



Astronomy Club News

February, 2004

John Kocijanski, Editor

| | |
|-------------------------|-----------------------|
| Jim McKeegan, | President |
| John Kocijanski, | Vice President |
| Brian Deis, | Secretary |
| Bud Wertheim, | Treasurer |

Catskills Astronomy Club News

2/1/04

Club News:

The January 24th observation session was attempted. Two members tried to observe at Walnut Mountain Park but the windy conditions and cold temperatures made conditions unbearable. A very brief viewing of the Orion Nebula M42, the Double Cluster in Perseus, open cluster M35 in Gemini, and the three open clusters M36, M37, and M38 in Auriga was done with a small refractor.

The January 17th observation session was canceled due to poor weather. The next observation sessions are on February 21st and 28th. The gate at Walnut Mountain Park is now working with the same combination. A new lock was put on the gate.

The Northeast Astronomy Forum at Rockland County Community College in Suffern, NY will be held on April 17th and 18th in the college field house. Our club will be setting up a table on the balcony of the field house near the entrance to the show on Saturday April 17th. Anyone interested in helping out at the table please contact John at kocis@verizon.net.

Brian Deis has formed an astronomy club in Orange County. It is called the Orange County Astronomical Association. (OCAA). Their url is www.ocastronomy.org.

The 2004 observation dates for our club are shown below. Alternate dates will be announced as needed.

2/21, 2/28, 3/13, 3/20, 4/17, 4/24, 5/15, 5/22, 6/12, 6/19, 7/10, 7/17, 8/7, 8/14, 9/11, 9/18, 10/9, 10/16, 11/6, 11/13, 12/4, 12/11

Some members who attended the dinner meetings that were held last winter have expressed interest in repeating this

again when the weather looks poor for an observation session. When an opportunity arises for a dinner meeting the membership will be contacted via email.

The club has selection of astronomy books, Stardate audio CDs, a Macintosh computer with astronomy software, and a Meade 8 inch reflector for members to borrow. Please contact John at 791-5240 or kocis@catskill.net if you are interested in borrowing any of these.

Astronomy News:

Here are some articles from various NASA sources that might be of interest.

NEWS RELEASE: 2004-044 January 29, 2004

Healthier Spirit Gets Back to Work While Opportunity Prepares to Roll

NASA's Spirit rover on Mars has resumed taking pictures as engineers continue work on restoring its health. Meanwhile, Spirit's twin, Opportunity, extended its rear wheels backward to driving position last night as part of preparations to roll off its lander, possibly as early as overnight Saturday-to-Sunday.

Spirit shot and transmitted a picture yesterday to show the position of its robotic arm. "The arm is exactly where we expected," said Jennifer Trosper, mission manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif. It is still extended in the same position as when the rover developed communication and computer problems on Jan. 22. A mineral-identifying instrument called a Moessbauer spectrometer, at the tip of the arm, is positioned at a rock nicknamed Adirondack.

Engineers have been carefully nursing Spirit back toward full operations for the past week. They are sending commands today for the rover to begin making new scientific observa-

tions again, starting with panoramic camera images of nearby rocks. Today's commands also tell the rover to send data stored by two instruments since they took readings on Adirondack last week — the Moessbauer spectrometer and the alpha particle X-ray spectrometer, which identifies the chemical elements in a target.

“We know we still have some engineering work to do, but we think we understand the problem well enough to do science in parallel with that work,” Trosper said. Several attempts to get a full trace of data related to the rover's problem have only partially succeeded. The engineers might choose to reformat the rover's flash memory in the next few days.

A health check of Spirit's camera mast is on the agenda for today. Another health check, of an actuator motor for a periscope mirror of the miniature thermal emission spectrometer, is planned for Friday.

Halfway around Mars from Spirit, Opportunity's lander platform successfully tilted itself forward by pulling airbag material under the rear portion of the lander then flexing its rear petal downward. “What this did is drive our front edge lower,” said JPL's Matt Wallace, mission manager. “The tips of the egress aid (a reinforced fabric ramp) are now in the soil. That makes egress look perfect. It's going to be an easy ride.” The rover also retracted a lift mechanism underneath the rover, to get it out of the way for the egress, or drive-off.

During Opportunity's sol 6, the martian day that started today at 10:26 a.m. PST, the rover will be commanded to lower the middle pair of its six wheels and to release its robotic arm from the latch that has held it since before launch.

Yesterday, Opportunity used its miniature thermal emission spectrometer on a portion of the landing neighborhood that includes a rock outcrop. The instrument identifies the composition of rocks and soils from a distance. Opportunity did not

return the data from those observations before going to sleep for the martian night, but may later today.

The rovers' main task in coming weeks and months is to explore their landing sites for evidence in the rocks and soil about whether the sites' past environments were ever watery and possibly suitable for sustaining life.

JPL, a division of the California Institute of Technology in Pasadena, manages the Mars Exploration Rover project for NASA's Office of Space Science, Washington, D.C. Images and additional information about the project are available from JPL at <http://marsrovers.jpl.nasa.gov> and from Cornell University, Ithaca, N.Y., at <http://athena.cornell.edu> .

-end-

NEWS RELEASE: 2004-026 January 21, 2004

Astronomers Measure Distance to Well-Known Star

The cluster of stars known as the Pleiades is one of the most recognizable objects in the night sky, and for millennia has been celebrated in literature and legend. Now, a group of astronomers has obtained a highly accurate distance to one of the stars of the Pleiades known since antiquity as Atlas. The new results will be useful in the longstanding effort to improve the cosmic distance scale, and to conduct research on the stellar life-cycle.

In the January 22 issue of the journal Nature, astronomers from the California Institute of Technology and NASA's Jet Propulsion Laboratory, both in Pasadena, Calif., report the best-ever distance to the double-star Atlas. The star, along with "wife" Pleione and their daughters, the "seven sisters," are the principal stars of the Pleiades that are visible to the unaided eye, although there are actually thousands of stars in the cluster. Atlas, according to the team's decade of careful interferometric measurements, is somewhere between

434 and 446 light-years from Earth.

The range of distance to the Pleiades cluster may seem somewhat imprecise, but in fact is accurate by astronomical standards. The traditional method of measuring distance is by noting the precise position of a star and then measuring its slight change in position when Earth itself has moved to the other side of the sun. This approach can also be used to find distance on Earth: If you carefully record the position of a tree an unknown distance away, move a specific distance to your side, and measure how far the tree has apparently “moved,” then it’s possible to calculate the actual distance to the tree by using trigonometry.

However, this procedure gives only a rough distance estimate to even the nearest stars, due to the gigantic distances involved and the subtle changes in stellar position that must be measured.

The team’s new measurement settles a controversy that arose when the European satellite Hipparcos provided a much shorter distance measurement to the Pleiades than expected and contradicted theoretical models of the life cycles of stars.

This contradiction was due to the physical laws of luminosity and its relationship to distance. A 100-watt light bulb one mile away looks exactly as bright as a 25-watt light bulb half a mile away. So to figure out the wattage of a distant light bulb, we have to know how far away it is. Similarly, to figure out the “wattage” (luminosity) of observed stars, we have to measure how far away they are. Theoretical models of the internal structure and nuclear reactions of stars of known mass also predict their luminosities. So the theory and measurements can be compared.

However, the Hipparcos data provided a distance lower than that assumed from the theoretical models, thereby suggest-

ing either that the Hipparcos distance measurements themselves were off, or else that there was something wrong with the models of the life cycles of stars. The new results show that the Hipparcos data was in error, and that the models of stellar evolution are indeed sound.

The new results come from careful observation of the orbit of Atlas and its companion — a binary relationship that wasn't conclusively demonstrated until 1974 and certainly was unknown to ancient watchers of the sky. Using data from the Mount Wilson stellar interferometer, next to the historic Mount Wilson Observatory, and the Palomar Testbed Interferometer at Caltech's Palomar Observatory near San Diego, the team determined a precise orbit of the binary.

Interferometry is an advanced technique that allows, among other things, for the “splitting” of two bodies so far away that they normally appear as a single blur, even in the biggest telescopes. Knowing the orbital period and combining it with orbital mechanics allowed the team to infer the distance between the two bodies, and with this information, to calculate the distance of the binary to Earth.

”For many months I had a hard time believing our distance estimate was 10 percent larger than that published by the Hipparcos team,” said the lead author, Xiao Pei Pan of JPL. “Finally, after intensive rechecking, I became confident of our result.”

Coauthor Shrinivas Kulkarni, a Caltech astronomy and planetary science professor, said, “Our distance estimate shows that all is well in the heavens. Stellar models used by astronomers are vindicated by our value.”

”Interferometry is a young technique in astronomy and our result paves the way for wonderful returns from the Keck interferometer and the anticipated Space Interferometry

Mission that is expected to be launched in 2009,” said coauthor Michael Shao of JPL, principal investigator for that planned mission, and for the Keck Interferometer, which links the two 10-meter telescopes at the Keck Observatory in Hawaii. The Palomar Testbed Interferometer was designed and built by a team of researchers from JPL led by Mark Colavita and Shao. It served as an engineering testbed for the Keck Interferometer.

-end-

Image Advisory: 2004-017 Jan. 13, 2004

Stormy Cloud of Star Birth Glows in New Spitzer Image

A dusty stellar nursery shines brightly in a new image from NASA’s Spitzer Space Telescope, formerly known as the Space Infrared Telescope Facility. Spitzer’s heat-sensing “infrared eyes” have pierced the veiled core of the Tarantula Nebula to provide an unprecedented peek at massive newborn stars.

The new image is available online at <http://www.spitzer.caltech.edu> and <http://photojournal.jpl.nasa.gov/catalog/PIA05062> .

“We can now see the details of what’s going on inside this active star-forming region,” said Dr. Bernhard Brandl, principal investigator for the latest observations and an astronomer at both Cornell University, Ithaca, N.Y., and the University of Leiden, the Netherlands.

Launched on August 25, 2003, from Cape Canaveral Air Force Station, Florida, the Spitzer Space Telescope is the fourth of NASA’s Great Observatories, a program that also includes Compton Gamma Ray Observatory, the Chandra X-ray Observatory and the Hubble Space Telescope. Spitzer’s state-of-the-art infrared detectors can sense the infrared

radiation, or heat, from the farthest, coldest and dustiest objects in the universe.

One such dusty object is the Tarantula Nebula. Located in the southern constellation of Dorado, in a nearby galaxy called the Large Magellanic Cloud, this glowing cloud of gas and dust is one of the most dynamic star-forming regions in our local group of galaxies. It harbors some of the most massive stars in the universe, up to 100 times more massive than our own Sun, and is the only nebula outside our galaxy visible to the naked eye.

While other telescopes have highlighted the nebula's spidery filaments and its star-studded core, none was capable of fully penetrating its dust-enshrouded pockets of younger stars.

The new Spitzer image shows, for the first time, a more complete picture of this huge stellar nursery, including previously hidden stars. The image also captures in stunning detail a hollow cavity around the stars, where intense radiation has blown away cosmic dust.

"You can see a hole in the cloud as if a giant hair dryer blew away all the gas and dust," said Brandl.

By studying this portrait of a family of stars, astronomers can piece together how stars in general, including those like our Sun, form.

JPL manages the Spitzer Space Telescope mission for NASA's Office of Space Science, Washington. Science operations are conducted at the Spitzer Science Center at the California Institute of Technology in Pasadena. JPL is a division of Caltech.

Additional information about the Spitzer Space Telescope is available at <http://www.spitzer.caltech.edu> .

-end-

News Release: 2004-001 January 2, 2003

NASA Spacecraft Makes Great Catch...Heads for Touch-down

Team Stardust, NASA's first dedicated sample return mission to a comet, passed a huge milestone today by successfully navigating through the particle and gas-laden coma around comet Wild 2 (pronounced "Vilt-2"). During the hazardous traverse, the spacecraft flew within 240 kilometers (149 miles) of the comet, catching samples of comet particles and scoring detailed pictures of Wild 2's pockmarked surface.

"Things couldn't have worked better in a fairy tale," said Tom Duxbury, Stardust project manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif.

"These images are better than we had hoped for in our wildest dreams," said Ray Newburn of JPL, a co-investigator for Stardust. "They will help us better understand the mechanisms that drive conditions on comets."

"These are the best pictures ever taken of a comet," said Principal Investigator Dr. Don Brownlee of the University of Washington, Seattle. "Although Stardust was designed to be a comet sample return mission, the fantastic details shown in these images greatly exceed our expectations."

The collected particles, stowed in a sample return capsule onboard Stardust, will be returned to Earth for in-depth analysis. That dramatic event will occur on January 15, 2006, when the capsule makes a soft landing at the U.S. Air Force Utah Test and Training Range. The microscopic particle samples of comet and interstellar dust collected by Stardust will be taken to the planetary material curatorial facility at NASA's Johnson Space Center, Houston, Texas, for analysis.

Stardust has traveled about 3.22 billion kilometers (2 billion

miles) since its launch on February 7, 1999. As it closed the final gap with its cometary quarry, it endured a bombardment of particles surrounding the nucleus of comet Wild 2. To protect Stardust against the blast of expected cometary particles and rocks, the spacecraft rotated so it was flying in the shadow of its “Whipple Shields.” The shields are named for American astronomer Dr. Fred L. Whipple, who, in the 1950s, came up with the idea of shielding spacecraft from high-speed collisions with the bits and pieces ejected from comets. The system includes two bumpers at the front of the spacecraft — which protect Stardust’s solar panels — and another shield protecting the main spacecraft body. Each shield is built around composite panels designed to disperse particles as they impact, augmented by blankets of a ceramic cloth called Nextel that further dissipate and spread particle debris.

“Everything occurred pretty much to the minute,” said Duxbury. “And with our cometary encounter complete, we invite everybody to tune in about one million, 71 thousand minutes from now when Stardust returns to Earth, bringing with it the first comet samples in the history of space exploration.”

Scientists believe in-depth terrestrial analysis of the samples will reveal much about comets and the earliest history of the solar system. Chemical and physical information locked within the cometary particles could be the record of the formation of the planets and the materials from which they were made. More information on the Stardust mission is available at <http://stardust.jpl.nasa.gov> .

Stardust, a part of NASA’s Discovery Program of low-cost, highly focused science missions, was built by Lockheed Martin Space Systems, Denver, Colo., and is managed by JPL for NASA’s Office of Space Science, Washington, D.C. JPL is a division of the California Institute of Technology in Pasadena.

-end-

NEWS RELEASE: 2004-032 January 23, 2004

New NASA Data Release Invites You to Explore Two Vast Continents

Marco Polo. Alexander the Great. They were some of history's most prolific explorers, each trekking across sweeping stretches of Europe and Asia in their lifetimes. But these greats of world history have nothing on you, thanks to a new topographic data set from NASA and the National Geospatial-Intelligence Agency. You now can explore the vast reaches of most of Europe, Asia and numerous islands in the Indian and Pacific Oceans, from the comfort of home, without breaking a sweat.

Gathered in just 10 days by NASA's Shuttle Radar Topography Mission in February 2000, the new digital elevation data set showcases some of Earth's most diverse, mysterious and extreme topography. Much of it previously had been very poorly mapped due to persistent cloud cover or inaccessible terrain. The new data being released comprise about 40 percent of the entire mission data set.

The new images are available on the JPL Planetary Photojournal at:

<http://photojournal.jpl.nasa.gov/catalog/PIA03398>

<http://photojournal.jpl.nasa.gov/catalog/PIA03399>

<http://photojournal.jpl.nasa.gov/catalog/PIA04950>

<http://photojournal.jpl.nasa.gov/catalog/PIA04951>

"People around the world will benefit from the release of the mission's Europe and Asia topographic data sets because they greatly extend our knowledge of this immense region that also is home to most of Earth's citizens," said Dr. John LaBrecque, manager, Solid Earth and Natural Hazards Program, NASA Headquarters, Washington. "The shape of

Earth's surface affects nearly every natural process and human endeavor. Precise, uniform 3-D elevation data are needed for a wide range of applications from studying earthquakes, volcanism, floods and other natural hazards, to planning development, managing precious water resources, and insuring the safety of aircraft navigation.”

”Releasing the Eurasia SRTM data provides geospatial data users with a remarkably consistent Earth-elevation surface,” said National Geospatial-Intelligence Agency Technical Executive Roberta Lenczowski. “This enhances our global knowledge, provides a baseline for any future comparisons, and delivers accuracy and integrity unparalleled in any other global-elevation model of the Earth. The mission’s data represents 40 percent of the data collected during the mission, which covered roughly 80 percent of the landmass of the Earth. The cooperative effort between NASA and the National Geospatial-Intelligence Agency, fusing science objectives with national security requirements, benefits all.”

The area covered in the current data release stretches eastward from the British Isles and the Iberian Peninsula in the west, across the Alps and Carpathian Mountains, as well as the Northern European Plain, to the Ural and Caucasus Mountains bordering Asia. The Asian coverage includes a great variety of landforms, including the Tibetan Plateau, Tarin Basin, Mongolian Plateau and the mountains surrounding Lake Baikal, the world’s deepest lake. Mt. Everest in the Himalayas, at 8,848 meters (29,029 feet) is the world’s highest mountain. From India’s Deccan Plateau, to Southeast Asia, coastal China, and Korea, various landforms place constraints on land-use planning during periods of population growth. Volcanoes in the East Indies, the Philippines, Japan and the Kamchatka Peninsula form the western part of the “Ring of Fire” around the Pacific Ocean.

Previous releases from the mission covered North and South America. Forthcoming releases in 2004 will include Africa-

Arabia and Australia, as well as an “islands” release for those islands not included in the continental data releases. Together, these data releases constitute the world’s first high-resolution, near-global elevation model. The resolution of these data for Europe and Asia is three arc seconds (1/1,200th of a degree of latitude and longitude), which is about 90 meters (295 feet).

The mission is a cooperative project of NASA, the National Geospatial-Intelligence Agency and the German and Italian space agencies. NASA’s Jet Propulsion Laboratory, Pasadena, Calif., processed the data into research-quality digital elevation data. The National Geospatial-Intelligence Agency is providing additional processing to develop mapping products. The U.S. Geological Survey Earth Resources Observation Systems Data Center in Sioux Falls, S.D., provides final archiving and distribution of the Shuttle Radar Topography Mission data products.

Information about the Shuttle Radar Topography Mission is available at <http://www.jpl.nasa.gov/srtm> .

More information about NASA is available at <http://www.nasa.gov> .

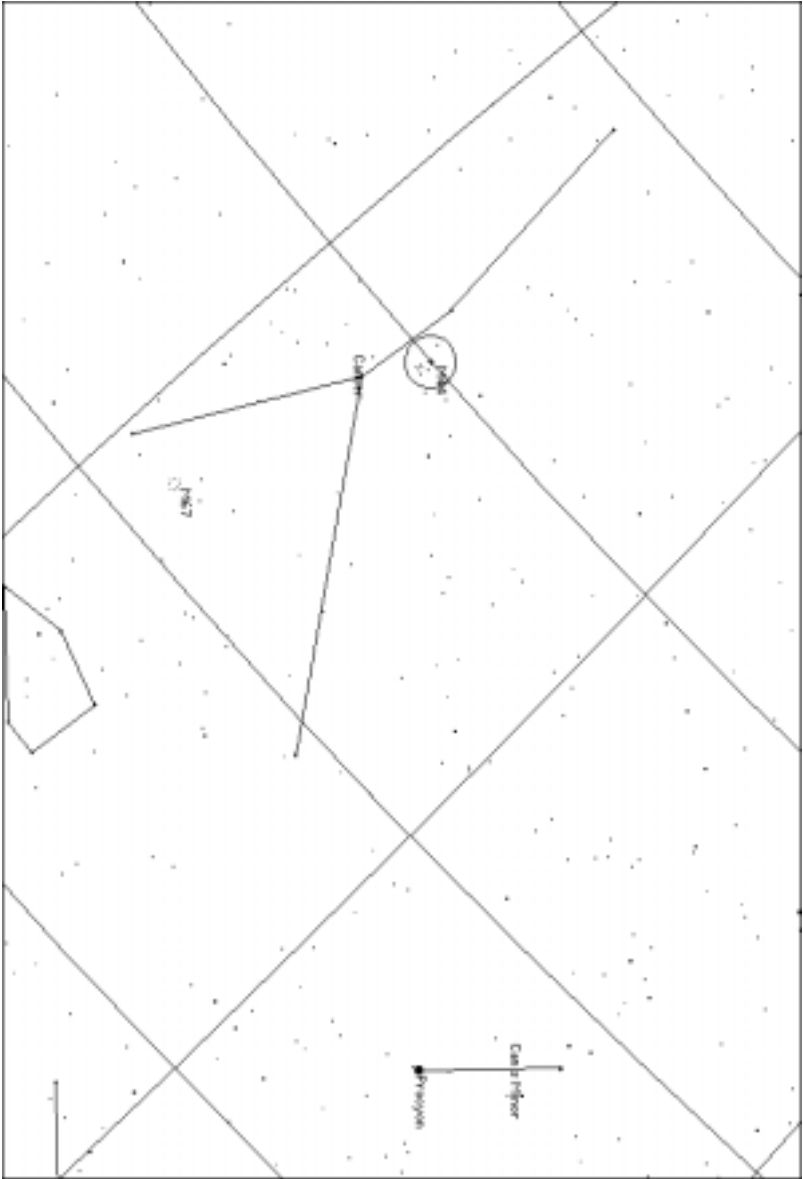
JPL is managed for NASA by the California Institute of Technology in Pasadena.

-end-

Mid Evening Observing Highlights for January

Saturn is high in the sky. Jupiter is rising in the eastern sky. Orion is prominent in the southern sky as is the Winter Triangle of Betelgeuse, Sirius, and Procyon. Look for the open star clusters M41 just south of Sirius and M35 in Gemini. Leo is rising in the east. Higher in the eastern sky look for the open star cluster M44 (the Beehive Cluster) in Cancer. The Big Dipper is standing on its handle in the northeast. The

galaxies M81 and M82 can be found just west of the Pointer Stars in the Big Dipper (Duhbe and Merak). New moon is on February 20th and full moon is on February 6th. The image below shows the location of Procyon and M44 in Cancer as well as the smaller open cluster M67.



BARLOW BOB'S CORNER

Barlow Bob is a member of the Rockland Astronomy Club.

The Rockland Astronomy Club has a new name:

Northeast Astronomical Society (NAS)
formerly Rockland Astronomy Club.

2004 EVENTS

**APRIL 14 – 18 DELMARVA STAR PARTY TUCKAHOE
STATE PARK, MARYLAND**

APRIL 17 – 18 NEAF SUFFERN, NEW YORK

**APRIL 24 ASTRONOMY DAY BOSTON MUSEUM OF
SCIENCE**

**JUNE 5 STARCONN WESLEYAN UNIVERSITY,
MIDDLETOWN, CT WWW.ASGH.ORG**

**JUNE 18 – 20 JERSEY STARQUEST STAR PARTY HOPE,
NEW JERSEY**

**JULY 9 – 18 ROCKLAND SUMMER STAR PARTY SAVOY,
MASSACHUSETTES**

**JULY 16 TO 18 ROCHESTAR FEST ROCHESTER, NEW
YORK**

AUGUST 13 – 14 STELLAFANE VERMONT

**AUG 29 – SEPT 1 ARUNAH HILL DAYS CUMMINGTON,
MA**

**SEPTEMBER 10 – 12 BLACK FOREST STAR PARTY
PENNSYLVANIA**

**SEPTEMBER 10 – 12 CONNECTICUT STAR PARTY
COLBROOK, CONNECTICUT**

SEPTEMBER 15 – 19 DELMARVA STAR PARTY TUCKAHOE STATE PARK, MARYLAND

NO DATE YET THE CONJUNCTION NORTHFIELD, MASSACHUSETTS

NASA Space Place

NASA did not send an article this month.

The 2004 dues are due

Please snip off the voucher and return it as soon as possible. Thank you,

Bud Wertheim, Treasurer

Please make check to: **Catskills Astronomy Club**

Mail to: Bud Wertheim, Treasurer

143 Covered Bridge Road

Livingston Manor, NY 12758

Individual Membership.....\$28.50

Renewal Individual.....\$23.50

Family Membership..... \$33.50

Renewal Family.....\$28.50

Name _____

Address: _____

City _____ State _____ Zip _____

Phone: _____

Email: _____

Family members _____

(names)