



January 04

Volume XXXIV, Issue 1

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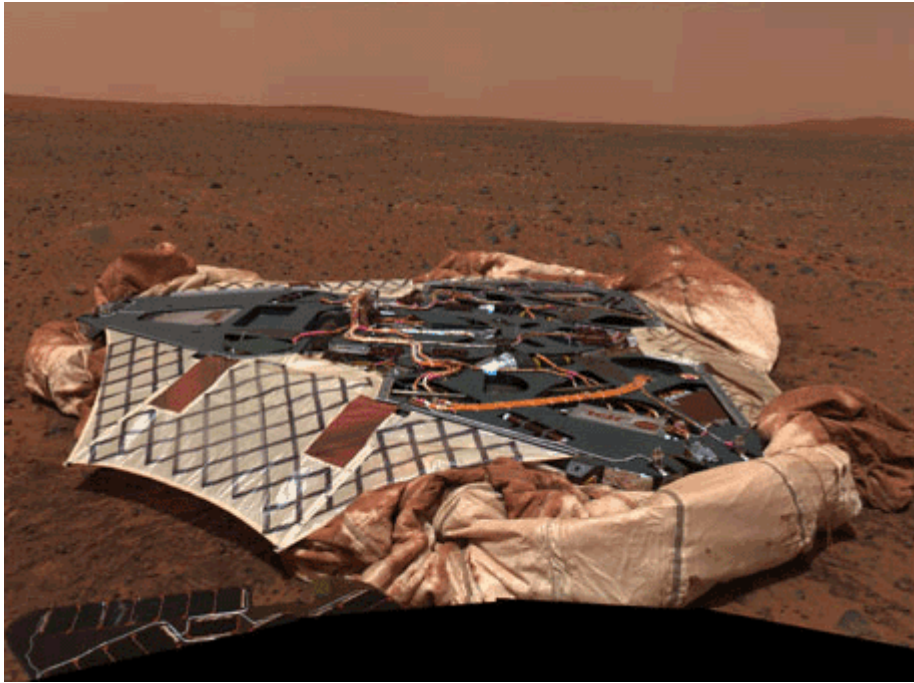
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Spirit is Alive - on Mars!

And so is Opportunity!



Spirit landing vehicle, sans Spirit rover, Mars Spirit Rover Image courtesy NASA / JPL, 21 January 2004

The Empty Nest

January 3rd and early today, January 25th saw tension and high anxiety turn to relief followed by shouts of joy and celebration as the United States successfully returned to Mars with the Spirit rover and its fellow traveler and twin, Opportunity. Spirit landed at Gusev Crater and Opportunity landed at Meridiani Planum, each landing site as diverse and different from each other as is the distance they're separated by. The scientists and engineers at JPL were visibly moved and excited at the treasure trove of science and knowledge waiting to be discovered, the fruit of hard work, attention to detail coupled with engineering and technical expertise and lessons learned from failed prior missions. 2 functioning rovers poised for unprecedented science and discovery.....on another planet(!) is truly extraordinary!

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Announcements & General Interest

AOS C14 Arrives at Adzone Offices

Win-win negotiations between Custer board member and Adzone CEO Charles Cardona III and Custer member Bill Bogardus has yielded a vintage C14 for the AOS to be used in the recently delivered observatory and dome assembly awaiting installation at Custer. Congratulations to Sue Rose and the Amateur Observers Society!

Custer and AOS Receive Substantial Private Backing

The following is the breakdown and distribution of recent donations of preferred Adzone (ADZR) stock and the respective donors:

225,000 shares from Charles Cardona III, CEO, Adzone Research Corp;
225,000 shares from John Cardona, CFO, Adzone Research Corp;
100,000 shares from Reidar Sjoen, Chief Technology Officer, Adzone Research Corp;
30,000 shares from Tom Madigan, Director, Global Intelligence and Data Operations, Adzone Research Corp;

570,000 shares for Custer
10,000 shares for the Custer-AOS Observatory

Editor's Column

<p>Tom Madigan, Editor Tom Madigan 99 North Summit Ave. Patchogue, NY 11772-2226 tmadigan@optonline.net 631-447-5339</p> <p>Cutoff for submissions is the 15th of the month preceding publication</p> <p>Visit the new Custer Website at http://www.custerobservatory.org</p>	<p>The Custer Comment is published monthly by</p> <p>Custer Institute P.O. Box 1204 Main Bayview Road Southold, NY 11971 631-765-2626</p>
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Gift Corner & Classifieds

<p>We have meteorites; Great sets mounted in beautiful display cases. Perfect for gifts!</p> <p>New Custer logo coffee cups, only \$4 each.</p> <p>Back By popular demand, exclusive 2004 Custer Astronomical Pocket Diary, for our area, still just \$9 + tax. Quantities are limited.</p>	<p>The Gift Shop still has a dwindling number of copies of ASTRONOMY FOR ALL AGES, by Philip Harrington & Edward Pascuzzi just \$20. As an added bonus, copies are signed by Ed Pascuzzi. We also have copies of PARALLAX, the book that was referred to in the recent lecture. Quantities are limited so hurry and add to your collection while supplies last. Back by popular demand, we again have the <i>exclusive Custer Astronomical Pocket Diary</i> still just \$9. Quantities are limited.</p>	<p>For Sale Super C-8 Telescope, Richfield Finder, Tripod Wedge, Polaris Pointer, Polar Axis Finder, Case liner, Handle, Handbook-\$1307. No-tool knob set for C-8- \$12. Illuminated Reticule ocular assembly for C-8 including 12.5MM ocular rheostat-\$66. 2 inch Premium grade Deep Sky filter and 1 1/4 inch ocular adaptor-\$121. Observer's Chair with adjustable height-\$47. Rubber eyeguards (4)-12. Vernon mounted glass filters- neutral density, blue 80A, violet 47, light red-\$23A, green 58, orange- \$51. Adapter for Celestron 1 1/4 inch non-threaded oculars-\$10.</p> <p>Rich Field Adaptor with TeleCompressor and 20mm Erfle ocular-\$150. 8mm Brandon-\$69. 12mm Brandon-\$59. 2.4X Dakin Barlow- \$59. 25mm Kellner-\$28. 40mm Kellner-\$28. Declination Motor & Accutrack Telescope Drive Corrector, Dual Axis-\$199. Counter Weight set-\$30. Astronomer's Flashlight-\$7. Omni-axis Camera Mount-\$ 50. Accessory tray-\$30. Accessory Case-\$25. Helical Focuser-\$28. Dewcap-\$40. T-adaptor-\$20. Eyepiece projection adapter: teleextende-\$20. Best offer or \$1600 for the whole. Original cost \$2468. Contact Bill Richards at 631-957-2032, 98 Laurel Road, Lindenhurst, NY 11757-1705.</p>
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HEAVENLY EVENTS TO WATCH FOR January 04

“Winter’s the time for choosing stars,
Come out to the blazing dark
And take your pick. White earth lies still
save for a dog’s cold bark
two farms over. Out of this vast
splendor, which star will you have? ...”

- Frances Frost

(See remainder of her poem
“Star Choosing” next month.)

already risen over the east-northeast horizon at dusk and leaps high into the winter sky by midnight. Now is the time to allow yourself to be placed under the spell of this seductive ringed world with the help of your telescope.

On any cold, crisp, clear morning during the first 3 weeks of the new year MERCURY glimmers very low over the southeast horizon an hour before sunrise. VENUS, as usual, is not so shy; she is firmly established as “evening star” and will remain so thru late May. Find her low in the southwest at dusk, setting about 3 hours after sunset. After last year’s flashy performance, MARS stays out of the limelight this year. At midmonth you’ll find the 0.5 magnitude Mars halfway up in the south-southwest at nightfall, and it sets shortly before midnight. This month JUPITER begins its retrograde loop (moving westward) beneath the hindquarters of Leo the Lion. At midmonth Jupiter rises in the east around 9:30 PM. Having reached opposition on New Year’s Eve, SATURN has

- 2 Algol, β Persei, is in mid-eclipse at 10:38 PM, and again at 7:27 PM on the 5th.
- 4 In the early morning hours today you may enjoy one of the year’s best meteor displays - the Quadrantids, which seem to fan out from an area of sky beneath the end of the Big Dipper’s handle as you face northeast. However, a bright waxing gibbous Moon will be an annoyance until it sets about an hour before daybreak, around 5 AM.
- 4 Around this date is the latest sunrise of the year, around 7:20 AM. (Exact time of sunrise depends greatly on where you are on Long Island - or elsewhere.) ALSO: The Earth is at perihelion, only 91.35 million miles from the Sun. ALSO: Retrograde ends for Jupiter in eastern Leo, and it will drift eastward, reaching Virgo in late August.
- 6 A nearly-full Moon creates a massive light-pollution problem for Saturn-watchers tonight.
- 7 Full Wolf Moon sets after sunrise / rises around sunset.
- 9 The largest object in the asteroid belt between Mars and Jupiter is Ceres, about 580 miles across. Today Ceres reaches opposition, at 6.8 magnitude, about 3° southwest of Castor, α in Gemini.
- 12 In the predawn hours Jupiter is joined by the waning gibbous Moon.
- 19 The slim waning crescent Moon rises over the southeast horizon an hour before sunrise, with Mercury to its left. Mercury was at greatest elongation west of the Sun on the 17th, and will now quickly slip away from the dawn sky.
- 24 Venus and the 3-day crescent Moon cuddle close together in the southwest after sunset. Try finding both before sunset, before 5 PM. Which one can you see first?
- 25 Algol is in mid-eclipse at 9:12 PM, and again at 6:01 PM on the 28th.
- 27 Fat crescent Moon is beneath Mars as they set together this evening.

Prepared by Robert Chapin

PRESIDENT'S MESSAGE

I hope you all had a wonderful holiday season with your loved ones. I know I did, spending it with my two lovely Grand Daughters aged 3 and 20 months and my Daughter and Son in Law in Pennsylvania.

As you no doubt read in last month's Comment, Custer has received a very large donation of stock which is going to allow us to make several long needed repairs over the coming year or two, including replacement of the Old Wooden Dome, which has served us these past 50 or so years. I wish to express my thanks on behalf of the Institute to Charles Cardona III, John Cardona, Tom Madigan and Reidar Sjoen for their most gracious gift. We are arranging to hold an evening's celebration at Custer later this spring to more formally honor their contributions. Keep watching for the announcement of the date and time as plans solidify. I hope you will all join us in properly thanking our benefactors.

In addition, Bill Bogardus and Chuck Cardona are donating a C14 Telescope for the AOS Observatory with the understanding that Custer will give it permanently to the AOS for use in the Little Dome.

Have you been following the Landing on Mars and the progress of the Spirit Rover? What pictures. Now where are my 3-D glasses from those 50's and 60's movies?

What a joyous way for Custer to start the New Year. On behalf of the Custer Board, may I wish you and yours a **VERY HAPPY NEW YEAR!** Bob Vanson

WELCOME TO OUR NEW OR RETURNING MEMBERS:

Sidney and Gloria Waxler of Peconic, the Matthew Campbell Family of Southold, Lynne Wenchell of Southold and Bill Huxley of NYC. Welcome one and all!

6 Minutes of Terror

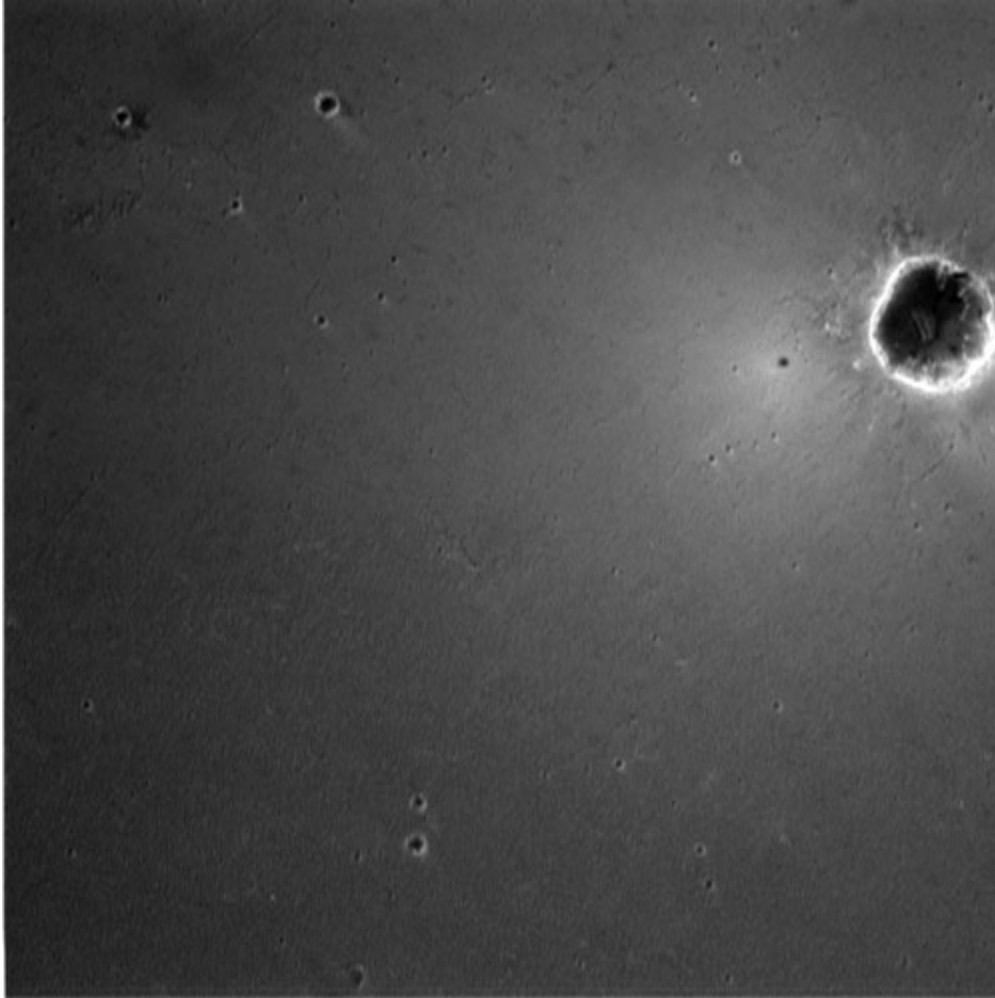
By Tom Madigan

Amid tension and high-anxiety followed by shouts of joy and relief, as was the case for Spirit's successful landing 2 weeks ago, Opportunity, the companion rover to Spirit, arrived with the descent and landing systems performing flawlessly! The landings of both rovers were described as 'better than the best practice sessions' and 'textbook'. In order for successful landings to occur, the final phase in the journey, consisting of a complex series of carefully timed steps, had to be executed successfully. If anyone of them had failed, the rovers, in all likelihood, would have been lost. An amusing aside, California's new governor Arnold Schwarzenegger and former vice president Al Gore were on hand at JPL to witness Opportunity's landing.

The interplanetary cruise configurations for both rovers were basically the same. The final stage of the cruise, atmospheric entry and descent, where the rovers undergo severe deceleration exceeding 6g, varied slightly between Spirit and Opportunity as they landed at opposite points on the Martian surface with different prevailing surface, weather and topographical conditions. Since Opportunity was to land at an elevation approximately 1.5 Km higher than Spirit, the parachute was deployed 1 Km higher while the vehicle was still traveling at high supersonic speeds. The decision to do this was made after reviewing landing data returned by Spirit. In their final stage of flight both Spirit and Opportunity were hurtling toward the Martian surface in excess of 12,000 MpH (Mach 27), nary 6 minutes before touchdown, when they both had to be slowed to a vertical velocity of "0" prior to landing. First, the heat shield, rotated 180* to face the surface in a prior maneuver, protects the lander from the 2,700* heat of friction caused by entry into the Martian atmosphere. This shield acted both to protect the lander and as the first and principal braking mechanism, slowing the vehicles down from hyper-sonic speeds to the barely supersonic speed of 1,100 MpH. 4 minutes later, with only 2 minutes left in the decent, the braking parachute, connected to the lander by a strong but lightweight Zylon tether, was deployed further slowing the crafts to high sub-sonic speeds. A minute and a half later and only 8,000 feet above the surface, airbags are inflated, surrounding and protecting the lander. At this point, the ground acquisition radar was activated, providing guidance and steering telemetry to the onboard flight computer. This data was used in conjunction with a series of 3 images taken (see below) with a downward-looking camera to guide the lander to its touchdown point. With the lander suspended on the 20 meter Zylon tether and only 3 seconds left before landing, the 3 solid-fuel braking (retro) rockets were fired bringing the vehicle to a 'stop' about 40 feet above the Martian surface. At this point, the tether is cut and the air-bag protected lander is "dropped" to the surface, bouncing and rolling to a stop up to a kilometer from the point of impact. While all this was occurring, a series of tones was transmitted back to Earth, providing confirmation that each step had been successfully completed, with only a "proof-of-life" carrier signal being transmitted during the bounce and roll segment of the landing. All this occurred flawlessly for both landers and continues to be described as 'picture-perfect'.

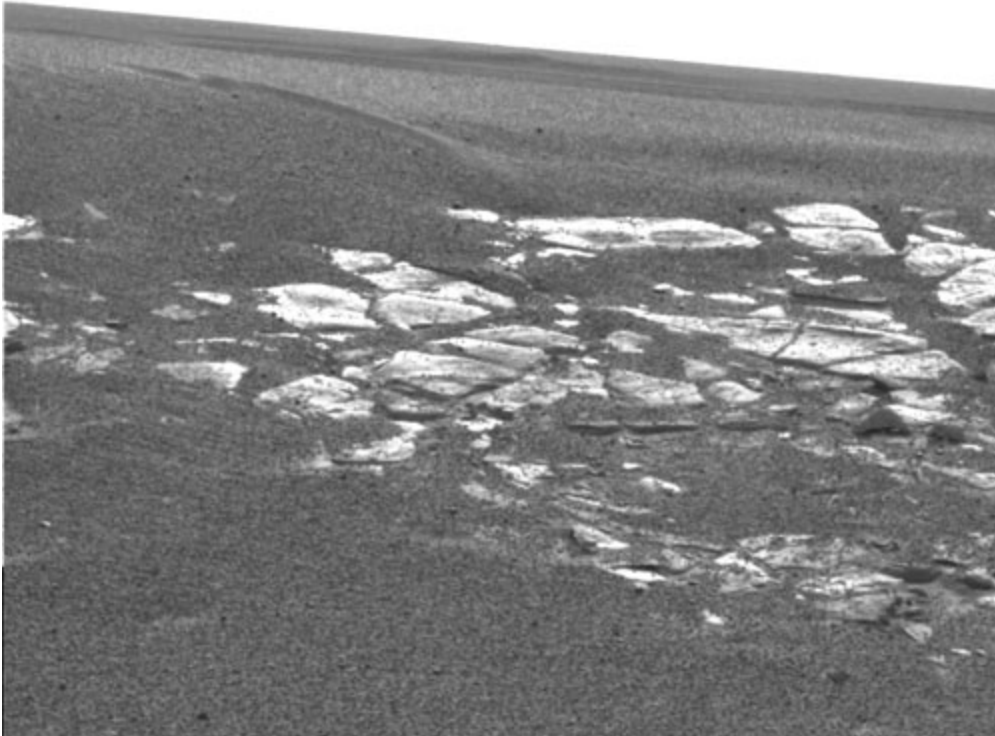
The first telemetry and data was transmitted to Earth via Mars Odyssey in high orbit overhead. This data was relayed via the low-gain UHF antenna on both rovers. The high-gain antenna will provide direct telemetry to Goldstone and Canberra DSN tracking stations (<http://deepspace.jpl.nasa.gov/dsn>).

For complete coverage and continuing updates, browse to NASA's live coverage at: <http://www.nasa.gov/multimedia/nasatv/index.html> , (http://www.nasa.gov/ram/35037main_portal.ram) or visit NASA's rover home page at <http://marsrovers.jpl.nasa.gov> . REAL (<http://www.real.com>) player is required to watch NASA's live internet feed.



Opportunity Photo courtesy NASA / JPL

The large, circular feature in this image is a crater near Opportunity's landing site. This image was taken at an altitude of 1,404 meters (4,606 feet) by Opportunity's descent image motion estimation system camera located on the bottom of the rover. The image spans approximately 1.2 kilometers (3/4 of a mile) across the surface of Mars. The circular, black 'spot' to the left of the crater and at its 9:00 position is the shadow formed by the lander's braking parachute!



Opportunity Photo courtesy NASA / JPL

This "postcard" from the panoramic camera on the Mars Exploration Rover Opportunity shows the view of the Martian landscape southwest of the rover. The image was taken in the late Martian afternoon at Meridiani Planum, where Opportunity landed at approximately 9:05 p.m. PST on Saturday, Jan. 24. It shows the "tabular" composition of the underlying bedrock, believed to date back to the epoch immediately following planetary formation. This outcropping will be one of the first targets for NASA geologists.

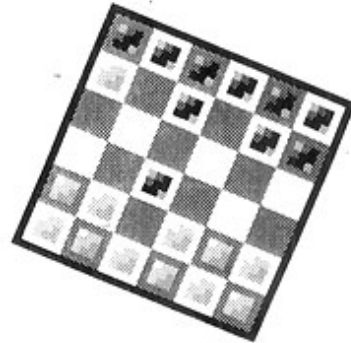
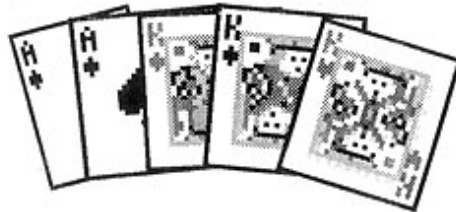
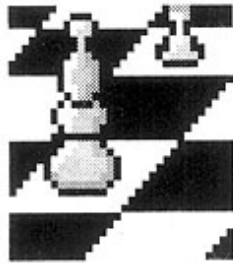
All events surrounding Opportunity's EDL (Entry, Descent and Landing) combined with select programming segments and broadcasts during its first day on Mars (Sol 1) have been taped by this editor via NASA TV and DirecTV and will be available to Custer within 2 weeks.



CUSTER GAME NIGHT



Saturday January 31, 2004 7:00 PM
Covered Dish Supper at 5:00 PM
Bring your favorites to share!



CHES, CHECKERS, POKER, BACKGAMMON, SCRABBLE,
MONOPOLY AND MORE!
Bring your favorite game to share.

Upcoming Programs

Saturday Feb 21, 2004 7PM The new AOS Observatory a program led by Jeff Johns and John Bliex chairmen of the AOS Observatory Committee: They will discuss the new AOS-Custer Observatory plans. This is an exciting new venture for the AOS and Custer. Find out about the new 8' dome, telescope and plans for this observatory.

Astronomy Day Saturday April 24, 2004 A Fun filled day for the whole family. Starts at 12:00 noon

Directions: LIE (495) Exit 73 east Route 58 becomes Rt. 25. Follow 17 miles east, make sharp right at Gulf gas onto Main Bayview Rd. Custer is ¼ mile down on left.



Custer Institute

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CUSTER EVENTS CALENDAR

OBSERVATORY DUTY

Any staff on hand will be more than glad to assist in the operation of the telescope.

AT THE INSTITUTE

Public observing every Saturday night, weather permitting.

The Custer Comment

**TOM MADIGAN, Editor
CUSTER COMMENT**

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PATCHOGUE, NY

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