MARSBUGS:

The Electronic Exobiology Newsletter
Volume 2, Number 10, 20 July 1995.

Co-editors:

David Thomas, Life Sciences Department, Belleville Area College, Belleville, IL 62221, USA, thomasd@basenet.net (basegrp.com).

Julian Hiscox, Microbiology Department, BBRB 17, Room 361, University of Alabama at Birmingham, Birmingham, AL 35294-2170, USA, julian_hiscox@micro.microbio.uab.edu.

MARSBUGS is published on a weekly to quarterly basis as warranted by the number of articles and announcements. Copyright exists with the co-editors, except for specific articles, in which instance copyright exists with the author/authors. E-mail subscriptions are free, and may be obtained by contacting either of the editors. Contributions are welcome, and should be submitted to either of the two editors. Contributions should include a short biographical statement about the author(s) along with the author(s)' correspondence address. Subscribers are advised to make appropriate inquiries before joining societies, ordering goods etc.

CONTENTS

NASA LIFE SCIENCES RESEARCH GOES ON LINE
NASA press release

Beginning today on the Internet, computer users will be able to access the first stage of a NASA data archive that eventually will provide the wealth of scientific knowledge developed from 30 years of space-based research into the effects of microgravity on living systems, including the human body.

The Life Sciences Data Archive (LSDA) contains overview information on the 18 experiments conducted on the Spacelab Life Sciences-1 mission that flew on board the Shuttle in June 1991. As the system grows and matures, information from other life sciences research conducted on other missions, such as the International Microgravity Laboratory flights, Spacelab-Japan and Spacelab Life Sciences-2, will be included.

"We have a great deal of valuable information in our life sciences archive," said Gerry Taylor, Project Manager of the Life Sciences Data Archive and staff scientist in the Life Sciences Program Integration Office at the Johnson Space Center (JSC), Houston. "Now, people will be able to learn about the research we have done and how it has direct applications to their own quality of life here on Earth."

The information is housed at the National Space Science Data Center (NSSDC) with active links to a number of other NASA-related home pages. Internet users can access the information at
http://nssdc.gsfc.nasa.gov/life/nssdc/life_home.html

The archives are designed for easy use by researchers, educators and students. The Master Catalog will serve as a top-level directory describing each completed life science space flight, and provide an overview of each experiment conducted during the flight. Beginning in the Fall of 1995,

users also will be able to order several CD-ROM products from the NSSDC for more detailed information about a single mission or single experiment. The Mission CD-ROMs will provide information about the mission itself; the available LSDA Experiment CD-ROM will contain fundamental, analyzed and summarized data for any particular life sciences experiment conducted on a flight.

"We are very excited about the prospect of sharing this wealth of knowledge with the American public," Taylor said. "With the archives available through the Internet, researchers will be able to stay current with space life science research and results, and will benefit from having a central location where they can find this information."

Taylor also stressed that the information available on the Internet will be valuable to students and educators in preparing research papers or class lessons, and in proposing student experiments to NASA.

The Life Sciences Data Archive was developed jointly by the Office of Life and Microgravity Sciences and Applications at NASA Headquarters; JSC; Ames Research Center, Mountain View, CA; and Goddard Space Flight Center, Greenbelt, MD; with support from Martin Marietta Services Group, Houston, TX; Futron Corp. and the Uniformed Services University of Health Sciences, Bethesda, MD; Lockheed Engineering and Science Group, Houston, TX and Sunnyvale, CA; Hughes STX, Greenbelt, MD; Mains Associates, Berkeley, CA; and Universities Space Research Association, Washington, DC.

SHUTTLE MISSION HOME PAGE GOES ONLINE WEDNESDAY
NASA Internet advisory

With the countdown underway for this week's planned launch of the Shuttle Atlantis, NASA is unveiling a permanent home on the Internet for Shuttle mission information.

"On Board STS-71," focusing on the Atlantis-Mir docking flight, will be the maiden voyage of the official NASA source for World Wide Web information about all Space Shuttle missions.

The page also will feature five spectacular new images of Russia's Mir Space Station, available to the media from NASA Headquarters and to computer users via the Internet on Wednesday, June 21. The pictures are being released to help illustrate the upcoming docking of the Space Shuttle Atlantis to the Mir space station. The high resolution images show Mir over the Pacific ocean and were recorded using the IMAX Cargo Bay Camera during the STS-63 rendezvous mission on February 6, 1995.

The IMAX images and other information on STS-71 can be accessed at the following URL
http://shuttle.nasa.gov

The Shuttle mission home pages are designed to give visitors the opportunity to experience a Space Shuttle mission through access to detailed, up-to-the-minute multimedia information during each flight. The first effort to provide this kind of information to the public drew interest from tens of thousands of computer users all over the world during the STS-67/Astro-2 mission earlier this year.

For this and subsequent missions, the NASA Shuttle home page will provide real-time data that originates with the actual stream of telemetry between the Atlantis and Mission Control, Houston.

NASA'S LEGACY OF MARS EXPLORATION
NASA backgrounder

In the decade between mid-1964 and late 1975, the United States' National Aeronautics and Space Administration (NASA) launched nine robotic spacecraft--seven Mariners and two Vikings--to explore Mars. All but two reached the planet and sent the first close-up pictures and scientific observations back to scientists on Earth. Mariner 9 and the Vikings went into orbit around the planet and the Vikings placed two landing craft on the surface of Mars.

During roughly the same time frame, the former Soviet Union launched eight spacecraft to Mars. Unfortunately, few of them returned useful scientific data about the planet, although a number of spacecraft achieved orbit or delivered surface capsules.

The Mariner spacecraft were relatively small scientific explorers, launched by the Atlas rocket with either the Agena or Centaur upper stages. They weighed less than half a ton (without onboard rocket propellant). The Viking Orbiter spacecraft were scaled-up Mariners, each carrying a lander sealed in a sterile atmospheric-entry capsule plus enough rocket propellant to place the compound vehicle in orbit and then send the capsule into the atmosphere and then to the ground.

The design of these missions was based on the developing communications capability of the Deep Space Instrumentation Facility--later renamed the Deep Space Network--and the concept of an attitude-stabilized, solar-powered spacecraft that could orient solar panels at the Sun, a communications dish antenna at the Earth and a camera or other sensors at the target planet. The Mariners and the Viking Orbiters were developed by NASA's Jet Propulsion Laboratory. The Viking project and its lander development were managed by NASA's Langley Research Center in Hampton, Va.

Mariners 4, 6 and 7 flew by the planet, spending less than an hour in close proximity. Mariner 4, equipped to measure the interplanetary environment as well as Mars, continued to send useful scientific data for three years. Mariner 9 spent 11 months mapping the planet from orbit. The two Viking orbiters lasted two and four years, respectively, in orbit. The pair of landers operated for almost two years and more than four years, respectively, on the surface of Mars.

The Mariner series actually began with a 203-kilogram (446 pound) spacecraft developed in 11 months for a flight to Venus. Mariner 2 carried no camera, but made important measurements at the planet and in interplanetary space. Mariner 4 then was launched in November 1964 on an eight-month odyssey to Mars, where in July 1965 it collected the first close-up photographs of another planet.

The pictures, played back from Mariner 4's small tape recorder over a long period of time, showed impact craters like those on the Moon, some of them sprinkled with frost in the chill of a Martian evening. After its encounter with Mars, Mariner 4 flew behind the planet from Earth, letting scientists use its deep-space radio link as a probe to measure the density of the Martian atmosphere right down to the surface.

In 1969, Mariner 6 and Mariner 7 completed the first dual mission to Mars, flying by the equator and south polar regions and analyzing the atmosphere and surface with remote sensors, as well as recording and relaying hundreds of

pictures. By chance, both flew over cratered regions and missed both the giant northern volcanoes and the equatorial grand canyon. Their approach pictures did, however, show the dark features long seen from Earth (and named "seas" and "bays"), but no canals. Indeed, the three early Mars Mariners changed the perception of the planet from one that could possibly harbor life to a frozen, cratered, moon-like world--a perception that soon changed again.

The first spacecraft to orbit Mars was Mariner 9, launched in May 1971. Achieving orbit that November, Mariner 9 observed that a great dust storm had obscured the whole globe from view. Since 1969, Mariner spacecraft operations such as science sequencing and pointing had been programmable, using simple flight computers with limited memory, and the spacecraft used a digital tape- recorder rather than film to store images and other science data. Two Soviet Mars orbiters, arriving right around the same time, were controlled by fixed clocks and recorded pictures on photographic film. They helplessly shot all their pictures of dust clouds.

Mariner 9 was able to wait until the storm abated, the dust settled and the surface was clearly visible to compile its global mosaic of high-quality images of the Martian surface. For the first time the giant shield volcanoes of the Tharsis region, the 4,000-kilometer (2,500-mile) grand canyon named for Mariner and many river-like channels became visible. Mariner 9 also transmitted the first close-up photographs of Mars' two small, irregular moons, Phobos and Deimos. A detailed Mars globe was created from more than 1,500 images of Mariner 9's 7,329 images.

The Viking Orbiters deepened the global view presented by Mariner 9, especially in the case of full-color images or high-resolution studies of selected surface features. The Viking landers sent back horizontal landscape panoramas from the landing gear to Mars' horizon during every season of the Martian year, as well as long-term climate records, surface chemical analyses, studies of physical properties and searches for Martian life at the two landing sites, Chryse Planitia and Utopia Planitia.

From orbit, Mars displayed a greater variety of terrains than was found on the Moon or Mercury and appeared to still be evolving and changing, with winds driving the erosion process and playing a powerful role in surface changes. Many areas revealed the effects of flooding and volcanic activity that had occurred in Mars' distant past, at least 50 million years ago and, perhaps, more like several billion years ago. Where the floodwaters came from and what happened to them remained a puzzle. No liquid water and almost no atmospheric water were found; the deeply layered north polar cap, with dust and permanent ice layers under seasonal carbon-dioxide dry ice deposits, was almost the only Martian water observed.

The local weather at the landing sites was uniformly cold and dry. Viking 1 measured high and low temperatures of between minus 30 degrees and minus 86 degrees Celsius (minus 22 degrees and minus 123 degrees Fahrenheit) the day after landing. Winds reached 29 kilometers per hour (18 miles per hour) with gusts up to 52 kilometers per hour (32 miles per hour). Soil analysis found almost 100 times as much sulfur present in the Martian terrain as was the case in either terrestrial or lunar soil, with iron and magnesium found in abundance among other expected chemical elements. The biology and organic chemistry experiments discovered chemical activity in surface samples and some other surprising results. But the mission uncovered no evidence of organic chemicals and or other clear evidence that life had ever existed at the Viking landing sites.

The next logical step in the exploration of Mars was a mission that could provide scientists with a global profile of the planet's surface and atmosphere over the course of a full Martian year, the equivalent of two Earth years. Mars Observer was to take that next scientific step. The spacecraft was launched on September 25, 1992, atop a Titan III launch vehicle and spent 11 months cruising to Mars. But after a 71l-million-kilometer (442- million-mile) journey, and just three days short of entering orbit around Mars, the spacecraft fell silent. One black-and- white approach picture of Mars had been taken before the spacecraft was lost, showing clear skies over the planet.

To recover from this loss, NASA quickly set in place a decade-long program of Mars exploration that would fulfill the science objectives of the Mars Observer mission and take scientists much further along in their knowledge and studies of this planetary neighbor. In 1996, NASA plans to launch two spacecraft to Mars: Mars Global Surveyor, a scaled down version of Mars Observer, and Mars Pathfinder, a lander and rover designed to demonstrate new ways of landing and exploring the surface. Every two years after that, another pair of landers, orbiters or combinations of the two will be launched to Mars. NASA's new 10-year-long program is called the Mars Surveyor program.

US and USSR (*) Mars Exploration Missions Launched

Title, Launch Date, Mission, Description (LOS - Loss of Signal)

- *Mars 1, 11/1/62, Mars probe, LOS at 65.9 million miles
- Mariner 3, 11/5/64, Mars probe, shroud failed.
- Mariner 4, 11/28/64, Mars flyby 7/14/65 w/photos, LOS 12/20/67.
- *Zond 2, 11/30/64, Mars probe, failed to return planetary data.
- Mariner 6, 2/24/69, Mars flyby 7/31/69 w/photos, lasted to 12/70.
- Mariner 7, 3/27/69, Mars flyby 8/5/69 w/photos, lasted to 12/70.
- Mariner 8, 5/8/71, Mars orbiter; launch vehicle malfunctioned shortly after liftoff.
- *Mars 2, 5/19/71, Mars orbiter/lander arrived 11/27/71, no useful data returned.
- *Mars 3, 5/28/71, Mars orbiter/lander, arrived 12/3/71, data & few photos.
- Mariner 9, 5/30/71, Mars orbiter, operated in orbit 11/13/71 to 10/27/72.
- *Mars 4, 7/21/73, failed Mars orbiter, flyby 2/10/74.
- *Mars 5, 7/25/73, Mars orbiter, arrived 2/12/74, few days.
- *Mars 6, 8/5/73, Mars orbiter/lander, arrived 3/12/74, little data return.
- *Mars 7, 8/9/73, Mars orbiter/lander, arrived 3/9/74, little data return.
- Viking 1, 8/20/75, Mars orbiter/lander, orbited 6/19/76-1980, landed 7/20/76-1982.
- Viking 2, 9/9/75, Mars orbiter/lander, orbit 8/7/76-1987, landed 9/3/76-1980.
- *Phobos 1, 7/7/88, Mars/Phobos orbiter/lander, LOS 8/89 en route to Mars.
- *Phobos 2, 7/12/88, Mars/Phobos orbiter/lander, LOS 3/89 near Phobos.
- Mars Observer, 10/25/92, LOS at Mars arrival 8/21/93.

Sources: TRW Space Log, On Mars (NASA SP-4212).

MARINER 4 ANNIVERSARY MARKS 30 YEARS OF MARS EXPLORATION
NASA press release

Three decades after Mariner 4's flyby of Mars on July 14, 1965-- the first spacecraft ever to reach the planet and take close-up photographs of the Martian surface--NASA is preparing a whole new decade of Mars missions that will rely on revolutionary new technologies and smaller, cheaper, faster spacecraft to continue robotic exploration of the Red Planet.

Kicking off this new decade of discovery are two missions scheduled for launch in the fall of 1996: Mars Global Surveyor, an orbiter to map the surface and atmosphere of the planet; and Mars Pathfinder, a Discovery program mission designed to deliver a lander, camera and instrumented rover to the Martian surface on July 4, 1997.

As NASA prepares for these missions, the community is also celebrating the roots of Mars exploration, which reach back 30 years to one tense day in the summer of 1965 at the Jet Propulsion Laboratory in Pasadena, Calif.

It was on July 14, 1965, that scientists and engineers waited anxiously for radio signals from NASA's Mariner 4 spacecraft, near Mars, to tell them that the spacecraft was successfully photographing the Red Planet close up for the very first time. With a round-trip communication time of 24 minutes, they could not remotely control the spacecraft. Mariner 4 was following a primitive onboard computer program and a sequence that engineers had started earlier that morning.

The signal arrived at the communication site at Goldstone, Calif., right on schedule at 5:30 p.m. Pacific Time. After 26 minutes of television recording, slightly more than 21 pictures filled the recording tape. The camera was switched off and Mariner's other instruments came on again to monitor the space environment around Mars. A few minutes later, the spacecraft flew within 10,000 kilometers (more than 6,000 miles) of Mars, then continued on its course to become one more object orbiting the Sun.

Mariner 4's flight past Mars was just the second successful interplanetary mission in history for the U.S. space program, preceded by Mariner 2's flight to Venus in 1962. The Mariner 4 mission had been developed, built and tested at the Jet Propulsion Laboratory in just two years time.

The Mariner team had to be ready for launch in November 1964 in order to reach Mars in July 1965, and the spacecraft could only weigh about 260 kilograms (575 pounds) in order to achieve the velocity needed to get to Mars.

With very little experience in interplanetary space travel, engineers did not have much of an idea about the space environment that Mariner 4 would encounter during its eight-month trip to Mars. The ability of the spacecraft and its parts to survive eight months in space was an open question--one that only the mission itself would answer. The sheer distance alone-- nearly three times the range of the first interplanetary flight-- challenged the telecommunication system. Even the precise location of Mars and the lighting conditions on its surface were unclear.

Mariner 4's sister ship, Mariner 3, was launched three weeks earlier, but was doomed when the launch rocket's nose fairing failed to jettison properly. This trapped the spacecraft and forced NASA, JPL and the contractor for the upper-stage rocket, Lockheed Corp., into a race to design and build a new fairing in time to launch the second spacecraft while the Earth and Mars were still in proper alignment with each other.

They won the race. Mariner 4 lifted off Earth on an Atlas/Agena rocket on November 27, 1964. After about a week of radio tracking on the way to Mars, the spacecraft was commanded to perform a rocket-thrust maneuver, refining its course toward Mars. Then it coasted the rest of the way.

Throughout its flight the spacecraft kept its four solar panels oriented toward the Sun to generate electric power to run its equipment and keep the battery charged. It kept up a constant two-way communication link with the Earth, providing for radar- based navigation and the receipt of commands from the ground, as well as sending science data to six teams of scientists and engineering health and performance measurements to engineers.

Between February and June 1965, Mariner 4 detected the effects of five separate solar flares, significant increases in the solar wind and its spiral flow of charged particles from the Sun. These events showed up in the magnetometer, several charged- particle sensors and the cosmic-ray telescope. During the flight to Mars, the cosmic dust detector indicated an irregular increase in the number of micrometeorites, counting a total of about 200 particles.

Seven and a half months after launch the spacecraft approached Mars. On command it switched from "cruise science," carried out during the flight, to "encounter science," the observations of Mars. Another command aimed the camera and seven hours later a Mars detector started the camera shutter clicking. After recording its pictures, the spacecraft passed behind Mars and its radio signal faded into silence for nearly an hour. Scientists measuring the fadeout and return of the radio signal were able to measure the ionosphere and atmospheric density of Mars, similar to the way astronomers measure planetary atmospheres through the fading of starlight.

The next day, Mariner 4 began more than a week of playback of the recorded pictures of Mars. Very slowly the cratered, cold, hostile new world crept into view. Interpreting the dim gray of the Martian images was made far easier by a new photographic tool: the computer.

Taken for granted today, digital imaging and image processing were the state of the art in the early 1960's. In fact, scientists developed image processing to help solve the anticipated difficulties in reproducing pictures of Mars taken by spacecraft, though the technique was first tested on spacecraft pictures of the Moon. Removing "noise" on the image from spacecraft circuits and the space environment, and smoothly improving the contrast of the dim Martian scenes were just the beginning of an art that now pervades medical, forensic, scientific and commercial images.

Looking at the densely packed craters in the image of the small swatch of the Martian plains, the Mariner scientists could hardly believe that almost no Earth-based astronomers had predicted that Mars might resemble Earth's Moon. But the impact craters were the dominant features of the scenery. Small craters lay on the rims of large ones and scientists judged that the topography was very old and little changed in contrast to Earth.

No mountains, valleys, ocean basins or canals were visible. The first picture revealed the edge or limb of the planet. Image processing brought out an atmospheric haze above the horizon. The last few pictures were dark, showing the night

side of Mars, but just before the edge of night, what appeared to be frost glistened on crater rims.

The Mariner 4 atmospheric team estimated the Martian surface pressure to be 4 millibars to 7 millibars, compared to about 1,000 millibars on Earth. That made the air on Mars about 150 to 200 times thinner than on Earth. They concluded that it was mostly carbon dioxide. Other instruments searched in vain for indications of an Earth-like magnetic field or radiation belts.

After the Mars encounter and playback were finished, the spacecraft resumed its observations of the interplanetary environment. However, Mariner 4 and Earth soon moved in their orbits so that telemetry could no longer be detected. In 1967 the spacecraft returned to the vicinity of Earth, approaching as close as 29 million miles, and sent back data from a few months of solar wind and solar flare measurements. On December 20, 1967, after three years in flight, Mariner 4 finally ran out of the propellant used to turn and orient it, thereby ending the first mission to Mars in U.S. space exploration history.

NASA NAMES FIRST ROVER TO EXPLORE THE SURFACE OF MARS
NASA press release

On the 30th anniversary of Mars exploration, NASA has selected the name "Sojourner" for the first rover to explore the planet. The 11.5-kilogram (25-pound), six-wheeled robotic explorer is now being readied for launch, and will roam across an ancient Martian flood plain after its companion lander, Mars Pathfinder, touches down on the surface on July 4, 1997.

The U.S. spacecraft Mariner 4 ushered in the beginnings of humanity's detailed exploration of the Red Planet 30 years ago today when it flew by Mars at a distance of about 10,000 kilometers (6,000 miles) on July 14, 1965, taking the first close-up images of another planet.

The name Sojourner was chosen for the Mars Pathfinder rover after a year-long, worldwide competition in which students up to 18 years old were invited to select a heroine and submit an essay about her historical accomplishments. The students were asked to address in their essays how a rover named for their heroine would translate these accomplishments to the Martian environment.

Initiated in March 1994 by The Planetary Society of Pasadena, Calif., in cooperation with NASA's Jet Propulsion Laboratory, the contest got under way with an announcement in the January 1995 issue of the National Science Teachers Association's magazine "Science and Children," which is circulated to 20,000 teachers and schools across the nation.

Valerie Ambroise, 12, of Bridgeport, Conn., submitted the winning essay about Sojourner Truth, an African-American reformist who lived during the tumultuous era of the U.S. Civil War. An abolitionist and champion of women's rights, Sojourner Truth, whose legal name was Isabella Van Wagener, made it her mission to "travel up and down the land," advocating the rights of all people to be free and the rights of women to participate fully in society. The name Sojourner was selected because it means "traveler."

JPL scientists and engineers working on the Mars Pathfinder project and Planetary Society staff members reviewed the 3,500 total entries received from all over the world, including essays from students living in Canada, India, Israel, Japan, Mexico, Poland and Russia. Nearly 1,700 of the essays were submitted by students aged 5 to 18 years old and met all of the qualifying criteria.

The selection of winners from this group by representatives of JPL and NASA Headquarters was based on several factors: the quality and creativity of the essay, taking into consideration the age of each contestant; the appropriateness of the name for a Mars rover; and the knowledge and understanding of the Pathfinder rover's mission conveyed in each essay.

The second place prize winner was Deepti Rohatgi, 18, of Rockville, Md., who proposed naming the rover after Marie Curie, a Polish-born chemist who won the Nobel Prize in 1911 for her discovery of the elements radium and polonium. The third place prize goes to Adam Sheedy, 16, of Round Rock, Texas, who chose the late astronaut Judith Resnik as his namesake for the new rover.

Other popular names included Sacajewea, who explored North America with Lewis and Clark; Amelia Earhart, one of the first female aviators; Athena, the Greek goddess of wisdom; Harriet Tubman, a 19th-century African-American writer and political reformist; Greek goddesses Minerva and Atalanta; and Thumbelina, the tiny fairy tale character created by Hans Christian Andersen.

The Mars Pathfinder lander and rover will be launched in December 1996 aboard a Delta rocket and then will spend seven months cruising to Mars. The mission will demonstrate a new, low- cost way of entering a planetary atmosphere and landing through a combination of parachutes, rockets and shock-absorbing airbags designed to slow the spacecraft's descent and place it safely on the surface. Once Pathfinder lands and opens its exterior petals, the solar-powered rover will be sent off to explore the chemistry of rocks in the area and other features of the planet's rocky surface.

Mars Pathfinder is part of NASA's Discovery program, a new generation of low-cost spacecraft designed to explore the solar system. The mission is managed by the Jet Propulsion Laboratory for NASA's Office of Space Science and Office of Space Access and Technology, Washington, D.C.

MARS GLOBAL SURVEYOR FAQ INQUIRIES WANTED

On 4 November 1996 at 1:37 p.m. EST, the United States will begin its return to Mars as NASA launches the Mars Global Surveyor space-craft on the start of a five year mission. MGS will attempt the most comprehensive study of the red planet ever attempted in history.

A high resolution camera on-board will take extremely high resolution photographs of surface features, a laser altimeter will determine the global topography, a thermal emission spectrometer will measure the thermal properties of the surface as well as determine the composition of surface minerals and rocks, and a magnetometer will attempt to establish the nature of the magnetic field. Other experiments will keep track of Martian weather patterns and atmospheric properties.

By studying Mars, the most likely planet for future human expeditions, scientists hope to better understand the formation and evolution of Earth and the inner solar system.

Currently, the MGS project is in the process of updating its Home Page on the World Wide Web. We are in the process of compiling a list of answers to the most frequently asked

questions (FAQs) regarding our mission, Mars exploration, and Mars science.

If you are interested in helping us out, please send questions about Mars or Mars exploration that you would most like to see answered. Ideal questions should be worded in a few sentences or less.

Please e-mail your questions to: mars-faq@cranberry.jpl.nasa.gov

If you prefer, you may send your questions via U.S. Mail to:
Wayne Lee
Mars Global Surveyor Project
Jet Propulsion Laboratory
Mail Stop 301-180
4800 Oak Grove Drive
Pasadena, CA 91109-8099

Unfortunately, personal responses will probably not be possible at this time. However, we promise to post the FAQ list (along with the answers) to various news groups if the home page is not yet completed.

Thank you for your support of planetary exploration!

Mars Global Surveyor Project
Jet Propulsion Laboratory
National Aeronautics and Space Administration
United States of America
http://mgs-www.jpl.nasa.gov
http://www.jpl.nasa.gov

ELECTRONIC JOURNAL CONFERENCE
Zsolt and Csaba Orczan

We invite owners, journalists, moderators, editors and publishers to Budapest, Hungary on November 9-11, 1995.

Topics: electronic journal, newsletter writing, editing and publishing, public relations in the e-journal, gopher and www.

Call for papers:
Papers are invited on all subjects mentioned. Please submit ASCII text and image (uuencode) [written in English] 5000 words containing 65 character/line and a brief abstract (at max. 5 lines long).

Send papers to:
MET@huearn.sztaki.hu
subject: papers

Lecture Authors will be notified about the acceptance of papers by August 20, 1995. The conference proceedings are intended to be published on floppy disc.

Conference language: English (translation into Hungarian)

PROGRAM COMMITTEE
Csaba S. Orczan (chair)
Zsolt Orczan Dr. (co-chair) orczanz@mars.iif.hu

SOCIAL PROGRAMME
Welcome Cocktail November 9, 1995
Excursion , Theatre, Opera...

CALL FOR PARTICIPATION
To participate in the conference please fill in and e-mail the attached Registration Form to the met@huearn.sztaki.hu at your earliest convenience. Please note that for early registration a reduced fee is applicable. You will receive the confirmation of your participation and the detailed program in due time.

Early Registration until August 20, 1995 FEES

before August 20,	after
$299 US	$350 US

Accompanying persons are welcome and may attend the welcome cocktail, the conference reception and the lunches on the conference days at a fee of $120 US.

PAYMENT
Participants are kindly requested to transfer the fees to the following:
MoneyGram to AMERICAN EXPRESS BUDAPEST HUNGARY-1052, ORCZAN Zsolt or POSTA BANK Budapest H-1920 account number: 131-121844 ORCZAN Zsolt

Please note that in case of cancellation only a 50 % of the paid fee will be refunded.

CONFERENCE SECRETARIAT
MET Budapest Pf.311 Hungary H-1536
e-mail: met@huearn.sztaki.hu

.....cut here.....

REGISTRATION FORM

Family Name:_____ male/female
First Name(s):_____
Address:_____
e-mail:_____
Telephone:_____
I intend to submit a paper: yes/no
Title/area of paper:_____
Technical equipment required:_____

I pay the fee MoneyGram: yes/no or Bank account: yes/no
transaction date:_____ and number_____

I register _____ accompanying persons.
Please send me information about available accommodations: yes/no
I need a hotel room: single/double
luxus___ five star(*****)___ four star (****)___ three star (***)___
Date from _____ to _____

Please inform me about Excursion, Theatre, or Opera: yes/no

.....cut here.....

ABOUT BUDAPEST

In 1835, an English peer by the name of John Paget got his first look of Buda and Pest from the crest of Gellert Hill. Of what he saw there he wrote as follows: "Buda with its blue chain of hills, Pest with its yellow plain, and the majestic Danube with its green isles were all sprawled out at our feet... and we sat for some time, enthralled by all that beauty... One hundred and fifty years have passed since the ousting of the Turk, and in this space of time, the city has risen from squalid ruins to become one of the great cities of Europe. Pest owes its progress not to the good will of a benevolent ruler, but to its natural endowments and the energy of its people... It lies on the banks of a river that traverses half of Europe, and may expand unbounded in every direction. All this leads one to anticipate a splendid future for Pest-Buda."

It is interesting to compare Paget's description with the observation made by the geographer Kohl from Bremen just seven years later. The order-loving German appraised the city with satisfaction: "Pest was conceived in an orderly manner, the city plan was elaborated with proper circumspection. The main thoroughfares leading in every direction from the centre of the town are broad and straight." The haphazardness of Buda, however, was less to his liking. "There is no sign of planning. The streets are neither centralized nor straight; consequently, the town has no core, and in its network of streets, one will find nothing that resembles order. The reason for this is the unfavorable soil and the fact that the roads are cut off by hills, preventing the population from building their houses in a rational manner."

Whether we think of the past or the present, the description is faithful. Whether to its advantage or otherwise, Pest is comparable to other big cities lying on the plain. But Buda is unique, like Stockholm, Istanbul, or Rio, and this is due precisely to its "disorderliness". Pest may expand without constraint, but Buda is bound by the surrounding hill country. In the course of its development, Pest has smothered and devoured its environment, as most big cities do. But even today, Buda is inseparable from it, despite the fact that the "peaceful coexistence" between man and nature is being increasingly threatened. More and more houses are appearing on the formerly sparsely populated hillsides, and the tentacles of urbanization feel their way not only upward: they bore their way into the remotest hollows of the valleys. Small plots of land are being congested by large houses, and even sometimes entire neighborhoods; the gardens are shrinking, the woods receding into the distance. New roads are being built, public utilities, service accommodations established.

Nevertheless, Buda continued to be characterized not so much by its wreath of hills as by the fragmentedness of its inner area. It has no rational geometrical scheme. The inner city hills-- Rozsadomb, Naphegy, Varhegy (Castle Hill), Gellerthegy and Sashegy--which boast perhaps the world's only big city nature conservation area, divide the body of the town into sections, thus giving the whole a diversified, exciting aspect. The old sixteenth-century Italian saying according to which the world has three gems: Venice on the water, Florence on the plain, and Buda on the hill, in all probability still holds true, and so does the ironic saying of Hungarian architects, according to which the natural endowments of Buda are so beautiful that even they, the architects can't wipe them out completely.

Please reply as soon as possible!
Yours sincerely,
Dr. ORCZAN, Zsolt & ORCZAN Csaba

MET Publisher: ORCZAN, Zsolt e-mail.:orczanz@mars.iif.hu
MET Chief editor: ORCZAN, Csaba e-mail: orczanc@mars.iif.hu MET BUDAPEST PoBox. 311. HUNGARY, H-1536 MET@HUEARN

THE INTERSTELLAR PROPULSION SOCIETY
Society Announcement

The mission of the Interstellar Propulsion Society is to accelerate scientific and engineering advancements in space propulsion, leading to manned missions to other star systems at fractional light speeds, relativistic velocities and beyond. The Society's main function is to provide a medium for scientists and engineers, worldwide, to join in collaborative efforts to advance interstellar propulsion technology.

While at first impression the Society may appear to be highly focused in a problem of broad dimensions, it is a fact of history that major advancements travel have been preceded by the invention and development of power plants and propulsion devices. If the same holds true for interstellar travel, the invention of a practical space drive will shortly be followed by the first robotic probe to a distant star system.

The major areas of emphasis for fulfilling the mission of the Society will be:

A) Digital Library
An advanced digital library, accessible through World Wide Web Mosaic-style browsers, that will consolidate worldwide knowledge in interstellar propulsion. This "library of the future" will be capable of indexing and retrieving millions of documents stored in formats such as Postscript, Frame, Word Perfect, LATEX, Tex, and others. The library will offer search tools including Boolean, Fuzzy Boolean, Similarity Search, Quorum operator and technical thesauri.

B) Member Directory
A worldwide directory of research members searchable by name, specialty, and research interests.

C) IPS Newsgroup
A private newsgroup patterned after the successful USENET News with extensions for scientific and engineering articles.

D) Collaborative Research Tools
A private FTP site containing analysis, simulation, computational physics, visualization, and communications software for use by Society Professional Members.

E) Interstellar Propulsion Journal
A professional research journal which will publish research papers which have been submitted for peer review.

F) Quarterly IPS Newsletter
A brief newsletter summarizing recent Society developments and upcoming events.

G) IPS Calendar
A inter-society calendar of upcoming research conferences, meetings and workshops.

H) IPS Research Conferences
The Society will eventually sponsor research conferences on different topics in Interstellar Propulsion which will be held in different locations around the world.

I) IPS Research Grants
The Society will eventually sponsor research to address specific problems and funding teaching/research chairs at selected universities and research institutes to a build stronger participating scientific and engineering base than presently exists.

J) Public Relations
The Society will provide advocacy for advanced research in interstellar space propulsion and its beneficial impact on the course of human progress.

Advisor Roles:

a) Provide advice and ideas relative to Society operation, including identifying promising research objectives, identifying sources of funding to be explored, recommending high payoff areas for funding by the Society, and recommending improvements in the IPS worldwide information retrieval and collaborative research infrastructure.

b) Provide peer review and assist in the selection of papers to be published in the Journal of the Interstellar Propulsion Society.

c) Assist in the collection and review of material for inclusion in the Society digital library.

d) Assist in planning and conducting meetings convened expressly for presenting papers, conducting workshops and discussions relative to Society long term goals, recent progress, and near term challenges.

e) Assist in evaluation of proposals for research grants.

==========

IPS MEMBERSHIP FORM
INTERSTELLAR PROPULSION SOCIETY
Professional Membership Application
Mail with $25.00 fee to the
Interstellar Propulsion Society
P.O. Box 1292
La Jolla, CA 92038-1292

==========

NAME AND ADDRESS AS IT SHOULD APPEAR ON ALL MAILINGS

---

first name middle name last name

---

street address

---

city state/province postal/zip code country

---

telephone number fax number email address

==========

BUSINESS/PROFESSIONAL INFORMATION

---

occupation

---

title or position

---

firm/institution address

---

city state/province postal/zip code country

==========

SUMMARY OF BACKGROUND

Summarize in 200 words or less the specialized skills that you offer to the IPS objective. This material will be entered into the Society Professional On-Line Directory.

MARS GLOBAL SURVEYOR-THERMAL EMISSIONS SPECTROPHOTOMETER T- SHIRTS AVAILABLE
(Communicated by Dr. Ken Edgett)

"The Arizona Mars K-12 Education Programme now has a collector's edition T-shirt available. The back of this unique 6-color Mars Global Surveyor T-shirt portrays school kids on Earth wearing spacesuits and looking skyward at Mars and the MGS spacecraft. The front page of the shirt has the following inscribed: "Mars Global Surveyor TES K-12 Education, Arizona State University."

This is non-profit and further details may be obtained from:

Arizona Mars K-12 Education Programme,
c/o Ken Edgett,
Department of Geology,
Arizona State University,
Box 871404,
T#004#empe, AZ 85287-1404, U.S.A.

E-mail: edgett@esther.la.asu.edu

End *Marsbugs* Vol. 2, No.