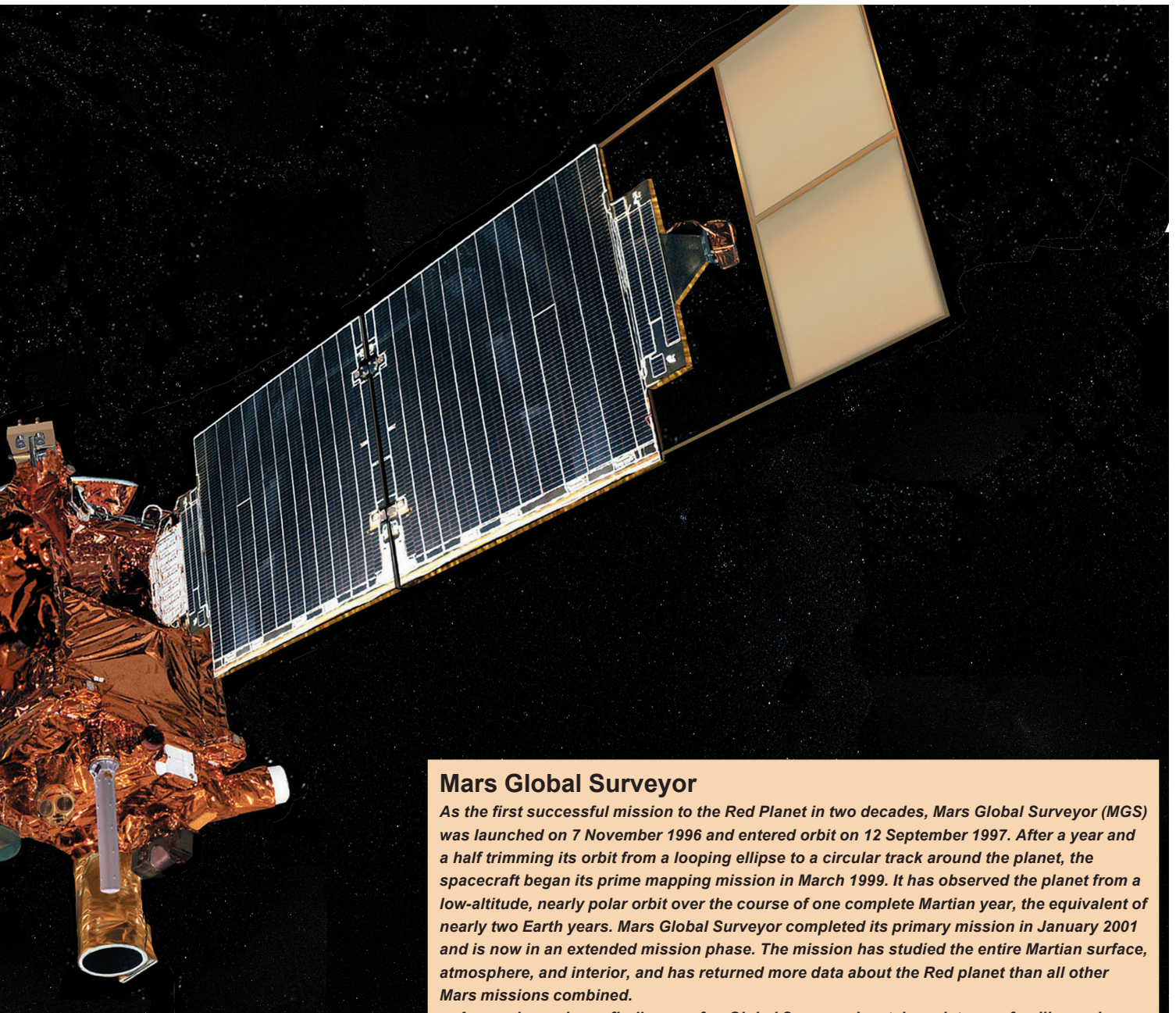
Other members (Crater and Levasseur) recently published work on several face-like surface areas with unusually distinct eye-like features. This is taking two directions: one is to see if these areas are placed at significant locations on the planet; for example Dr Tom Van Flandern has shown the Cydonia face is upright north and at the equator relative to an older north pole. The other approach is to see if features can be explained purely on reasonable chance appearances of certain geological phenomena.

Previously, much hostility has been directed towards the approach taken by SPSR from so-



called "mainstream" scientists, many "science educators" and many amongst the space-interested general public. As far as Crater is concerned, he feels hostility is directed more towards excessive speculation, appearing without research seriously challenged by a peer-review process with which most mainstream scientists are familiar. With several exceptions Crater feels this hostility is due mainly to ignorance, mistaking SPSR's approach for those of other groups who do not choose the process of scientific peer-review.

When asked if too much attention has been focused on the meteoritic and microbial side of the "life on Mars" debate – to the detriment of other approaches – Crater responds that, to the extent that life on Mars in any form becomes more acceptable, so the concept of possible intelligent surface interventions becomes less inconceivable. Putting the



### Mars Global Surveyor

*As the first successful mission to the Red Planet in two decades, Mars Global Surveyor (MGS) was launched on 7 November 1996 and entered orbit on 12 September 1997. After a year and a half trimming its orbit from a looping ellipse to a circular track around the planet, the spacecraft began its prime mapping mission in March 1999. It has observed the planet from a low-altitude, nearly polar orbit over the course of one complete Martian year, the equivalent of nearly two Earth years. Mars Global Surveyor completed its primary mission in January 2001 and is now in an extended mission phase. The mission has studied the entire Martian surface, atmosphere, and interior, and has returned more data about the Red planet than all other Mars missions combined.*

*Among key science findings so far, Global Surveyor has taken pictures of gullies and debris flow features that suggest there may be current sources of liquid water, similar to an aquifer, at or near the surface of the planet. Magnetometer readings show that the planet's magnetic field is not globally generated in the planet's core, but is localised in particular areas of the crust. New temperature data and closeup images of the Martian moon Phobos show its surface is composed of powdery material at least one metre thick, caused by millions of years of meteoroid impacts. Data from the spacecraft's laser altimeter have given scientists their first 3D views of Mars' north polar ice cap.*

Cydonia debate aside, Crater goes on to say that resolving the issue of possible life of any form on Mars (past or present) has to be one of the highest priorities for space agencies.

Aurora, the long-term Mars exploration programme of the European Space Agency (ESA), aims to put "a European on Mars by 2025". To those at ESA concerned with Aurora, Crater hopes at the very least they become aware of the published peer-reviewed literature on Planetary SETI. Whilst SPSR has not yet approached ESA's Mars Express camera team to request additional imagery, they intend to ask for images of the Cydonia area at medium resolution (between Viking and MGS), particularly for the mounds and 'the face'.

For some time now Crater has thought professional planetary scientists should take SPSR research seriously. The Society has

been able to present research work at scientific conferences in 1998 and 1999 (both at the Spring meeting of the American Geophysical Union). Researcher Van Flandern gave an oral presentation entitled 'Artificial Structures on Mars' to the June 2002 meeting of the American Astronomical Society in Albuquerque. SPSR has also received encouraging comments from high-profile individuals involved with Mars exploration. Astronauts who are believed to be sympathetic to SPSR research include (possibly) Edgar Mitchell.

With regard to ongoing and future research work, perhaps it is best to end with a statement from SPSR's website: "Despite many challenges, SPSR is committed to keeping the Mars investigation as much in the scientific mainstream as possible. To this end, members are encouraged to submit their papers to peer-review within the group and to seek publication in appropriate peer-reviewed science journals. In this way we hope, in essence, to broaden the mainstream subject matter to include a scientific approach to Planetary SETI.