NORTH JERSEY ASTRONOMICAL GROUP

THE Dark Sky Observer

Summer A Publication of the North Jersey Astronomical Group **2004**

THE DARK SKY OBSERVER

The Dark Sky Observer is a publication of the North Jersey Astronomical Group (NJAG), whose purpose is to promote the study and knowledge of the science of astronomy.
The Dark Sky Observer needs your input! Letters, comments, suggestions, book and product reviews, and articles are welcomed and encouraged. Contact the editor at 973-586-0612, kdconod@optonline.net, or at this address:

Dark Sky Observer
North Jersey Astronomical Group
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VISIT OUR WEB PAGE AT

http://njagweb.tripod.com.
Mary Lou West also maintains a web page at:
http://www.csam.montclair.edu/~west/njag.html

MEMBERSHIP

Dues are only $15.00 per year ($20.00 for family and $10.00 for student memberships). Benefits of membership include: $10 discount on subscriptions to "Sky & Telescope" or "Astronomy" magazines ("Sky & Telescope" subscribers also get a 10% discount on all books, maps, and products at Sky Publishing); a subscription to this newsletter; an e-mail list for the latest club and astronomy news; use of our dark sky sites; field trips to local planetariums, science centers, and star parties; a lending library of astronomical books; a Telescope Loan Program; and star parties for special celestial events.
Make checks out to the NJAG and mail to: North Jersey Astronomical Group, P.O. Box 1472, Clifton, NJ 07015-1472. If you have any questions regarding membership, contact our Acting Membership Committee Chair, Gigi Inturrisi at: g.inturrisi@verizon.net.

UACNJ

The NJAG is a member of the United Astronomy Clubs of New Jersey (UACNJ),a consortium of more than a dozen astronomy clubs, united to better help support, coordinate, and communicate ideas between stargazers in and around the state. The UACNJ operates an observatory at Jenny Jump State Forest near Hope, NJ which serves as the NJAG's dark sky site.

SUMMER STARGAZING

Wed., August 11, 9:00 p.m. – midnight

Join us for some summer stargazing and a preview of the Perseid meteor shower. For directions, see: njagweb.tripod.com/directions.htm

Note:

Our telescopes cannot see through clouds! Telescopes will be set up only if weather permits. If the event needs to be canceled, a message will be left on the planetarium hotline (973-596-6529) after 5:00 p.m. on the day of the event. Cosponsored by the Newark Museum and Essex County Department of Parks.

NEXT MEETING:

Space Spinoffs
Wednesday, September 8, 8:00 p.m.

There will be no August meeting, therefore the next meeting will be on Sept. 8. On Sept. 8 our guest speaker will be Laura Venner, NASA Solar System Ambassador. He topic will be:

NASA Spinoffs: Bringing Space Technology to Earth

Our lives are enhanced everyday by technologies and medical breakthroughs that are a direct result of the space program. The need to create innovative materials that can endure and function in space has resulted in technological advancements while performing experiments in the weightless environment of space has uncovered new medical treatments. Discover some of those benefits and explore the possibility for future technologies and space program benefits. The meeting will be held at 8:00 p.m. on the campus of Montclair State in Richardson Hall room 232.

CELESTIAL BOUNDARIES AT THE OCTOBER MEETING

Wednesday, October 13

We are planning a special evening in honor of the opening of a new exhibit "Celestial Boundaries" in Montclair State's Art Galleries. Dr. Mary Lou West will give a lecture and stargazing will follow (weather permitting). Stay tuned for details!
Important note about parking:
Montclair State is now charging for visitor's parking. Parking is $3 for 1 to 2 hours at the Red Hawk Parking Deck. Metered parking near the Red Hawk Diner is $0.50 per half hour. See: http://www.montclair.edu/pages/ofo/Parking

TELESCOPE NIGHTS

Our telescope nights at Montclair State University have ended for the season. Telescope Nights will resume in September.

STARLINE For a weekly update on the night sky, call the StarLine at 973-680-8420.

VENUS TRANSIT

By Kevin Conod

Thanks to a number of volunteers from NJAG, many people were able to see a rare transit of Venus on June 8. The site chosen for the event was Eagle Rock Reservation in West Orange which had a good view of the eastern horizon. By sunrise many were already there setting up their telescopes. As the Sun rose blood red through the low clouds, we could see Venus as a dark black dot with the unaided (and unfiltered) eye.

In addition to scopes provided by NJAG members and Mary Lou West from Montcliar State, I set up the Dreyfuss Planetarium's new 8" Celestron with a white light Baader solar filter, while planetarium instructors Bill McClain and Mariel O'Brien set up a hydrogen alpha solar telescope. Carsten Dencker, Dale Gary, and their students from NJIT had two telescopes set up with a CCD camera for imaging.

We had an interesting mix of people: from businessmen in suits on their way to work, kids on their way to school, to locals in their pajamas! We even had a couple from California who happened to be in the area. In all, more than 200 people came to see Venus cross the face of the Sun.

The event was good publicity for the NJAG: Todd Wright was interviewed by the Star-Ledger for a large article that appeared on the front page of the New Jersey section the next day.

Thank you to all who participated!

For images from this event, see: njagweb.tripod.com/photos/transit

VOYAGE TO A DOUBLE PLANET

By Patrick L. Barry and Dr. Tony Phillips, NASA/JPL

Download a "nine planets" screensaver for your computer with spectacular photos of our solar system, and you'll notice that one planet is conspicuously missing: Pluto. Icy and mysterious, Pluto is the only planet never visited and photographed by NASA space probes.

In fact, the clearest image we have of Pluto is a tiny, pixelated blob of light and dark patches taken by the Hubble Space Telescope in 1994. It's tantalizing _ but not much more. Earth-based telescopes have succeeded, however, in discovering one amazing fact: Pluto is not a lone world, but a double-planet system. Its companion, measuring about half the size of Pluto itself, is named Charon.

Work is underway to launch a robotic probe to visit and photograph Pluto and Charon. The project, called New Horizons, will map both worlds. Sensors will chart surface minerals and ices, and catalog the gases that make up Pluto's wispy atmosphere.

"It's the second epoch in the exploration of the planets," says Alan Stern, the principal investigator for New Horizons at the Southwest Research Institute in Colorado. "We're going to the very edge of the solar system."

The probe is scheduled to launch in January 2006. Its journey will be a long one. Pluto is more than 30 times further away from the Sun than Earth is! Even with a speed boost from a flyby of Jupiter, the probe won't arrive at Pluto until July 2015. Afterward, the probe will venture on to explore the Kuiper Belt, a distant "halo" of small, frozen objects surrounding the solar system, from which comets originate.

Aside from sheer curiosity about these distant worlds, scientists are motivated by questions about the formation of the solar system. Orbiting in the deep freeze far from the sun, Pluto and Charon have undergone less change than the inner planets during the solar system's 4.5 billion year history. These two worlds will provide a glimpse into the past.

Pluto could also shed light on the origin of our own Moon. Earth, with its single, large moon, is unusual. The Pluto-Charon system is the only other pair like it in the solar system. In fact, some astronomers consider Earth and the Moon to be a double planet, too. So knowing more about Pluto and Charon could give clues about how the Earth-Moon system formed.

And, of course, the spectacular, up-close photos of Pluto and Charon are going to look great as a screensaver!

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

Artist Dan Durda's idea of the New Horizons spacecraft flying by Pluto and its moon, Charon

STUMP THE ASTRONOMERS

Have a question about astronomy?
Send it in to Kevin Conod at the address on page 1
or to kdconod@optonline.net
and we'll try to have an answer in the next newsletter.

NJAG

CASSINI REACHES SATURN

The Cassini spacecraft is now in orbit around Saturn. The spacecraft has already returned some ground-breaking science. During its June 11 flyby of the moon Phoebe, the spacecraft discovered that it is made up of much more ice than expected. This may indicate that it formed in the outer solar system rather than in the asteroid belt. Its surface chemistry has much in common with Pluto, Neptune's moon Triton and some comets. Cassini is one of the largest and most complex unmanned spacecraft ever built. It is 22 feet long and weighs 12, 600 pounds. During its four-year mission, it will bring 18 scientific instruments to bear on the planet, its rings and moons. It will orbit 76 times during its four-year mission, which includes 52 flybys of its moons. Stunning high-resolution images of Saturn will be streaming back to Earth all summer long. You can check on Cassini's progress and latest snapshots at: saturn.jpl.nasa.gov

NASA SPACECRAFT REVEALS SURPRISING ANATOMY OF A COMET

By Jane Platt and Dwayne Brown, NASA

Findings from a historic encounter between NASA's Stardust spacecraft and a comet have revealed a much stranger world than previously believed. The comet's rigid surface, dotted with towering pinnacles, plunging craters, steep cliffs, and dozens of jets spewing violently, has surprised scientists.

"We thought Comet Wild 2 would be like a dirty, black, fluffy snowball," said Stardust Principal Investigator Dr. Donald Brownlee of the University of Washington, Seattle. "Instead, it was mind-boggling to see the diverse landscape in the first pictures from Stardust, including spires, pits and craters, which must be supported by a cohesive surface."

Stardust gathered the images on Jan. 2, 2004, when it flew 236 kilometers (about 147 miles) from Wild 2. The flyby yielded the most detailed, high-resolution comet images ever.

"We know Wild 2 has features sculpted by many processes. It may turn out to be typical of other comets, but it is unlike any other type of solar system body," Brownlee said. "We're fortunate that nature gave us such a rich object to study."

Stardust images show pinnacles 100 meters tall (328 feet), and craters more than 150 meters deep (492 feet). Some craters have a round central pit surrounded by ragged, ejected material, while others have a flat floor and straight sides. The diameter of one large crater, called Left Foot, is one fifth of the surface of the comet. Left Foot is one kilometer (.62 miles) across, while the entire comet is only five kilometers (3.1 miles) across.

"Another big surprise was the abundance and behavior of jets of particles shooting up from the comet's surface. We expected a couple of jets, but saw more than two dozen in the brief flyby," said Dr. Benton Clark, chief scientist of space exploration systems, Lockheed Martin Space Systems, Denver.

The team predicted the jets would shoot up for a short distance, and then be dispersed into a halo around Wild 2. Instead, some super-speedy jets remained intact, like blasts of water from a powerful garden hose. This phenomenon created quite a wild ride for Stardust during the encounter.

"Stardust was absolutely pummeled. It flew through three huge jets that bombarded the spacecraft with about a million particles per second," said Thomas Duxbury, Stardust project manager at NASA's Jet Propulsion Laboratory, Pasadena, Calif. Twelve particles, some larger than a bullet, penetrated the top layer of the spacecraft's protective shield.

The violent jets may form when the Sun shines on icy areas near or just below the comet's surface. The solid ice becomes a gas without going through a liquid phase. Escaping into the vacuum of space, the jets blast out at hundreds of kilometers per hour. The Stardust team theorizes sublimation and object hits may have created the comet's distinct features. Some features may have formed billions of years ago, when life began on Earth, Brownlee said. Particles collected by Stardust during the Wild 2 encounter may help unscramble the secrets of how the solar system formed.

Stardust was launched in 1999. It is zooming back to Earth with thousands of captured particles tucked inside a capsule. The capsule will make a soft landing in the Utah desert in January 2006. The samples will be analyzed at the planetary material curatorial facility at NASA's Johnson Space Center, Houston.

To view Stardust images on the Internet, visit: http://stardust.jpl.nasa.gov under a contract with the National Aeronautics and Space Administration.

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SKY CALENDAR

August

11&12	Moon near Venus (dawn)
11/12	Perseid Meteor Shower
13	Moon near Saturn (dawn)
17	Venus greatest elongation (dawn)
18	Moon near Jupiter
31	Venus and Saturn close (dawn)

September

8	Genesis solar wind sample return
9	Mercury at greatest elongation (dawn)
9-11	Venus & Saturn near Moon (dawn)
10	Mercury near Regulus (dawn)
15	Mars passes into morning sky
21	Jupiter passes into morning sky
23	Autumn Equinox (12:29 p.m.)
28	Harvest Moon

SCALE MODEL SOLAR SYSTEM

Last year NJBG, the volunteer support group of the NJ State Botanical Garden in Ringwood State Park (Morris Road, Ringwood, NJ) installed a scale model of the solar system based on the 'Earth as a Peppercorn' model. On this scale, the Sun is 8" in diameter, and the distance to Pluto is 1036 yards. The trip from the Sun to Pluto is a pleasant half-mile walk along the eastern edge of the Great Meadow. The Jupiter sign (above) shows the planet as a correctly scaled dot with the yellow Sun to scale in the background. (One small problem: since 'boys will be boys,' the sign for Uranus keeps disappearing!) To accompany the walk, NJBG has published a brochure with a map and planet info in which NJAG is credited for its assistance. The model has been a tremendous success over the past year, and NJBG is currently trying to raise $3,500 to make the exhibit permanent, with new carved wooden signs more in keeping with the surroundings. If you know a group or individual who might care to contribute, please contact Maja Britton at adastrawes@aol.com