

Inside Orbit

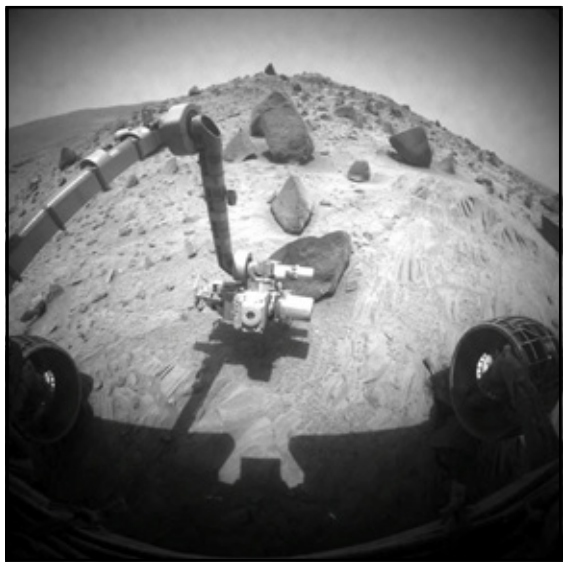
November 2007

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A Publication of the Grand Rapids Amateur Astronomical Association

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★ *It's sometimes said that scientists* ★
★ *are unromantic, that their passion* ★
★ *to figure out robs the world of* ★
★ *beauty and mystery. But it does no* ★
★ *harm to the romance of the sunset to* ★
★ *know a little bit about it.* ★
☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆

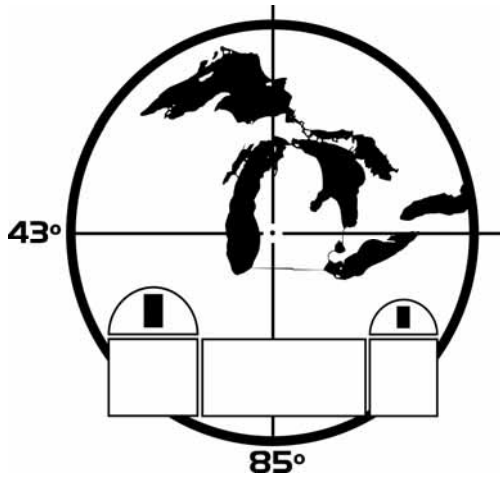
- Carl Sagan (1934-1996)



This Issue:

- ☆ Calendar of Events & News Notes
- ☆ Field Trip to Adler Planetarium
- ☆ NASA's Space Place
- ☆ Roger B. Chaffee Planetarium





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A Publication of the
Grand Rapids Amateur
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In This Issue:

Calendar of Events & News Notes

Happenings in the GRAAA and the astronomical community

Field Trip to Adler Planetariumby Richard Bell

The Kalamazoo Astronomical Society invites the GRAAA to come on the adventure

NASA's Space Place - "The Red (Hot?) Planet"

The wonders of the world of science and technology, brought to you by NASA and the Jet Propulsion Laboratory

Roger B. Chaffee Planetarium

Note: Any views and opinions expressed by the authors in this publication are not necessarily those of the GRAAA or its members.

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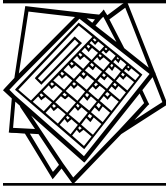
GRAAA Website

www.graaa.org

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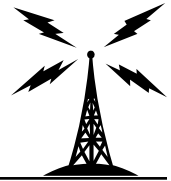
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News and Events

(Latest News and Events always online
at www.graaa.org)



THE NOVEMBER STAR PARTY will be on Saturday, November 17th (if clear).

VISITORS' NIGHTS AT THE OBSERVATORY are done for the year. **MUCH** thanks to those members who came out and helped, either once or twice, or every time. This year we got *extremely* lucky with the weather, and were only called off four times. Now we can relax and after the first of the year plan on the 2008 season.

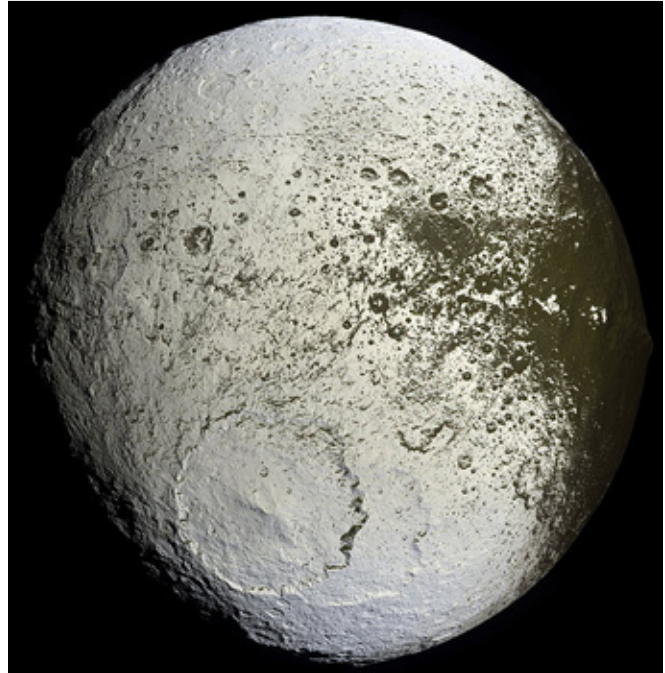
RASC OBSERVER'S HANDBOOK FOR 2008: If you have been interested in amateur astronomy for more than 5 minutes you know that the premiere guide to the Universe is the Royal Astronomy Society of Canada's Observer's Handbook, now in its 100th year of publication. Jim Foerch has offered to make a group order to save a few dollars for that new eyepiece. If at least 5 people order the Observer's Handbook we pay only \$20.45 each as opposed to \$31.95 a piece individually. If interested in getting one, please email Jim at Banjo-Jim@BlueWaterRamblers.com to arrange payment and pickup. This offer ends November 30, so write right now!

THE 2007 YOU'LL BURN will be on December 15th, and there is a chance of a "special meeting" just after Christmas. Make sure to stay tuned to your email and the website.

GRAAA ONLINE FORUM: Just a reminder of the forum for club members. It's a great place to get the latest scoop on club (and general astronomy) news, observing tips & tricks, and a whole bunch of other fun and informative things for all members to share in. You can find a link to the Forum in the Members' Section of the website.

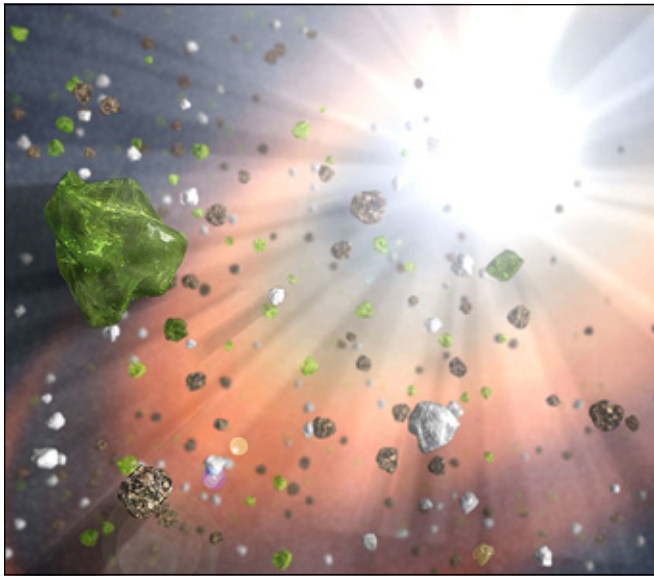
DECEMBER INSIDE ORBIT: The deadline for submissions to the November *Inside Orbit* is November 24th. If you'd like to write anything, please feel free. The staff is very relaxed concerning submissions, and take anything that's remotely interesting.

CASSINI IS ON THE TRAIL OF A RUNAWAY MYSTERY: NASA scientists are on the trail of Iapetus' mysterious dark side, which seems to be home to a bizarre "runaway" process that is transporting vaporized water ice from the dark areas to the white areas of the Saturnian moon.



This "thermal segregation" model may explain many details of the moon's strange and dramatically two-toned appearance, which have been revealed exquisitely in images collected during a recent close flyby of Iapetus by NASA's *Cassini* spacecraft.

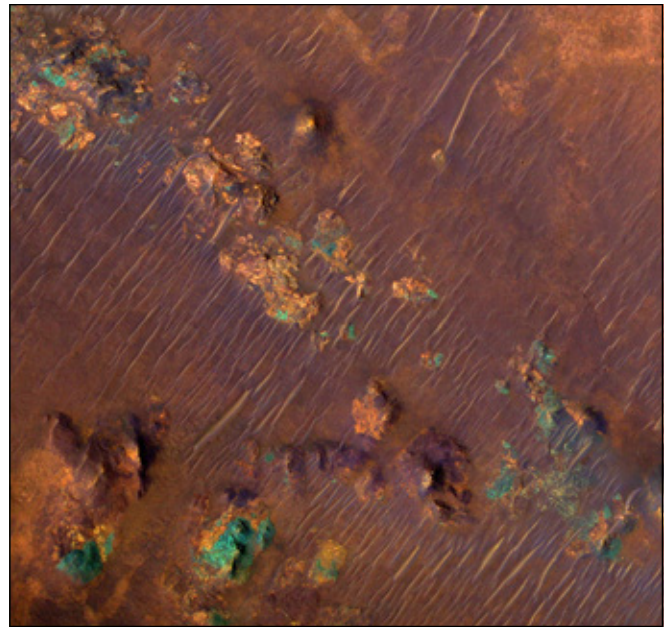
ASTRONOMERS FIND DUST IN THE WIND OF BLACK HOLES: The hit song that proclaimed, "All we are is dust in the wind," may have some cosmic truth to it. New findings from NASA's *Spitzer Space Telescope* suggest that space dust -- the same stuff that makes up living creatures and planets -- was manufactured in large quantities in the winds of black holes that populated our early universe. The findings are a significant new clue in an unsolved mystery: where did all the dust in the young universe originate?



"We were surprised to find what appears to be freshly made dust entrained in the winds that blow away from supermassive black holes," said Ciska Markwick-Kemper of the University of Manchester, U.K. Markwick-Kemper is lead author of a new paper appearing in an upcoming issue of the *Astrophysical Journal Letters*. "This could explain where the dust came from that was needed to make the first generations of stars in the early universe."

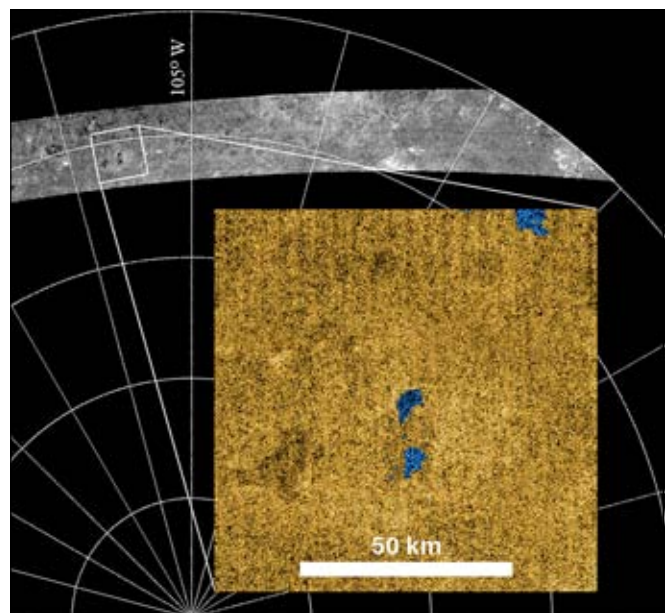
NASA HONORS APOLLO ASTRONAUT ROGER CHAFFEE: NASA honored the late astronaut Naval Lt. Cmdr. Roger B. Chaffee with the presentation of an Ambassador of Exploration Award for his involvement in the U.S. space program. Chaffee's wife Martha accepted the award Saturday, Oct. 6, and present it for display at Purdue University during the halftime show of the Purdue - Ohio State football game. NASA is giving the Ambassador of Exploration Award to the first generation of explorers in the Mercury, Gemini and Apollo space programs for realizing America's vision of going to the moon. NASA also is recognizing several other key individuals who played significant roles in the early space programs.

NASA ORBITER PROVIDES COLOR VIEWS OF MARS LANDING SITE CANDIDATES: Less than a year since beginning the prime science phase of its mission, NASA's *Mars Reconnaissance Orbiter* has passed a mission-success milestone for the amount of data returned.



The data-volume target of 26 terabits, which was surpassed this week, is equivalent to about 5,000 CD-ROMs full and exceeds the total from all other current and past Mars missions combined.

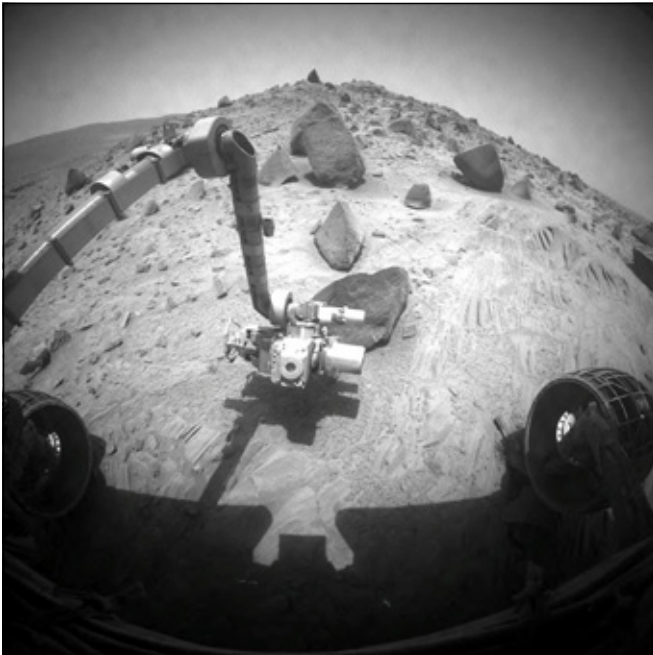
CASSINI PROVIDES NEW VIEWS OF TITAN'S LAND OF LAKES AND SEAS: Newly assembled radar images from the *Cassini* spacecraft provide the best view of the hydrocarbon lakes and seas on the north pole of Saturn's moon Titan, while a new radar image reveals that Titan's south polar region also has lakes. The southern region images were beamed back after an Oct. 2 flyby in



which a prime goal was the hunt for lakes at the south pole.

A new mosaic image, created by stitching together radar images from seven Titan flybys over the last year and a half, shows a north pole pitted with giant lakes and seas, at least one of them larger than Lake Superior.

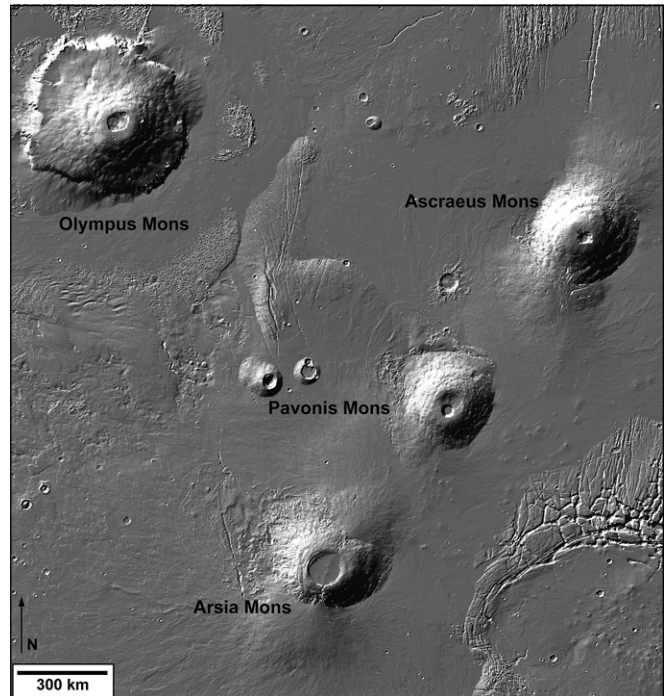
NASA EXTENDS OPERATIONS FOR ITS LONG-LIVED MARS ROVERS: NASA is extending, for a fifth time, the activities of the Mars Exploration Rovers, *Spirit* and *Opportunity*. The decision keeps the trailblazing mobile robotic pioneers active on opposite sides of Mars, possibly through 2009. This extended mission and the associated science are dependent upon the continued productivity and operability of the rovers.



"We are extremely happy to be able to further the exploration of Mars. The rovers are amazing machines, and they continue to produce amazing scientific results operating far beyond their design life," said Alan Stern, associate administrator for NASA's Science Mission Directorate, Washington.

HAWAII REVEALS STEAMY MARTIAN UNDERGROUND: Is Mars dead, or is it only sleeping? The surface of Mars is completely hostile to life as we know it. Martian deserts are blasted by radiation from the sun and space. The air is so

thin, cold, and dry, if liquid water were present on the surface, it would freeze and boil at the same time. But there is evidence, like vast, dried up riverbeds, that Mars once was a warm and wet world that could have supported life. Are the best times over, at least for life, on Mars?



New research raises the possibility that Mars could awaken from within -- three large Martian volcanoes may only be dormant, not extinct. Volcanic eruptions release lots of greenhouse gases, like carbon dioxide, into the atmosphere. If the eruptions are not complete, and future eruptions are large enough, they could warm the Martian climate from its present extremely cold and dry state.

OUR FIRST LUNAR PROGRAM: WHAT DID WE GET FROM APOLLO?: American plans now call for a return of humans to the Moon by around 2020. What can we hope to gain from such a program? It will be helpful to look back at our first lunar program, Apollo, and ask what we got from it, beside some 850 pounds of rock and soil – fascinating to geologists, but perhaps not to all taxpayers. I will try to summarize highlights of the payoff from *Apollo*.

What was the "Apollo Program"? There was much more to it than Neil Armstrong's "one small step," and even more than the following five lu-

nar landings – any one of which would have been a gigantic accomplishment. First, Apollo began with the Gemini Program, which was solely a technological warm-up for Apollo. Gemini was the first true American spaceship, with propulsion, radar, on-board computers, and extravehicular activity (“space walk”) capability. Ten manned *Gemini* missions were flown, developing the technological and operational capability needed for the following lunar program. However, the Gemini astronauts carried out many scientific experiments, in addition to practicing various space-flight techniques such as orbital rendezvous.

HEAVIEST STELLAR BLACK HOLE DISCOVERED IN NEARBY GALAXY: Astronomers have located an exceptionally massive black hole in orbit around a huge companion star. This result has intriguing implications for the evolution and ultimate fate of massive stars.



The black hole is part of a binary system in M33, a nearby galaxy about 3 million light years from Earth. By combining data from NASA's *Chandra X-ray Observatory* and the *Gemini* telescope on Mauna Kea, Hawaii, the mass of the black hole, known as M33 X-7, was determined to be 15.7 times that of the Sun. This makes M33 X-7 the most massive stellar black hole known. A stellar black hole is formed from the collapse of the core of a massive star at the end of its life.

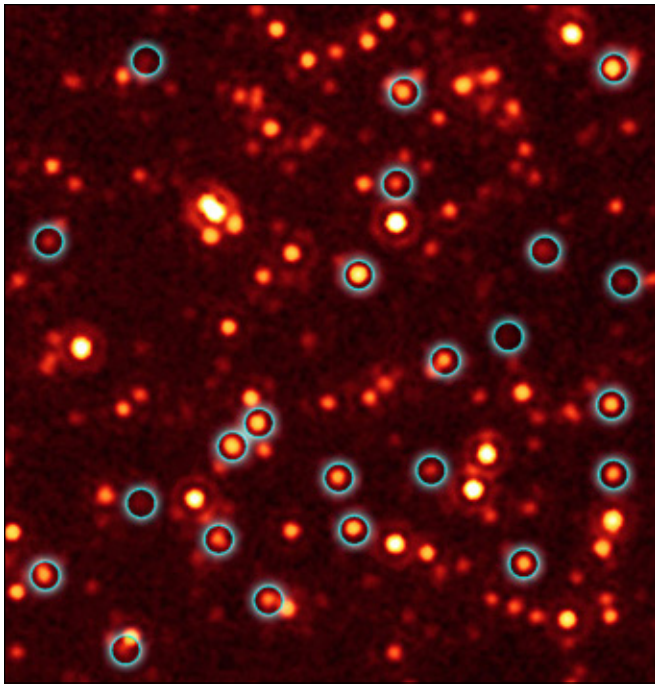
CRISM HAS KEY ROLE IN SELECTING NEXT MARS ROVER LANDING SITE: Scientists scouting potential landing sites for NASA's next Mars rover mission are using new data from a powerful mineral-mapping camera to narrow the site selection. When NASA Mars Program officials and members of the Mars science community gather in California next week to pare down the list of candidate landing sites for the 2009 Mars Science Laboratory (MSL), they can refer to 125 new images from the Compact Reconnaissance Imaging Spectrometer for Mars (CRISM). The images and accompanying analysis products are available on the CRISM Web site at http://crism.jhuapl.edu/msl_landing_sites/.

CHANG'E-1 - NEW MISSION TO MOON LIFTS OFF: A bold new mission to the Moon was launched today by the Chinese National Space Administration (CNSA). Chang'e-1 blasted off from the Xichang Satellite Launch Centre, Sichuan, atop a Long March 3A rocket.



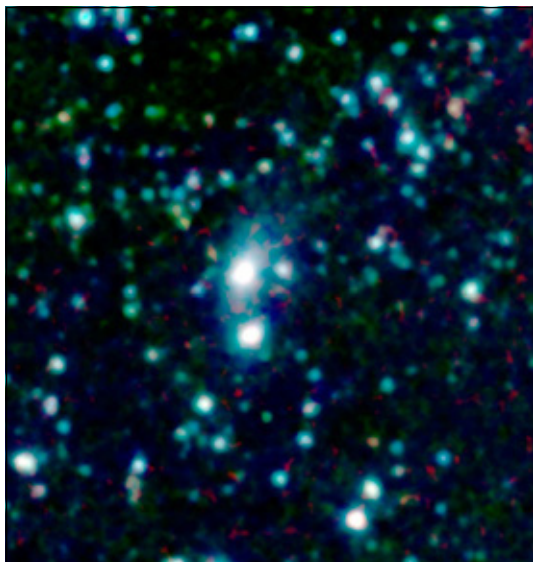
Chang'e-1 represents the first step in the Chinese ambition to land robotic explorers on the Moon before 2020.

MISSING BLACK HOLE REPORT: HUNDREDS FOUND! Astronomers have unmasked hundreds of black holes hiding deep inside dusty galaxies billions of light-years away.



The massive, growing black holes, discovered by NASA's *Spitzer* and *Chandra* space telescopes, represent a large fraction of a long-sought missing population. Their discovery implies there were hundreds of millions of additional black holes growing in our young universe, more than doubling the total amount known at that distance.

TO CATCH A GALACTIC THIEF: On Earth, thieves steal everything from diamonds to art to bags full of money. In space, gas -- fuel for making stars -- is a commodity worth the price of theft.



New observations from NASA's *Spitzer Space Telescope* reveal a distant, massive galaxy in the act of ripping off vast reservoirs of gas -- the equivalent of one billion suns -- from its smaller, neighbor galaxy. The stolen gas, which has become scorching hot during the heist, will likely cool down and get turned into new stars and planets.

IT CAME FROM VESTA: Their infiltration began - like so many other infiltrations - with a tell-tale contrail of smoke and flame creating a super-sonic slash across the afternoon sky.

FANTASTIC SCIENCE LEAPS AT YOU!
 IN **ASTEROIDVISION**
 AMAZING!
 DIAGNOSTIC!
 ERUDITE!

IT CAME FROM VESTA

From Hans Tancredo's
 absonant science fact story!

Starring
Keyur PATEL · Carol RAYMOND
 with MARC RAYMAN · RAY MORRIS
 KATHY SCHIMMELS · TIM WEISE
 and introducing
DR. CHRISTOPHER RUSSELL as the P.I.

Universal
Intergalactic

Produced by ROC E. METEOR for the JET PROPULSION LABORATORY • A NASA Release

But this time they would not go unnoticed. This time, two Australian station workers, just going about their job, opening a gate to a boundary fence, witnessed their arrival. The eyewitnesses later said they observed a "fireball with sparks

(Continued on page 8)

Field Trip to Adler Planetarium

The members of the Kalamazoo Astronomical Society would like to extend another invitation to the GRAAA to join us on a field trip to Adler Planetarium & Astronomy Museum in Chicago. Adler Planetarium was the first planetarium built in the Western Hemisphere and the oldest in existence today. Adler features two planetarium theaters and over 35,000 square feet of exhibits. So, mark **November 10th** on your calendar. Our itinerary will include:

— — — *All times are EST* — — —

Meet at the Oakland Drive Park-and-Ride for carpooling between 6:30 am - 6:40 am.

The Park-and-Ride is located near I-94 just off exit 75.

Depart for Michigan City at 6:40 am.

Arrive at Carroll Avenue Station, Michigan City at 8:00 am. *Trains tickets cost \$6.50 (i.e. \$13 for a two-way trip). You must pay in cash and only \$20 bills or less are accepted.*

Train Departs for Roosevelt Road Station, Chicago at 8:20 am.

Train Arrives at Roosevelt Road Station at 9:55 am. *We will walk approximately two blocks to Adler.*

Adler Planetarium opens at 10:30 am (9:30 am CST).

Group admission (minimum of 15) is \$16/adult, \$15/senior, and \$14/child. This includes a ticket to one planetarium show. Each additional theater presentation is \$5.00 per show per person.

Attend planetarium shows and tour exhibits:

The first show begins at 10:00 am CST and continue throughout the day. Please visit the Adler web site for show titles and times:

<http://www.adlerplanetarium.org/>

Lunch is available at Galileo's Café, located in Adler.

Adler closes at 5:30 pm (4:30 pm CST).

Dinner [tentatively] at Grace O'Malleys Restaurant & Pub at 6:00 pm.

Walk to Roosevelt Road Station at ~8:30 pm.

Depart from Roosevelt Road Station at 9:00 pm.

Arrive at Carroll Avenue Station at 10:40 pm.

Arrive in Kalamazoo at ~12:00 am.

Please contact KAS President Richard Bell (richard.s.bell@gmail.com) ASAP if you're interested in attending. This trip is subject to cancellation if the weather is *really* bad (heavy rain, snow storms, etc.). We will notify everyone that has signed up.

Note: These articles are courtesy **NASA Space Place Program** at the Jet Propulsion Laboratory.

The Red (Hot?) Planet

by Patrick L. Barry

Don't let Mars's cold, quiet demeanor fool you. For much of its history, the Red Planet has been a fiery world.

Dozens of volcanoes that dot the planet's surface stand as monuments to the eruptions that once reddened Mars's skies with plumes of glowing lava. But the planet has settled down in its old age, and these volcanoes have been dormant for hundreds of millions of years.

Or have they? Some evidence indicates that lava may have flowed on Mars much more recently. Images of the Martian surface taken by orbiting probes show regions of solidified lava with surprisingly few impact craters, suggesting that the volcanic rock is perhaps only a million years old.

If so, could molten lava still occasionally flow on the surface of Mars today?

With the help of some artificial intelligence software, a heat-sensing instrument currently orbiting Mars aboard NASA's Mars Odyssey spacecraft could be just the tool for finding active lava flows.

"Discovering such flows would be a phenomenally exciting scientific finding," says Steve Chien, supervisor of the Artificial Intelligence Group at JPL. For example, volcanic activity could provide a source of heat, thus making it more likely that Martian microbes might be living in the frosty soil.

The instrument, called THEMIS (for Thermal Emission Imaging System), can "see" the heat emissions of the Martian surface in high resolution—each pixel in a THEMIS image represents only 100 meters on the ground. But THEMIS produces about five times more data than it can transmit back to Earth.

Scientists usually know ahead of time which THEMIS data they want to keep, but they can't plan ahead for unexpected events like lava

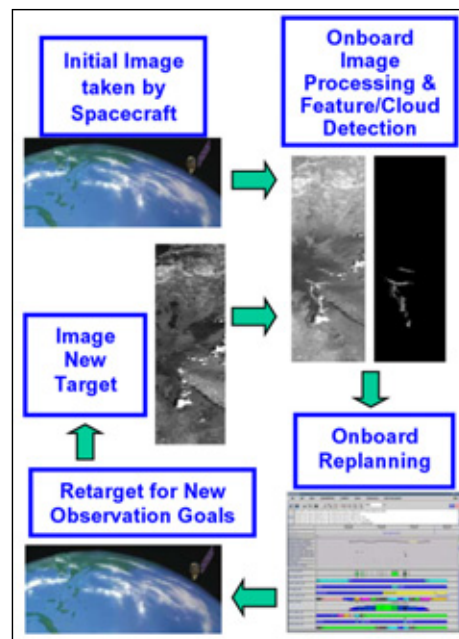
flows. So Chien and his colleagues are customizing artificial intelligence software called ScienceCraft to empower THEMIS to identify important data on its own.

This decision-making ability of the ScienceCraft software was first tested in Earth orbit aboard a satellite called Earth Observing-1 by NASA's New Millennium Program. Earth Observing-1 had already completed its primary mission, and the ScienceCraft experiment was part of the New Millennium Program's Space Technology 6 mission.

On Odyssey, ScienceCraft will look for anomalous hotspots on the cold, night side of Mars and flag that data as important. "Then the satellite can look at it more closely on the next orbit," Chien explains.

Finding lava is considered a long shot, but since THEMIS is on all the time, "it makes sense to look," Chien says. Or better yet, have ScienceCraft look for you—it's the intelligent thing to do.

To learn more about the Autonomous ScienceCraft software and see an animation of how it works, visit <http://ase.jpl.nasa.gov>.





ROGER B. CHAFFEE PLANETARIUM

Public Museum, Grand Rapids

November 2007 Show Schedule

For general audiences

THE COWBOY ASTRONOMER – Cowboy poet and humorist Baxter Black becomes the Cowboy Astronomer. Western sky lore and modern science are blended together, illustrating how we can all make a personal connection to the sky. **40 minutes**

SHOWTIMES: Daily at 2:00 pm

UNDER STARLIT SKIES – The planetarium operator takes the audience on a live tour of the night sky, pointing out prominent stars, constellations, and planets currently visible. Special astronomical events are also illustrated. **30-40 minutes.**

News & Events...

(Continued from page 5)

coming off," streaking from the south to the north, make its descent into a hummock of spinifex grass. It would be another 10 years before they told their story. A decade before the world realized -- the Eucrites had arrived.

MASSIVE BLACK HOLE SMASHES RECORD: Using two NASA satellites, astronomers have discovered a black hole that obliterates a record announced just two weeks ago. The new black hole, with a mass 24 to 33 times that of our Sun, is the heftiest known black hole that orbits another star.

The record-breaker belongs to the category of "stellar-mass" black holes. Formed in the death throes of massive stars, they are smaller than the monster black holes found in galactic cores. The previous record holder for largest stellar-mass black hole is a 16-solar-mass black hole in the galaxy M33, announced on October 17.

SHOWTIMES: Saturday and Sunday at 3:00 pm

Added Value: This show is free with paid Museum admission; or arrive after 2:30 p.m. for the planetarium show only and pay only \$3.00/ person.

For Families and Children

THE GREAT SPACE CHASE – A police detective investigating a robbery pursues a criminal mastermind across the universe. Brilliant laser light, along with the planetarium's wide array of effects take you on the adventure. The show includes five exciting musical interludes, featuring artists such as U2, Madonna and Monty Python. **40 minutes**

SHOWTIMES: Saturday and Sunday at 1:00 pm



INFORMATION SPOT: An Accretion Disk is a swirling disk of gas and dust orbiting a star or black hole. The material within the disk may generate heat from friction; the hottest accretion disks produce enormous amounts of X-rays.

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**Grand Rapids Amateur Astronomical Association
Membership Application or Renewal Form**

DATE: _____

- New Membership** **Renewal**

Please fill out the information below as completely as possible.
For Family memberships, please include all persons for whom membership is desired.

Please Print

Name: _____ Birthdate: _____

Name: _____ Birthdate: _____

Name: _____ Birthdate: _____

Name: _____ Birthdate: _____

Name: _____ Birthdate: _____

Name: _____ Birthdate: _____

Address: _____

City: _____ State: _____ Zip: _____

Home Phone: _____ Cell Phone: _____

E-Mail: _____

(Note: For Family members, if more than one e-mail address, please list others on back of application)

Adult (18 or older, a Minimum of \$40.00) \$ _____

Student (through 17 yrs old, a Minimum of \$25.00) \$ _____

Family (all members of one family, a Minimum of \$50.00) \$ _____

(Note: Contributions greater than the minimum dues are considered a donation and are tax-deductible)

Observatory Endowment Fund \$ _____

Miscellaneous Donations \$ _____

(Note: Contributions to these funds are tax-deductible. Indicate amount of donation)

OBSERVATORY USER FEE: (a Minimum of \$25.00 per user) \$ _____

(Contributions of more than \$25 will help meet repairs and upgrade of equipment costs.)

If you are a qualified user of the Vein Observatory, and wish to remain so,
check the box for **"User Fee."**

TOTAL ENCLOSED (From all categories above) \$ _____

Make Check or Money Order to:
GRAND RAPIDS AMATEUR ASTRONOMICAL ASSOCIATION (or GRAAA)

Mail to: Jerry Persha, GRAAA Treasurer
199 Smith St.
Lowell, MI 49331

Grand Rapids Amateur Astronomical Association
3308 Kissing Rock Ave. SE
Lowell, MI 49331-8918