

IO – September 2005

Issue # 2005-09

www.eugeneastro.org

Eugene Astronomical Society, Annual Club Dues \$25, President: AC Illig, Treasurer: Roscco Wright, Secretary Alicia McGraw
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Io (EYE-oh) is nearest to Jupiter and fastest orbiting of the four Galilean moons

EAS is a Proud Member of:

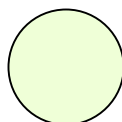
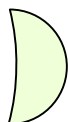
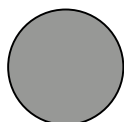
The Astronomical League
The World's Largest Federation of Amateur Astronomers

Monday- September 5th MEETING EUGENE ASTRONOMICAL SOCIETY At The Science Factory Planetarium

The meeting will begin at **7:00 PM** in the Planetarium. Come early and help others learn about their scopes. Those of you, who are new or not sure about your equipment, show up early and some of our members will assist you in understanding your equipment better. If you are planning on getting a scope please come out and ask questions, we're glad to assist you in making a good solid choice to maximize your viewing pleasure.

The Science Factory is at 2300 Leo Harris Parkway, behind Autzen Stadium.

Check EAS WEB site for up to the minute Information



September 3	September 11	September 17	September 24
New Moon	First Quarter	Full Moon	Last Quarter
Sunset: 7:44 PM	Sunset: 7:29 PM	Sunset: 7:18 PM	Sunset: 7:05 PM
Sunrise 6:38 AM	Sunrise 6:47 AM	Sunrise 6:54 AM	Sunrise 7:02 AM
Mercury Rise 5:25 AM	Mercury Rise 6:13 AM	Mercury Rise 6:50 AM	Mercury Rise 7:29 AM
Venus	Venus	Venus	Venus
Mars Rise 10:22 PM	Mars Rise 9:57 PM	Mars Rise 9:37 PM	Mars Rise 9:12 PM
Jupiter Set 8:09 PM	Jupiter Set 8:40 PM	Jupiter Set 8:49 PM	Jupiter Set 7:55 PM
Saturn Rise 3:34 AM	Saturn Rise 3:07 AM	Saturn Rise 2:47 AM	Saturn Rise 2:23 AM
Uranus Rise 7:33 PM	Uranus Rise 7:01 PM	Uranus Rise 6:37 PM	Uranus Rise 6:09 PM
Neptune Rise 6:33 PM	Neptune Rise 6:01 PM	Neptune Rise 5:37 PM	Neptune Rise 5:09 PM

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

Magazine subscriptions go to Richard Boyd: checkerkit@comcast.net



Join the user List!

Keep in-touch with Members and Events!



<http://eugeneastro.org/mailman/listinfo/org.eugeneastro.gen>

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Oregon Star Party 2005

<http://www.oregonstarparty.org/>

September 1-4



Star Party is an astronomy adventure featuring quality deep sky viewing. It attracts intellectually curious outdoor lovers who enjoy the romance of a renaissance gathering. All ages enjoy camping among ponderosa, juniper, mountain mahogany, and sage. Past attendees have told us emphatically how much they have enjoyed the camaraderie and dark skies of Indian Trail Spring, and that they will return again!

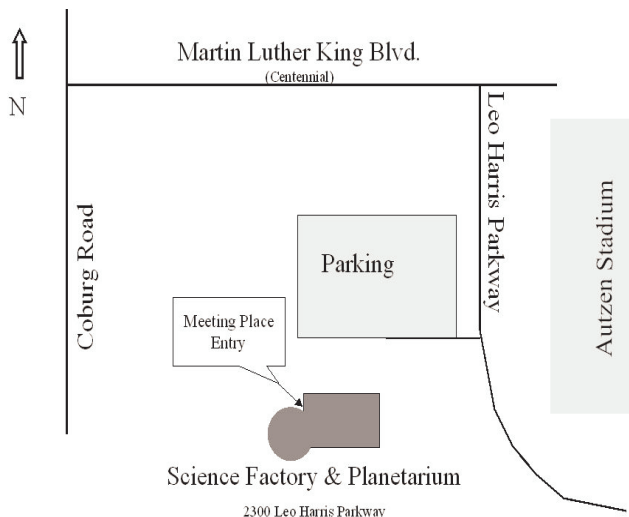
The Oregon Star Party operates under a Special Use Permit on the Ochoco National Forest. This institution is an equal opportunity provider. The site is located on primitive and undeveloped Forest Service land, approximately one hour's traveling time east of Prineville, Oregon, which is the nearest location for medical facilities, supplies, and gas.

Indian Trail Spring prairie has a panoramic horizon. Its 5000-foot altitude location has good air drainage, excellent sky transparency, steady air, and almost zero light glow from Bend (60 miles) and Prineville (35 miles.) Portland is 190 miles away. The roads are paved to within four miles. The graveled section is in excellent condition.

New EAS List Address

Please use the new address for the EAS list: **org.eugeneastro.general**

To sign-up go to: **<http://eugeneastro.org/mailman/listinfo/org.eugeneastro.general>**



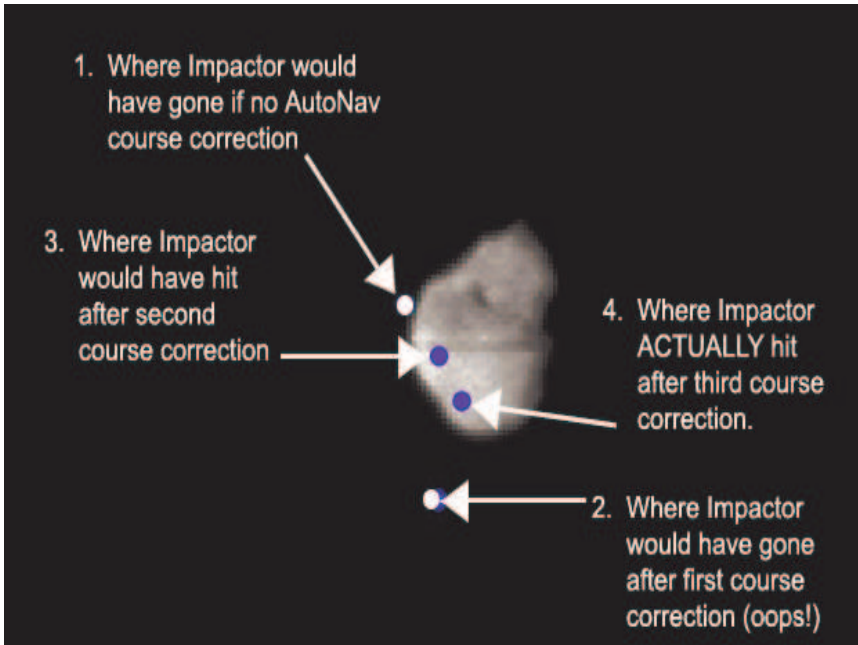
Map to Eugene Astronomical Society's Monthly Meetings in Eugene, Oregon

Rosco presented a mounted & framed Astro-photo to a happy family recently. Sam Pitts donated some of his photos to help EAS raise money.



Improbable Bulls-Eye

by Dr. Tony Phillips



Comet Tempel 1, as seen by the Deep Impact impactor's camera. Three last-minute AutoNav-controlled impact correction maneuvers enabled the Impactor to hit the bulls-eye.

Picture this: Eighty-eight million miles from Earth, a robot spacecraft plunges into a billowing cloud almost as wide as the planet Jupiter. It looks around. Somewhere in there, among jets of gas and dust, is an icy nugget invisible to telescopes on Earth—a 23,000 mph moving target.

The ship glides deeper into the cloud and jettisons its cargo, the “impactor.” Bulls-eye! A blinding flash, a perfect strike.

As incredible as it sounds, this really happened on the 4th of July, 2005. Gliding through the vast atmosphere of Comet Tempel 1, NASA's Deep Impact spacecraft pinpointed the comet's 3x7-mile wide nucleus and hit it with an 820-lb copper impactor.

That's navigation.

Credit the JPL navigation team. By sending commands from Earth, they guided Deep Impact within sight of the comet's core. But even greater precision would be needed to strike the comet's spinning, oddly-shaped nucleus.

On July 3rd, a day before the strike, Deep Impact released the impactor. No dumb hunk of metal, the impactor was a spaceship in its own right, with its own camera, thrusters and computer brain. Most important of all, it had “AutoNav.”

AutoNav, short for *Autonomous Navigation*, is a computer program full of artificial intelligence. It uses a camera to see and thrusters to steer—no humans required. Keeping its “eye” on the target, AutoNav guided the impactor directly into the nucleus.

The system was developed and tested on another “Deep” spacecraft: Deep Space 1, which flew to asteroid Braille in 1999 and Comet Borrelly in 2001. The mission of Deep Space 1 was to try out a dozen new technologies, among them an ion propulsion drive, advanced solar panels and AutoNav. AutoNav worked so well it was eventually installed on Deep Impact.

“Without AutoNav, the impactor would have completely missed the nucleus,” says JPL's Ed Riedel, who led the development of AutoNav on Deep Space 1 and helped colleague Dan Kubitschek implement it on Deep Impact.

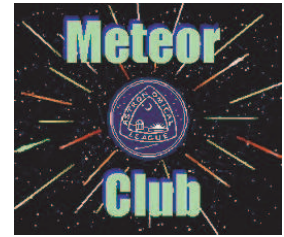
En route to the nucleus, AutoNav “executed three maneuvers to keep the impactor on course: 90, 35, and 12.5 minutes before impact,” says Riedel. The nearest human navigators were 14 light-minutes away (round trip) on Earth, too far and too slow to make those critical last-minute changes.

Having proved itself with comets, AutoNav is ready for new challenges: moons, planets, asteroids ... wherever NASA needs an improbable bulls-eye.

Dr. Marc Rayman, project manager for Deep Space 1, describes the validation performance of AutoNav in his mission log at <http://nmp.nasa.gov/ds1/arch/mrlog13.html> (also check mrlog24.html and the two following). Also, for junior astronomers, the Deep Impact mission is described at <http://spaceplace.nasa.gov/en/kids/deepimpact/deepimpact.shtml>



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Meteor observing is both fun and scientifically useful. It does not require expensive equipment, only your two eyes. Becoming a member of the Meteor Club only requires that you are willing to allocate some of your time to looking for nature's fireworks. In addition, your observations can contribute to research on meteors and meteor streams by the [Association of Lunar and Planetary Observers \(A.L.P.O.\)](#).

To share your data with the A.L.P.O., mail the report forms in a timely manner to the A.L.P.O. Meteors Section, 161 Vance Street, Chula Vista, CA 91910-4828, within 30 days of observation. Your report will then be added with other observers across North America and published in A.L.P.O.'s quarterly journal *The Strolling Astronomer*. The Section Recorder will archive a copy and send a copy to Europe for analysis by the [International Meteor Organization](#)

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Another organization interested in meteors and meteor observing is the [American Meteor Society](#). You can get more information on them by clicking [here](#).

The Meteor Club.

The Astronomical League offers special recognition in the form of a Meteor Club Certificate for those that have dedicated a substantial amount of time to observing meteors in an organized way. To qualify you must either be a [Member-at-Large](#) or be a member of an astronomical society which is affiliated with the League. To obtain an award you must observe the following rules:

Rule 1:

Observe meteors for at least 6 hours. You must observe at least one hour each session. Your notes must show all the information on the meteor observing form:

- a. Date of observation;
- b. Time of observation (beginning and end);
- c. Location of observation (Place name, Latitude, Longitude, and Elevation);
- c. Observer's name;
- d. Percent cloudy at each hour during the observing period;
- e. Direction faced and altitude observed and time of any changes;
- f. Sky conditions at each hour during the observing period;
- g. Beginning and ending time of any breaks;
- h. Comments on the observations;
- f. Time, magnitude, shower membership, color, speed, train (if any), and comments for each meteor observed

Rule 2:

Send a copy of your observations to:

Scott Kranz
106 N Darrowby Drive
Raymore, MO 64083-9181
(816) 331-5796
E-mail: s.kranz1@comcast.net

Be sure you keep a copy of all your observations, as there is always the possibility that they could be lost in the mail. A Certificate of Membership in the Meteor Club will be forwarded to your or your Society for presentation at a meeting.

Rule 3: When you have observed for 12, 18, 24, 30 and 36 hours, send in your additional observations to Mr. Kranz, indicating that you have completed the observations for an additional six-hour certificate. When you have reached 36 hours, you will receive an Honorary membership certificate. Be sure to indicate the return address. After 36 hours, it is no longer necessary to send your observations to the Astronomical League, but be sure to continue sending them to A.L.P.O.

Enjoy your observing!