



September 2003
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Stars and Scopes

Newsletter of the Rocky Mountain Astronomy Club
www.rmastronomy.org

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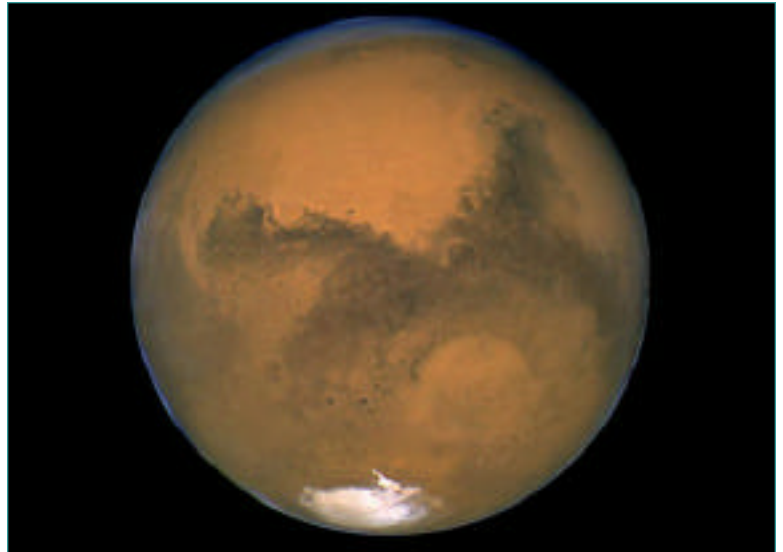
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*August 27, 2003 view
of Mars. Courtesy NASA,
J. Bell (Cornell Univ.),
and M. Wolff (SSI).*



Hubble's Closest Look at Mars

Sky & Telescope Website

The week of August 27th, seemingly all skygazers had turned toward Mars—the Hubble Space Telescope included. On August 26th, controllers aimed Hubble at the red planet and captured a series of images using the Wide Field and Planetary Camera 2 between 6:20 and 7:12 p.m. Eastern Daylight Time, only 11 hours—and 2,422 miles—shy of Mars' closest approach to Earth in more than 60,000 years. The color-composite photo was assembled from frames taken with red, green, and blue filters. The images were quickly processed and released this morning.

During the exposures, Mars was 34,648,840 miles (55,760,220 kilometers) away from Earth. With a resolution of 8 miles per pixel, the view shows numerous impact craters, many of which have dark floors. The murky swath on the left side of the disk is Sinus Meridiani; the triangular one on the right is Syrtis Major. The Hellas impact basin lies just below the dark features.

RMAC Annual Meeting and Officer Elections

The Rocky Mountain Astronomy Club will hold its Annual Meeting and Officer Elections on September 8, 2003. In accordance to the RMAC Bylaws, officers will be voted by the majority of members present during the elections and by absentee ballot. All RMAC members are encouraged to vote either in person or by sending their vote by absentee ballot.

The candidates for each office are as follows: President, Phil Brown; Vice President, Bill Brown; Treasurer, Walt Russell; Secretary, Bob Adams; and Member-at-Large, Michael Verry. **If you are unable to attend the September meeting, please complete and mail the enclosed absentee ballot in time for it to be received before September 8.**

Upcoming Events

Sep 8 – **Board Meeting**, 6 pm,
Annual Meeting/Elections,
7 pm at Colorado State
University, Pueblo, Rm.244
of the Technology Building

Sep 20 – **Public Star Watch**,
8 pm, at the CSU
Observatory, Pueblo

Sep 27 – **Club Star Watch**,
8 pm (or earlier if light
allows), at Walt Russell's
ranch in Boone, CO

Oct 13 – **Board Meeting**, 6 pm,
Club Meeting, 7 pm at
Colorado State University,
Pueblo, Rm.244 of the
Technology Building

Oct 18 – **Public Star Watch**,
7 pm, at the CSU
Observatory, Pueblo

Oct 25 – **Club Star Watch**,
7 pm, location TBA



Celestial Events

October 2003

Comet Encke; 3.3 year orbit will bring it close enough to almost see naked eye nice with binoculars or scopes.

November 9, 2003

Total Lunar eclipse; watch for totality to occur during moonrise.

December 2003

At Midnight, **Saturn** will be at its highest point in the sky in 30 years. Spectacular viewing!

Regional SP's

September 21-28, 2003

Okie-Tex Star Party, Camp Billy Joe located near Kenton, OK. For more information, go to: <http://www.okie-tex.com>.

September 23-28, 2003

Great Plains Star Party, at Scopeville, KS. For more information, go to: <http://astronomyvillage.org/gpsp/gpsp.htm>.

September 25-28, 2003

Enchanted Skies Star Party, near Socorro, NM. For more information, go to: <http://www.socorro-nm.com/starparty>.

October 24-25, 2003

All Arizona Star Party, near Arizona City, AZ. For more information, go to: <http://www.eastvalleyastronomy.org/EVAC/aasp.htm>.

November 15, 2003

North Texas Skywatch Star Party, Lake Mineral Wells State Park. For more information, go to: <http://www.tarleton.edu/~planetarium>.

Observatory Open House

Due to popular demand and good weather, the CSU-Pueblo Observatory will continue to hold its Tuesday Night Open House over the next few months. You can find more information about the observatory at: <http://ceeps.uscolo.edu/observatory>.

Erasing the Ancient Martian Landscape

By Pamela L. Gay, Sky & Telescope Website

When Mars was a youngster, it was a far different place. The now dry and frigid world was apparently warmer and had flowing water on its surface. It was also a pock-marked teenager, with active volcanoes and deep impact scars. But today there is little evidence of the red planet's youth. And if a team of astronomers are correct, it is because Mars has literally buried its past.

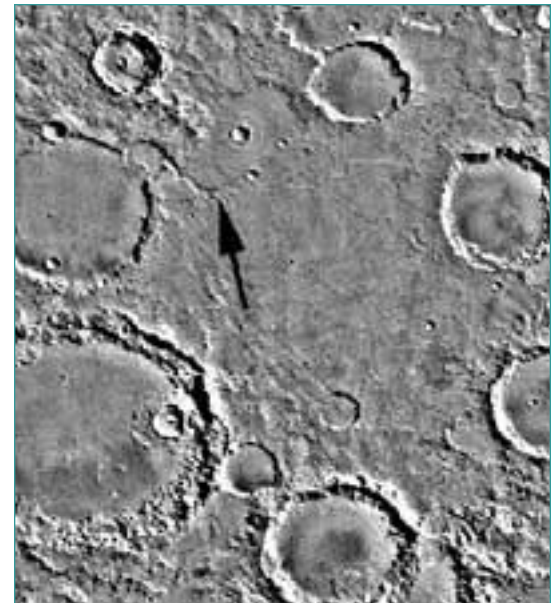
As a child, Mars formed an intricate drainage system to channel its water. During this period, which ended roughly 3 billion years ago, impacts were relentless as space debris bombarded the planet. The oldest geological formations on Mars hark back to this violent period. But time has managed to erase most of the wounds. Craters smaller than about 30 kilometers aren't found in the numbers expected, and astronomers believe that most of these ancient impact sites have long since eroded away.

Explaining these missing craters is difficult because the sparse and disconnected small drainage systems visible on Mars today couldn't have carried enough water to cause all the erosion. According to Ted Maxwell (National Air and Space Museum), "The lack of small tributary channels in the Martian Highlands has been a continuing problem for interpreting whether rainfall or subsurface water was responsible for the many larger channels."

If water from rain was responsible for many of the observed erosion features, small drainage networks must have existed in higher numbers in the past. This implies that something filled in and eroded away both the small craters and the minor drainage systems.

New work by Ross Irwin (University of Virginia) and Maxwell, presented at last month's Sixth International Conference on Mars in Pasadena, California, finds that the combination of drainage systems and cratering effectively redistributes the surface and creates much of the observed erosion. Impacts throw material into the air, which falls into surrounding craters and valleys. Drainage systems carry debris in streams, removing it from one place and building it up in another. This redistribution, combined with other forms of erosion such as wind-blown dust and landslides, efficiently fills in and buries the small drainage systems and erases small craters.

"In the early Martian environment, craters and rivers were competing for supremacy in sculpting the surface," says Maxwell. Together, these two forces created a dynamic world that is slowly revealing its secrets to Earthbound scientists.



Valley networks, appearing as ripples on the Martian surface, flow to the northwest in the Al-Qahira Vallis drainage basin. Ancient craters eroded by drainage systems (black arrow) sit side-by-side with fresh craters that block old valleys. Viking image courtesy NASA/JPL.



Careful Planning and Quick Improvisation Succeed in Space Biz

By Tony Phillips

On December 18, 2001, ground controllers at JPL commanded NASA's Deep Space 1 (DS1) spacecraft to go to sleep. "It was a bitter-sweet moment," recalls Marc Rayman, the DS1 project manager. Everyone was exhausted, including Deep Space 1, which for three years had taken Rayman and his team on the ride of their lives.

DS1 blasted off atop a Delta rocket in 1998. Most spacecraft are built from tried-and-true technology—otherwise mission controllers won't let them off the ground. But Deep Space 1 was different. Its mission was to test 12 advanced technologies. Among them: an experimental ion engine, a solar array that focused sunlight for extra power, and an autopilot with artificial intelligence. "There was a good chance DS1 wouldn't work at all; there were so many untried systems," recalls Rayman. Nevertheless, all 12 technologies worked; the mission was a big success.

Indeed, DS1 worked so well that in 1999 NASA approved an extended mission, which Rayman and colleagues had dreamed up long before DS1 left Earth—a visit to a comet. "We were thrilled," says Rayman. And that's when disaster struck. DS1's orientation system failed. The spacecraft couldn't navigate! What do you do when a spacecraft breaks and it is 200 million miles away? "Improvise," says Rayman.

Ironically, the device that broke, the 'Star Tracker,' was old technology. The DS1 team decided to use one of the 12 experimental devices—a miniature camera called MICAS—as a substitute. With Comet Borrelly receding fast, they reprogrammed the spacecraft and taught it to use MICAS for navigation, finishing barely in time to catch the comet. "It was a very close shave."

In September 2001, DS1 swooped past the furiously evaporating nucleus of Comet Borrelly. "We thought the spacecraft might be pulverized," Rayman recalls, but once again DS1 defied the odds. It captured the best-ever view of a comet's heart and emerged intact. By that time, DS1 had been operating three times longer than planned, and it had nearly exhausted its supply of thruster-gas used to keep solar arrays pointed toward the Sun. Controllers had no choice but to deactivate the spacecraft, which remains in orbit between Earth and Mars.

Rayman has moved on to a new project—Dawn, an ion-propelled spacecraft that will visit two enormous asteroids, Ceres and Vesta, in 2010 and 2014. "Dawn is based on technologies that DS1 pioneered," he says. Even asleep, DS1 continues to amaze. Find out more about DS1 at <http://nmp.jpl.nasa.gov/ds1>.

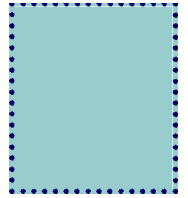
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



This was the final image of the nucleus of comet Borrelly, taken just 160 seconds before Deep Space 1's closest approach to it. This image shows the 8-km (5-mile) long nucleus from about 3417 kilometers (over 2,000 miles) away.

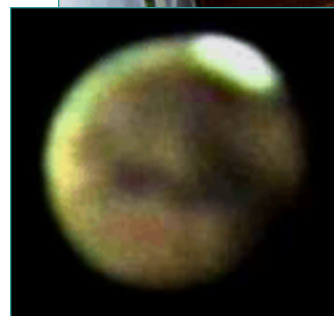
A Call for Newsletter Submissions

If you would like to contribute an **article**, **observing report** or **astrophoto** to be published in *Stars and Scopes*, please send them to Debbie Schermerhorn at astrogirl@astrogirl.org or PO Box 25396, Colorado Springs, CO 80936-5396. When sending photos, please send them in **JPG format** and as large as possible.



Stargate Observatory

The Stargate Observatory is the personal observatory of RMAC member Steven Abraas. The observatory currently houses a Sky Watcher 6-inch refractor with 80mm finderscope. It also is equipped with a Meade ETX-105 which Steven uses as a photographic tool while he guides through the refractor. The pier was homebuilt and the whole set-up is solid as a rock.



Above: Steven's Stargate Observatory. Inset: Image of Mars which Steven took on August 2, 2003 through the 6-inch refractor.

Stars and Scopes

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We're on the Web!

See us at:

www.rmastronomy.org

RMAC members are invited to visit Steven at his Canon City observatory. He is also willing to share with RMAC members an article on how he built his own roll-off roof observatory. You can contact Steven via email at stephan610@ris.net or by writing to him at: 610 Burrage Avenue, Canon City, CO 81212.

Rocky Mountain Astronomy Club Officer Election Absentee Ballot

The Officer Elections for the 2004 Rocky Mountain Astronomy Club Executive Board, will occur during the Annual Meeting on September 8, 2003.

According to the RMAC Bylaws, officer will be elected by a written secret ballot during the Annual Meeting. Officers will be elected by a simple majority of members present casting ballots and by ballots cast by absentee ballot. The term of office for elected officers shall be one year commencing on January 1 of the following year and ending December 31 of that same year. Officers may serve any number of terms, provided they have the desire to continue to serve and they are re-elected under the election procedures of Article VI. **The descriptions of the duties of each officer is as follows:**

President—The President shall preside over all Club Membership Meetings and Executive Board Meetings. The President shall supervise the business affairs and the general operations of RMAC subject to the direction of the Executive Board to support the purpose of Rocky Mountain Astronomy Club. The President shall be a member of all committees and shall appoint or dissolve committees as needed to support the purpose of RMAC.

Vice President—The Vice President shall assist the President. In the absence of the President, the Vice President shall perform all the duties of the President. In such circumstances the Vice President shall have all the authority of the President, and shall be subject to the direction of the Executive Board. If the office of President shall become vacant for whatever reason, the Vice President shall assume the office of President. In such circumstances, a special election will be held to fill the office of Vice President.

Secretary—The Secretary shall record and maintain the minutes of all Executive Board and General Membership Meetings. The Secretary shall make two copies of the minutes one copy given to the President and the second copy will be available for inspection by any member upon request. The Secretary shall keep the meeting minutes on file for seven years.

Treasurer—The Treasurer is the chief financial officer. The Treasurer shall maintain accurate records of the financial status of RMAC. The Treasurer shall endorse checks, collect and deposit all funds of RMAC into the RMAC Bank account(s) and shall disburse funds for RMAC business affairs at the direction of the Executive Board. The Treasurer will give a report of the financial status of RMAC at all General Membership and Executive Board meetings. In the Treasurer's absence, the President will give the Treasurer's Report.

Member at Large—The Member at large shall be the spokesman of the membership at the Executive Board Meetings. The Member at Large shall present any concerns or desires of the membership of RMAC to the Executive Board. The Member at Large shall be the fifth voting member of the Executive Board.

The candidates running for election to these offices are as follows:

RMAC President

Mr. Philip Brown

RMAC Vice President

Mr. William Brown

RMAC Secretary

Mr. Robert Adams

RMAC Treasurer

Mr. Walter Russell

RMAC Member-at-Large

Mr. Michael Verry

**Please mark your vote in the box next to the candidate's name, and return this ballot in time to be received before September 8, 2003 to:
Rocky Mountain Astronomy Club, c/o 63 Portero, Pueblo, CO 81005.**

Place
\$.37
Stamp
Here

Rocky Mountain Astronomy Club
c/o 63 Portero
Pueblo, CO 81005

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