



Eugene Astronomical Society,
Annual Club Dues \$25, Board Members:
President: Sam Pitts - 688-7330
Secretary: Jerry Olton - 343-4758
Jacob Strandlien, Tommy Lightning Bolt
& Fred Domineack

www.eugeneastro.org

EAS is a Proud Member of:

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

IO editor- sampitts@comcast.net 688-7330

Io (EYE-oh) is nearest to Jupiter and fastest orbiting of the four Galilean moons

Monday- August 6th MEETING EUGENE ASTRONOMICAL SOCIETY

Held at:

"Science Factory Children's Museum & Planetarium"
2300 Leo Harris Parkway, Eugene
SW of Autzen Stadium

"The Northern Lights" Mystery, Myth and Magic

By: Tommy Lightning Bolt

Mr. Lightning Bolton will talk about the Northern Lights, How they are created, legends, and myths they have inspired. This will include a large Photography presentation (projected onto the planetarium ceiling) with music from Lightning Bolt's Debut C.D. "Dancing with the Thunder Beings" Native American Flute.

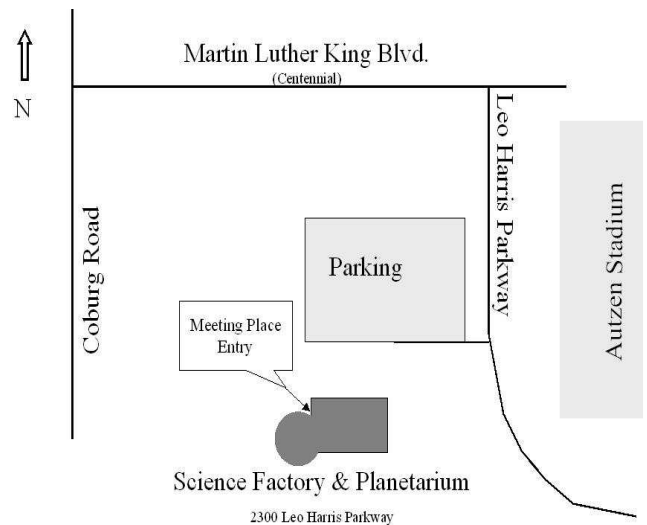
We always encourage audience participation during our meetings. EAS meetings are traditionally times when we learn about astronomy and share other's experiences and knowledge of astronomy and the night sky.

Jacob Strandlien will keep you up to date with his monthly presentation on current events and news in Space & Astronomy. Jacob always has some interesting news and great images to share with the group.

Come and enjoy the wonders of the night sky with the Eugene Astronomical Society at The Science Factory's comfortable Planetarium. The meeting will begin at **7:00 PM** in the Planetarium.

The Eugene Astronomical Society is a group of amateur astronomers dedicated to observing the night sky, learning about the Universe, and sharing that understanding and appreciation of astronomy with students and the general public. EAS has been doing astronomy education and public outreach for many years. The EAS holds club meetings on the first Monday of each month at 7 PM at The Science Factory Children's Museum & Planetarium. Guests are welcome to visit; we ask for a \$1 guest contribution. Meetings feature speakers with presentations on topics of interest to club members, current viewing opportunities, telescope help, and star party planning.

EAS thanks the Science Factory Children's Museum & Planetarium for providing the Planetarium for our monthly meetings.





Observing in August

August 5	August 12	August 20	August 28
Mercury Rise 5:04 AM	Mercury Rise 5:50 AM	Mercury Set 8:29 PM	Mercury Set 8:26 PM
Venus Set 8:43 PM	Venus Set 8:01 PM	Venus Rise 6:23 AM	Venus Rise 5:30 AM
Mars Rise 12:43 AM	Mars Rise 12:29 AM	Mars Rise 12:14 AM	Mars Rise 11:59 PM
Jupiter Set 1:26 AM	Jupiter Set 12:54 AM	Jupiter Set 12:23 AM	Jupiter Set 11:51 PM
Saturn Rise 7:15 AM	Saturn Rise 6:52 AM	Saturn Rise 6:26 AM	Saturn Rise 6:00 AM
Uranus Rise 9:50 PM	Uranus Rise 9:22 PM	Uranus Rise 8:50 PM	Uranus Rise 8:18 PM
Neptune Rise 8:44 PM	Neptune Rise 8:16 PM	Neptune Rise 7:44 PM	Neptune Rise 7:12 PM
Pluto Set 3:00 AM	Pluto Set 2:32 AM	Pluto Set 2:00 AM	Pluto Set 1:28 AM

All times: U.S. Pacific Daylight Time (March 11-November 4, 2007) = UT - 7 hours. Pacific Standard Time (Nov.-March) = UT-8

Date	Moonrise	Moonsset	Sunrise	Sunset	Twilight Begin	Twilight End
8/1/2007	22:05	09:05	06:00	20:36	03:58	22:37
8/2/2007	22:26	10:21	06:01	20:35	04:00	22:35
8/3/2007	22:47	11:38	06:02	20:34	04:02	22:33
8/4/2007	23:12	12:56	06:03	20:32	04:04	22:31
8/5/2007	23:42	14:15	06:04	20:31	04:05	22:29
8/6/2007	-----	15:35	06:06	20:30	04:07	22:27
8/7/2007	00:19	16:50	06:07	20:28	04:09	22:25
8/8/2007	01:08	17:56	06:08	20:27	04:11	22:23
8/9/2007	02:07	18:50	06:09	20:26	04:13	22:21
8/10/2007	03:17	19:32	06:10	20:24	04:14	22:19
8/11/2007	04:31	20:04	06:11	20:23	04:16	22:17
8/12/2007	05:45	20:28	06:12	20:21	04:18	22:15
8/13/2007	06:56	20:49	06:13	20:20	04:20	22:13
8/14/2007	08:04	21:08	06:15	20:18	04:22	22:11
8/15/2007	09:10	21:25	06:16	20:17	04:23	22:08
8/16/2007	10:14	21:42	06:17	20:15	04:25	22:06
8/17/2007	11:18	21:59	06:18	20:14	04:27	22:04
8/18/2007	12:22	22:20	06:19	20:12	04:29	22:02
8/19/2007	13:27	22:44	06:20	20:11	04:30	22:00
8/20/2007	14:33	23:15	06:21	20:09	04:32	21:58
8/21/2007	15:38	23:53	06:22	20:07	04:34	21:56
8/22/2007	16:38	-----	06:24	20:06	04:35	21:54
8/23/2007	17:32	00:42	06:25	20:04	04:37	21:51
8/24/2007	18:16	01:43	06:26	20:02	04:39	21:49
8/25/2007	18:52	02:52	06:27	20:01	04:40	21:47
8/26/2007	19:22	04:07	06:28	19:59	04:42	21:45
8/27/2007	19:47	05:25	06:29	19:57	04:44	21:43
8/28/2007	20:08	06:43	06:30	19:56	04:45	21:41
8/29/2007	20:29	08:02	06:32	19:54	04:47	21:38
8/30/2007	20:51	09:21	06:33	19:52	04:49	21:36
8/31/2007	21:15	10:41	06:34	19:51	04:50	21:34

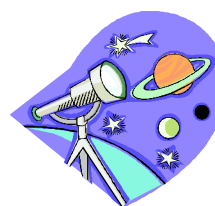
Current Occultations & Other Events

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.



Where did all these clouds come from?

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

Events

AUGUST 2007

1	Alpha Capricornids Meteor Shower Peak ¹
3	Phoenix Delta 2 Launch (Mars Lander)
6	Peak Southern Iota Aquarids Meteor Shower
7	STS-118 Launch, Space Shuttle Endeavour, S5 Truss Segment (International Space Station 13A.1)
8	Asteroid 2002 CB19 Near-Earth Flyby (0.044 AU) 4,090,055 miles, Mt Bachelor Star Party 2007 , near Bend, Oregon ²
9	Comet Shoemaker-Levy 1 Closest Approach To Earth (1.363 AU); 72nd Convention of Amateur Telescope Makers (Stellafane), Springfield, Vermont; 5th Annual Indiana Family Star Party: GREATCon 2007, Frankfort, Indiana; Starfest 2007, Mount Forest, Canada
10	Asteroid 2000 PN8 Near-Earth Flyby (0.092 AU)
11	130th Anniversary (1877), Asaph Hall's Discovery of Mars Moon Deimos
12	Perseids Meteor Shower Peak: See Page 4
13	Neptune At Opposition; 365th Anniversary (1642); Christiaan Huygens' Discovery of Mars' South Polar Cap; 70th Annual Meeting of the Meteoritical Society, Tucson, Arizona; Workshop on Dark Matter and Dark Energy, Beijing, China
16	Selene 1/Micro-Labsat 2 H-2A Launch (Japan Lunar Orbiter); Uranus Ring Plane Crossing; Oregon Star Party 2007 , Indian Trail Spring, Oregon (See Page 5)
25	Northern Iota Aquarids Meteor Shower Peak; Asteroid 2005 QQ87 Near-Earth Flyby (0.079 AU)
27	45th Anniversary (1962), Mariner 2 Launch
28	Total Lunar Eclipse (See Page 6) ; DSP-23 Delta 4 Heavy Launch; Asteroid 2004 TD10 Near-Mercury Flyby (0.021 AU)
30	Cassini, Rhea Flyby; 15th Anniversary (1992), David Jewitt's & Jane Luu's Discovery of the 1st Kuiper Belt Object (1992 QB1); Cassini, Titan Flyby
31	Cassini, Titan Flyby; Asteroid 33342 (1998 WT24) Near-Mercury Flyby (0.049 AU)

AU=Astronomical Unit (92,955,800 miles)

1- The duration of this shower extends from July 15 to September 11. Maximum seems to occur during August 1 ($\lambda=128.6^\circ$) from an average radiant of $\alpha=306.7^\circ$, $\delta=-8.3^\circ$. The maximum ZHR ranges from 6-14, while the meteors are generally described as slow. The shower has the reputation of producing some of the brightest meteors of the major showers, with the average magnitude being estimated as about 2.2.

2 - Imagine viewing the stars at 5,800' in Central Oregon, barbecues, heated bathrooms, a short walk away from the viewing area. See more information on page 5.

Star Party - July 25th (Saturday): Cascara State Campgrounds, Dexter, Oregon



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.

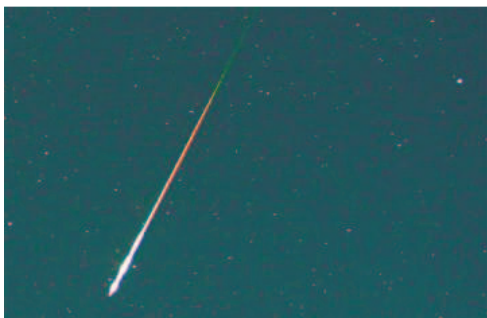
Join the EAS mail list→<http://eugeneastro.org/mailman/listinfo/org.eugeneastro.general>

Keep up to date on opportunities to join local amateur astronomer outings to observe the night skies. This is a great opportunity to get advice in setting up your own equipment from seasoned veterans or just to look through different scopes. They always have fun and enjoy helping newcomers.

Perseids Meteor Shower

July 11, 2007: Got a calendar? Circle this date: Sunday, August 12th. Next to the circle write "*all night*" and "*Meteors!*" Attach the above to your refrigerator in plain view so you won't miss the 2007 Perseid meteor shower.

"It's going to be a great show," says Bill Cooke of NASA's Meteoroid Environment Office at the Marshall Space Flight Center. "The Moon is new on August 12th--which means no moonlight, dark skies and plenty of meteors." How many? Cooke estimates one or two Perseids per minute at the shower's peak.



A Perseid fireball photographed August 12, 2006, by Pierre Martin of Arnprior, Ontario, Canada.

The source of the shower is Comet Swift-Tuttle. Although the comet is nowhere near Earth, the comet's tail does intersect Earth's orbit. We glide through it every year in August. Tiny bits of comet dust hit Earth's atmosphere traveling 132,000 mph. At that speed, even a smidgen of dust makes a vivid streak of light--a meteor--when it disintegrates. Because Swift-Tuttle's meteors fly out of the constellation Perseus, they are called "Perseids."

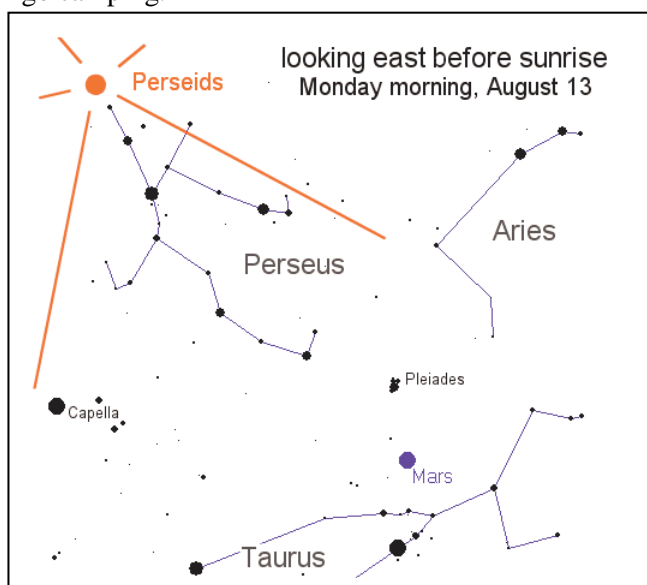
Note: In the narrative that follows, all times are local. For instance, 9:00 pm means 9:00 pm in your time zone, where you live.

The show begins between 9:00 and 10:00 pm on Sunday, August 12th, when Perseus rises in the northeast. This is the time to look for Perseid Earthgrazers--meteors that

approach from the horizon and skim the atmosphere overhead like a stone skipping the surface of a pond.

"Earthgrazers are long, slow and colorful; they are among the most beautiful of meteors," says Cooke. He cautions that an hour of watching may net only a few of these--"at most"--but seeing even one makes the long night worthwhile. As the night unfolds, Perseus climbs higher and the meteor rate will increase many-fold. "By 2 am on Monday morning, August 13th, dozens of Perseids may be flitting across the sky every hour." The crescendo comes before dawn when rates could exceed a meteor a minute.

For maximum effect, Cooke advises, "get away from city lights." The brightest Perseids *can* be seen from cities, he allows, but the greater flurry of faint, delicate meteors is visible only from the countryside. Scouts, this is a good time to go camping.



And there's a bonus: Mars. In the constellation Taurus, just below Perseus, Mars shines like a bright red star. Many of the Perseids you see on August 12th and 13th will flit right past it. Instead of following the meteor, you may find you have a hard time taking your eyes off Mars. There's something bewitching about it, maybe the red color or perhaps the fact that it doesn't twinkle like a true star. You stare at Mars and it stares right back.

Earth and Mars are converging for a close encounter in December 2007. NASA is taking advantage by launching a new mission to Mars--the Phoenix Lander. Phoenix will touch down on an arctic plain where it can dig into the ground and investigate layers of soil and ice, searching for, among other things, a habitable zone for primitive microbes. The launch window opens on August 3rd, so by the time the Perseids arrive Phoenix may be hurtling toward the Red Planet. Landing: late Spring 2008.

It's something to think about at four in the morning, with Mars rising in the east, meteors flitting across the sky, and a summer breeze rustling the legs of your pajamas.

Maybe you should go circle your calendar again.

Author: Dr. Tony Phillips; Production Editor: Dr. Tony Phillips | Credit: Science@NASA





See June 2007 Issue of IO for detailed map and additional information:
<http://www.eugeneastro.org/pdf/iojun07>
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[First Aid Volunteers Registration Here](#)

If you have questions or problems contact the [ospdirector](#)

**Indian trail spring
august 18 - 19, 2007**

OSP 2007 PRE-REGISTRATION

Pre-Registration Prices BEFORE July 20th

Registrations	Clothing	Misc
Adult \$45	T-shirts \$14	8x10 Group Photo \$8 10x14 Group Photo \$14
Ages 12-17 \$15	Sweatshirts \$20	Shower \$9 each
Ages 6-11 \$5	Hooded Sweatshirts \$40	Star Dinners \$10 each Thursday - Baked Ham Dinner Friday - Meatball Dinner Saturday - BBQ Chicken Dinner
Ages 0-5 Free		

PRE-REGISTRATION BY MAIL Fill out the form on-screen and print it.	PRE-REGISTRATION BY CREDIT CARD USING PAYPAL isn't quite ready yet - please check back next week There will be a \$3 charge for using Paypal.
The Deadline for Pre-Registration is July 20th	

On-Site Prices AFTER July 20th

Registrations	Clothing	Misc
Adult \$55	Available only by Pre-Registration	Group Photo 8x10 \$8 Group Photo 10x14 \$14
Ages 12-17 \$25	T-shirts, Sweatshirts and Hooded Sweatshirts might be available at the Information Tent after 10am on Saturday	Showers \$9
Ages 6-11 \$15		Star Dinners might available
Ages 0-5 Free		

Cash or Check only at OSP - No Credit or Debit Cards

Mt Bachelor Star Party 2007
 August 8 - 12, 2007
 Updated June 14, 2007

Registration form is now available
Important! The road from SunRiver to Mt Bachelor will be closed for construction.

Speakers and events will be added as bookings are firmed up
 Check back frequently as we update this website for 2007

Home	Information	Facts	Schedule	Food
Registration	Links	Directions	Contact Us	Photos

Excellent dark sky viewing and convenient parking. All of the telescope field is paved.

Plenty of great speakers and fun for all ages.

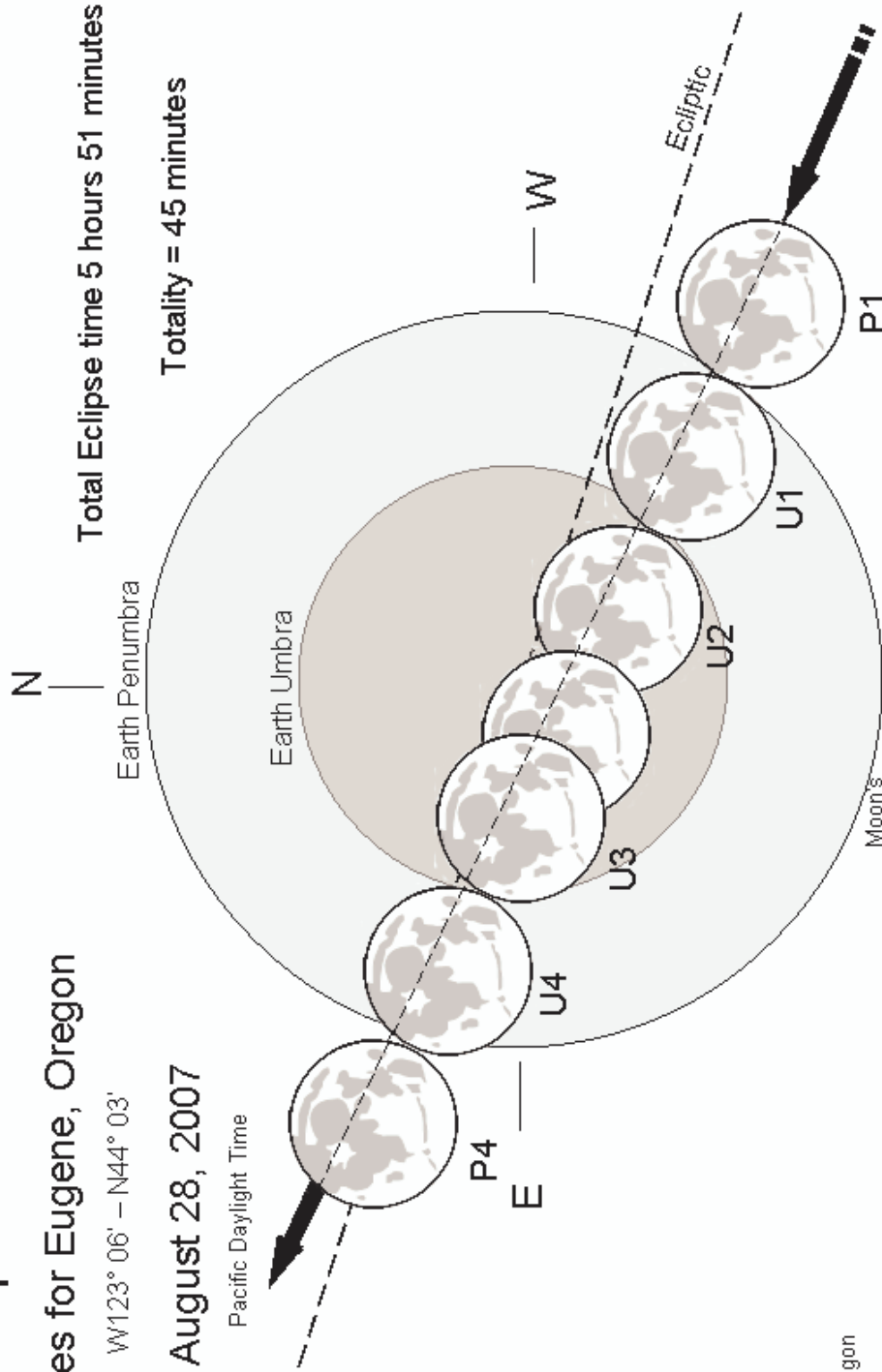
Total Eclipse of the Moon

All times for Eugene, Oregon

W123° 06' – N44° 03'

August 28, 2007

Pacific Daylight Time



Total Eclipse time 5 hours 51 minutes

Totally = 45 minutes

PDT for Eugene, Oregon

	2007 Aug 27	2007 Aug 28	2007 Aug 28	2007 Aug 28	2007 Aug 28	2007 Aug 28	2007 Aug 28	2007 Aug 28	2007 Aug 28	2007 Aug 28
Moonrise		19:47								
Moon enters penumbra			00:52.2							
Moon enters umbra			01:50.9							
Moon enters totality			02:52.0							
Middle of eclipse			03:37.3							
Moon leaves totality			04:22.7							
Moon leaves umbra			05:23.8							
Moon leaves penumbra			06:22.5							
Moonset			06:44							

Sam Pitts

Mirror Grinding Machine

Thanks to fellow astronomer and telescope craftsman Dave Davis of Corvallis EAS now has a Hinkle Mirror grinding machine. Dave and his lovely wife came down to Eugene and delivered the machine at our July meeting. Dave went over the operations and discussed various projects he has done using the Hinkle Mirror Grinding machine. Many EAS members accompanied Dave and followed me to my shop for temporary storage of the machine. I would like to thank Dave and his wife for their generosity in giving EAS the mirror grinding machine.

Many EAS members will benefit from grinding some nice mirrors in the future. We will be updating and learning as we go. Hopefully Mel Bartels along with other EAS members will lend a hand and their expertise in learning to use the machine and in building telescopes. Thanks to everyone that helped! --Sam

Omit Needless Bytes!

Space Place Astronomy Club Column -
http://spaceplace.jpl.nasa.gov/astro_clubs

By Patrick Barry and Tony Phillips

Now is an exciting time for space enthusiasts. In the history of the Space Age, there have never been so many missions “out there” at once. NASA has, for example, robots on Mars, satellites orbiting Mars, a spacecraft circling Saturn, probes en route to Pluto and Mercury—and four spacecraft, the two Voyagers and the two Pioneers, are exiting the solar system altogether.

It’s wonderful, but it is also creating a challenge.

The Deep Space Network that NASA uses to communicate with distant probes is becoming overtaxed. Status reports and data transmissions are coming in from all over the solar system—and there’s only so much time to listen. Expanding the network would be expensive, so it would be nice if these probes could learn to communicate with greater brevity. But how?

Solving problems like this is why NASA created the New Millennium Program (NMP). The goal of NMP is to flight-test experimental hardware and software for future space missions. In 1998, for instance, NMP launched an experimental spacecraft called Deep Space 1 that carried a suite of new technologies, including a new kind of communication system known as Beacon Monitor.

The system leverages the fact that for most of a probe’s long voyage to a distant planet or asteroid or comet, it’s not doing very much. There’s little to report. During that time, mission scientists usually only need to know whether the spacecraft is in good health.



This artist's concept shows the New Horizons spacecraft during its planned encounter with Pluto and its moon, Charon. The spacecraft is currently using the Beacon Monitor system on its way to Pluto. *Credit: Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute (JHUAPL/SwRI)*

“If you don't need to transmit a full data stream, if you only need some basic state information, then you can use a much simpler transmission system,” notes Henry Hotz, an engineer at NASA's Jet Propulsion Laboratory who worked on Beacon Monitor for Deep Space 1. So instead of beaming back complete data about the spacecraft’s operation, Beacon Monitor uses sophisticated software in the probe’s onboard computer to boil that data down to a single “diagnosis.” It then uses a low-power antenna to transmit that diagnosis as one of four simple radio tones, signifying “all clear,” “need some attention whenever you can,” “need attention soon,” or “I’m in big trouble—need attention right now!”

“These simple tones are much easier to detect from Earth than complex data streams, so the mission needs far less of the network's valuable time and bandwidth,” says Hotz. After being tested on Deep Space 1, Beacon Monitor was approved for the New Horizons mission, currently on its way to Pluto, beaming back a simple beacon as it goes.

Discover more about Beacon Monitor technology, as well as other technologies, on the NMP Technology Validation Reports page, <http://nmp-techval-reports.jpl.nasa.gov>.

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

Andromeda is Coming



Computer simulations by Cox and Loeb show that big changes are coming in only 2 billion years, when the Milky Way and Andromeda experience their first close pass. A viewer on Earth would see the night sky evolve from today's strip of stars (the Milky Way seen edge-on) to a bright muddled mess as Andromeda approaches and its powerful pull flings stars from their stately orbits. (Image Credit: NASA, James Gitlin)

stately orbits. At that time, the Sun will still be a hydrogen-burning main-sequence star, although it will have brightened and heated enough to boil the oceans from the Earth. The two galaxies will swing around each other a couple of times, intermingling their stars as gravitational forces stir them together.

About 5 billion years from now, Andromeda and the Milky Way will have completely combined to form a single, football-shaped elliptical galaxy. The Sun will be an aging star nearing the red giant phase and the end of its lifetime. It and the solar system likely will reside 100,000 light-years from the center of the new galaxy -- 4 times further than the current 25,000 light-year distance.

Any descendants of humans observing the future sky will experience a very different view. The strip of Milky Way will be gone, replaced by a huge bulge of billions of stars. Future scientists may look back on today's research as the first prediction of things to come.

A direct collision would lead to a grand merger between the two behemoths, and the Milky Way would no longer be the pinwheel spiral we are familiar with, but would evolve into a huge elliptical galaxy.

It would happen no sooner than five billion years in the future. By then the Sun may have burned out, and the Earth reduced to a frigid, lifeless cinder. It's impossible to predict if there would be any vestige of humanity colonized among the stars, not to mention extraterrestrial civilizations around to witness this great collision.

The collision will take several billion years to fully run its course, so it will be hard for any one civilization, like ours, to fully understand the vast scale - both in time and space — of the collision. However, by studying pairs of other colliding galaxies and using computer simulations, astronomers can assemble a series of snapshots of the collision process and get a preview of what might eventually happen to our galaxy. Here is a scenario of how the Milky Way might change if it were to have a head-on collision with Andromeda.

Today, the Andromeda galaxy appears simply as a spindle-shaped smudge of light in the northern autumn sky. Because it is 2.2 million light-years away — or roughly 20 times the diameter of our Milky Way galaxy - it only appears four times the width of the full moon. As the two galaxies approach each other, Andromeda will grow ever larger in the sky, resembling an eerie glowing sword of light.

When the Andromeda galaxy and our Milky Way galaxy are close enough, huge clumps of cold, giant molecular clouds, each measuring tens to hundreds of light-years across, will be compressed. Like plugging in a string of Christmas light bulbs, these dark knots will light up as millions of stars burst into life. Most of these stars will be in brilliant blue clusters, many of them 100 times brighter than the original globular star clusters already present in the two galaxies.

The disk of dust and stars that for billions of years marked the lanes of our galaxy and the Andromeda galaxy will also begin to come apart under the gravitational pull of the two galaxies. As Andromeda swings past our galaxy, the sky will grow increasingly jumbled with tattered lanes of dust, gas, and brilliant young stars and star clusters.

So many new stars will be born that the fraction of massive stars that are present will increase dramatically. These stars will begin popping off like a string of firecrackers as they self-destruct as supernovae.

After swinging by our galaxy, Andromeda will take perhaps 100 million years to make a slow and graceful U-turn, before plunging nearly directly into the Milky Way's core. Another, even more spectacular burst of star formation will then occur, with the winds from the supernovae driving most of the remaining gas and dust out of the galaxy. Soon both the old and new stars of the two galaxies will intermingle to form a single elliptical-shaped galaxy.

As the stars gravitationally settle into their new home, through a dynamic process called "violent relaxation", any hint of the Milky Way and Andromeda as majestic spiral galaxies will be gone. The band known as the Milky Way will be gone, but far in the future some astronomers might gaze out onto a starry sky and look all the way into the core of the new elliptical galaxy. They would have no clue that there were once two majestic spiral galaxies, called the Milky Way and Andromeda by a long forgotten civilization.

For more information: <http://www.cfa.harvard.edu/press/2007/pr200714.html> <http://hubblesite.org/newscenter/archive/releases/1997/1997/34/astrofile/>