

Southwest Florida Astronomical Society SWFAS



The Eyepiece January 2015

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A MESSAGE FROM THE PRESIDENT

A little late, but as I am sure other of you out there have been waylaid by this season's nasty cold. (Ron, thanks for getting this ready!)

We have a lot happening in the next 2 months. There are some special events happening at the Calusa Nature Center. On the 3rd is a Moonlight Madness event and Heather says she has some new shows for it.

On the 7th, there is a special planetarium presentation:

Wednesday, January 7th 12:00 noon – 1:00pm

Special Planetarium Presentation and "Sneak Peek" – Black Holes: Monsters of the Cosmos

Some of the most mysterious objects in our universe are black holes, which are found in sizes ranging from a few solar masses to millions of times the mass of the Sun and occupying the centers of large spiral galaxies – including our own Milky Way! What is fact and what is myth? See this live show and preview the new black hole planetarium video from John Boswell and Dome3D, "Monsters of the Cosmos," featuring Morgan Freeman, Neil deGrasse Tyson, and Michio Kaku – set to music!

Our meeting on Feb 5th has a special guest speaker. Please let people know it is open to the public. Derek Buzasi is doing the presentation. (He is Heather's husband too!) See the meeting announcement below for full details.

Don't forget, it is annual dues times. Please pay Tony at the meeting or events or mail it to our PO Box:

Southwest Florida Astronomical Society, Inc. P.O. Box 100127 Cape Coral, FL 33910
Dues are \$20.00 (If you paid in the last quarter of the year, you have paid for 2015)

Officers were retained at the voter meeting. Minutes should be in the next issue. Still looking for a Program Coordinator.

If you can help at any of the upcoming events, please contact the event coordinator.
Brian

In the Sky this Month

Moon: January – Full, 4th; Last Quarter, 13th; New, 20th; 1st Quarter, 26th.

The Planets:

Mercury is paired with Venus low in the west all month long in the evenings. Look for Mercury to the lower right of Venus early in the month, then to the right through the 17th. Venus will shine brightly at -3.9 magnitude all month while Mercury starts at -0.8, dims to -0.4 on 17th, then dims rapidly for rest of month.

Mars glows red about 20° above and to the left of Venus at magnitude of 1.1-1.2.

Neptune is visible just ¼° to the upper right of Mars.

Uranus is found still higher just after dusk. Finder charts for Neptune and Uranus are located at skypub.com/urnep.

Jupiter will be rising at 8 pm early in the month about 10° above Regulus at magnitude of about -2.4 to -2.6 during the month. A rare event occurs on night of Jan 23-24 when 3 of the Galilean moons will cast their shadows onto Jupiter at once.

Saturn will be rising at 4 am early in the month, but will be up at 2:30 later in the month with a magnitude of 0.5.

Comet Lovejoy – Don't miss the opportunity to observe this comet which should be bright enough for binocular or possibly naked eye viewing early in January. It may reach magnitude of 4.1. See following article for finder charts.

Asteroid 2004 BL₈₆ will be visible in Cancer at magnitude 9.2 during night of January 26-27. You'll need a telescope and a dark site, but it is about half kilometer wide and will be racing past the earth missing us by only 750,000 miles.

R Geminorum Variable Star – A long period red variable will be brightening from minimum of 13.2 last October to 9.5 to 9.0 by first of January on its way to maximum brightness of 7.1 by early February.

International Space Station: No evening viewings visible this month.

Future Events

Upcoming Meetings

Our Next monthly meeting will be February 5th at 7:30pm at the Calusa Nature Center Planetarium.

Exoplanets: Hot, Cold, and Habitable:

Driven by NASA's Kepler mission, in the past two decades the number of planets outside our solar system has grown from a handful to thousands. Surprisingly, many of these new solar systems are very unlike our own; they include "Super-Earths", "hot Jupiters", and ice giants, along with gas giants like those in our solar system -- and a very few Earth-like planets. In this talk, Derek Buzasi will discuss how exoplanets are detected and characterized, the current exoplanet census, and our current understanding of how planetary systems form and evolve. He will also explore the future prospects for detecting habitable worlds around other stars.

Dr. Buzasi is Professor of Physics and the Whitaker Eminent Scholar in Science at Florida Gulf Coast University. He spent four years serving on the Kepler Science team, and remains actively involved with NASA's K2 mission.

Several other events are happening as shown in schedule below.

Star Party and Event Schedule

Date	Event	Location	Time	Info/Contact
Saturday, January 3rd, 2015	Moonlight Madness Event	Calusa Nature Center & Planetarium	7 - 9 pm	Heather Preston
Jan 7 th , 2015	Black Holes/Monsters of the Cosmos	Calusa Nature Center & Planetarium	12:00 noon	Heather Preston
Friday, January 16 th	Astronomy for Amateurs	Hickey's Creek Park	6:30 pm	Kelly Flaherty
Saturday, January 17 th	Star Party	CRP	Dusk	Bruce Dissette
Thursday, January 22 nd	Science Night	Franklin Park Elementary	6 - 7 pm	Carol Stewart
Thursday, January 22 nd	School Event	Country Oaks Elementary - Labelle	6 - 7:30 pm	Brian Risley
Friday, January 23 rd	Oasis Middle School	Cape Coral	6:00	Carol Stewart Johnnie Royal
Saturday, January 24 th	Cape Coral Star Party/Camp Out	Jaycee Park	Dusk	Brian Risley Katie Locklin
Thursday, February 5 th	Monthly Meeting	Calusa Nature Center & Planetarium	7:30 pm	Brian Risley
Saturday, February 7 th	Shell Point Star Party	Shell Point Village	Dusk	Doug Heatherly

Saturday, February 7 th	Moonlight Madness Event	Calusa Nature Center & Planetarium	7 - 9 pm	Heather Preston
Friday February 13 th	Cape Coral Star Party	Rotary Park	Dusk-10 pm	Brian Risley Katie Locklin
Saturday, February 14 th	Edison Day of Discovery STEMtastic	Centennial Park/Harborside Event Center	10am -3pm (Setup by 8 am)	Brian Risley
Thursday, February 19 th	Harn's Marsh Elementary Science Night	Harn's Marsh Elementary Lehigh	5 - 7:30 pm	Brian Risley
Friday, February 20 th	Astronomy for Amateurs	Hickey's Creek Park	7:00 pm	Kelly Flaherty
Saturday, February 21 st	Star Party	CRP	Dusk	Bruce Dissette
Saturday, February 28 th	Burrowing Owl Festival	Rotary Park	8am - 4 pm	Brian Risley
Thursday, March 5 th	Monthly Meeting	Calusa Nature Center & Planetarium	7:30 pm	Brian Risley
Saturday March 21 st	Star Party	CRP	Dusk	Bruce Dissette
Thursday April 2 nd	Monthly Meeting - Program: Jack Berninger	Calusa Nature Center & Planetarium	7:30program followed by business meeting	Brian Risley
April 18 th	Star Party		Dusk	Bruce Dissette
May 16 th	Star Party		Dusk	Bruce Dissette
June 13 th	Star Party		Dusk	Bruce Dissette
July 18 th	Star Party		Dusk	Bruce Dissette
August 15 th	Star Party		Dusk	Bruce Dissette
Sept. 12 th	Star Party		Dusk	Bruce Dissette
October 10 th	Star Party		Dusk	Bruce Dissette
November 14 th	Star Party		Dusk	Bruce Dissette
December 12 th	Star Party		Dusk	Bruce Dissette

Minutes of December SWFAS Meeting – December 4th, 2014 will appear in a future newsletter

Binocular Comet Lovejoy Heading Our Way

By: [Alan MacRobert](#) | December 15, 2014

The latest Comet Lovejoy should reach at least 5th magnitude in late December and January, when it will be nicely placed high in the dark for your binoculars or telescope. And it may become detectable with the naked eye.

Update Dec. 15: Comet Lovejoy is brightening faster than expected. Last night it was visual magnitude 6.1, estimated by veteran comet observer Alan Hale using 10×50 binoculars in a post to the [Comet Mailing List](#) on Yahoo Groups. The comet was very low in his sky. From Australia, where the comet currently passes overhead, David Seargent says that on December 13th he "just managed to glimpse 2014 Q2 naked eye in a very clear sky. I estimated it at mag. 6.1 and at 6.2 with 2×25 opera glasses." Then on the 14th: "Much easier to see naked eye than 24 hours earlier, and estimated as bright as 5.5!" That same night Michael Mattiazzo in Australia estimated it at 6.0. Paul Camilleri said 5.7.

At this rate Comet Lovejoy would crest at about 4.1 in mid-January.



The new Comet Lovejoy, C/2014 Q2, as imaged on November 27th by Gerald Rhemann in Austria using a remotely operated 12-inch f/3.6 astrograph in Namibia. Click image for larger view.

A new Comet Lovejoy, designated C/2014 Q2, is heading our way out of deep space and out of the deep southern sky. It may brighten to 5th magnitude from late December through much of January as it climbs into excellent viewing position for the Northern Hemisphere, high in the dark winter night.

This is Australian amateur Terry Lovejoy's fifth comet discovery. He turned it up at 15th magnitude in Puppis last August, in search images that he took with a wide-field 8-inch scope. It hasn't moved very much since then — it's still in Puppis as of December 11th — but it's hundreds of times brighter now at visual magnitude 6.8, reports David Seargent in Australia. On December 9th "I saw it easily using a pair of 6x35 binoculars," Seargent writes. Using a 4-inch binocular telescope at 25×, he says it was a good 8 arcminutes wide with a strong central condensation and no visible tail.

And it's picking up speed across the sky for a long northward dash.

A Comet of the High Dark

"Comet Q2," as some are calling it, will skim through Columba south of Orion and Lepus from the nights of December 16th through the 26th, brightening all the while, as shown on the finder charts for December and January below and on the print-friendly versions here: [December](#), [January](#). The dates on the charts are in Universal Time, and the ticks are for 0:00 UT.

The comet spends the last few days of December in Lepus at perhaps 6th magnitude, though by then the light of the waxing Moon (at first quarter on the 28th) will start to be an annoyance. On New Year's Eve, a little after January 1st Universal Time, look for the comet just off Lepus's forehead as shown on the charts.

The Moon brightens to become full on January 4th. Most of us won't get a dark moonless view again until early in the evening of January 7th, with the comet now crossing northernmost Eridanus. That's the same day it passes closest by Earth: at a distance of 0.47 a.u (44 million miles; 70 million km). That's also about when it should start glowing brightest for its best two weeks, as it crosses Taurus and Aries high in early evening.

By then the comet is starting to recede into the distance, but its *intrinsic* brightness should still be increasing a bit; it doesn't reach perihelion until January 30th, at a rather distant 1.29 a.u. from the Sun. By that date the comet should be starting to fade slightly from Earth's point of view. In February it will continue north between Andromeda and Perseus as it fades further, on its way to passing very close to Polaris late next May when it should again be very faint.

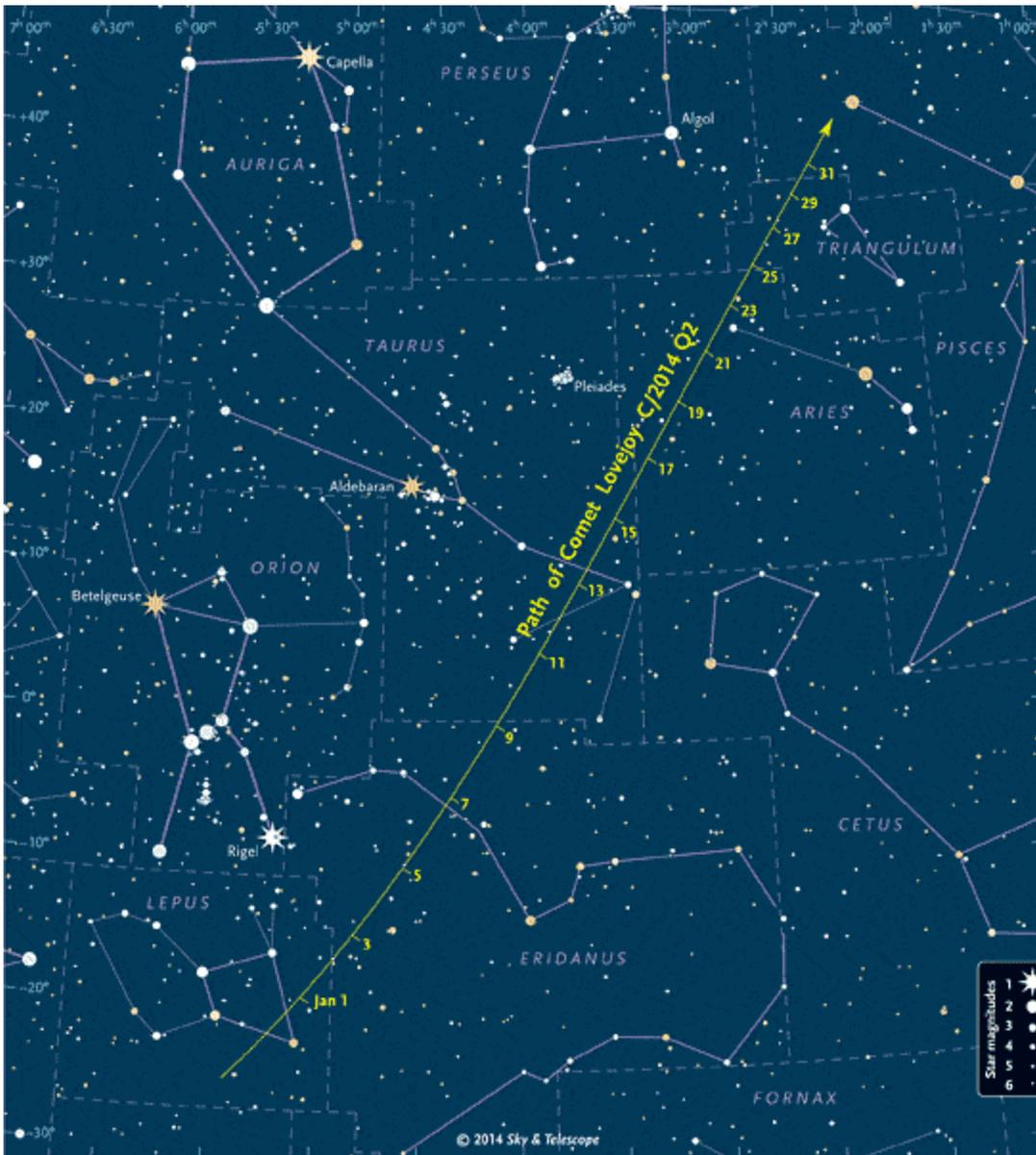
Originally Comet Q2 wasn't expected to become this bright. We're basing these predictions on an analysis by J. P. Navarro Pina in late November using the comet's

visual behavior for the previous several weeks. Whether it will continue to brighten on schedule is anybody's guess, but the odds are good; comets that don't come near the Sun are more predictable in their brightnesses than those that do.

Q2 is a very long-period comet, but this is not its first time coming through the inner solar system. On the way in, its path showed an orbital period of roughly 11,500 years. Slight perturbations by the planets during this apparition will alter the orbit a bit, so that it will next return in about 8,000 years.



Finder chart for Comet Lovejoy, C/2014 Q2, during December 2014. The dates are in Universal Time; the ticks are at 0:00 UT (7 p.m. on the previous date Eastern Standard Time). [Click here for print-friendly black-on-white PDF.](#)



Finder chart for Comet Lovejoy, C/2014 Q2, during January 2015. The dates are in Universal Time; the ticks are at 0:00 UT (7 p.m. on the previous date Eastern Standard Time). [Click here for larger, print-friendly black-on-white PDF.](#)

- See more at: http://www.skyandtelescope.com/astronomy-news/observing-news/binocular-comet-lovejoy-heading-c2014-q2-lovejoy-1211142/?et_mid=709591&rid=246752253#sthash.NGfrca4V.dpuf



Tony Heiner's photo's of Lovejoy Q2 (Lower one is with M79)

How to See the Orion Nebula in 3D

By: [Bob King](#) | December 17, 2014

Add another dimension of viewing to winter's favorite deep sky object, the Great Nebula of Orion.



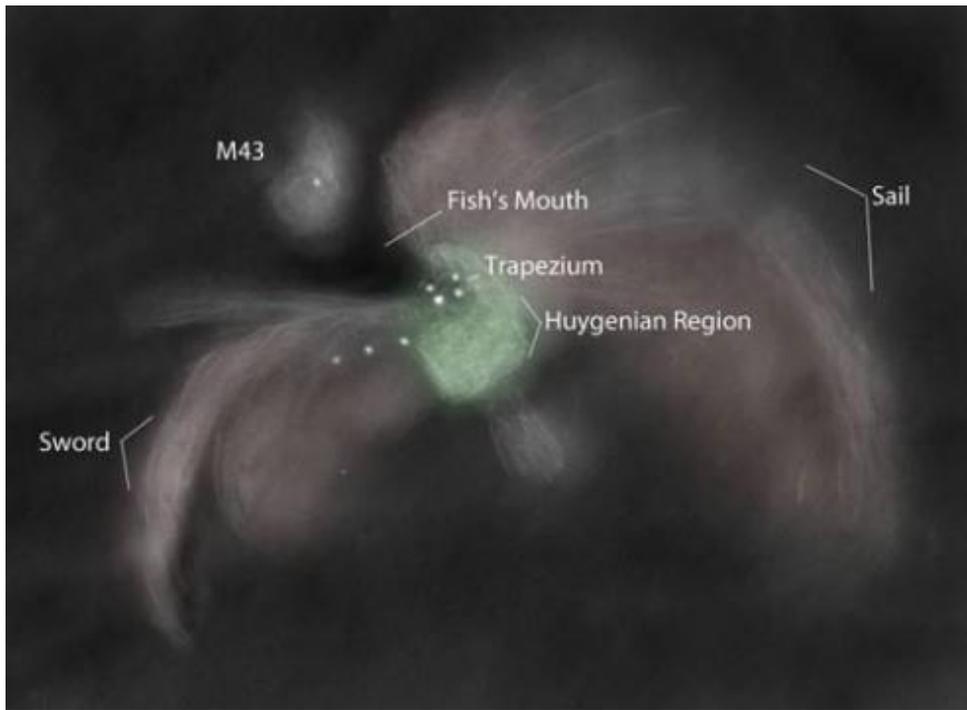
The Orion Nebula, located in Orion's Sword directly below the familiar Belt, is an enormous stellar nursery 24 light years across located about 1,350 light-years from Earth. Newborn suns within the nebula's dusty folds set dust and gas alike aglow.
HST / NASA / ESA

The [Orion Nebula](#) is arguably the centerpiece of the winter sky. This bright, richly-detailed blossom of glowing gas and dust invites repeated observation. How many of us have pointed our telescope or binoculars in its direction five, six, or even ten times a season?

After the planets and Moon, it's *the* deep sky object to show family and friends, provided we can coax them into the cold.

Faintly visible with the naked eye and revealing a distinct shape in binoculars, a telescope lays bare the nebula's breathtaking whorls of nebulosity that unfurl from the brilliant [Trapezium cluster](#) blazing at its core.

Most sky objects appear pasted against a two-dimensional sky because human stereo vision can't sense depth over cosmic distances. Our eyeballs would have to be light years apart to accomplish that feat. But clues to the sky's hidden third dimension are out there. If you've ever watched one of Jupiter's moons cast its shadow on the planet's cloud tops, the sensation of depth is almost visceral.



Sketch of the Orion Nebula, also known as M42, viewed at low magnification through a 15-inch (37-cm) telescope. We see its basic features including the dark nebulosity nicknamed the Fish's Mouth, the bright quadruple star [Theta 1 Orionis](#), better known as the Trapezium, and the adjacent nebula M43.

Bob King

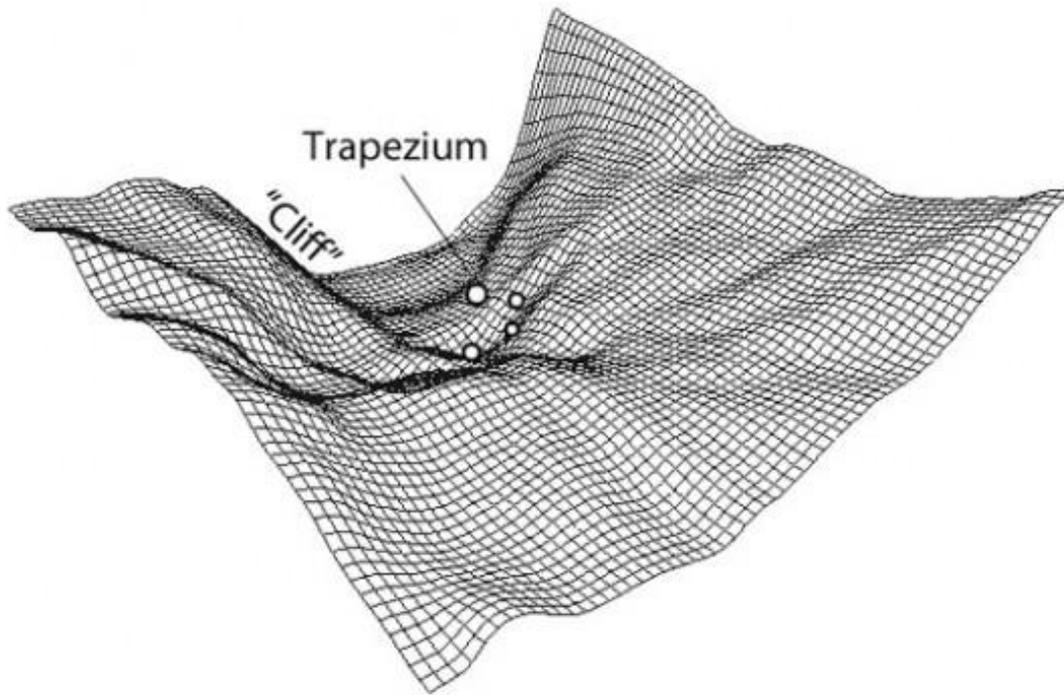
With a little help, we can sense the depth in the Orion Nebula, too. The easiest place to begin is the thumb of dark nebulosity, nicknamed the Fish's Mouth, located between the bright multiple star, the Trapezium, and adjacent nebula M43 to the north. Through a small telescope the shadowy shape appears opaque, but a larger instrument clearly shows its mottled texture as light from bright nebulosity in the more distant background punches through.



In this close up image, the spectacular texture of the Fish's Mouth is evident as light from bright nebulosity in the background filters through gaps in the dark veil. The Trapezium, the Orion Nebula's key source of illumination, is seen at center right.
HST / NASA / ESA

The 3D effect is dramatic on a dark, moonless night using high magnification. The first time I tried this, I spent the next 20 minutes completely absorbed while visually thrashing through a dark forest of nebulosity I never knew existed. When seen in its entirety, the Fish's Mouth looks a lot more like a [Dementor](#) in the Harry Potter movies. Creepy, but utterly moving.

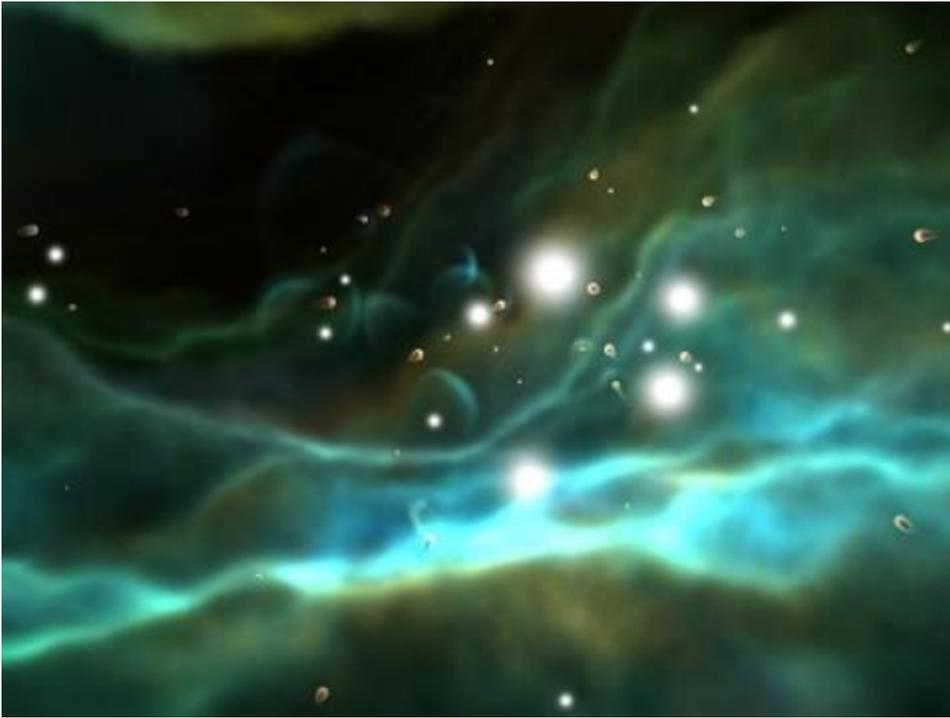
Studies of the structure of the Orion Nebula have shown that radiation pressure from the hot, young Trapezium stars has hollowed out the core of the nebula and literally "blown a hole" through the dust and gas, allowing us to peer inside the cloud to stare this clump of fresh-faced suns in the face.



A 3D representation of the folded, glowing surface of the Orion Nebula shows the Trapezium multiple star hovering in a "valley." To the left is a steep "cliff" of nebulosity that faces the stars and fluoresces in their light to form the bright pink, bar-like feature that borders the bright inner or Huygenian Region of the nebula.

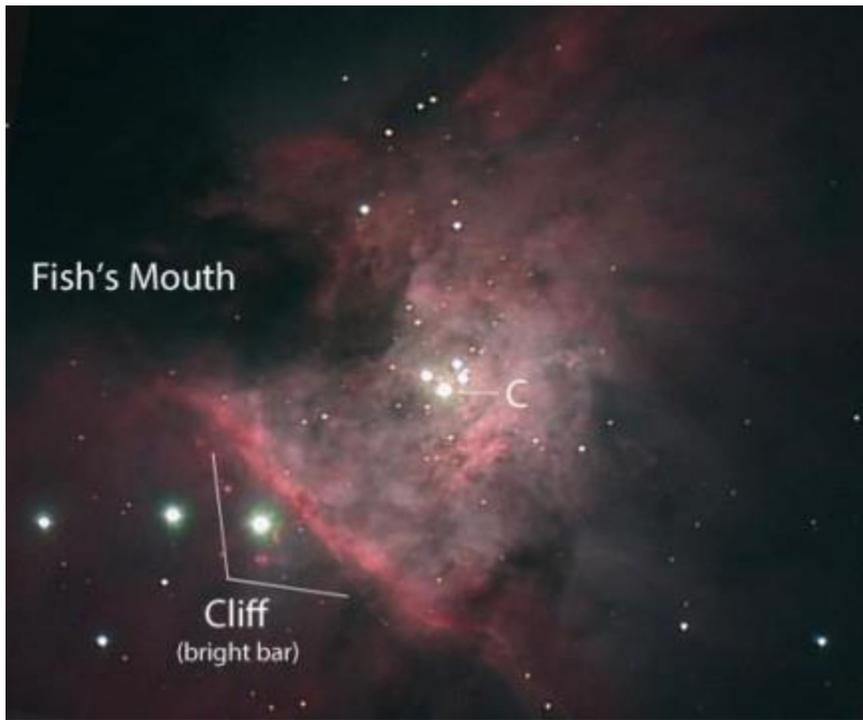
C.R. O'Dell and Zheng Wen with addition of Trapezium stars and annotations by the author

Using infrared and visible light observations from the Hubble Space Telescope and ground-based imagery, astrophysicists [C.R. O'Dell](#) and Zheng Wen (*Rice University*) created a 3D model of the inner surface of the hollowed out core of the nebula. Their model shows that the Trapezium stars hover above a wrinkled, shallow "valley" not far from a steep "cliff." Light from the stars ionizes the nebular gases and sets them aglow. According to research by O'Dell, the visible nebula we see is little more than a popped blister .08 light-years thick on the surface of the [Orion Molecular Cloud](#), a vast complex of nebulae host to ongoing star formation.



When you put some "meat" on the diagram above, you get something like this — a frame from the Orion Nebula fly-through movie based on data from C.R. O'Dell, Zheng Wen, and David Nadeau with additional contributions from Greg Bacon and the American Museum of Natural History / Rose Center for Earth and Space. Tiny, teardrop-shaped objects are "proplyds," or protoplanetary embryos. Click to watch the fly-through.

So what do we see when we put eye to eyepiece? The bright, green-hued Huygenian Region, named after the 17th century astronomer, Christian Huygens, who first studied it in detail, forms the valley's floor. The cliff is the bright bar-like feature southeast of the Trapezium.

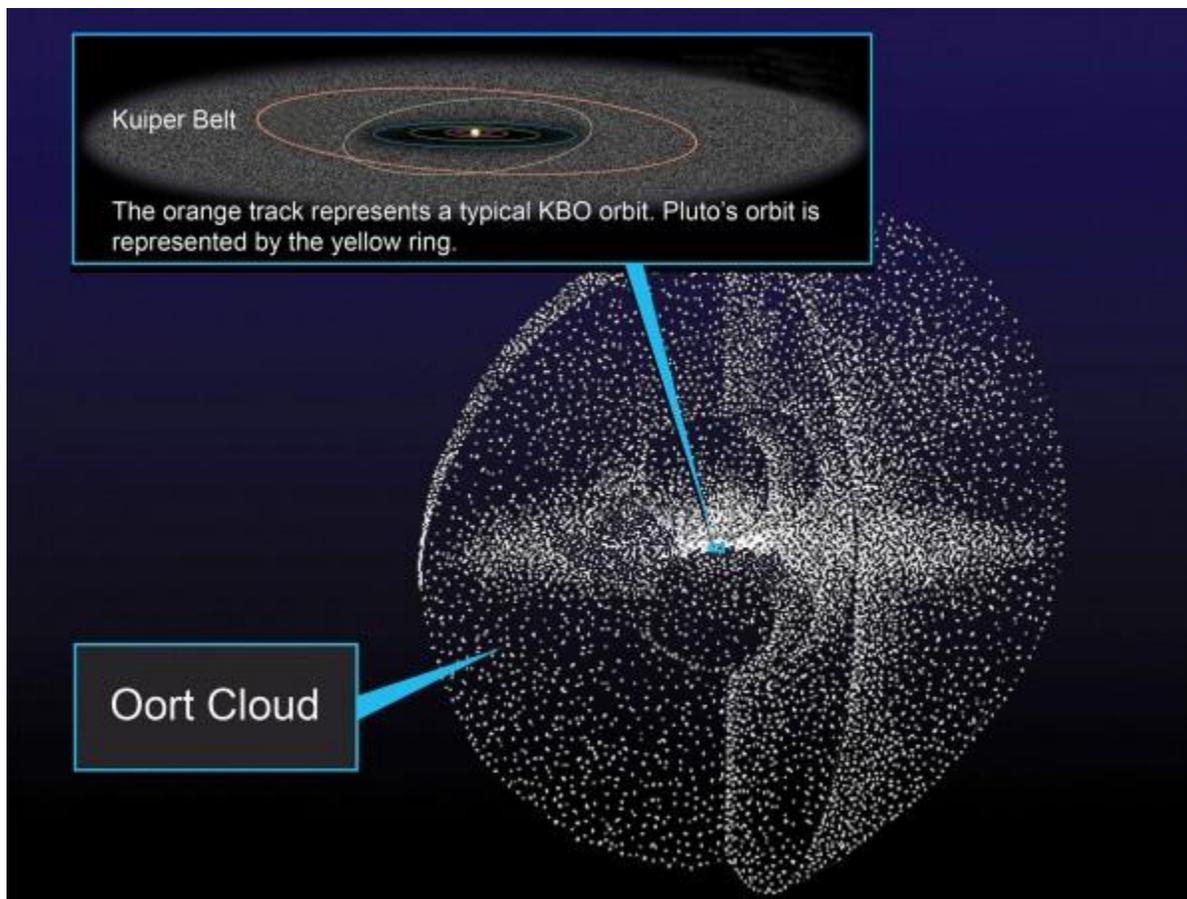


The bright, inner Huygenian Region of M42. The next time you look at the nebula, imagine the dark Fish's Mouth overhanging the bright nebula. The bright bar or "cliff" towers above the Trapezium, which is nestled in a valley of its own creation. The brightest star in the Trapezium, named Theta 1 Orionis C, is responsible for a large proportion of the nebula's light. It's the most massive of the four and one of the most luminous stars known.

Patric Knoll

Wishing you happy travels to another dimension of one of the most beautiful objects in the night sky.

- See more at: http://www.skyandtelescope.com/observing/see-orion-nebula-3d12172014/?et_mid=711240&rid=246752253#sthash.UITLbrae.dpuf



NASA

Eight billion 'dark asteroids' may lurk in Oort cloud

By [Sid Perkins](#)

Our solar system's asteroid belt, which lies between Mars and Jupiter, may contain a few hundred thousand objects. But much farther away, in regions long presumed to be the realm of comets and other icy bodies, there could be *billions* of rocky orbs circling the sun, a new study suggests. Researchers used computer programs to simulate the fate of objects circling our young sun once its planetary disk was largely cleared of gas and dust. Gravitational interactions with planets over the subsequent 4.5 billion years caused some objects to crash into the sun and others to be flung out of the solar system altogether. But many of the objects were cast into exile in the [Oort cloud](#), a spherical haze of objects that stretches far beyond Neptune and a good fraction of the way toward our nearest stellar neighbors. (The image above depicts the Oort cloud as compared with the solar system and the much nearer Kuiper belt of objects.) Of those deportees, about 4% came from within about 375 million kilometers of the sun, rendering them rock- or metal-rich bodies like asteroids rather than icy orbs like comets, the researchers report online ahead of print in the *Monthly Notices of the Royal Astronomical Society*.

Previous observations suggest that the Oort cloud contains about 200 billion comets, the researchers note. If that's correct, [the new results suggest that those comets are accompanied by about 8 billion asteroids](#). If one of those objects ever fell toward Earth, it would be tougher to spot than a comet (being much darker) and more difficult to divert than the typical near-Earth asteroid (as it would be traveling much faster). Don't fear, though: The team estimates that a planet-killing collision with such an object might happen only once every billion years or so.

Hubble data could explain missing stars

Thursday, December 4, 2014 - 2:30pm



nate2b/Flickr ([CC BY-NC-ND 2.0](#))

Scientists have discovered a distant galaxy that may explain why the universe doesn't have as many stars as predicted. Using the Hubble telescope, they observed a distant galaxy that is spewing stars so rapidly that it appears to be burning itself out. Galaxies form when giant gas clouds are pulled together by gravity, but *The Guardian* reports that [all the newly formed stars are "driving out" the remaining gas](#). The astronomers say the distant galaxy is making 260 times more stars than our Milky Way (pictured above): about 1820 every year compared with our seven. Many other galaxies we've observed have already run out of gas and stopped producing stars; the behavior described here could explain why.

BREAKTHROUGH OF THE YEAR

The Rosetta mission lands on a comet

Europe's most ambitious space mission captured the public's imagination with a series of hard-won pictures, beamed to Earth from a place beyond Mars. Rosetta's continuous orbit around comet 67P/Churyumov-Gerasimenko is helping scientists figure out how life began on Earth—and heralds a new age of comet science. *Science*, Dec 18, 2014

Club Officers & Positions:

President: Brian Risley swfasbrisley@embarqmail.com (239-464-0366)	Vice President: Bruce Dissette bdissette@centurylink.net (239-936-2212)	Secretary: Don Palmer swfas.sec@gmail.com (239-334-3471)
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