

# *Starscan*

Johnson Space Center  
Astronomical Society

Volume 25, Number 9 September 2009



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## Un mensaje del Presidente (A message from the President)

Folks:

Life moves along as we get closer to Fort dates, Oct 15-18, and the All Clubs/ADAY Oct 23rd, and 24th. I hope you are getting your scopes out tuned and ready! I plan to be this months speaker if I can sit still long enough to put the seminar together. Do I have a taker for the novice talk? Seriously, folks, we neglected to take up a collection last month for the ADAY budget. We'd like to meet our goal of \$150 and anything above that will go to door prizes. Also, I hate to ask, but we are also running lean of door prizes for "us" too... We'll need some for the December Solstice party in December! Until later.. Keep your eyes tuned to the netslyder... David



## LETTER FROM THE EDITOR By Connie Haviland

Hi Everyone!!

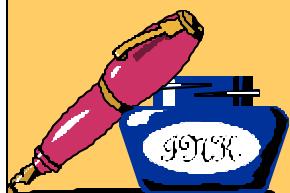
On this month's cover is the spectacular photo provided by Chuck Shaw. This is not ours to take credit for and at this time this comment serves as a reminder that under copyright law, no one is authorized to use this photo in any manner without the expressed written consent of its owner. We were given this photo for our club members and here it is being used for that purpose. Anyone who uses this is subject to all legal repercussions under Intellectual Property Law. Now that that is out of the way..we have a lot in this month's edition. Please note in the "For Sale" section, I have mentioned that we now have the opportunity to buy new club shirts and such. I brought a sample of the shirts I have found so far, but for those who have expressed a desire to have the denim shirt, I will be visiting a new vendor that I have found and they do have those denim shirts. I hope to get a sample of both men's and women's short sleeve and long sleeve to show at the September meeting.

As mentioned last month, I have an article regarding building your own observatory, in your own backyard. This has a lot of information, as I am sure you know and will take more than one or two editions. I still want to be able to include other things in our newsletter and so without having the Starscan too large for our members who may have trouble loading large files, I have elected to divide this article into 4 more "subsets"..making the final subset coming in December's edition. And as always.....

Enjoy.....Connie

## LETTER TO THE EDITOR

NOTHING THIS MONTH!!!



## Star Parties for 2009

Bob Taylor

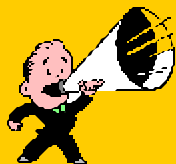
JUNE—AUGUST	OPEN
SEPTEMBER 12	MOODY GARDENS
OCTOBER 15-18	FORT McKAVETT
NOVEMBER 6	HAAK WINERY
DECEMBER	OPEN



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## *What's Happening at the George!!!*

Cynthia Gustava



Need volunteers



Friday Night Group – 7:30 p.m. to 10:00 p.m.

Sep 11 – HMNS Teacher Workshop – Volunteers needed to run domed scopes and bring out deck scopes. Write to Cynthia Gustava at [cynm31@att.net](mailto:cynm31@att.net) to volunteer.

Saturday Night Public Viewing – Dusk to 10:30 p.m.

Contact the following building manager teams to volunteer any Saturday night in September.

Sep 05 – Building Managers: Barbara Wilson and Buster Wilson [[gobserve@consolidated.net](mailto:gobserve@consolidated.net) or [retsub@ix.netcom.com](mailto:retsub@ix.netcom.com)]

Sep 12 – Building Managers: Justin McCollum and Carl Sexton [[justinmccollum@hotmail.com](mailto:justinmccollum@hotmail.com) or [carlsexton@hotmail.com](mailto:carlsexton@hotmail.com)]

Sep 19 – Building Managers: Jessica Kingsley and Cynthia Gustava [[gnjkingsley@att.net](mailto:gnjkingsley@att.net) or [cynm31@att.net](mailto:cynm31@att.net)]

Sep 26 – Building Managers: Carl Sexton and Jack McKaye [carlsexton@hotmail.com](mailto:carlsexton@hotmail.com) or [jemckaye@comcast.net](mailto:jemckaye@comcast.net)

## Lunar and Planetary Institute

September 19, 10am to 1pm - Solar System Extremes

October 17, 7 p.m. – Night Viewing of the Moon

November 21, 10 a.m. – 1 p.m. – Near Earth Objects

December – No Family Space Day Scheduled. Enjoy your holidays!

Please note: Each child must be accompanied by a responsible parent or adult the entire time they are visiting the LPI.

For more information e-mail [Spaceday@lpi.usra.edu](mailto:Spaceday@lpi.usra.edu) or call 281-486-2106.

**For more information, go to**

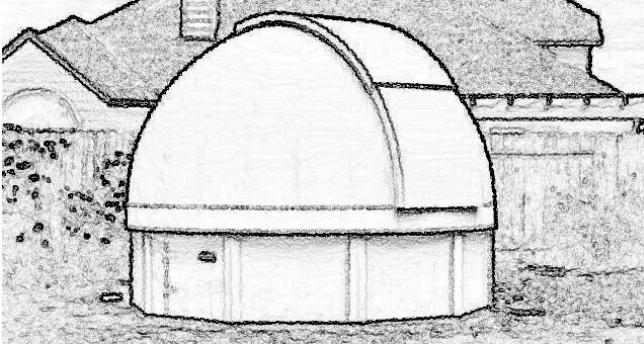
**[http://www.lpi.usra.edu/education/space\\_days/](http://www.lpi.usra.edu/education/space_days/)**

**Or call Katy at (281) 486-2106**

3600 Bay Area Boulevard, Houston, Texas



## Building Your Own Observatory (Part 2-A)



This article is the second installment of a two part series on the planning and building of a backyard observatory. The first article covered the planning, design and city approval phases of the project. This article covers construction and lessons learned. I hope sharing my experiences might be helpful to others interested in planning and building an observatory of their own. (note from editor. Due to the size of the article and the information in this 2nd section, we plan to split it up into 4 subsets. The 2nd part will be completed in our December edition.)

### Construction Preparation

I estimated the building would take two (2) months of moderate but steady effort to complete. Construction was to begin in March and end in early May. During that time I expected I would need sole use of the garage for building the dome. The schedule had me enjoying the observatory before the heat of summer arrived. I was woefully inaccurate in my estimation of time and level of effort.

Following is a list of the tools used during construction:

Compound Miter saw	Hacksaw	Pencil
Table Saw (contractor style)	Sawhorses	Sharpie Marker
Circular Saw	Workmate	Shovel
Jigsaw	Pliers	Wheelbarrow
Belt Sander	Screwdrivers	Pickaxe
Random Orbit Sander	Clamps	Ladder
Drill	Carpenter's Square	Stepstool
Hammer	6 ft Ruler	Concrete Mixer
Router		

### The Pier

Since the pier is isolated from the rest of the structure, the city did not consider it part of the structure and therefore did not require a permit. I decided that if I did not receive approval for the building, I could still use the pier in an outdoor setting. Thus, during the fall of 2008, while I was finalizing my plans with the city, I decided to go ahead and pour the pier.

Digging the hole for the pier footing proved to be as difficult as I expected. The first couple of inches consisted of sand that was easy to remove. The next 20 inches was solid clay. The top 8-10 inches of clay could be cut and pried-out in fairly large blocks. As the hole deepened, the clay became progressively harder and drier. Excavation of the last 10 inches involved the use of a pickaxe to loosen the clay followed by a shovel and hand trowel to remove the debris. Overall, it required 15 hours of excavation split over 5 days. I then constructed two rebar cages, one for the footing and the other for the actual pier. On November 8, 2008, with the help of my son and a neighbor, we poured the pier. Inserted into the pier column are 4 18-inch threaded rods. Each rod is 2.5 inches from the edge of the column. The spacing between the rods allows for an 8-inch steel pier to be installed.



I allowed the concrete to cure for 5 days before removing the Sonotube column form. When I removed the form, some of the surface concrete pulled away from the column, leaving a rough surface in a few spots. The cardboard form had a waterproof membrane that must have leaked, allowing the concrete to bind to the cardboard. While the rough patches are unsightly, the column was structurally sound.



The building design has the concrete footing and pier physically isolated from the slab foundation. The top of the footing is 3-4 inches below the bottom of the slab. Two weeks after pouring the pier, I covered the footing with some of the fill dirt removed during excavation. During the ensuing weeks I periodically compressed the soil above the footing and added more as necessary so that all of the soil below the future slab had a consistent firmness and height.

### The Slab Foundation



I made no progress on construction until late February 2009. This was intentional. My yard is normally very wet during the winter months. I was not interested in preparing for the slab pour until the approach of spring.



Prior to digging the perimeter trench for the slab footing, I built the slab form with 2x4 lumber and 2x2 stakes. Since I plan on using an equatorial mount in the observatory, the pier needed to be centered in the middle of the slab. Note: If I were using a fork mount on a wedge, the pier would have been offset north of center. To set the form corners I needed to measure from the center of the pier column. I created a fixed building center point by partially driving a nail into the center of the square piece of plywood used to secure the threaded rods in the pier (see the images above). I then tied a string to the nail and used a plumb and 6 foot ruler to mark a corner point every 36 degrees that was 5' 11" from the nail. After marking each corner I verified the length of each wall segment (44 inches). I spent a couple of hours adjusting the corner placement until all corners were properly spaced and were 5'11" from the center of the pier. A landscape timber nail was placed at each corner.

I then used a string to connect each corner nail to its neighboring corner. This provided a precise guide for setting the form lumber and digging the trench. Setting the form was straightforward. The form edges comprised of 5 5-foot 2x4s and 5 44-inch 2x4s. The 5-foot 2x4s were set in place at every other wall segment and held in place using 3 2x2 stakes. The form was leveled with a water level using a 20-foot piece of 0.5" clear tubing. Using a miter saw, I cut a 36-degree bevel into each end of the 44" 2x4s. These 2x4s were then placed and secured to the longer 5-foot 2x4s. I paid special attention to the proper wall corner location prior to securing the form segments.

Once I finished the form, I started digging the slab perimeter trench. The trench was approximately 8 inches wide and 12 inches deep. A significant amount of fill was removed from the trench. Next I laid plastic sheeting on the ground in preparation of installing the rebar grid. I then cut, placed and tied the rebar into a grid inside the form. The rebar was raised off the ground using plastic stands that may be found at the local home improvement store.

Note: Disposal of the fill dirt was a problem. Initially, I used the dirt to level low spots in my yard and flower beds. Eventually I ran out of locations to place the fill dirt. You should plan for this problem in advance. Moving the soil more than once can lengthen the overall effort.

Just prior to requesting a city inspection of the slab preparation work, approximately one inch of rain fell. This caused a small amount of soil to wash into the trenches. The trench depth was reduced to about 11 inches. I made the mistake of not worrying about the depth. When the inspector came, he said the plans dictate 12-inch trench depth (which it did). I would have to make them 12 inches before it would pass inspection. So I had to remove the rebar grid, dig out the trenches, and then reset the grid. The next day the city approved the slab pour.

The slab required approximately 2 yards of concrete. Since I have little experience working with concrete and the proper installation of the slab was critical to my project, I decided to contract out the concrete pour. On March 20, 2009 the slab was poured.



# LARGE ASTEROID PASSES DIRECTLY OVER HOUSTON: GOES RELATIVELY UNOBSERVED

By Paul D. Maley

An eclipse of a 6.8 magnitude star, the brightest star in all of 2009 to be occulted from Texas was largely unobserved in the Houston area. It is unfortunate that of the dozens of potential observers only 5 chose to go outside and watch; but those who did were treated to an abrupt 8 magnitude drop as the 14th magnitude minor planet closed in and blocked out the light from the star for between 3 and 7 seconds depending on where the observer was located. The attached graphic shows where the eclipse path actually occurred—centrally over Houston about 47 minutes past local sunset. The date was Wednesday, August 19, 2009 and the occultation time was 8:45pm.

The object performing the eclipse was the asteroid (240) Vanadis. This body rotates once every 10.6 hours. Positional data was analyzed by S.Preston from 1906 through July 2009 in order to create the prediction. At the time of occultation, Vanadis was situated at a very distant 287 million miles from Earth.

Complicating the observation were thunderstorms that cropped up in late afternoon. Clouds were slow to clear but did push north and out of much (but not all) the Houston area path. A few of us traveled more than one hour from the city in order to guarantee we would escape the cloud bank.

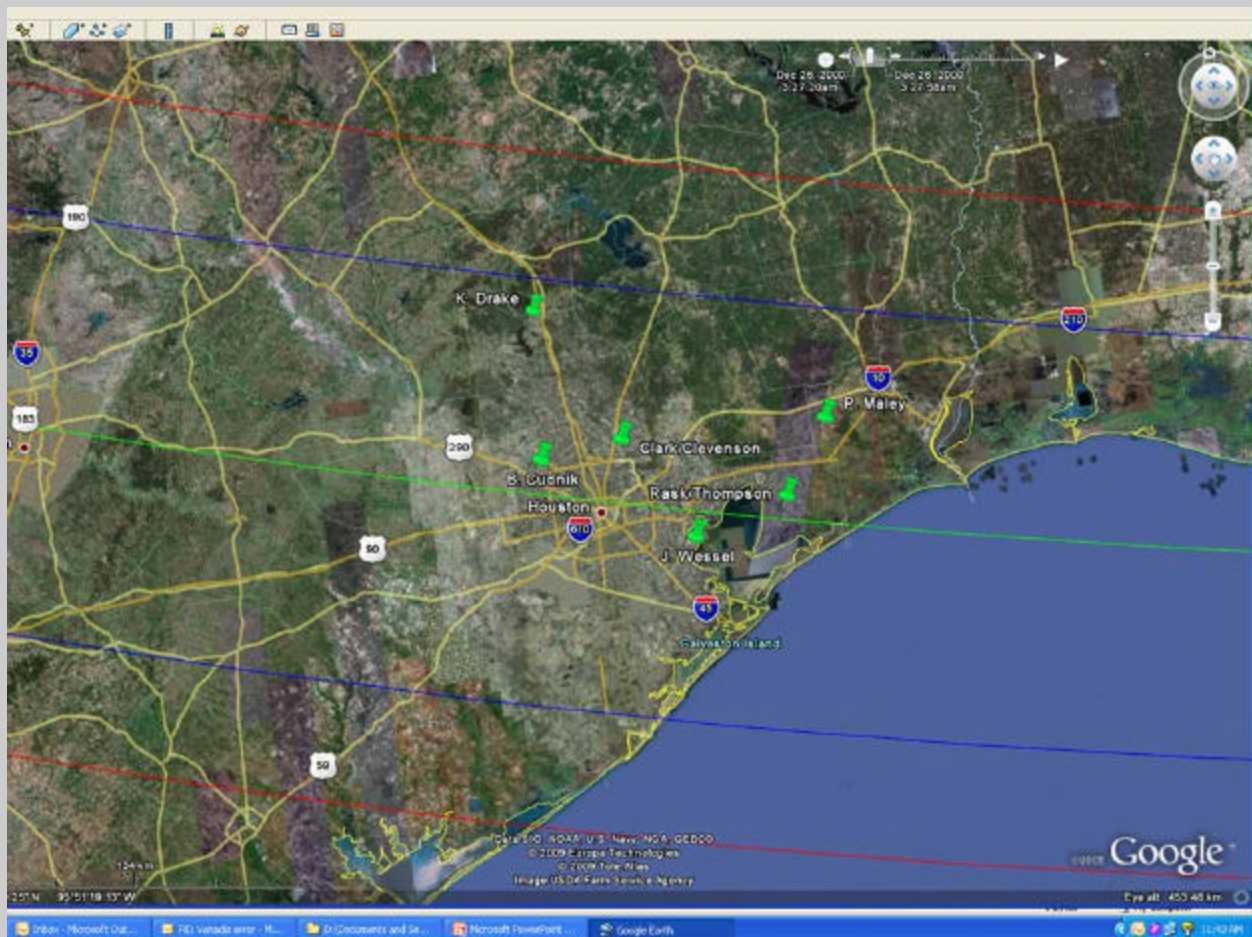


Figure 1. Map of southeast Texas showing the actual path (not the predicted path) of the occultation of a 6.8 magnitude star by (240) Vanadis on 8/19/09.

The upper limits of the actual path went over Lake Conroe (north edge) to as far south as Freeport (south edge). The path center crossed downtown Houston; anyone positioned at the true center would have seen the 6.8 magnitude star eclipsed for about 7 seconds. Successful observations were carried out by Jim Wessel, Doug Rask, Brian Cudnik (with some cloud), Ken Drake, Dave Clark (in Austin actually), Aaron Clevenson, and myself. Five chords were obtained along with two others in Florida (Richard Nugent from Houston was one). The resulting two dimensional profile of the asteroid is shown below.

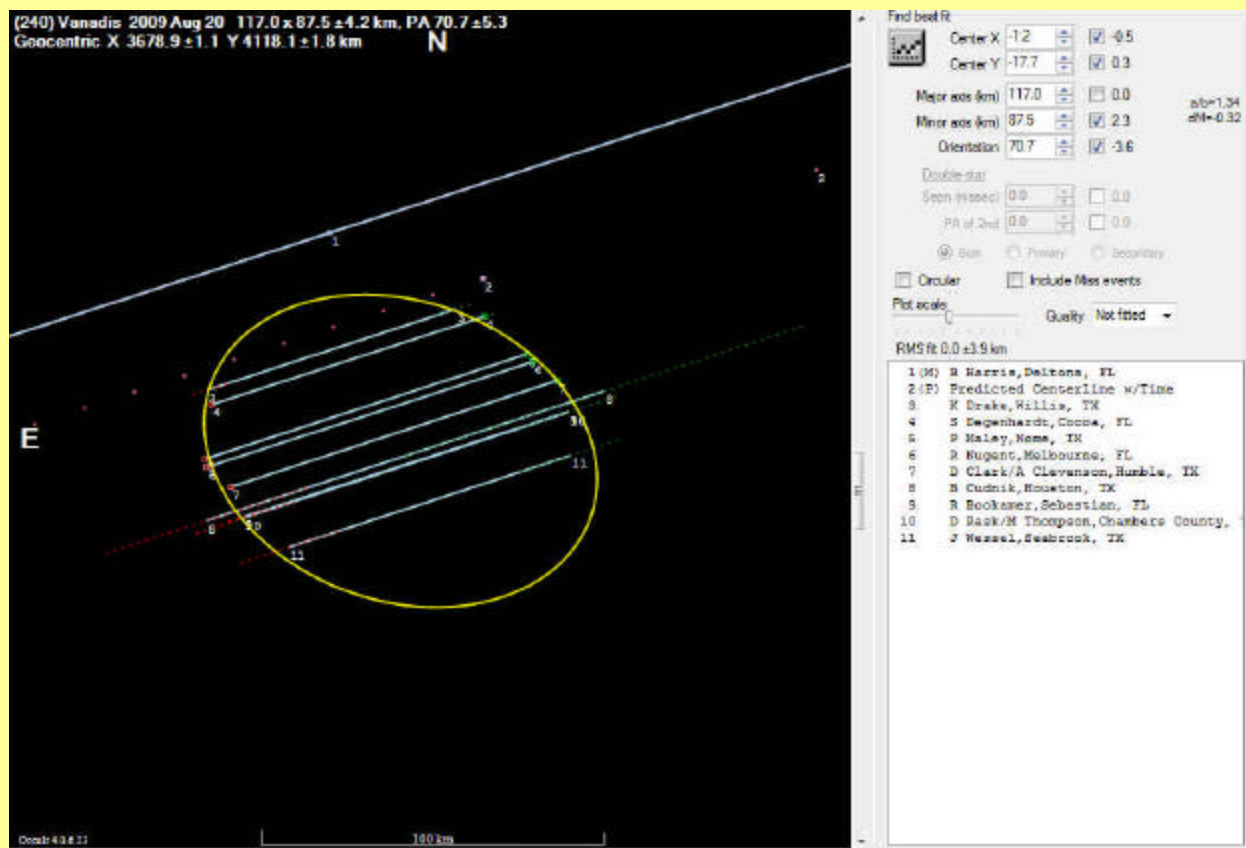


Figure 2. Reduction made using the OCCULT program performed by B. Timerson.

The profile above was assembled by Brad Timerson and shows an ellipsoidal fit of 117 x 88km. You may be able to spot small faint dashes extending from each chord line represent the raw timing. The solid white line is the fitted observation. In the small box you can see the legend identifying the chord number with the observer. The solid white line at the top was a 'miss' observation where the observer reported no occultation. The line with dots spaced far apart represents the predicted center line of the path.

If we had had observers across the area watching, we could have mapped quite accurately the entire shape of this minor planet. As it is we have only a very approximate idea of the silhouette created from linking the disappearance and reappearance times from each site. Vanadis is apparently irregular in shape. The uncorrected raw timings from the lower portion would make it seem that it is larger at the bottom than on the top.

The photometric light curve of Vanadis is shown on the following page. Prior to August 20 its assumed diameter was 120km.

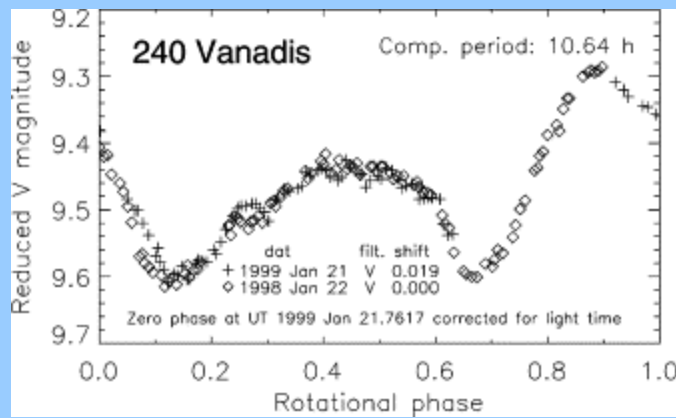


Figure 3. Photometric light curve constructed from data more than 10 years ago.

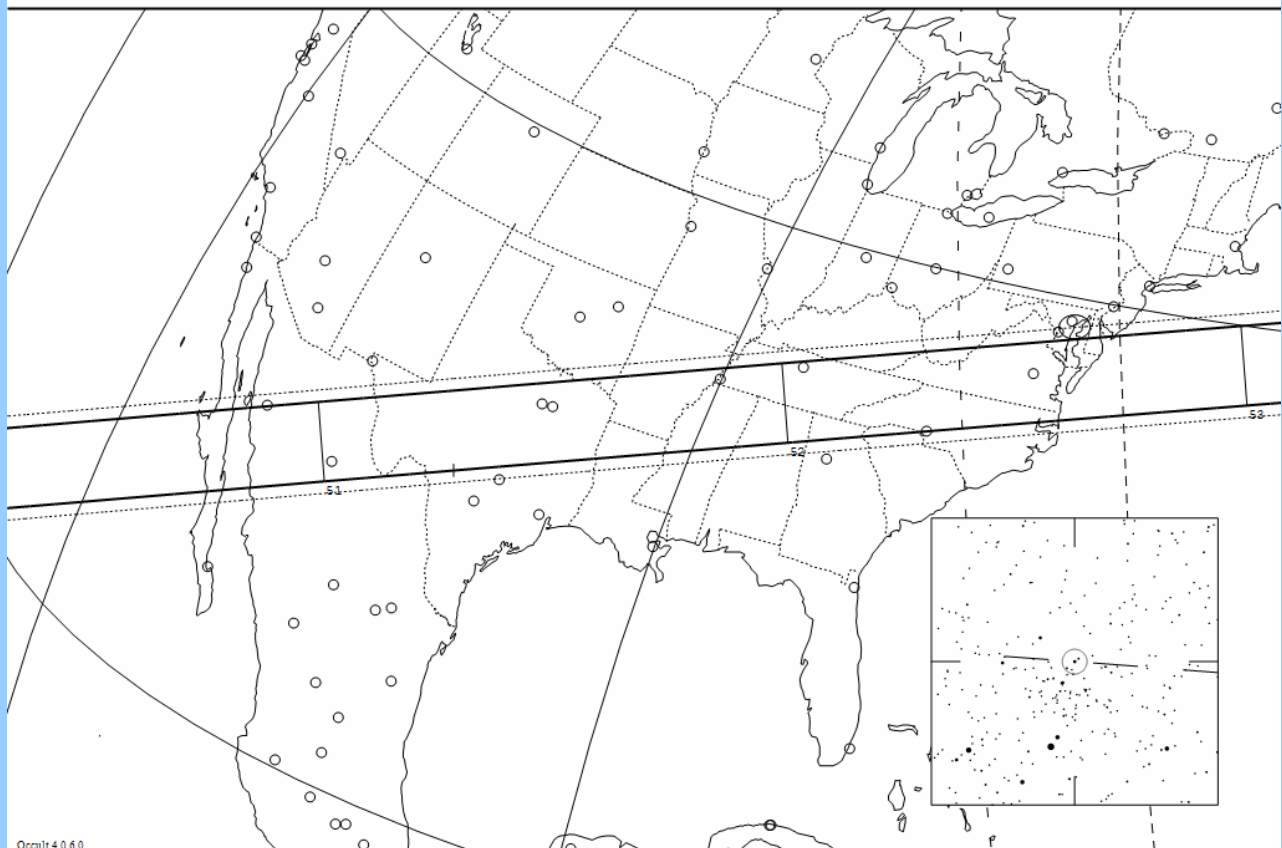
Most asteroid occultations involved stars between +10 and +12 magnitude. The rarity of a 6.8 magnitude star eclipse creates a wonderful opportunity for collecting valuable data. It is hoped that in the future when announcements are made of such events that we can obtain your help in observing and recording the times of disappearance and reappearance. It is one of the disciplines in astronomy where amateur observations can still make a valuable contribution to the structural knowledge of minor planets. While not as spectacular as this event, next year offers a couple of exciting opportunities for Texas: Saturday morning, August 21 occultation of an 8.5 magnitude star mainly over Dallas. See map below.

**16 Psyche occults HIP 22112 on 2010 Aug 21 from 9h 50m to 9h 58m UT**

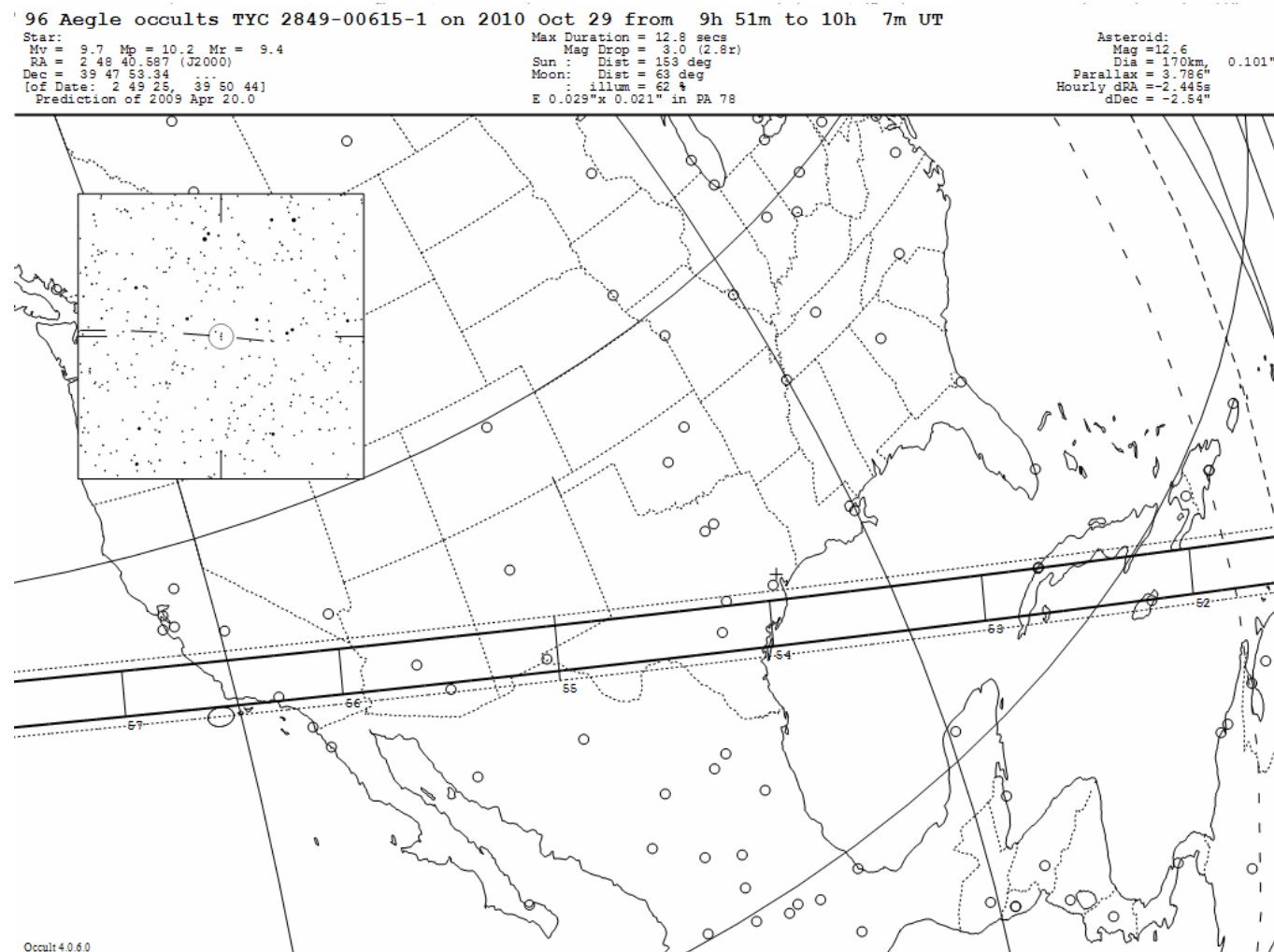
Star:  
 Mv = 8.5 Mp = 8.8 Mr = 8.3  
 RA = 4 45 34.698 (J2000)  
 Dec = 19 19 41.92  
 [of Date: 4 46 13, 19 20 54]  
 Prediction of 2009 Apr 20.0

Max Duration = 10.3 secs  
 Mag Drop = 2.7 (2.4x)  
 Sun: Dist = 76 deg  
 Moon: Dist = 140 deg  
 : illum = 90 %  
 E 0.026"x 0.020" in RA 89

Asteroid:  
 Mag = 11.1  
 Dia = 253km, 0.133"  
 Parallax = 3.350"  
 Hourly dRA = 3.281s  
 dDec = 3.48"



This is followed by an occultation Friday morning, October 29 of a 9.7 magnitude star whose north edge comes very close to Houston.



# What's a planet? Debate over Pluto rages on

Updated 8:15 a.m. EDT, Mon August 24, 2009

By A. Pawlowski (CNN)



This image taken by the Hubble Space Telescope shows Pluto and its moons. A spacecraft arrives at Pluto in 2015.



This montage of images taken by Voyager shows, from left to right Neptune, Uranus, Saturn and Jupiter.

It was three years ago Monday that the International Astronomical Union demoted Pluto from a planet to a dwarf planet, a decision that made jaws drop around the world.

An outcry followed, textbooks had to be rewritten, long-held beliefs were shattered, and many people felt our cosmic neighborhood just didn't seem the same with eight -- instead of nine -- planets in the solar system.

Today, debate still rages over how to classify the little celestial body, along with others orbiting the sun, but the IAU stands by its definition. "I think that most of the astronomical community has come to terms with the fact that we now know that the solar system has a continuous distribution of objects from very large down to very small," said Lars Lindberg Christensen, a spokesman for the [IAU](#).

"We now know that what we call the different objects has to necessarily change with time." Don't tell that to Plutophiles still seething about the decision. Some are even taking action.

Earlier this year, the Illinois Senate adopted a resolution declaring that Pluto was "unfairly downgraded" and restoring "full planetary status" to the celestial body as it "passes overhead through Illinois' night skies.". It also designated March 13, 2009, as "Pluto Day" in honor of the date that its discovery was announced in 1930. (In case you are wondering why the state is so passionate about Pluto: Clyde Tombaugh, who discovered the planet-now-dwarf-planet, was born in Illinois.) Meanwhile, New Mexico's House of Representatives proclaimed February 18, 2009, as "Pluto is a Planet in New Mexico Day" and praised Tombaugh, who worked in the state for decades and died there in 1997.

## Passionate about Pluto

Don't live in those states and want to make your voice heard? You can order "Plutophile" bumper stickers to proclaim your firm support for Pluto, print out a Pluto Fan Club card -- which allows you to declare, "In my heart, Pluto will always be a planet" -- or sign an online petition.

## What's Pluto like?

- Pluto's average distance from the sun is about 3.6 billions miles
- The temperature of Pluto may be about -375 °F
- Pluto is mostly brown
- It takes Pluto 248 Earth years to travel once around the Sun
- Pluto cannot be seen without a telescope
- Pluto's diameter is about 1,400 miles, smaller than Earth's moon

Source: World Book at NASA

Christensen said 90 percent of the critical e-mails and letters the IAU received after its decision in 2006 came from North America.

Astrophysicist Neil deGrasse Tyson, director of New York City's Hayden Planetarium and author of "The Pluto Files," believes there are two reasons why Americans are so engaged in the issue.

"Disney's dog Pluto was sketched the same year the cosmic object was discovered. And Pluto was discovered by an American. So here you have a recipe for Americans falling in love with a planet that really is just a tiny ice ball," Tyson told Time magazine.

Still, [astronomers](#) are divided about the best way to classify Pluto.

At the heart of the matter lies the question: What makes a planet in the solar system?

According to the IAU's definition, it must orbit the sun, it must be big enough for gravity to crush it into a nearly round shape, and it must clear the neighborhood around its orbit. In other words, it must be dominant enough to clear away objects in its orbital space, according to [NASA](#).

This last point is what proved to be Pluto's demise as a planet: There are other competing objects in its orbit.

### **Crowded solar system?**

Some scientists say that part of the definition doesn't make sense.

"It's kind of like, I'm going to tell you what your car is on the basis of how the traffic around you is behaving," said Mark Sykes, director of the [Planetary Science Institute](#).

The more logical way to classify planets is the geophysical definition, which simply states that planets are round objects that orbit the sun, Sykes argues. The objects must still be big enough so that gravity crushes them into a ball.

"The problem with the geophysical definition is we might have a couple of dozen planets in the solar system as more are discovered in the distant reaches," Sykes said.

He believes the International Astronomical Union's definition won't stick around after NASA spacecraft reach Pluto and Ceres, a Texas-size asteroid in an orbit between Mars and Jupiter that is now also classified as a dwarf planet.

"I think [the IAU's definition] is going to collapse by 2015 when the [Dawn](#) mission gets to Ceres and the [New Horizons](#) mission gets to Pluto because we're not going to see irregular-shaped, impact crater-filled, boring surfaces. We're going to see dynamic worlds," Sykes said.

The IAU's decision also came under fire because only 4 percent of its scientists participated in the vote that reclassified Pluto. But Christensen said the IAU was following its statutes and bylaws and has passed other resolutions in a similar way.

The subject of Pluto didn't come up at the IAU's general assembly earlier this month in Rio de Janeiro, Brazil, Christensen added.

Sykes countered that astronomers wanted to discuss the issue, just as they have at other recent major meetings, but the IAU didn't allow there to be any sessions on planet classification.

"I think the IAU did a terrible disservice to science, because it gives the public the impression that science is done by votes," Sykes said. "And that's not the way science is done at all."

## THE SEPTEMBER SKY

Hernan Contreras

Between the bright stars of the summer and the even brighter stars of the winter lie the seemingly more tranquil sky of September. Here we are looking away from the Milky Way. Now we look for the lesser known constellations. Some may say the September sky is for the birds and in a way, it is. The prominent constellations are Cygnus, the swan and Aquila, the eagle, flying parallel to each other but in opposite direction; the swan heading south for the winter and eagle heading north.

The brightest star in Aquila is Atair, one of the bright stars of the "Summer Triangle." Altair is a white, main sequence star only 16 light years away. It is about 1.5 times the size of our sun but much more luminous. It rotates so rapidly (6



hours vs. 25 days for our sun) that the star is distorted, oval shaped rather than round.

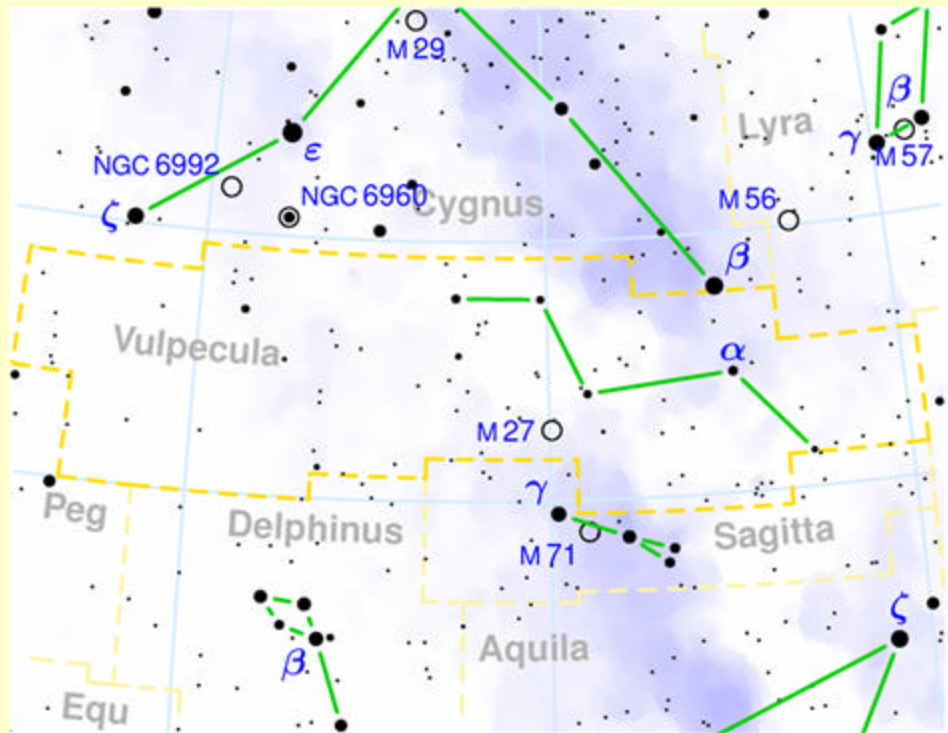
North of Aquila is Sagitta, the arrow, one the smallest constellations and southwest of Sagitta is the exquisite Delphinus, the dolphin. A careful look and you can almost see the mammal jumping out of the water in a graceful arc. Two of the stars in Delphinus are named Sulocin and Rotanev. First named in a catalog compiled in Palermo in 1814. The names remained a mystery until someone noticed that in reverse the names spelled Nicholas Venator, an astronomer at the Palermo Observatory! The most interesting thing about constellation Vulpecula, the fox, just north of Sagitta, and the reason I mention it here, is that it is the least interesting of all the constellations. It is appropriate that it should be last in an alphabetical list of constellations. It does contain a dumb celestial gem, the Dumbbell Nebula (M27).. In Cephus, the King, is the "Garnet Star," the reddest star visible to the naked eye.

### Mythology

Aquila, Zeus' pet eagle showed his gentler side when he carefully carried Ganymede to Mount Olympus to be the cup bearer to his master, however there is a ferocious dark side. Prometheus, a Titan god, stole a ray of the sun and gave it to mankind so they could have fire. Zeus did not believe man deserved the gift of fire and was furious at Prometheus for acting without permission. As punishment, he had Prometheus chained to the side of a mountain to be disemboweled by Aquila. Since the Titan was immortal, wounds would heal every evening only to be reopened the next day. Prometheus was finally rescued by Hercules, who shot the eagle with a poisoned arrow. Zeus placed the eagle and the arrow that killed in the sky.

## DEEP SKY

**M27** The Dumbbell Nebula, a planetary nebula. The central star is a white dwarf.



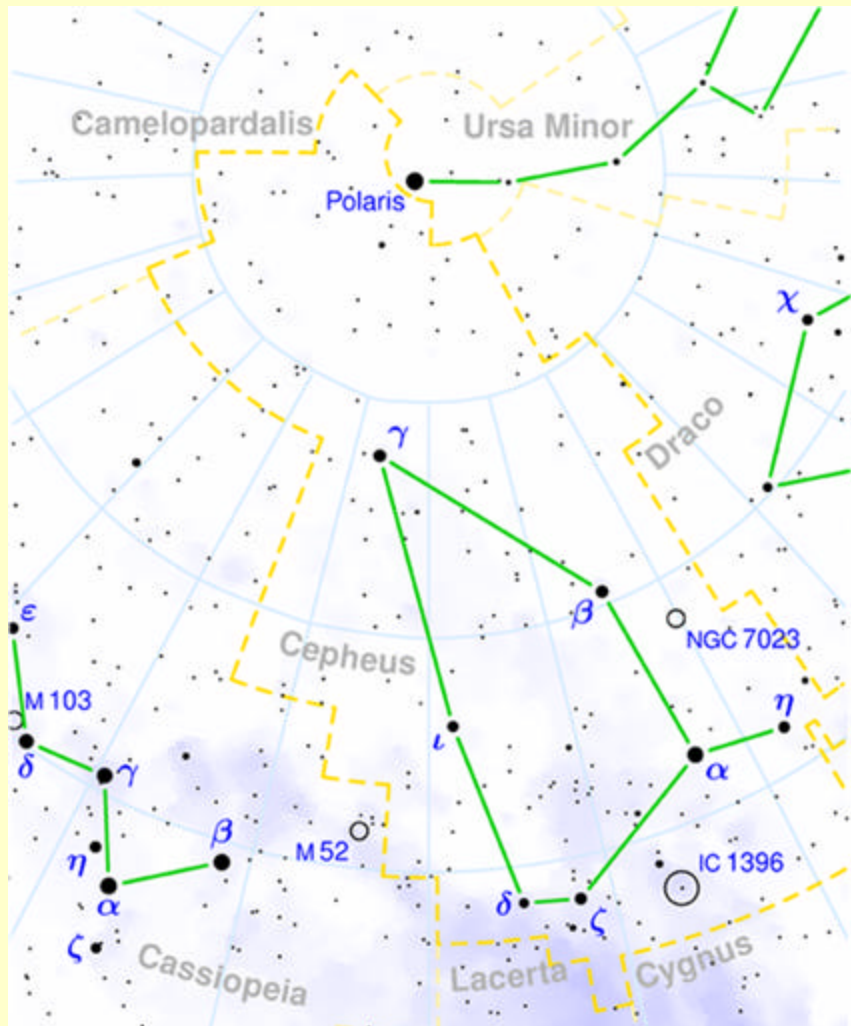
**Garnet Star** Mu Cephei, the reddest star visible by the naked eye. The Garnet Star varies nearly a magnitude with a semi-regular period of 800-1000 days.

## Solar System

Jupiter dominates the September sky. Saturn and Mercury are below the horizon. Mars rises a few hours before dawn and Venus is low in the eastern sky.

## September Events

The autumnal equinox will occur on September 22 at 5:22 PM Eastern Daylight Time.



Folks:

In times past, people that have wanted to take advantage of the club discount have had to write their check, put it in with the renewal slip, and then either mail it to me at my home or chase me down at a meeting. In most cases, within a week, I have sent out the renewal. Sometimes, and I don't really mind, the renewals have gone out at my expense for the postage. Without hesitation, question, or fail, it is not the most efficient means to maintain club subscriptions. So as secretary, I'd like to try something new...

You get all your stuff ready for the subscription, whether it be Astronomy or Sky & Telescope, you keep it - you hang on to it. Email (most reliable) or tell me when you see me that you want to take advantage of the club discount for either or both of these publications and that you need a supporting letter. What I'll do is get the letter together and email the "letter from the treasurer/secretary" back to you as a PDF. You print it off, and enclose it with your renewal. For this to work your computer must have Adobe Reader (which is free) and a means to print it. I would like this procedure to become the "Standard Operating Procedure" for Astronomy/S&T discounts through JSCAS. For those still not in the computer age, we can process things as we have in the past.

Clear skies,  
David Haviland



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CORNER!!!!**

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## Members' Gallery—SEPTEMBER 2009

Our cover photo, provided by Chuck Shaw...Xenon lights over Launch Pad 39A at NASA's Kennedy Space Center in Florida compete with the lightning strike seen to the left. Space shuttle Discovery is on the pad waiting for a scheduled launch on the STS-128 mission.

Launch was scrubbed due to the weather conditions that violated the limitations for liftoff. The next launch attempt is scheduled for 1:10 a.m. Aug. 26.

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Jupiter and 4 of the moons  
through a hockey stick...

Provided by Jeff Stone taken through is "hockey stick" telescope..that's right..

The moon through a hockey  
stick...

Also provided by Jeff Stone, using the same  
telescope and  
Al Kelley providing just a little "touch-up"



*Light pollution:*

*Any adverse effect of artificial light including sky glow, glare, light trespass, light clutter, decreased visibility at night, and energy waste.*

.Do you have a question about light pollution, protecting the night sky, or IDA's resources? **Get Help from IDA** <http://www.darksky.org/mc/page.do?sitePageId=56399>

Photograph © [Phil Hart](#)

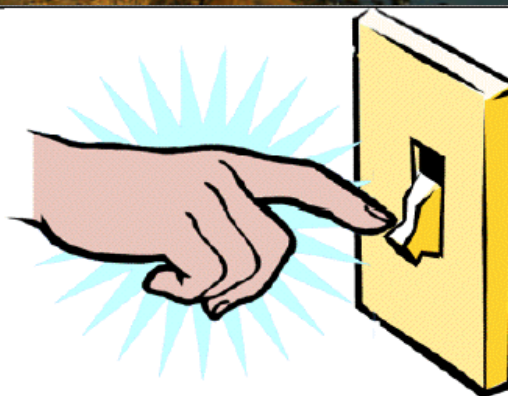


## Help turn off the lights...

Join the  
**International Dark-Sky Association (IDA)**

<http://www.darksky.org>

"To preserve and protect the nighttime environment and our heritage of dark skies through quality outdoor lighting."



### Brazosport Astronomy Club

Meets the Third Tuesday of the month, 7:45p.m.

At the Planetarium

400 College Drive

Clute, Texas (For more information, contact Judi James at the Planetarium 979-265-3376)

### Fort Bend Astronomy Club <http://www.fbac.org>

Meets the third Friday of the month, 7:00 p.m.

First Colony Conference Center

3232 Austin Pkwy

Sugarland, Texas

### Houston Astronomical Society <http://spacibm.rice.edu/~has>

Meets the first Friday of the month, 8:00 p.m.

University of Houston, University Park

Science and Research Building, Room 117

### North Houston Astronomy Club <http://www.astronomyclub.org>

Meets the fourth Friday of the month, 7:30 p.m.

In the Teaching Theatre at Kingwood College

20000 Kingwood Drive

Kingwood, Texas

### Galveston Stargazers

Meets the first Wednesday of the month At Home Cut Donuts, 6807 Stewart Rd, Galveston, TX

From 7PM to 9PM.

Contact: Jim Gilliam at [Jim.Gilliam@dars.state.tx.us](mailto:Jim.Gilliam@dars.state.tx.us) or

At (409)795-3620, M - F, 8AM to 5PM

**Houston**

**Area**

**Astronomy**

**Clubs**

## Starscan Submission Procedures

Original articles of some relation to astronomy will be accepted up to 6 p. m. (18:00 hrs) on the 25th of each month. THE most convenient way to submit articles or a Calendar of Events is by email and is preferred, but hard copies (CD, disk) are also accepted. All articles must include author's name and phone number. Also include any picture credits. Word, WordPerfect, and text files will be accepted. I have set up a special email account so that I can keep all of the Starscan articles, pictures, information, etc, separate from all of the other email I get. This makes it much easier to edit and set up the Starscan

Please send all submissions to:  
[conniesstarscanaccount@gmail.com](mailto:conniesstarscanaccount@gmail.com)

The author of individual articles bears all responsibility for publishing any e-mail addresses in the article on the World Wide Web

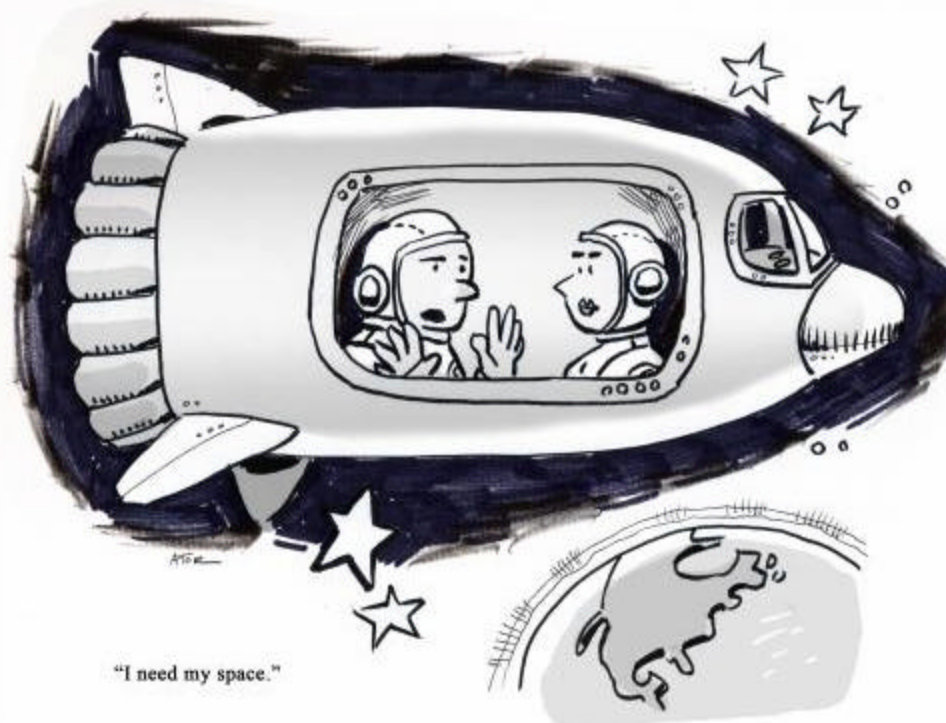
## Johnson Space Center Astronomical Society

### 2008-Club Officers

**President – David Haviland**  
**Vice President – Chris Randall**  
**Secretary – David Haviland**  
**Starscan Editor – Connie Haviland**  
**Star Party Chairperson –**  
**Librarian – Bob and Karen Taylor**  
**Historian – Chris Randall**  
**Scientific Expeditions – Paul Maley**  
**Web Master—Chris Randall**

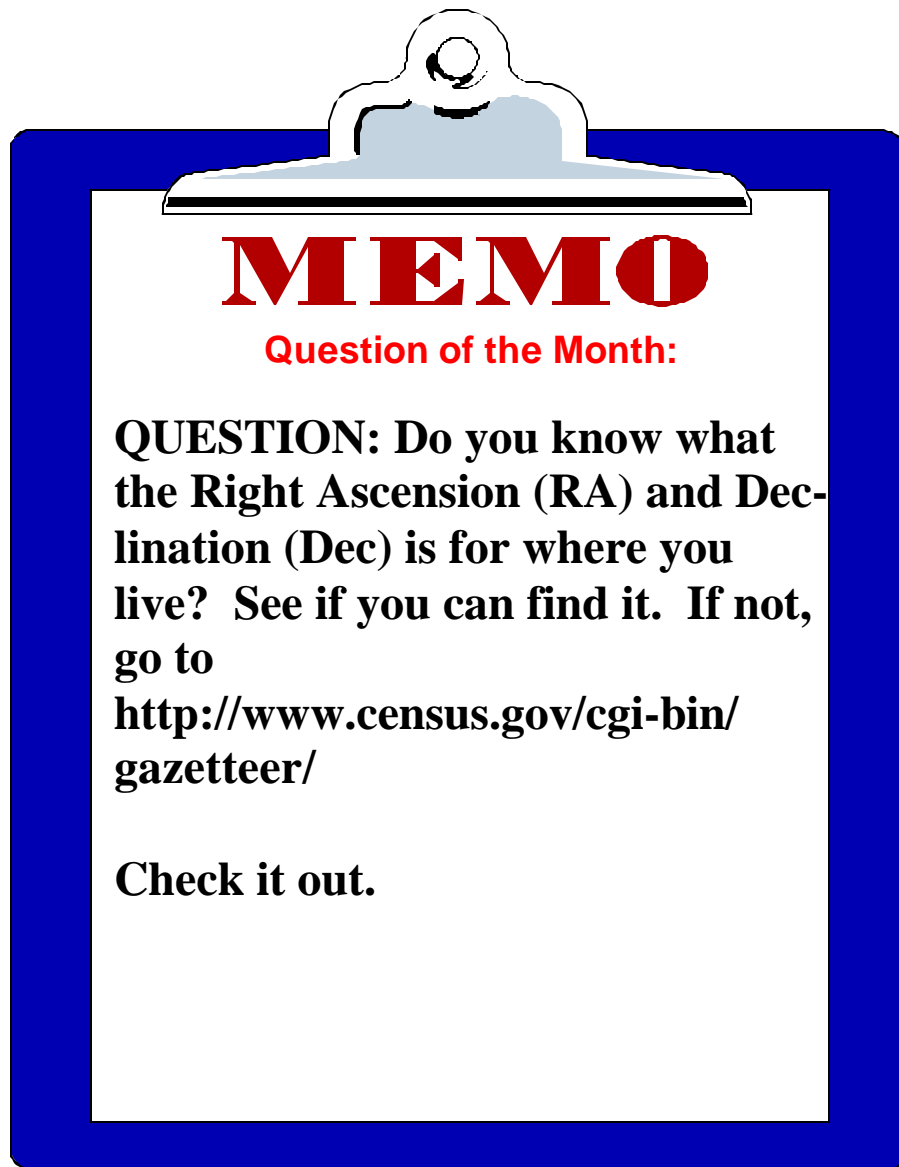
### SIGS

*Observing Awards – Triple Nickel*  
*Astronomy 101 – Triple Nickel*  
*CCD Imaging – Al Kelly*  
*Binocular Observing – “OPEN”*  
*Telescope Making – Bob Taylor*  
*Deep Sky Observing – Hernan Contreras*



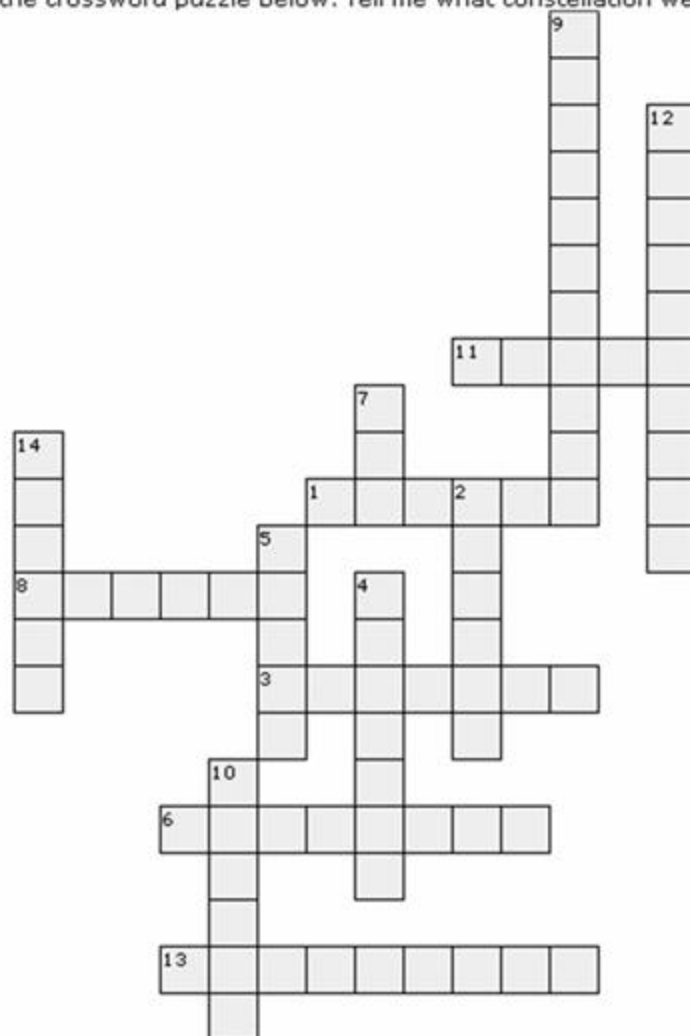
# Astronomy and Kids

This is the section strictly for kids (or kids at heart). We will be including information, stories, ideas, puzzles or anything that has to do with astronomy. The only difference here is, it will be directed for children. We don't discourage parents or any other adult to get involved. In fact, we encourage it strongly. So we hope you enjoy this section and if it touches a child's interest in astronomy, our goal has been achieved. Enjoy!!



# DO YOU KNOW YOUR CONSTELLATIONS ? PART 1

Please complete the crossword puzzle below. Tell me what constellation we are talking about.



## Across:

1. You will not find any Messier, but you will find Arcturus
3. You can find M29 & M39 here
6. If you want to find M13 or M92, go here
8. You will see M44 & M67
11. This has 10 Messier and 10 MESSIER, 1 is THE SOMBRERO GALAXY
13. You will find M31, M32 & M110 here

## Down:

2. You will find M1 and M45 here
4. If you want to see M15, go to this constellation
5. This constellation was seen in the movie Dragonheart, upside down
7. This constellation has M65, M66, M95, M96 & M105
9. This constellation has 15 Messier located here
10. This constellation has M35 in it
12. You will find M52 & M103 here
14. If I want to find M74, I go here

# LEARNING OUR CONSTELLATIONS





















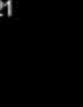








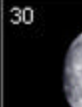
See if you can find the constellations and related words

X G J U L T G O M P I S C E S P P U B B Q E B M G P P P Y Q  
J H P G R J L T V I Y F F L C Q R Z G G A S O H U T F X B U  
A T F B P L N Y S P G S J E E Y M H A S K D F J U E P O U O  
Y N S S X Q O G T E F C R E C N A C B W B U T H L F H C C B  
D M I L A O I F X W M C F J X B Q X T L E S P O A E P A T C  
A E B V J E S P R W P C K G Q F U A N D Y K K X R A F R V Z  
J Q C P H D N I M Z A X N P P B T H I S R Q K C C Q G D J R  
T V C L P A E Z D C B R Y G X O M O A E R I U N F K R T I D  
K Y F W I A C E O V I R G O Q Q T H B M P L T S M J E L E W  
A T A C Q N S F M T K Z V A O Y A O M Z E O F E K H D N X N  
T Z C E Q P A L T W O Q B Y C Y L T X S B U I X S S N O L Q  
K W Q O T K T T G K P B G S A G I T T A R I U S Z V I C V U  
D A P J D I H G I P J D F L E O X G U W H A O F S D D J N V  
L G M U X N G Y P O K R E M M Y S N Z C A H J K Y A V J P X  
M Y F U F M I I S M N B O E M J D V O S B Z G P Q W C U P T  
Z X X M L L R M X C L H J H G R Q I K J L I R R R H D D K O  
B A N Z W Q T V F K Y I N J L V X G G E D C N A D B I P I K  
W W A A Q D X Z I N R W S W Z E I C K V F O O I A H N U S A  
X R T O D L U Q O F U O S S C L H U M Q Q R S Z C X M M U Y K U  
D C O V E W I A H L T H M Q H D Y M Q G N S L C R Y E D B T D  
J Y T J T M E X F L G O A K R A B X Y E W E S T U S A G E P B  
U F Y F L D O Y I U H V I S M F Q Y F E M K T S G T E N E G I  
L Z B E K S T R B F K D M L R G P I H F U W T O P N W F D W  
S U R U A T U F D X O X Q P J Z U P Q M J V S U B K Y B F L  
H R U T I H U N Q N D G D H Q L Z G H F W E W L Q J M U H E  
A C D S T X I G G P A H L S J I H P S S B Z G J D H Q A L C  
L N H L T E J P E Y F W S Y P U F B W U E H S V Y U G P C V  
O A J N U D Z U D M C N V I G V Z W C L B Q U G M M Q K K T  
T E L R X A P Q Z E H T N A A G O Y B K U U X G J Y J Z K Q  
H U C S M X B J L T Y I A G Z U H A S U X Z G D O E S Y O D

- ANDROMEDA
- CANCER
- CYGNUS
- GEMINI
- LEO
- PISCES
- TAURUS
- RIGHTASCENSION

- BOTES
- CASSIOPEIA
- DRACO
- HERCULES
- PEGASUS
- SAGITTARIUS
- VIRGO
- DECLINATION

## PHASES OF THE MOON FOR SEPTEMBER 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 	2 	3 	4 	5 
6 	7 	8 	9 	10 	11 	12 
13 	14 	15 	16 	17 	18 	19 
20 	21 	22 	23 	24 	25 	26 
27 	28 	29 	30 			

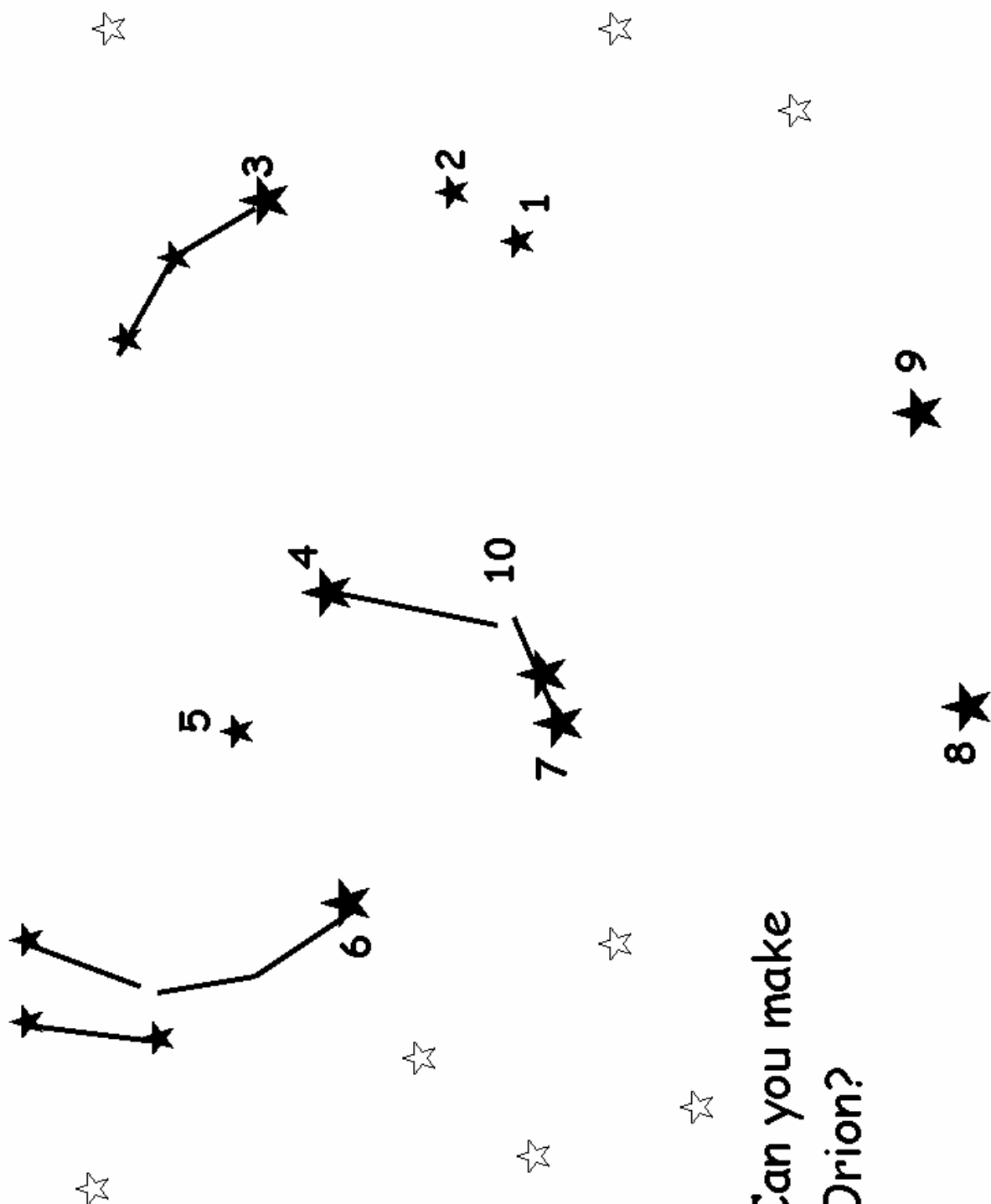
Moon calculations are based on your time zone. Check your computer time to ensure accuracy.  
(c) 2009 MoonConnection.com. All Rights Reserved. Please report unauthorized use.

## SUNRISE AND SUNSET FOR HOUSTON

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 Tw: 6:34am Sunrise: 6:59am Sunset: 7:44pm Tw: 8:09pm Moonrise: 6:04pm Moonset: 4:12am	2 Tw: 6:34am Sunrise: 6:59am Sunset: 7:43pm Tw: 8:07pm Moonrise: 6:39pm Moonset: 5:07am	3 Tw: 6:35am Sunrise: 6:59am Sunset: 7:42pm Tw: 8:05pm Moonrise: 7:05pm Moonset: 6:02am	4 Tw: 6:36am Sunrise: 7:00am Sunset: 7:41pm Tw: 8:05pm Moonrise: 7:34pm Moonset: 6:57am Full Moon: 10:03am	5 Tw: 6:36am Sunrise: 7:00am Sunset: 7:40pm Tw: 8:04pm Moonrise: 8:03pm Moonset: 7:52am
6 Tw: 6:37am Sunrise: 7:01am Sunset: 7:38pm Tw: 8:03pm Moonrise: 8:33pm Moonset: 8:40am	7 Tw: 6:37am Sunrise: 7:01am Sunset: 7:37pm Tw: 8:01pm Moonrise: 9:05pm Moonset: 9:46am	8 Tw: 6:38am Sunrise: 7:02am Sunset: 7:36pm Tw: 8:00pm Moonrise: 9:43pm Moonset: 10:47am	9 Tw: 6:38am Sunrise: 7:02am Sunset: 7:35pm Tw: 7:59pm Moonrise: 10:25pm Moonset: 11:50am	10 Tw: 6:39am Sunrise: 7:03am Sunset: 7:33pm Tw: 7:58pm Moonrise: 11:15pm Moonset: 12:54pm	11 Tw: 6:39am Sunrise: 7:03am Sunset: 7:32pm Tw: 7:56pm Moonrise: none Moonset: 1:57pm Last Qtr: 8:10pm	12 Tw: 6:40am Sunrise: 7:04am Sunset: 7:31pm Tw: 7:55pm Moonrise: 12:12am Moonset: 2:57pm
13 Tw: 6:41am Sunrise: 7:05am Sunset: 7:30pm Tw: 7:54pm Moonrise: 1:55am Moonset: 3:51pm	14 Tw: 6:41am Sunrise: 7:05am Sunset: 7:29pm Tw: 7:52pm Moonrise: 2:24am Moonset: 4:30pm	15 Tw: 6:42am Sunrise: 7:06am Sunset: 7:27pm Tw: 7:51pm Moonrise: 3:04am Moonset: 5:22pm	16 Tw: 6:42am Sunrise: 7:06am Sunset: 7:26pm Tw: 7:50pm Moonrise: 4:43am Moonset: 6:00pm	17 Tw: 6:43am Sunrise: 7:07am Sunset: 7:25pm Tw: 7:49pm Moonrise: 5:50am Moonset: 6:36pm	18 Tw: 6:43am Sunrise: 7:07am Sunset: 7:24pm Tw: 7:47pm Moonrise: 6:56am Moonset: 7:10pm New Moon: 12:49pm	19 Tw: 6:44am Sunrise: 7:08am Sunset: 7:22pm Tw: 7:46pm Moonrise: 8:01am Moonset: 7:44pm
20 Tw: 6:44am Sunrise: 7:08am Sunset: 7:21pm Tw: 7:45pm Moonrise: 9:06pm Moonset: 8:20pm	21 Tw: 6:45am Sunrise: 7:09am Sunset: 7:20pm Tw: 7:44pm Moonrise: 10:10am Moonset: 8:59pm	22 Tw: 6:45am Sunrise: 7:09am Sunset: 7:19pm Tw: 7:42pm Moonrise: 11:12am Moonset: 9:42pm	23 Tw: 6:46am Sunrise: 7:10am Sunset: 7:17pm Tw: 7:41pm Moonrise: 12:13pm Moonset: 10:29pm	24 Tw: 6:47am Sunrise: 7:10am Sunset: 7:16pm Tw: 7:40pm Moonrise: 1:00pm Moonset: 11:20pm	25 Tw: 6:47am Sunrise: 7:11am Sunset: 7:15pm Tw: 7:39pm Moonrise: 2:01pm Moonset: none First Qtr: 10:50pm	26 Tw: 6:48am Sunrise: 7:11am Sunset: 7:14pm Tw: 7:37pm Moonrise: 2:47pm Moonset: 12:13am
27 Tw: 6:49am Sunrise: 7:12am Sunset: 7:12pm Tw: 7:36pm Moonrise: 3:28pm Moonset: 1:08am	28 Tw: 6:49am Sunrise: 7:13am Sunset: 7:10pm Tw: 7:35pm Moonrise: 4:04pm Moonset: 2:04am	29 Tw: 6:49am Sunrise: 7:13am Sunset: 7:10pm Tw: 7:34pm Moonrise: 4:30pm Moonset: 2:59am	30 Tw: 6:50am Sunrise: 7:14am Sunset: 7:09pm Tw: 7:33pm Moonrise: 5:05pm Moonset: 3:53am			

Daylight Saving/Summer Time is in effect for the entire month.  
Courtesy of [www.sunriseandsunset.com](http://www.sunriseandsunset.com)  
Copyright © 2001-2006 Steve Edwards

Name \_\_\_\_\_  
Date \_\_\_\_\_



## About Constellations

### What's a constellation?

A constellation is a group of stars that appears to form a pattern or picture like Orion the Great Hunter, Leo the Lion, or Taurus the Bull. Constellations are easily recognizable patterns that help people orient themselves using the night sky. There are 88 “official” constellations.

### Are the stars in a constellation near each other?

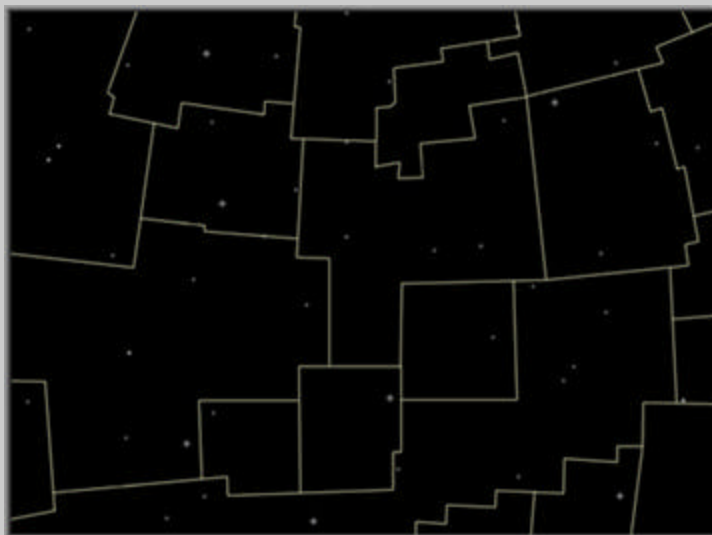
Not necessarily. Each constellation is a collection of stars that are distributed in space in three dimensions — the stars are all different distances from Earth. The stars in a constellation appear to be in the same plane because we are viewing them from very, very, far away. Stars vary greatly in size, distance from Earth, and temperature. Dimmer stars may be smaller, farther away, or cooler than brighter stars. By the same token, the brightest stars are not necessarily the closest. Of the stars in Cygnus, the swan, the faintest star is the closest and the brightest star is the farthest!

### How are constellations named?

Most of the constellation names we know came from the ancient Middle Eastern, Greek, and Roman cultures. They identified clusters of stars as gods, goddesses, animals, and objects of their stories. It is important to understand that these were not the only cultures populating the night sky with characters important to their lives. Cultures all over the world and throughout time — Native American, Asian, and African — have made pictures with those same stars. In some cases the constellations may have had ceremonial or religious significance. In other cases, the star groupings helped to mark the passage of time between planting and harvesting. There are 48 “ancient” constellations and they are the brightest groupings of stars — those observed easily by the unaided eye. There actually are 50 “ancient” constellations; astronomers divided one of the constellations (Argo) into 3 parts.

“Modern” constellations — like the Peacock, Telescope, and Giraffe — were identified by later astronomers of the 1500s, 1600s, and 1700s who used telescopes and who were able to observe the night sky in the southern hemisphere. These scientists “connected” the dimmer stars between the ancient constellations. There are 38 modern constellations.

In 1930 the International Astronomical Union officially listed 88 modern and ancient constellations (one of the ancient constellations was divided into 3 parts) and drew a boundary around each. The boundary edges meet, dividing the imaginary sphere — the celestial sphere — surrounding Earth into 88 pieces. Astronomers consider any star within a constellation boundary to be part of that constellation, even if it is not part of the actual picture.



## Are all stars part of a constellation?

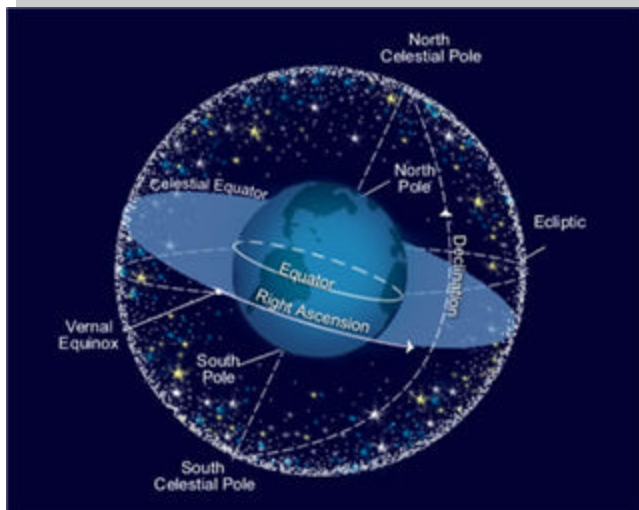
No, there are billions of stars, and only a fraction of them make up the shapes of our constellations — these are the stars that are easily seen with the unaided eye. Ancient observers connected these stars into the star pictures. All stars, however, fall within the boundaries of one of the 88 constellation regions. As astronomers studied the night sky with modern telescopes, they were able to discern stars in the dark spaces around the constellations — stars that were not part of the original star pictures. You can see some of these stars by observing the sky on a dark night. If you look at the sky with binoculars, you will see even more stars. If you have a telescope, you will see even more! All the stars you see belong to one special group of stars — the stars in our own galaxy, the Milky Way.

## How are stars and other objects in the sky named and located?

Hundreds of the brightest stars, those visible with the unaided eye, were given names in ancient times. These include Eltanin of Draco, the Dragon, and Vega in Lyra, the Lyre. Many of these stars have multiple names, having been observed by different cultures.

Today stars are named by their coordinates on the celestial sphere. This is an imaginary sphere surrounding Earth. Earth's north and south poles can be extended in space to this sphere, marking the north and south celestial poles, the poles around which the sphere spins. Polaris marks the intersection of the extended north pole and the sphere. Earth's equator, extended into space, intersects the sphere at the celestial equator, dividing it into northern and southern hemispheres. All stars and objects in space, such as constellations, can be mapped relative to the poles and equator of the celestial sphere. Their position north or south of the celestial equator — essentially their latitude — is called “declination.” Their position east or west essentially is their longitude, or right ascension, measured in hours, minutes, and seconds. On Earth, we measure our longitude east or west from Greenwich, England; right ascension on the celestial sphere is measured from the intersection of the ecliptic (plane of Earth's orbit) and the celestial equator.

There are numerous catalogs of stars, each with a different scheme for annotating position; this means that each star has even more names! One of the most famous catalogs from the 1800s, the Bonn Survey, divides the sky into  $1^\circ$ -wide bands of declination and numbers the stars from west to east using right ascension. In the Bonn Survey (“Bonner Durchmusterung”), Vega is “BD+38° 3238” — the 3238th star in the band between  $38^\circ$  and  $39^\circ$  north. Another catalog, the Smithsonian Astrophysical Observatory (SAO) catalog, integrated 10 catalogs to include the positions of over 250,000 stars. Vega is SAO 067174 in this catalog. The Hubble Space Telescope has allowed astronomers to see even more stars! The Hubble Space Telescope Guide Star



Catalogue currently lists the coordinates of over 19 million bright objects — 15 million of which are classified as stars!

Illustration of the components of the celestial sphere.

## Why Do Most Stars and Constellations Move?

The stars are distant objects. Their distances vary, but they are all very far away. Excluding our Sun, the nearest star, Proxima Centauri, is more than 4 light years away. As Earth spins on its axis, we, as Earth-bound observers, spin past this background of distant stars. As Earth spins, the stars appear to move across our night sky from east to west, for the same reason that our Sun appears to “rise” in the east and “set” in the west.

Stars close to the celestial poles, the imaginary points where Earth's north and south axes point in space, have a very small circle of spin. So if you find Polaris, Earth's north “pole star,” you will observe it move very, very, very little in the night sky. The farther from Polaris, the wider the circle the stars trace. Stars that make a

full circle around a celestial pole, like those in the Big and Little Dippers in the northern hemisphere, are called “circumpolar stars.” They stay in the night sky and do not set. At the equator, there are no circumpolar stars because the celestial poles are located at the horizon. All stars observed at the equator rise in the east and set in the west.

### Why Do We See Different Constellations During the Year?

If observed through the year, the constellations shift gradually to the west. This is caused by Earth’s orbit around our Sun. In the summer, viewers are looking in a different direction in space at night than they are during the winter.

Earth orbits our Sun once each year. Viewed from Earth, our Sun appears to trace a circular path. This path defines a plane called the plane of the ecliptic (or just the ecliptic). The zodiac is the group (or “belt”) of constellations that fall along the plane of the ecliptic. It is through these constellations that our Sun appears to “pass” during the year. While there are 12 *astrological* constellations of the zodiac, there are 13 *astromonomical* zodiac constellations: Capricornus, Aquarius, Pisces, Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, and Ophiuchus. The annual cycle of the zodiac was used by ancient cultures to determine the time of year.

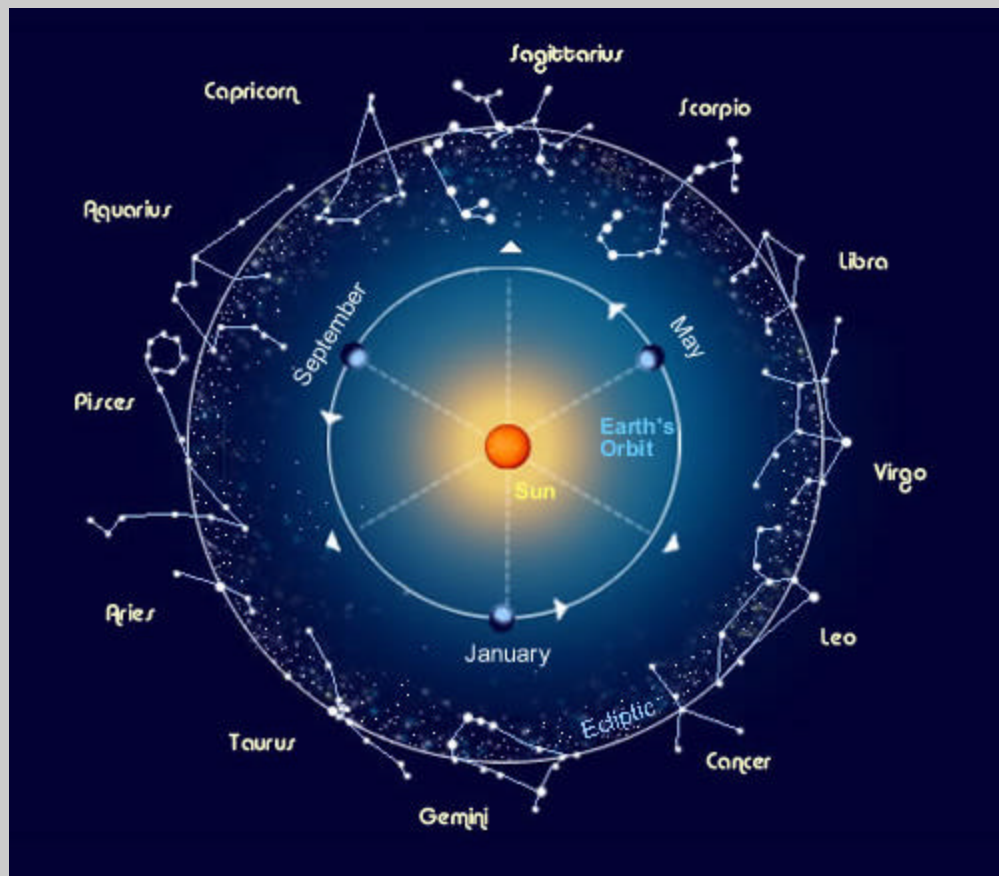


Illustration of the “zodiac band” with a few of the constellations depicting the objects they represent.

### What is the Zodiac?

Most of the planets (except Pluto) also have orbits that are very close to the ecliptic plane defined by Earth’s motion (within about 8 degrees above or below). If you include all the constellations encompassed by this broadened definition of the ecliptic plane, you have 21 to 24 constellations of the zodiac!

## Why Don't the Constellations Line Up with the Astrological Dates?

The astrological signs were identified and connected to the calendar about 2500 years ago. However, since that time, the timing of Earth's seasons has shifted. This is partly due to the fact that Earth wobbles a little like a top, making its axes point in different directions at different times. This is a predictable cycle of change over a period of about 23,000 years. Today the northern hemisphere winter solstice occurs during aphelion, when Earth is farthest from the Sun; about 6000 years ago, the *spring* equinox occurred during aphelion. Through time, then, the seasons have shifted with respect to the background of the zodiac constellations. Five thousand years ago, our Sun passed through Taurus during the spring equinox; today it is in Pisces at the start of spring. So if you ever wonder why your horoscope may be off a bit ... perhaps by several thousand years ... this shift may be the reason!

### An Interesting Tidbit



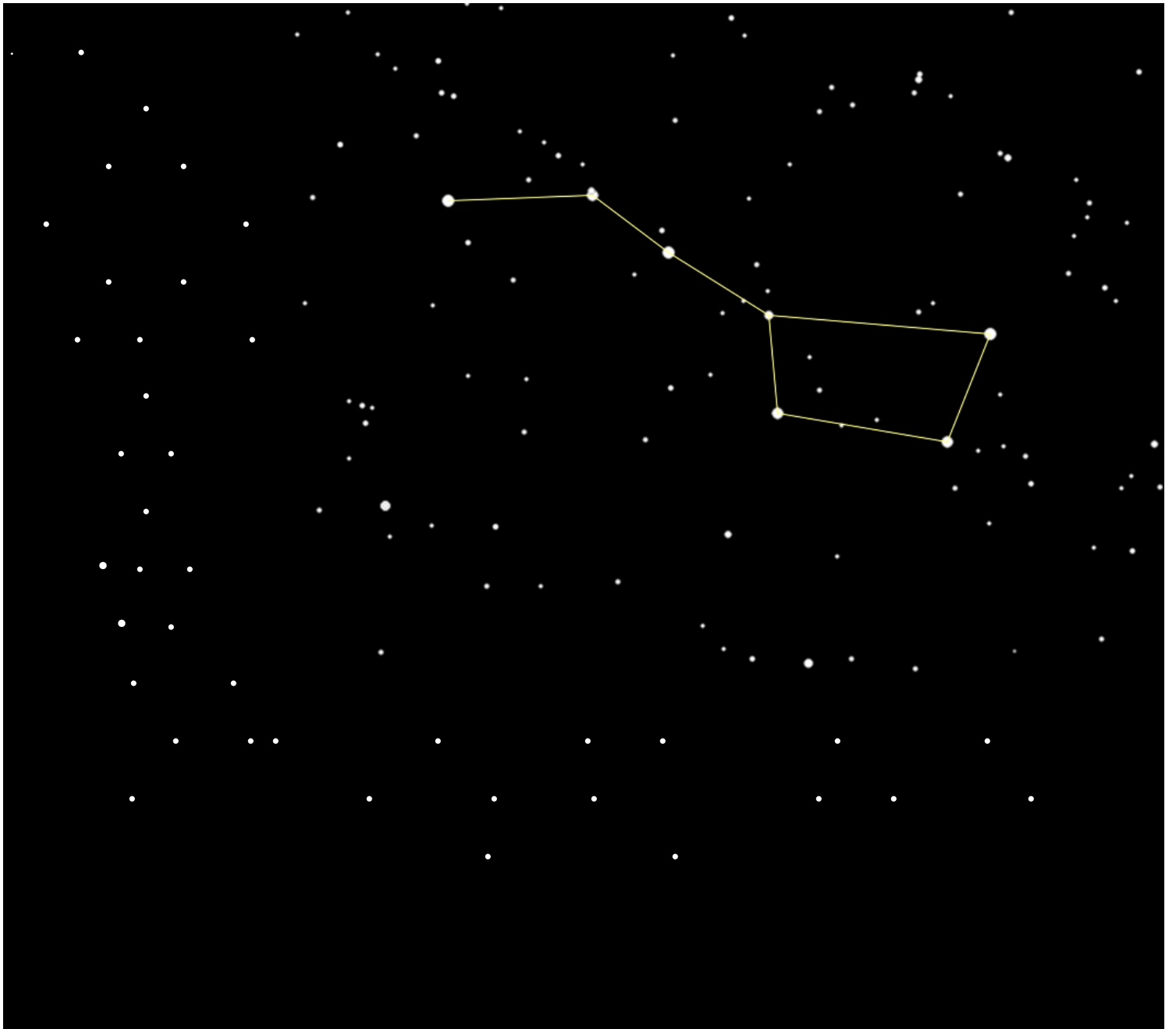
**The Big Dipper is not a constellation! It is part of Ursa Major, the Greater Bear.  
The Big Dipper is an asterism, a recognized, but not official, grouping of stars.  
Some asterisms fall within a single constellation, others cross constellations.**

Last updated  
May 21, 2007

[www.lpi.usra.edu/.../constellations/about.shtml](http://www.lpi.usra.edu/.../constellations/about.shtml)

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*Snoopy says, never stop looking  
up..reach for the stars and may you al-  
ways have clear skies!!!!*

