

Skywatchers

Newsletter of the China Lake Astronomical Society

Volume 43 No. 01

January 1, 2006

NEXT MEETING 7:30 p.m., Monday, January 9, 2006

Maturango Museum, 100 East Las Flores Avenue, Ridgecrest

PROGRAM FOR THE JANUARY 9 MEETING

At our December meeting we talked about the satellites of our solar system beyond Saturn. Although many of these objects have been discovered recently, Voyager II provided some fine camera shots of Uranus, Neptune, and their satellites. I would like to show slides of Voyager II photos at our January meeting. Hopefully this will foster continued discussion on the topic.

DATES TO KEEP IN MIND

Monday, January 9, 2006: Regular CLAS Meeting at the Maturango Museum in Ridgecrest, 7:30 p.m.

Tuesday, January 22, 2006: Deadline for next Skywatchers Newsletter

Monday, February 6, 2006: Regular CLAS Meeting at the Maturango Museum in Ridgecrest, 7:30 p.m.

ELECTION RESULTS: The annual election of officers for the China Lake Astronomical Society resulted in all officers continuing for another term.

ATTENTION! The Royal Astronomical Society of Canada Observer's Handbooks for 2006 are now on hand, along with their superb Astronomical Calendar. As a benefit of membership we have held the price to last year's amounts. The handbook will cost you \$15.00, and the calendar will be \$10.00. Thus, \$25.00 for the set.

STAR PARTIES WILL RESUME IN MARCH 2006

THE SKY IN JANUARY (Roger Brower)

1. On New Years Eve, Venus will be only 7% illuminated but will remain brilliant. Look for it very low in the southwest during the first week of the month. It will then be lost in the suns glare for a couple of weeks before moving rapidly to the morning sky. Look for it in the southeast in the morning sky the last week of the month.
2. Jupiter rises about 3 a.m., so by morning it is high enough in the southeast to be clearly visible.
3. Saturn reaches opposition on January 27th so will be well placed for observation all night. Look for it in the east at sunset and watch it move across the sky all night.
4. Mars continues to dim throughout the month but remains brighter than any stars around it. Look for it high in southeast after sunset.
5. Mercury will be in the morning for only the opening few days of the month. Look for it in the south-southeast before dawn.

6. The Quadrantid meteor shower peaks on January 3rd.

A WAY TO SPEND SOME MONEY (CARROLL EVANS)

Robert Richards, our Philadelphia Correspondent, has called our attention to the following URL:

WWW. Slooh.com

Take a look, and see what you think. Read the F.A.Q. This write-up is not to be construed as an endorsement.

Robert also points us to <http://www.rittenhouseastronomicalsociety.org/>, the home page of the club he belongs to. Check it out.

FROM EARL TOWSON

HUYGENS HIT SOFT GROUND: When ESA's Huygens probe touched down on the surface of Titan earlier this year, it hit hard, and then slumped sideways into the soft ground. After analyzing the landing in detail, ESA scientists have calculated that Huygens probably hit a surface similar to soft clay, lightly packed snow, or wet or dry sand. It penetrated about 10mm into the ground, and then settled slightly over time by a few millimeters, tilting the probe a few degrees. It's possible that Huygens landed on a Titan beach, shortly after the hydrocarbon ocean tide went out.

http://www.esa.int/SPECIALS/Results_from_Mars_Express_and_Huygens/SEM80TULWF

SPACE ENGINEERING & MISSION STATUS: HST: Preparations for a shuttle mission to upgrade and repair the Hubble Space Telescope in late 2007 or early 2008 are picking up steam as engineers map out the details of a five-spacewalk flight designed to keep the venerable observatory alive and well through at least 2013.

<http://spaceflightnow.com/news/n0512/05hubbleservicing/>

DWARF GALAXIES FOUND 'ABLAZE' WITH STAR FORMATION: When galaxies collide, it's a messy affair. Gas, dust and stars are often spun out into space and can form into satellite dwarf galaxies that continue to orbit their parent galaxies. NASA's Spitzer Space Telescope has spotted a few dwarf galaxies in the process of formation around a recent merger in NGC 5291. Spitzer found that the dwarf galaxies are ablaze with star formation. Dwarf galaxies, with stellar masses around 0.1 percent that of the Milky Way, are far more common than their more massive spiral or starburst counterparts. Some may be primordial remnants of the Big Bang; but others -- called tidal dwarfs -- formed later as a result of gravitational interactions after galactic collisions. To understand which dwarf galaxies are tidal in origin and how those galaxies differ from primordial dwarf galaxies, Cornell researcher Sarah Higdon and her colleagues studied a galactic merger called NGC 5291, which is 200 million light-years from Earth and roughly four times the size of the Milky Way. At the system's center are two colliding galaxies; behind them trail a string of much smaller dwarfs. The researchers focused on the system because they knew from earlier analyses that the trailing dwarfs were formed tidally as a result of the central collision. Until recently, though, they hadn't been able to look closely enough at the tidal dwarfs to catalog their properties for comparison with those of similar galaxies. Spitzer's sharp eye has changed that. Using it to look for compounds that indicate star-forming activity, Higdon's team found that when it comes to fostering new star formation, the colliding galaxies at the system's center are fairly dull. The exciting place to be, they found, is in the tidal dwarfs at the system's edges. Specifically, the team found that the tidal dwarfs show strong emission from organic compounds, found in crude petroleum, burnt toast, and (more relevantly) stellar nurseries, known as PAHs -- for polycyclic aromatic hydrocarbons. And for the first time, the researchers detected warm molecular hydrogen -- another indicator of star formation, and one that has never before been directly measured in tidal dwarf galaxies. "We know molecular hydrogen is out there. Now we have the sensitivity to measure it," Higdon said. Higdon and Cornell colleagues James Higdon and Jason Marshall describe the features of the NGC 5291 system in a forthcoming issue of the *Astrophysical Journal*. "Nearly

everything at some stage interacts," Higdon said. "This is a part of the puzzle. But we've only just started looking. We don't know how long lived [the tidal dwarf galaxies] will be, or how many formed like this." Next, the team plans to search for new tidal dwarf galaxies using the Spitzer surveys and compare their properties to the newly cataloged galaxies in NGC 5291. <http://www.spitzer.caltech.edu/Media/happenings/20051130>

LUNAR DUST STORM AT THE TERMINATOR: Every lunar morning, when the sun first peeks over the dusty soil of the moon after two weeks of frigid lunar night, a strange storm stirs the surface. The next time you see the moon, trace your finger along the terminator, the dividing line between lunar night and day. That's where the storm is. It's a long and skinny dust storm, stretching all the way from the North Pole to the South Pole, swirling across the surface, following the terminator as sunrise ceaselessly sweeps around the moon, heard of it? Few have. But scientists are increasingly confident that the storm is real. The evidence comes from an old Apollo experiment called LEAM, short for Lunar Ejecta and Meteorites. "Apollo 17 astronauts installed LEAM on the moon in 1972," explains Timothy Stubbs of the Solar System Exploration Division at NASA's Goddard Space Flight Center. "It was designed to look for dust kicked up by small meteoroids hitting the moon's surface."

Years ago, meteoroids hit the moon almost constantly, pulverizing rocks and coating the moon's surface with their dusty debris. Indeed, this is the reason why the moon is so dusty. Today these impacts happen less often, but they still happen. Apollo-era scientists wanted to know, how much dust is ejected by daily impacts? And what are the properties of that dust? LEAM was to answer these questions using three sensors that could record the speed, energy, and direction of tiny particles: one each pointing up, east, and west. LEAM's three-decade-old data are so intriguing, they're now being reexamined by several independent groups of NASA and university scientists. Gary Olhoeft, professor of geophysics at the Colorado School of Mines in Golden, is one of them: "To everyone's surprise," says Olhoeft, "LEAM saw a large number of particles every morning, mostly coming from the east or west--rather than above or below--and mostly slower than speeds expected for lunar ejecta."

What could cause this? Stubbs has an idea: "The dayside of the moon is positively charged; the nightside is negatively charged." At the interface between night and day, he explains, "electrostatically charged dust would be pushed across the terminator sideways," by horizontal electric fields

Even more surprising, Olhoeft continues, a few hours after every lunar sunrise, the experiment's temperature rocketed so high—near that of boiling water--which "LEAM had to be turned off because it was overheating." Those strange observations could mean that "electrically-charged moon dust was sticking to LEAM, darkening its surface so the experiment package absorbed rather than reflected sunlight," speculates Olhoeft. But nobody knows for sure. LEAM operated for a very short time: only 620 hours of data were gathered during the icy lunar night and a mere 150 hours of data from the blazing lunar day before its sensors were turned off and the Apollo program ended. Astronauts may have seen the storms, too. While orbiting the Moon, the crews of Apollo 8, 10, 12, and 17 sketched "bands" or "twilight rays" where sunlight was apparently filtering through dust above the moon's surface. This happened before each lunar sunrise and just after each lunar sunset. NASA's Surveyor spacecraft also photographed twilight "horizon glows," much like what the astronauts saw.

It's even possible that these storms have been spotted from Earth: For centuries, there have been reports of strange glowing lights on the moon, known as "lunar transient phenomena" or LTPs. Some LTPs have been observed as momentary flashes--now generally accepted to be visible evidence of meteoroids impacting the lunar surface. But others have appeared as amorphous reddish or whitish glows or even as dusky hazy regions that change shape or disappear over seconds or minutes. Early explanations, never satisfactory, ranged from volcanic gases to observers' overactive imaginations (including visiting extraterrestrials). Now a new scientific explanation is gaining traction. "It may be that LTPs are caused by sunlight reflecting off rising plumes of electrostatically lofted lunar dust," Olhoeft suggests. All this matters to NASA because, by 2018 or so, astronauts are returning to the Moon. Unlike Apollo astronauts, who never experienced lunar sunrise, the next explorers are going to establish a permanent outpost. They'll be there in the morning when the storm sweeps by. The wall of dust, if it exists, might be diaphanous, invisible, and harmless. Or it could be a real problem, clogging spacesuits, coating surfaces and causing hardware to overheat. Which will it be? Says Stubbs, "We've still got a lot to learn about the Moon."

MEMBERSHIP INFORMATION

Basic CLAS dues are \$20.00 per year, which includes the *Skywatchers Newsletter*. As a benefit of membership you may also receive *Astronomy Magazine* and/or *Sky and Telescope Magazine*. The fee schedule is as follows:

Basic membership	\$20.00 per year
Membership with Astronomy magazine	\$51.00 per year
Membership with Sky and Telescope magazine	\$53.00 per year
Membership with both S & T and Astronomy	\$84.00 per year

Send your check to: Roger Brower, Treasurer, China Lake Astronomical Society, P.O. Box 1783, Ridgecrest, CA 93556.

PRESIDENT – Earl Wilson – 760-876-5455 (email zearl.email@gmail.com)
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WESTERN AMATEUR ASTRONOMERS WEB SITE <http://www.waa.av.org/>

Meetings of the China Lake Astronomical Society are held at the **Maturango Museum** at 7:30 p.m. on the first Monday evening of each month, except when the first Monday is a holiday.

SKYWATCHERS

Newsletter of the

CHINA LAKE ASTRONOMICAL SOCIETY
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FIRST CLASS

NOTICE! CANADIAN OBSERVER'S HANDBOOKS ARE STILL AVAILABLE

NEXT MEETING: 7:30 p.m., MONDAY, JANUARY 9, 2006: "VOYAGER II REVISITED"
AT THE MATURANGO MUSEUM, 100 EAST LAS FLORES AVE.

CLAS WEB PAGE <http://www1.iwvisp.com/brower/clas.html>

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