

IO - June 2008

Issue 2008-06
Eugene Astronomical Society

Eugene Astronomical Society
Annual Club Dues \$25
President: Sam Pitts - 688-7330
Secretary: Jerry Oltion - 343-4758
Additional Board members:
Jacob Strandlien, Tony Dandurand,
Tommy Lightning Bolt.

www.eugeneastro.org

EAS is a proud member of:

The Astronomical League
The World's Largest Federation of Amateur Astronomers



NEXT MEETING: JUNE 26TH

A Rebuilt Scope, Astronomy News, and More

At our June meeting, Tony Dandurand will show us the 10-inch Dobsonian scope he completely rebuilt for the club, turning it from a beat-up old workhorse into a beautiful new work of art. Tony's scopes are a joy to behold and to observe with, and Tony will show us how he does it. Some lucky club member will get to be the first person to check this scope out of our lending program. The line forms right behind me!

Jacob Strandlien will present an extended news program covering what's happened in astronomy over the last several months while we in the Northwest have been staring at the bottom of the cloud deck.

Jerry Oltion will do a "What's Up" presentation to help us refamiliarize ourselves with the night sky that none of us have seen for several months.

If time permits, we'll have a short program on a subject to be announced later this month.

Remember that we now meet at EWEB. See next page for directions.

June Events

Remember our "First Quarter Friday" on June 13th at the College Hill Reservoir, 24th and Lawrence, starting at 9:00. First Quarter Fridays are meant to be informal, fun gatherings for EAS members and the general public. Bring a telescope and have fun observing and sharing the view with whoever shows up.

Also in June: Sam Pitts will give a talk at The Campbell Center June 23 at Noon on "Celestial Wonders" on behalf of EAS.

REMEMBER THAT WE NOW MEET AT EWEB

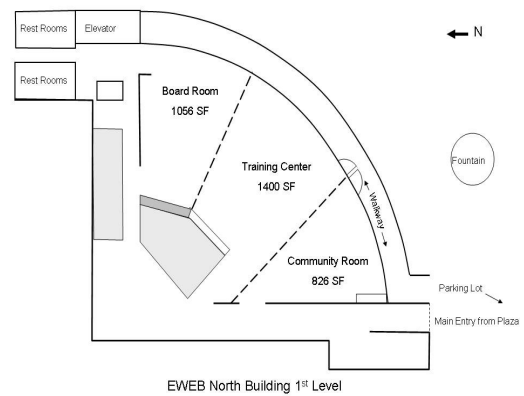
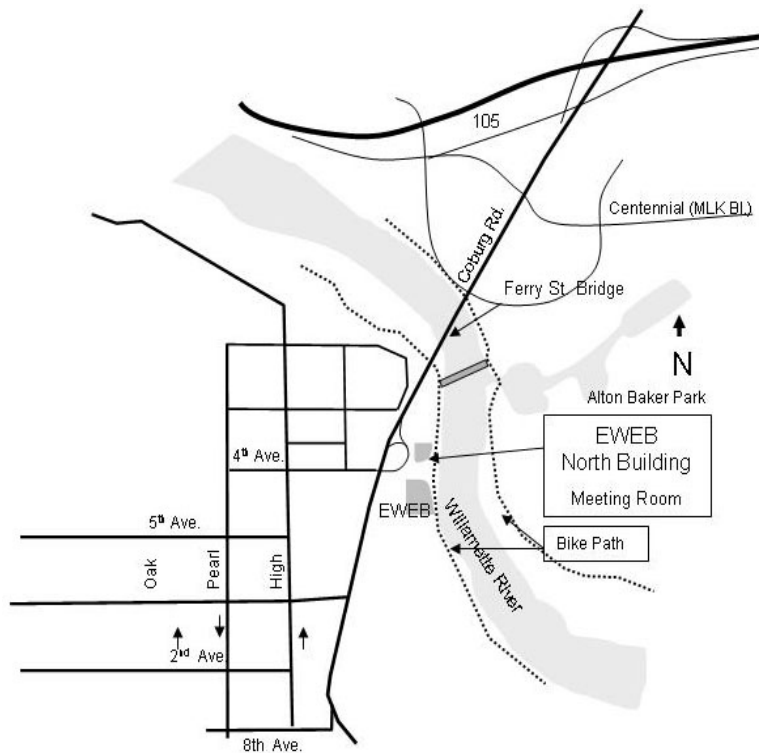
500 E. 4th Avenue in Eugene.

OUR NEXT MEETING WILL BE ON THURSDAY, JUNE 26TH AT 7:00 IN THE NORTH BUILDING'S COMMUNITY ROOM. This is the first of the three wedge-shaped rooms in the semicircular building to the north of the fountain at EWEB's main campus on the east end of 4th Avenue.

Meeting dates and times for the rest of the year:

- June 26 (Thursday) in Community Room
- July 24 (Thursday) in Community Room
- August 28 (Thursday) in Community Room
- September 30 (**Tuesday**) in Community Room
- October 23 (Thursday) in Community Room
- November 10 (**Monday**) in Community Room
- December 18 (Thursday) in Community Room

Join the EAS mail list at <http://eugeneastro.org/mailman/listinfo/org.eugeneastro.general>



EWEB is located at 500 E. 4th Avenue. Our meetings will be in the first room in the semicircular building to the north of the fountain.

CASTLE STORAGE

Unit _____
Code _____

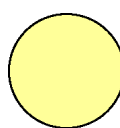
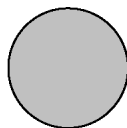
120 S. Danebo • Eugene, OR 97402 • 541.607.3800

Thank You Castle Storage

Board member Tommy Lightning Bolt was instrumental in getting a storage unit from the owners of Castle Storage for EAS to store its telescopes and equipment. EAS would like to thank Castle Storage for their generosity and support for our group. Please give them a call if you need a storage space, and tell your friends. They are great people and offer secure and quality units.



Observing in June



June 3	June 10	June 18	June 26
Mercury Set 9:04 PM	Mercury ——— PM	Mercury Rise 4:55 AM	Mercury Rise 4:28 AM
Venus Rise 00:00 AM	Venus Rise 00:00 AM	Venus Set 9:10 PM	Venus Set 9:21 PM
Mars Set 12:44 AM	Mars Set 12:27 AM	Mars Set 12:06 AM	Mars Set 11:46 PM
Jupiter Rise 11:20 PM	Jupiter Rise 10:50 PM	Jupiter Rise 10:16 PM	Jupiter Rise 9:41 PM
Saturn Set 1:35 AM	Saturn Set 1:09 AM	Saturn Set 12:34 AM	Saturn Set 12:04 AM
Uranus Rise 2:04 AM	Uranus Rise 1:36 AM	Uranus Rise 1:05 AM	Uranus Rise 12:34 AM
Neptune Rise 12:57 AM	Neptune Rise 12:30 AM	Neptune Rise 11:58 PM	Neptune Rise 11:26 PM
Pluto Rise 9:26 PM	Pluto Rise 8:58 PM	Pluto Rise 8:25 PM	Pluto Rise 7:53 PM

All times: Pacific Standard Time (Nov 4, 2007-March 9, 2008) = UT-8 or U.S. Pacific Daylight Time (March 9-November 2, 2008) = UT - 7 hours.

Date	Moonrise	Moonset	Sunrise	Sunset	Twilight Begin	Twilight End
6/1/2008	03:30	18:51	05:32	20:49	03:14	23:08
6/2/2008	04:06	20:15	05:32	20:50	03:13	23:09
6/3/2008	04:54	21:32	05:31	20:50	03:12	23:11
6/4/2008	05:55	22:36	05:31	20:51	03:11	23:12
6/5/2008	07:08	23:26	05:31	20:52	03:10	23:13
6/6/2008	08:28	—	05:30	20:53	03:09	23:15
6/7/2008	09:48	00:03	05:30	20:53	03:08	23:16
6/8/2008	11:04	00:31	05:30	20:54	03:07	23:17
6/9/2008	12:15	00:55	05:29	20:54	03:06	23:18
6/10/2008	13:23	01:15	05:29	20:55	03:06	23:19
6/11/2008	14:29	01:34	05:29	20:56	03:05	23:20
6/12/2008	15:34	01:52	05:29	20:56	03:05	23:21
6/13/2008	16:39	02:11	05:29	20:57	03:04	23:22
6/14/2008	17:44	02:34	05:29	20:57	03:04	23:22
6/15/2008	18:48	03:00	05:29	20:57	03:04	23:23
6/16/2008	19:50	03:32	05:29	20:58	03:03	23:24
6/17/2008	20:47	04:12	05:29	20:58	03:03	23:24
6/18/2008	21:36	05:00	05:29	20:58	03:03	23:24
6/19/2008	22:17	05:56	05:29	20:59	03:03	23:25
6/20/2008	22:50	06:59	05:29	20:59	03:04	23:25
6/21/2008	23:18	08:05	05:30	20:59	03:04	23:25
6/22/2008	23:41	09:13	05:30	20:59	03:04	23:25
6/23/2008	—	10:21	05:30	20:59	03:04	23:25
6/24/2008	00:02	11:30	05:31	20:59	03:05	23:25
6/25/2008	00:21	12:39	05:31	21:00	03:05	23:25
6/26/2008	00:41	13:51	05:31	21:00	03:06	23:25
6/27/2008	01:03	15:07	05:32	21:00	03:07	23:24
6/28/2008	01:28	16:26	05:32	20:59	03:07	23:24
6/29/2008	02:00	17:47	05:32	20:59	03:08	23:23
6/30/2008	02:40	19:06	05:33	20:59	03:09	23:23

Other Items of Interest This Month

All month: Jupiter rising earlier and earlier
 6/7 Moon near Mars just after sunset
 6/8 Moon near Saturn and Regulus
6/13 First Quarter Friday star party
 6/16 Moon near Antares
 6/19 Moon near Jupiter
 6/20 Pluto at opposition
 6/26 Peak of Boötid meteor shower
 6/30 Mars near Regulus

For Current Occultation Information

Visit Derek C. Breit's web site

“BREIT IDEAS Observatory”

<http://www.poyntsource.com/New/Regions/EAS.htm>

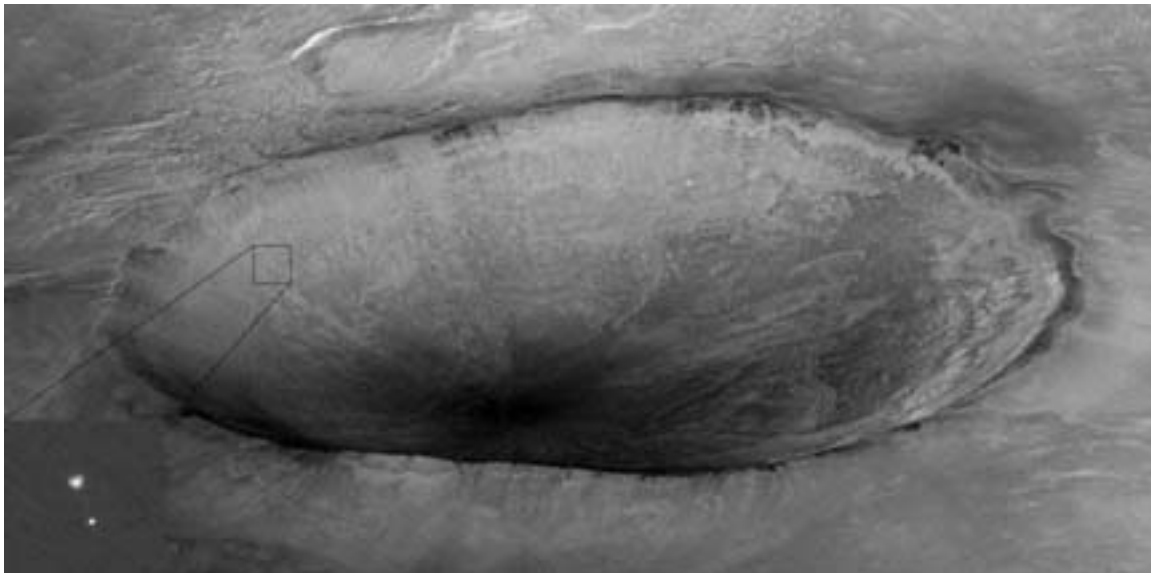
Go to Regional Events and click on the Eugene, Oregon section. This will take you to a current list of Lunar & asteroid events for the Eugene area. Breit continues to update and add to his site weekly if not daily. This is a site to place in your favorites list and visit often.

All times are for Eugene, Oregon Latitude 44° 3' 8" Longitude 123° 5' 8" for listed date

Phoenix Lands on Mars

Compiled from NASA and JPL news releases

Mars is growing smaller and smaller in astronomers' telescopes as Earth and the red planet move away from one another in their orbits, but NASA's Phoenix probe is providing some close-up images to compensate for our loss. Phoenix made a successful landing in Mars's north polar region on Sunday, May 25th to begin three months of examining a site chosen for its likelihood of having frozen water within reach of the lander's robotic arm. Even before touchdown, the images were spectacular. The Mars Reconnaissance Orbiter snapped this photo of the lander crossing in front of Heimdall Crater on the way down, its parachute streaming away behind it (inset).



When the lander neared the ground, it jettisoned its parachute and protective backshell and descended to a soft landing under rocket power. After performing a systems check, the lander activated its camera and gave us our first look at the Martian north polar region in which it came to rest. The ground is relatively flat and broken up into regular polygonal plates that are believed to be a sign of ice just beneath the surface.

In the image at right, the lander's backshell can readily be identified resting on the surface about 300 yards away. A line of low hills beyond lie about 6 miles distant. The fact that the lander's camera can resolve them so clearly means there is little dust in the atmosphere. "It's a very clear day," says principal investigator Peter Smith of the University of Arizona in Tucson. However, the latest data from the Canadian Space Agency's weather station on board the lander shows increasing dust in the atmosphere, indicating a possible storm brewing.

Weather data from the lander's first day on Mars showed that the local temperature varies from -20 to -110° Fahrenheit. Although the Sun is



currently above the horizon all day long at this latitude (68 degrees north), it dips down fairly low near midnight. At that point, temperatures are at their coldest and the amount of energy available to the lander's solar panels is at a minimum.



Polygonal fractures in the soil of Mar's north polar region may indicate ice close to the surface

Those imaging systems are already providing hard evidence for water ice. A view of the ground underneath NASA's Phoenix Mars Lander adds to evidence that descent thrusters dispersed overlying soil and exposed a harder substrate that may be ice.

The image at right, received Friday night from the spacecraft's Robotic Arm Camera, shows patches of smooth and level surfaces beneath the thrusters.



"This suggests we have an ice table under a thin layer of loose soil," said the lead scientist for the Robotic Arm Camera, Horst Uwe Keller of Max Planck Institute for Solar System Research.

"We were expecting to find ice within two to six inches of the surface," said Peter Smith of the University of Arizona, Tucson, principal investigator for Phoenix. "The thrusters have excavated two to six inches and, sure enough, we see something that looks like ice. It's not impossible that it's something else, but our leading interpretation is ice."

The Phoenix lander is still in the process of checking out its instruments before beginning to dig. Preliminary reports indicate a short circuit in one of its soil analysis instruments, but mission scientists are confident that they can work around the problem. The lander was built with multiply redundant methods for accomplishing most of its mission objectives. It needs to be: Mars is currently 177 million miles away and receding. Even the operators' radio commands take over 15 minutes to get there from Earth at that distance, and the nearest possible assistance — the twin rovers Spirit and Opportunity — would take several decades to drive over and help with repairs. Not to worry, says Phoenix project scientist Leslie Tamppari of JPL. "The process is designed to be very flexible, to respond to discoveries and issues that come up every day." Even if the short circuit can't be fixed, Phoenix can still perform a lot of science.

The months to come should provide many spectacular images and scientific discoveries, so even as Mars recedes into the sunset, it should continue to dazzle us for the rest of the year, if not longer.

Launched in August 2007, the Phoenix Mars Mission is the first in NASA's Scout Program. Phoenix is designed to study the history of water and habitability.

Phoenix uses some of the most sophisticated and advanced technology ever sent to Mars. A 7.7-foot-long robotic arm will dig through the soil to the water ice layer underneath and deliver soil and ice samples to the mission's experiments. On the deck, miniature ovens and a mass spectrometer will provide chemical analysis of trace matter. A chemistry lab-in-a-box will characterize the soil and ice chemistry. Imaging systems, including an atomic force microscope, will provide an unprecedented view of Mars spanning 12 powers of 10 in scale.

Explosions on the Moon

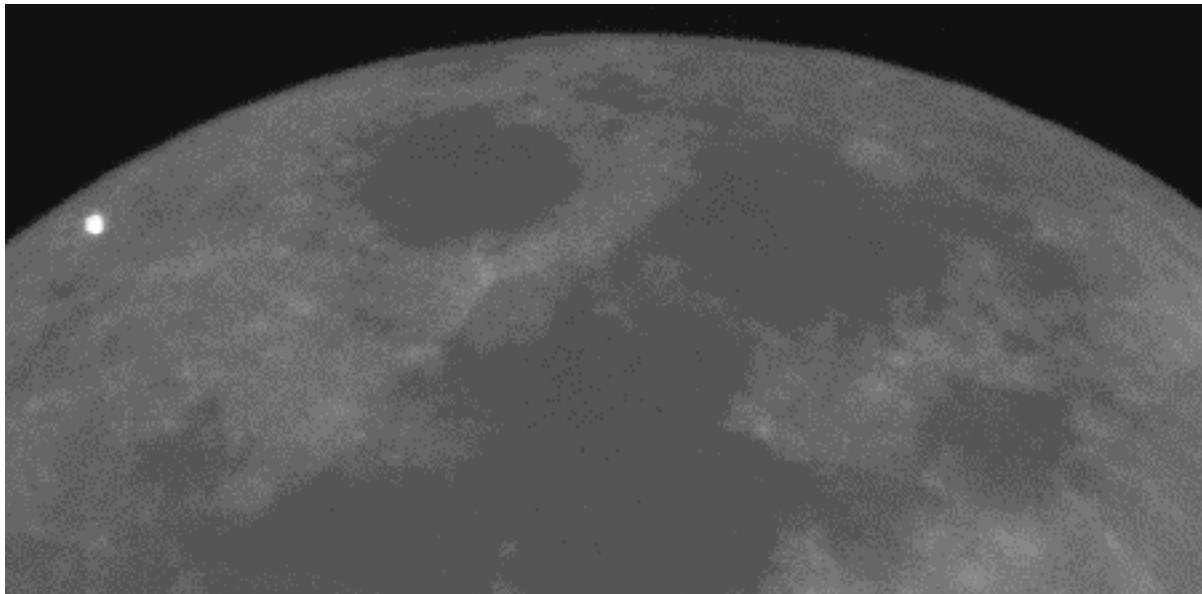
From Science@NASA.gov

Not so long ago, anyone claiming to see flashes of light on the Moon would be viewed with deep suspicion by professional astronomers. Such reports were filed under "L" ... for lunatic.

Not anymore. Over the past two and a half years, NASA astronomers have observed the Moon flashing at them not just once but one hundred times.

"They're explosions caused by meteoroids hitting the Moon," explains Bill Cooke, head of NASA's Meteoroid Environment Office at the Marshall Space Flight Center (MSFC). "A typical blast is about as powerful as a few hundred pounds of TNT and can be photographed easily using a backyard telescope."

As an example, he offers this image of an impact near crater Gauss on January 4, 2008:



This is number 86 on the list of 100 impacts recorded by the MEO team since their survey began in 2005.

The impactor was a tiny fragment of extinct comet 2003 EH1. Every year in early January, the Earth-Moon system passes through a stream of debris from that comet, producing the well-known Quadrantid meteor shower. Here on Earth, Quadrantids disintegrate as flashes of light in the atmosphere; on the airless Moon they hit the ground and explode.

"We started our monitoring program in late 2005 after NASA announced plans to return astronauts to the Moon," says team leader Rob Suggs of the MSFC. "If people were going to be walking around up there, it seemed like a good idea to measure how often the Moon was getting hit."

"Almost immediately, we detected a flash."

That first detection — "I'll never forget it," he says — came on Nov. 7, 2005, when a piece of Comet Encke about the size of a baseball hit Mare Imbrium. The resulting explosion produced a 7th magnitude flash, too dim for the naked eye but an easy target for the team's 10-inch telescope.

A common question, says Cooke, is "how can something explode on the Moon? There's no oxygen up there."

These explosions don't require oxygen or combustion. Meteoroids hit the moon with tremendous

kinetic energy, traveling 30,000 mph or faster. "At that speed, even a pebble can blast a crater several feet wide. The impact heats up rocks and soil on the lunar surface hot enough to glow like molten lava — hence the flash."

During meteor showers such as the Quadrantids or Perseids, when the Moon passes through dense streams of cometary debris, the rate of lunar flashes can go as high as one per hour. Impacts subside when the Moon exits the stream, but curiously the rate never goes to zero.

"Even when no meteor shower is active, we still see flashes," says Cooke.

These "off-shower" impacts come from a vast swarm of natural space junk littering the inner solar system. Bits of stray comet dust and chips off old asteroids pepper the Moon in small but ultimately significant numbers. Earth gets hit, too, which is why on any given night you can stand under a dark sky and see a few meteors per hour glide overhead — no meteor shower required. Over the course of a year, these random or "sporadic" impacts outnumber impacts from organized meteor showers by a ratio of approximately 2:1.

"That's an important finding," says Suggs. "It means there's no time of year when the Moon is impact-free."

Fortunately, says Cooke, astronauts are in little danger. "The odds of a direct hit are negligible. If, however, we start building big lunar outposts with lots of surface area, we'll have to carefully consider these statistics and bear in mind the odds of a structure getting hit."

Secondary impacts are the greater concern. When meteoroids strike the Moon, debris goes flying in all directions. A single meteoroid produces a spray consisting of thousands of "secondary" particles all traveling at bullet-like velocities. This could be a problem because, while the odds of a direct hit are low, the odds of a secondary hit may be significantly greater. "Secondary particles smaller than a millimeter could pierce a spacesuit," notes Cooke.

At present, no one knows how far and wide secondary particles travel. To get a handle on the problem, Cooke, Suggs and colleagues are shooting artificial meteoroids at simulated moon dust and measuring the spray. This work is being done at the Vertical Gun Range at NASA's Ames Research Center in Mountain View, CA.

Meanwhile, back at the observatory, the team has upgraded their original 10-inch (25 cm) telescope to a pair of telescopes, one 14-inch (36 cm) and one 20-inch (51 cm), located at the Marshall Space Flight Center in Alabama. They've also established a new observing site in Georgia with a 14-inch telescope. Multiple telescopes allow double- and triple-checking of faint flashes and improve the statistical underpinnings of the survey.

"The Moon is still flashing," says Suggs. Indeed, during the writing of this story, three more impacts were detected.



A simulated meteoroid explodes on impact at the NASA/Ames Vertical Gun Range. This is a genuine photo showing the spray of secondary particles



Sometimes You Get Lucky

EAS member Jeff Phillips says “I was taking some pictures of the Moon the other day and a plane flew right across the Moon.” From the degree of detail, you might suspect that Jeff was using a high-end scope and camera, but he says “I actually got that one with a 70mm beginner scope.” Jeff plans to write up an article for the EAS website about the capture of this image, including the video from which this single frame was taken. Keep an eye on our website (www.eugeneastro.org) for the article.



A Useful Website

Bill Murray found a website with links to many other useful astronomy websites, including several observing and imaging utilities, charting software, Solar System data, and much more. The site's owner, Pete Albrecht, says “Sometimes, it seems that finding astronomical data, software, and utilities online is like drinking from a fire hose — there's just so much out there, much of it free. I've made an effort to put together a list of links, downloadable software, and online utilities that I've found useful. Mostly so I'll know where they are and don't have to search for them elsewhere.”

Check it out at: www.petealbrecht.com/astrolinks.htm