THE 206-43

The Newsletter of NARHAMS, NAR Section #139.
NAR National Champions 2001, 2004

APRIL 2007 VOL 29 ISSUE 04

REPORT REVEALS LIKELY CAUSES OF MARS SPACECRAFT LOSS

WWW.NASA.GOV

WASHINGTON - After studying Mars four times as long as originally planned, NASA's Mars Global Surveyor orbiter appears to have succumbed to battery failure caused by a complex sequence of events involving the onboard computer memory and ground commands.

The causes were released today in a preliminary report by an internal review board. The board was formed to look more in-depth into why NASA's Mars Global Surveyor went silent in November 2006 and recommend any processes or procedures that could increase safety for other spacecraft.

Mars Global Surveyor last communicated with Earth on Nov. 2, 2006.Within 11 hours, depleted batteries likely left the spacecraft unable to control its orientation.

"The loss of the spacecraft was the result of a series of events linked to a computer error made five months before the likely battery failure," said board Chairperson Dolly Perkins, deputy

director-technical of NASA Goddard Space Flight Center, Greenbelt, Md.

On Nov. 2, after the spacecraft was ordered to perform a routine adjustment of its solar panels, the spacecraft reported a series of alarms, but indicated that it had stabilized. That was its final transmission. Subsequently, the spacecraft reoriented to an angle that exposed one of two batteries carried on the spacecraft to direct sunlight. This caused the battery to overheat and ultimately led to the depletion of both batteries. Incorrect antenna pointing prevented the orbiter from telling controllers its status, and its programmed safety response did not include making sure the spacecraft orientation was thermally safe.

The board also concluded that the Mars Global Surveyor team followed existing procedures, but that procedures were insufficient to catch the errors that occurred. The board is finalizing recommendations to apply to other missions, such as conducting more thorough reviews of all non-routine changes to stored data before they are uploaded and to evaluate spacecraft contingency modes for risks of overheating.

"We are making an end-to-end review of all our missions to be sure that we apply the lessons learned from Mars Global Surveyor to all our ongoing missions," said Fuk Li, Mars Exploration Program manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

Mars Global Surveyor, launched in 1996, operated longer at Mars than any other spacecraft in history, and for more than four times as long as the prime mission originally planned. The spacecraft returned detailed information that has overhauled understanding about Mars.

Major findings include dramatic evidence that water still flows in short bursts down hillside gullies, and identification of deposits of water-related minerals leading to selection of a Mars rover landing site.

The Jet Propulsion Laboratory, Pasadena, Calif., manages Mars Global Surveyor for NASA's Science Mission Directorate, Washington. Lockheed Martin Space Systems, Denver, developed and operates the spacecraft.

Information about the Mars Global Surveyor mission, including the preliminary report from the process review board and a list of some important discoveries by the mission, is available on the Internet at:

http://www.nasa.gov/mission_pages/mgs

ZOG-43

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ZOG-43 is the official newsletter of NARHAMS the National Association of Rocketry Headquarters Astro Modeling Section # 139

NARHAMS is the oldest model rocket club in the United States!

ZOG- 43 is dedicated to model rocketeers of all ages, abilities, and interest. We are committed to providing the most current, up-to-date information on model and real world rocketry, and to provide educational material as well as entertaining information. ZOG -43 is published monthly and is available to anyone on a subscription basis. Current rates are $10 for meeting pickup or email or $15 for postal mail U.S. Funds for 12 issues a year, payable to NARHAMS Material in ZOG -43 is not copyrighted. Free and unlimited reproduction is granted with the proper credit to the author and/or ZOG-43.

For more information.....

If you have any questions about ZOG-43 or NARHAMS, or if you have any comment(s), correspondence, free merchandise or if you'd like to submit an article, send them to :

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ZOG-43 is edited by Roy Lappalainen, and is an eight-time winner of the NAR/LAC "Rockwell" Trophy, recognized as the best NAR section newsletter.

Years won: 1969, 1973, 1975, 1990, 1991, 1992, 2003, 2004 & 2005

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NARHAMS ON THE WEB

http://www.narhams.org

Send and receive E-mail with other NARHAMS members through NARHAMS Web page grouplist via yahoo-groups.

NARHAMS serves Baltimore, the state of Md., Washington DC and the surrounding Metropolitan areas. The club is a section of the National Association of Model Rocketry (NAR) and we are the oldest continuously active model rocket club in the United States, first established as a high school club in 1963, changing our name to NARHAMS when chartered as a NAR section in 1965. NARHAMS is the only five time winner of the NAR "Section of the Year" award.

Years won: 1997,1998,1999, 2001, 2004 and 2006

NARHAMS members regularly fly their model rockets at NASA's Goddard Space Flight Center on Soil Conservation Rd. in Greenbelt Md. The launches are open to the public and are held the first Sunday of every month (weather permitting), starting at 1 PM.

Sport Launches are usually held the third Saturday of every month at Old National Pike Recreation Park near Mt. Airy Md. Check the web page for updates.

NARHAMS welcomes all prospective new members to our monthly meetings. They are held on the third Saturday of the month from 5:30 to 9:30 PM at the College Park Airport Annex Building. Dues are 10 cents a week, with an initial 50 cents up front (good for 5 weeks) as a sign of good faith.

NEW: Monthly meetings available on-line via chat-room , simply go to the NARHAMS homepage and click on the link.

Directions to College Park Airport:

Follow I-495 to Kenilworth Ave. South. Make a right onto Paint Branch Parkway, then make a right on Cpl. Frank S. Scott Dr. At the airport entrance go straight to the Operations Building, the annex building is adjacent to the "Ops" building.

ZOG ROYAL COURT

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SUNWARD

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NASA VIRGIN GALACTIC TO EXPLORE FUTURE COOPERATION

MOFFETT FIELD, Calif. - NASA officials signed a memorandum of understanding Tuesday with a U.S. company, Virgin Galactic, LLC, to explore the potential for collaborations on the development of space suits, heat shields for spaceships, hybrid rocket motors and hypersonic vehicles capable of traveling five or more times the speed of sound.

Under the terms of the memorandum, NASA Ames Research Center, located in California's Silicon Valley, and Virgin Galactic LLC, a U.S.-based subsidiary of Sir Richard Branson's Virgin Group, will explore possible collaborations in several technical areas employing capabilities and facilities of NASA's Ames Research Center.

"As we constantly seek to build upon the advances made by explorers who have come before us, we now embark upon an exciting time in space exploration history that realizes the unlimited opportunities presented by a commercial space economy," said Shana Dale, NASA's deputy administrator. "By encouraging such potential collaborations, NASA supports the development of greater commercial collaboration and applications that will serve to strengthen and enhance the future benefits of space exploration for all of mankind."

Dale is a longtime supporter of commercial space development. As the former staff director of the U.S. House of Representatives Subcommittee on Space and Aeronautics, she was instrumental in the passage of the Commercial Space Act of 1998. This legislation encourages commercial space development in a variety of areas, including launch vehicles, the International Space Station and the acquisition of space and Earth science data.

"This understanding with Virgin Galactic affords NASA an opportunity to work with an emerging company in the commercial human space transportation industry to support

Continued on page 5
















CADETS 2007

NASA Virgin Continued

the agency's exploration, science and aeronautics mission goals," said S. Pete Worden, director of NASA Ames Research Center. "Our location in California's Silicon Valley >provides a dynamic research and development platform for future potential collaborations with other such companies in support of a robust commercial space industry."

"We are excited to be working with NASA and look forward to future collaborations in exploration and space travel," said Alex Tai, vice president of operations for Virgin Galactic.

The agreement with Virgin Galactic was negotiated through NASA's Space >Portal, a newly formed organization in the NASA Research Park at Ames, which seeks to engage new opportunities for NASA to promote the development of the commercial space economy.

"This new type of private-public partnership can benefit the agency while helping to foster a new industry," said Dan Coughlin, NASA's lead for the Virgin Galactic agreement.

The memorandum of understanding will be in effect for two years and stipulates that neither NASA nor Virgin Galactic will be required to pay any fees or provide funds to support the areas of possible collaboration.

For information about NASA and agency programs, please visit:

http://www.nasa.gov

Calendar of Events for 2007

Jan 06	05:30 – 10:00 pm	Monthly meeting, Helicopter Building
Jan 07	01:00 – 02:00 pm	Goddard public launch
Jan 20	10:00 – 02:00 pm	Sport Launch
Feb 03	09:30 – 01:00 pm	Cadet building session
Feb 03	05:30 – 10:00 pm	Monthly meeting, Scale discussion
Feb 04	01:00 – 02:00 pm	Goddard public launch
Feb 17	10:00 – 02:00 pm	Sport Launch
Mar 03	09:30 – 01:00 pm	Cadet building session
Mar 03	05:30 – 10:00 pm	Monthly meeting, Streamer/Spot Landing
Mar 04	01:00 – 02:00 pm	Goddard public launch
Mar 08-11		NARCON
Mar 17	10:00 – 10:00 pm	Sport Launch, HSQM-40
Apr 01	01:00 – 02:00 pm	Goddard public launch
Apr 07	09:30 – 01:00 pm	Cadet building session
Apr 07	05:30 – 10:00 pm	Monthly meeting, C-RG building
Apr 21-22	10:00 – 04:00 pm	ECRM-34, Sport Launch
Apr 29	09:00 – 04:00 pm	Rockville Science Consortium
May 05	05:30 – 10:00 pm	Monthly meeting
May 06	01:00 – 02:00 pm	Goddard public launch
May 19	06:00 – 06:00 pm	Team America Finals, Great Meadows, VA
May 19	10:00 – 40:00 pm	Sport Launch
Jun 02	05:30 – 10:00 pm	Monthly meeting, missile building session
Jun 03	01:00 – 02:00 pm	Goddard public launch
Jun 16	10:00 – 40:00 pm	Sport Launch, C-Cargo Copter fun event
Jul 01	01:00 – 02:00 pm	Goddard public launch
Jul 02	05:30 – 10:00 pm	Monthly meeting, UFO building
Jul 15		Goddard Contest
Jul 21	10:00 - 04:00 pm	Sport launch
Jul 28 -		NARAM-49
Aug 03		NARAM-49
Aug 04	05:30 – 10:00 pm	Monthly meeting
Aug 05	01:00 – 02:00 pm	Goddard public launch
Aug 18	10:00 – 04:00 pm	Sport Launch
Sep 01	05:30 – 10:00 pm	Monthly meeting, build "A rocket"
Sep 02	01:00 – 02:00 pm	Goddard public launch
Sep 15	10:00 – 10:00 pm	Sport Launch, night launch, R/C fun fly 2 pm
Oct 06	05:30 – 10:00 pm	Monthly meeting, Sputnik building session
Oct 07	01:00 – 02:00 pm	Goddard public launch
Oct 20	10:00 – 04:00 pm	Sport launch, FAI Practice
Nov 03	12:00 – 05:00 pm	Planning meeting
Nov 03	05:30 – 10:00 pm	Monthly meeting, glider building session
Nov 04	01:00 – 02:00 pm	Goddard public launch
Nov 17	10:00 – 04:00 pm	OPOSSUM-12, Sport launch
Dec 01	05:30 – 10:00 pm	Potluck Dinner
Dec 02	01:00 – 02:00 pm	Goddard public launch

Sport launches are held at Old National Pike Park from 10am-4pm, waiver up to 3.3 lbs and "G" motors not exceeding 62.5 grams of propellant. All flights "E" power and above are restricted to 5 degrees from vertical and Questions? Call Club President Jennifer Ash-Poole at 410-674-6262 or visit NARHAMS online at http://www.narhams.org

McCoy's Micro Wonder Works

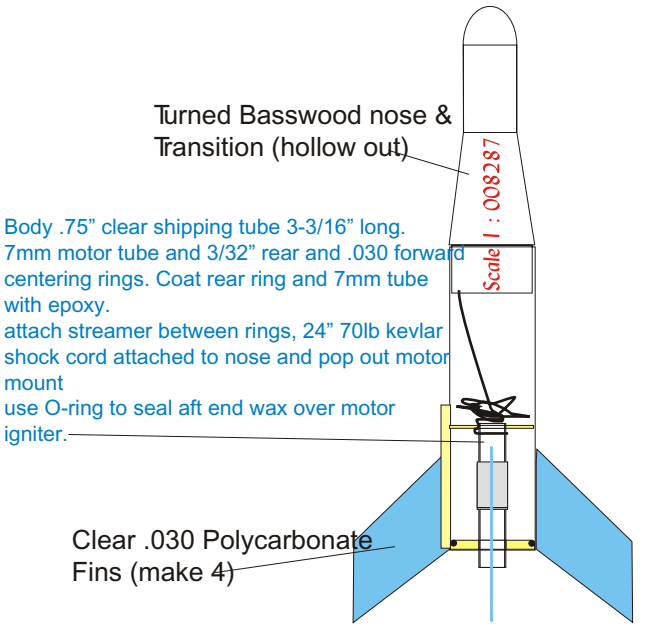
Micro-Maxx Polaris UGM-27 A1

with underwater launcher

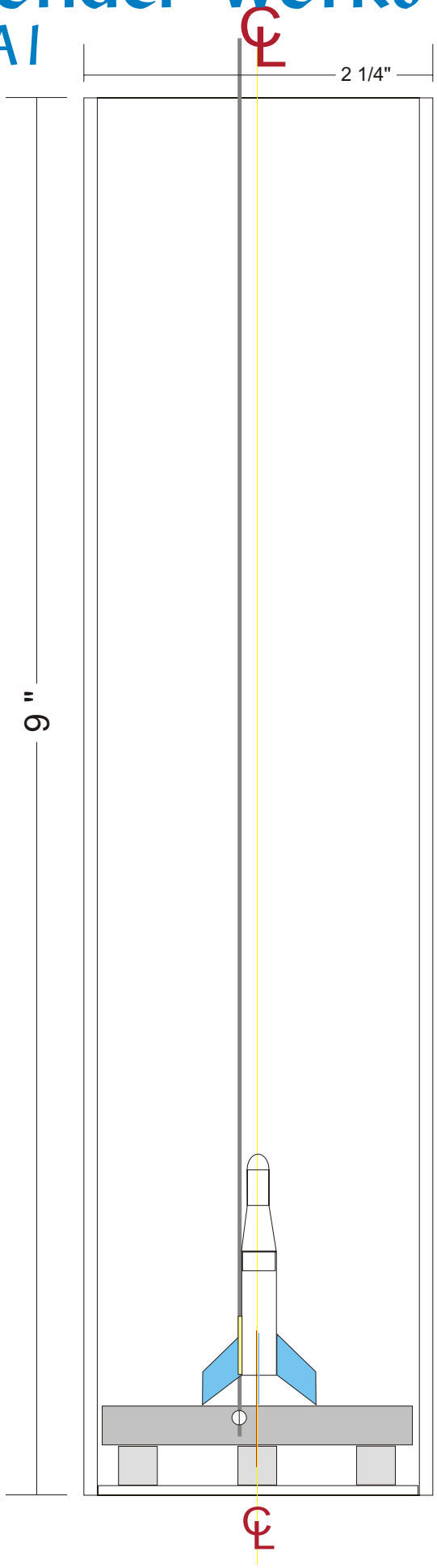
Drawing Scale: 1" = 2"(Half Scale)

Date : 01-10-2001

1 inch Square



Polaris UGM-27 A1
Full Scale



Early Bird Gets the Worm

By Dr. Tony Phillips

We all know that birds eat worms. Every day, millions of birds eat millions of worms. It's going on all around you! But how often have you awakened in the morning, stalked out in the dewy grass, and actually seen a bird having breakfast? Even though we know it happens all the time, a bird gulping a worm is a rare sight.

Just like a black hole gulping a star…

Every day in the Universe, millions of stars fall into millions of black holes. And that's bad news for the stars. Black holes exert terrible tides, and stars that come too close are literally ripped apart as they fall into the gullet of the monster. A long burp of X-rays and ultraviolet radiation signals the meal for all to see.

Yet astronomers rarely catch a black hole in the act. "It's like the problem of the bird and the worm," says astronomer Christopher Martin of Caltech. "You have to be in the right place at the right time, looking in the right direction *and* paying attention."

A great place to look is deep in the cores of galaxies. Most galaxies have massive black holes sitting in their pinwheel centers, with dense swarms of stars all around. An occasional meal is inevitable.

A group of astronomers led by Suvi Gezari of Caltech recently surveyed more than 10,000 galactic cores—and they caught one! In a distant, unnamed elliptical galaxy, a star fell into a central black hole and "burped" a blast of ultraviolet radiation.

"We detected the blast using the Galaxy Evolution Explorer (GALEX), an ultraviolet space telescope," explains Gezari. Her team reported the observation in the December 2006 issue of *The Astrophysical Journal Letters*. "Other telescopes have seen black holes devouring stars before," she adds, "but this is the first time we have been able to watch the process from beginning to end."

The meal began about two years ago. After the initial blast, radiation diminished as the black hole slowly consumed the star. GALEX has monitored the process throughout. Additional data from the Chandra X-ray Observatory, the Canada-France-Hawaii Telescope and the Keck Telescope in Hawaii helped Gezari's team chronicle the event in multiple wavelengths

Studying the process in its entirety "helps us understand how black holes feed and grow in their host galaxies," notes Martin.

One down, millions to go.

"Now that we know we can observe these events with ultraviolet light," says Gezari, "we've got a new tool for finding more."

For more on this and other findings of GALEX, see www.galex.caltech.edu. For help explaining black holes to kids, visit The Space Place at spaceplace.nasa.gov.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

ZOG-43, THE *ONLY* NAR SECTION NEWSLETTER PUBLISHED *MONTHLY*!

ZOG - FORTY THREE
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BALTIMORE, MD 21208

Launch Schedule

PUBLIC LAUNCH
Goddard Space Flight Center
Visitors Center
1:00PM - 2:00PM

Apr 1st

ECRM-34/SPORT LAUNCH
Old National Pike
10:00AM - 04:00PM

Apr 21st - 22nd

PUBLIC LAUNCH
Goddard Space Flight Center
Visitors Center
1:00PM - 2:00PM

May 6th