Starscan

Johnson Space Center
Astronomical Society

Volume 23, Number 9 September 2007

THE DOG DAYS OF SUMMER

SIRIUS (THE DOG STAR) AND MAJOR CANIS
(M41 CLOSE BY)

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Message from the el Presidente

Greetings!

I've noticed lately that the sun is starting to set noticeably earlier as August comes to an end. This means it's time to get those scopes out and give them a "once-over" before the cooler weather and longer nights get here. I packed up my 22" mirror this past week and shipped it off for recoating at Spectrum Coatings. I'll report on the results once I get the mirror back. I'm also upgrading my drive system to a servomotor setup recommended by our expert, Chuck Shaw. He even convinced me to get the wireless hand controller just incase I want to move the scope from 20' away. Actually, this will keep me from ripping cables out of the controller when slewing (yes, I've done this). It's also a good time to assess the condition of all the accessories that we drag along with us. I can't remember the last time I cleaned my eyepieces, so that's on my list, too.

Our scheduled Star Parties are set for the rest of the year and for those who come out to support these, THANKS!!! For information on these you can check our website or contact John Erickson. We need to set a high priority on the LPI Star Parties as we owe them a great deal for the use of our meeting place. At our next meeting I'll be passing the hat for donations to support Astronomy Day. We are also slated to bring about five door prizes. Books, pictures, astronomy related stuff…..you know the drill.

See ya at the next meeting!!

Bob Taylor
Prez.

Letter from the Editor

By Connie Haviland

Wow, I have to get back on track here, after being gone for a while. My trip was a blast, and I even squeezed in a little star-hopping (as much as a cruise ship, with a bunch of lights, would allow). John Cavuoti managed to find a small spot up on deck that didn't have much lights to mess up his viewing (our VP was looking, too), but this editor was not staying up that late. My days were filled with being the travel consultant for the Cavuoti-Haviland group and I needed my sleep. But we did make it a point to visit Kennedy Space Center and tried to catch the landing of Endeavour, on the digital camcorder. Unfortunately, it was too far east of us to catch it. The tour was really great and we are going back soon. So to the business at hand.

As the summer comes to an end, we look forward to clear skies and quality time with our scopes. Yes, they have missed us as much as we have missed them. So this month's edition is focused on the Dog Days of Summer and preparing us for what we can look forward to in the coming months. And check out Hernan's article; talk about a long year. Wow, that would be a long time to wait until your next vacation!!

There are some great observation recommendation from Chris this month. So check it out and don't forget to look at the star-party schedule. Take Chris' list and use it at the star party.

We also have a great article from Ken and Lisa at the Fort and even a book review from Lisa regarding national parks and star-gazing. This book was even a winner in the 2007 Media and Partnership Awards. I was doing some research on it and spotted a price (very reasonable, too).

Again, I want to thank those who have submitted articles, reports and even letters to the editor. Please feel free to comment and suggest any ideas that come to mind. I am more than happy to get anything from the club. I don't want to run out of main ideas for the newsletter.

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Letters to the Editor

Connie:

I recently submitted an article for the Starscan that contained a criticism of Halton Arp's idea that newly created matter has different spectra than the ancient matter we have here on earth that is used to calibrate the redshifts of quasars. I failed to credit the central idea of the piece (that new matter is constantly being created in accelerators) to Bill Leach of Kingwood College. I realized my error when he presented his talk a second time. Leach's talk starts with a very careful explanation of the concept of redshifts and then discusses the evidence relevant to Arp's ideas. The slide depicting the evidence from the accelerators is discussed so briefly that it is not clear without some thought how the identity of the subatomic particles depicted in the slide relates to the emission wavelengths from atoms that Arp is concerned with. My piece does explain this relation, but the really brilliant insight that new matter is created in the accelerators is due, as far as I know, to Bill Leach.

Charlie Hudson

Thank you Charlie. I don't know if Bill Leach reads our Starscan, but I will be happy to post your acknowledgement.

Connie Haviland

Connie, please post this to the Starscan:

Ok folks:

Here is the newly corrected list of our clubs history. Many thanks to Dennis Webb, Becky Ramotowski, Dick Miller, Hernan Contreras and Don Halter for filling in more details. However, we need more, if possible.

Time:	**President:**	**Vice President:**
2004-2007	Bob Taylor	David Haviland
2003-2004	Ed Malewitz	Ken Lester (2003): Bob Taylor (2004)
2001-2002	John Erickson	Lisa Judd (2001); Ed Malewitz (2002)
1997-1999	Hernan Contreras	Dick Miller
1996-1997	Becky Ramotowski	Ed Malewitz
1995-1997	Dennis Webb	David Portree (1994-1995) Becky Ramotowski (1995-1997)
1993-1995?	Dan Odom (1993?) --- Length of tenure? VP?	
1992?	Chuck Shaw (1992?) -- Length of tenure? VP?	
1991?	Eleta Malewitz (1991?) -- Length of tenure? VP?	
1986-1990??	Bill Williams -- Length of tenure? VP?	
1981-1986	Don Halter 1981-1986; --VP?	
????	Paul Maley; -- Length of tenure? VP?	

1967 – Club started? -- Who was the first president?

If anyone has any additional information, please submit it!!! From Presidents Eleta Malewitz through Dan Odom, were these single year office terms? Anyone know how long Bill William's tenure was? The above suggests 5 years, who was with him? Paul, do you remember how long your tenure was and who was with you at the time?

David
Veep.

There you go David… Connie Haviland

The Dog Days of Summer

Compiled by C. Haviland

Everyone knows that the “dog days of summer” occur during the hottest and muggiest part of the season. Webster defines “dog days” as...

1 : the period between early July and early September when the hot sultry weather of summer usually occurs in the northern hemisphere

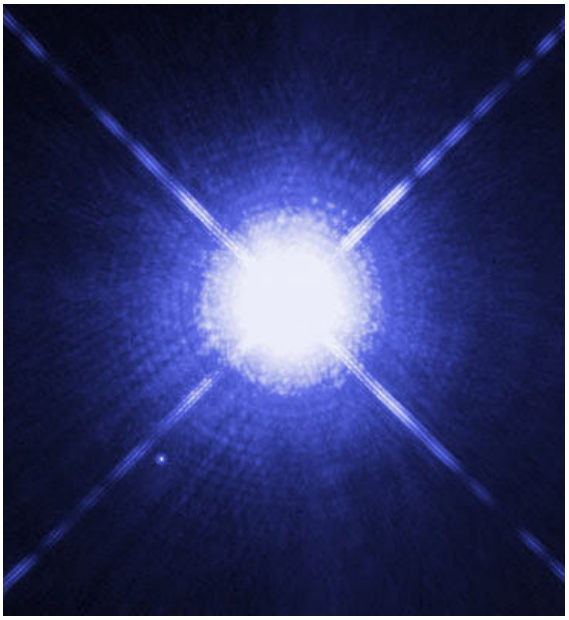
2 : a period of stagnation or inactivity

But where does the term come from? Why do we call the hot, sultry days of summer “dog days?”

In ancient times, when the night sky was unobscured by artificial lights and smog, different groups of peoples in different parts of the world drew images in the sky by “connecting the dots” of stars. The images drawn were dependent upon the culture: The Chinese saw different images than the Native Americans, who saw different pictures than the Europeans. These star pictures are now called constellations, and the constellations that are now mapped out in the sky come from our European ancestors.

They saw images of bears, (Ursa Major and Ursa Minor), twins, (Gemini), a bull, (Taurus), and others, including dogs, (Canis Major and Canis Minor).

The brightest of the stars in Canis Major (the big dog) is Sirius, which also happens to be the brightest star in the night sky. In fact, it is so bright that the ancient Romans thought that the earth received heat from it. Look for it in the southern sky (viewed from northern latitudes) during January.



Credited to the Hubble Gallery:http://hubblesite.org/gallery/album/entire_collection/pr2005036a/

In the summer, however, Sirius, the “dog star,” rises and sets with the sun. During late July Sirius is in conjunction with the sun, and the ancients believed that its heat added to the heat of the sun, creating a stretch of hot and sultry weather. They named this period of time, from 20 days before the conjunction to 20 days after, “dog days” after the dog star.

The conjunction of Sirius with the sun varies somewhat with latitude. And the “precession of the equinoxes” (a gradual drifting of the constellations over time) means that the constellations today are not in exactly the same place in the sky as they were in ancient Rome. Today, dog days occur during the period between July 3 and August 11. Although it is certainly the warmest period of the summer, the heat is not due to the added radiation from a far-away star, regardless of its brightness. No, the heat of summer is a direct result of the earth's tilt.

According to Wikipedia; the phrase **Dog Days** or **the dog days of summer** conjures up the hottest, most sultry days of summer. They are a phenomenon of the northern hemisphere where they usually fall between July and early September but the actual dates vary greatly from region to region, depending on latitude and climate. Dog Days can also define a time period or event that is very hot or stagnant.

The term "Dog Days" was coined by the ancient Romans, who called these days *caniculares dies* (days of the dogs) after Sirius (the "Dog Star"), the brightest star in the heavens besides the sun.

Popularly believed to be an evil time "when the seas boiled, wine turned sour, dogs grew mad, and all creatures became languid, causing to man burning fevers, hysterics, and phrensies" (from Brady’s *Clavis Calendarium*, 1813).

The Dog Days originally were the days when Sirius, the Dog Star, rose just before or at the same time as sunrise, which is no longer true owing to precession of the equinoxes. The ancients sacrificed a brown dog at the beginning of the Dog Days to appease the rage of Sirius, believing that that star was the cause of the hot, sultry weather.

The Old Farmer's Almanac lists the traditional timing of the Dog Days as the 40 days beginning July 3 and ending August 11, coinciding with the ancient heliacal (at sunrise) rising of the Dog Star, Sirius.

According to *The Book of Common Prayer* (1552), the "Dog Daies" begin on July 6 and end on August 17.

By contrast, "Dog Days" as defined herein do not occur at all in the southern hemisphere, for there even when the star is least favorably placed for viewing (around July 1), it still will be briefly visible from the southern hemisphere both in the east before dawn and again in the west after dusk. Throughout most of Antarctica Sirius is circumpolar; that is to say, constantly above the horizon.

In the northern hemisphere, the further north one goes, the longer Sirius remains invisible each year, and beyond a latitude of approximately 74°N (to the north of any part of mainland Europe or North America) the star never appears above the horizon at all.

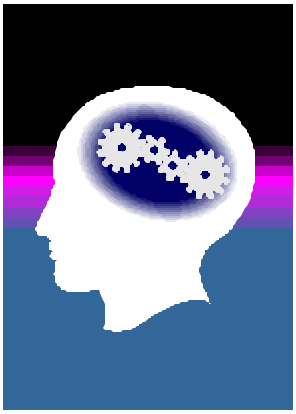
The period is called "Rötmånad" in Sweden and "Mätäkuu" in Finland, both literally meaning "rotting-month", due to the risk of foodstuff spoiling due to the high temperature.

For the ancient Egyptians, Sirius appeared just before the season of the Nile's flooding, so they used the star as a "watchdog" for that event. Since its rising also coincided with a time of extreme heat, the connection with hot, sultry weather was made for all time: "Dog Days bright and clear / indicate a happy year. / But when accompanied by rain, / for better times our hopes are vain."

The phrase is mentioned in the short story "The Bar Sinister" by Richard Harding Davis. The main character, who is a street dog, explains "but when the hot days come, I think they might remember that those are the dog days, and leave a little water outside in a trough, like they do for the horses."

In recent years, the phrase "Dog Days" or "Dog Days of Summer" have also found new meanings. The term has frequently been used in reference to the American stock market(s). Typically, summer is a very slow time for the stock market, and additionally, poorly performing stocks with little future potential are frequently known as "dogs." A casual survey will usually find that many people believe the phrase is in reference to the conspicuous laziness of domesticated dogs during the hottest days of the summer. When speaking of "Dog Days" there seems to be a connotation of lying or "dogging" around, or being "dog tired" on these hot and humid days. Although these meanings have nothing to do with the original source of the phrase, they may have been attached to the phrase in recent years due to common usage or misunderstanding of the origin of the phrase.

As we all know, Houston and surrounding areas deal with “our summers” much longer than most. I guess you could say, we are “dog tired” a little bit longer than the rest of the U.S.



Some time ago Hernan Contreras did a presentation about refracting telescopes before the invention of achromatic lenses. In order to avoid the problems of chromatic aberration, the telescopes were made very long. This made them exceedingly ungainly and hard to control in actual use. I undertook a simple mathematical analysis of the problem, expecting to find that the variation of focal length with refractive index would be inversely proportional to the focal length. I found the reverse; the variation of focal length with index of refraction is directly proportional to the focal length is directly proportional to the focal length. This follows from the *lens maker's equation*:

$$\frac{1}{f} = (n-1)\left(\frac{\mathbf{r}_2 - \mathbf{r}_1}{r_1 r_2}\right)$$

This is a fairly complicated equation. The lens has focal length f. The material the lens is made from has refractive index n (this depends on the color or wavelength, and it is this dependence that causes the problem of chromatic aberration). The distances from the center of curvature of each side of the lens to the curved surface are $\mathbf{r}_1$ and $\mathbf{r}_2$, with $\mathbf{r}_1$ referring to the surface nearer the object being imaged. The quantities $\mathbf{r}_1$ and $\mathbf{r}_2$ are printed in bold because they are vectors taken as positive when the center of curvature is on the opposite side of the lens from the object to be imaged and negative when the center of curvature is on the same side as the object to be imaged. The magnitudes of the radii of curvature in the denominator are not vectors and hence not in bold type. The variation of focal length with refractive index can be obtained by using calculus on this formula. As mentioned above, it shows direct proportion to the focal length.

That conclusion left me with no understanding of how long focal lengths helped with chromatic aberration. John Gordeuk gave a short talk about this that didn't make any sense to me. I finally found someone who could give me a somewhat sensible answer. He said that the magnification of the object to be imaged varied with wavelength. A feature of the object (Mars, let's say) not squarely in the center of the field will image in different places in different colors. This phenomenon, called *lateral chromatic aberration*, causes the position to be uncertain and a fuzzy image. The long focal lengths help (as Gordeuk had explained) by making the red and blue images so out of focus that they contributed less to the confusion about the position of the feature. The variation of focal length with wavelength that I had used calculus to investigate is a different phenomenon called *longitudinal chromatic aberration*, and is used to counteract the main problem of lateral chromatic aberration.

The problem I am left with is that the formula for magnification would seem to indicate to me that the magnification ought to be independent of wavelength for objective and eyepiece lenses made of the same material, relying again on the lens maker's equation:

$$M = \frac{f_o}{f_e}$$

Where M is the magnification, and f_o and f_e are the focal lengths of the of the objective and eyepiece, respectively. The answer pretty much has to be that this formula is valid only when the separation between the objective and the eyepiece is equal to the sum of their focal lengths individually, which is possible for only one color at a time. I considered presenting this to the club back when I was doing Charlie's Challenge at the meetings. The difficulty I ran into was that I didn't know how to do the illustration. I didn't know whether the red light (out of focus) image was inside or outside the green light image of maximum eye sensitivity. Similarly, I did not know where to place the blue image of a point away from the center of the field.

Charlie's Challenge #1: Can anyone help me out with this? I still don't know.

Charlie's Challenge #2: Who was the individual that finally explained the problem to me after I had asked many other people?

RESPONSE TO LAST MONTH'S CHALLENGE

Last month Charlie presented this challenge: ***What practical uses does polonium have? I do not know the answer to this question myself.***

1. Provided by David Haviland (courtesy of http://www.webelements.com/webelements/scholar/elements/polonium/uses.html)

Polonium
84
Po
[209]

Uses

The following uses for polonium are gathered from a number of sources as well as from anecdotal comments.

- mixed or alloyed with beryllium to provide a source of neutrons
- used for eliminating static charges in textile mills (ß-sources are more common and less dangerous)
- used on brushes for removing dust from photographic films
- thermoelectric power in space satellites
- source of neutrons

2. Provided by Hernan Contreras

There are two practical uses for polonium and which is more practical depends on your objective. Polonium is a very rare element and normally not found in nature, but it can be produced, most of it in Russia.

One of the proposed uses is to heat spaceships. Polonium, even in milligram quantities, will self heat to 500 degrees C. However it is very radioactive, so it could keep you warm and glowing.

The second practical use, and it has be used, is poison. Polonium is 250,000 times more poisonous than hydrogen cyanide. The main hazard is radioactivity that will destroy vital organs if ingested. This was the poison used to kill Alexander Litvinenko, the Russian dissident, in 2006. There was nothing medical science could do to counter the effects of the poison.

3. Provided by Al Kelly

I only know what Wikipedia tells me, that is it can be used to power RTGs radioisotope thermoelectric generators) and poison Russian dissidents (Litvinenko).

4. Provided by Aldora Louw
OK so now I had to go and see what I could find on the internet:

I found the following uses for polonium:

RTG's (As Al mentioned)
Used to eliminate static charges in textile mills
Used in brushes to remove dust from photographic film

It is also used as a source of radiation in research, so yes it is radioactive and therefore dangerous - a good enough reason for me to know to leave it alone.

5 . Provided by Don Halter: Poloniums main use today is in anti static devices. It is an alpha emmitter that discharges the build up of static ecectricity. All anti static devices have small amounts of polonium in them.

6. Provided by Andy Saulietis : It was used (in tiny quantities) to make anti-static lens brushes in our optics lab at NASA-JSC. Didn't work all that well in Houston's humidity. Don't know if they still make these.

Response from Charlie: That leads to the question of what a radioisotope thermoelectric generator is used for. The only use I know of for things like that is for a power source on space flights to the outer planets, where the sunlight is too dim to use photoelectric devices. My guess is that they are used in remote places for things like weather stations, ocean buoys, and pipeline pressure monitors.

My Treatment of Longitudinal Chromatic Aberration

By Charlie Hudson

According to the lens maker's formula (I sat in a bar and derived it one evening after I had moved to Galveston, having not thought about it for 15 years or so) the focal length of thin lenses of transparent materials bounded by spherical surfaces is given by:

$$f = \frac{1}{(n-1)\,(1/r_1 - 1/r_2)}$$

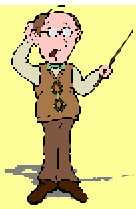
Where n is the refractive index of the material, and r_1 and r_2 are the radii of curvature of the lens surfaces. They are considered oppositely directed for biconcave and biconvex lenses, so for those lens types the difference in reciprocals of the radii becomes a sum of reciprocals. The derivative of focal length with wavelength is:

$$\frac{df}{dl} = \frac{df}{dn} \times \frac{dn}{dl}$$

Where l is the wavelength. For most transparent substances in the visible, dn/dl is a not particularly steep function of l related to the dispersion of the material.

$$\frac{df}{dn} = \frac{-1}{(n-1)^2\,(1/r_1 - 1/r_2)} = \frac{-f}{(n-1)}$$

In other words, if you change the focal length of a lens by varying the curvature of its surfaces but don't change the material, (so that n and dn/dl remain constant), then the variation of focal length with wavelength is proportional to the focal length.



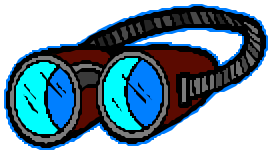
By Hernan Contreras

Astronomical Oddities—The Longest Year

While the Mayan calendar is complex and puzzling, it is no match to the Roman calendar especially if you consider the confusion factor. The Roman calendar had a total of 355 days divided into 12 months. To align the common year with the tropical year, the Romans would insert an "intercalary" month of 27 days sometime between February and March every two or three years. Of course the "intercalary" month was not inserted at the end of February but on the 23rd or the 24th day of the month essentially adding 22 or 23 days to the common year. Over a four-year period the Roman year averaged 366 ¼ days giving it an average drift of a little over a day every year. However the confusion doesn't end here. The *pontifex maximus*, an office normally held by a politician or a soldier, made the decision when and where to insert the intercalary. Of course, the decision was supposed to be based on observations to determine how to best align the solar year with the common year, but that was not always the case. Often political considerations took precedence over science. The unpredictability and the lateness of the announcement of the insertion of the intercalary month made it impossible to establish a date past February in advance. The calendar was particularly unpredictable during Julius Caesar's tenure as the *pontifex maximus* (63 BCE to 46 BCE) when only five intercalary months were added instead of eight. It seems that ordinary citizens had a better grasp of the situation and started calling this period the years of confusion.

It is somewhat ironic that Julius Caesar's abuse of the Roman calendar would lead to the reform calendar named after him. In 46 BCE, Julius Caesar installed the Julian calendar that was later tweaked to become the Gregorian calendar. The Julian calendar year consisted of 365 days divided into twelve months. A leap day was added to February every fourth year so that over a four-year period the Julian year averaged 365 ¼ days. However, since the Romans did not have the concept of zero they miscounted and added a leap day every 3rd year instead of every 4th year. No one noticed the error for 36 years. Augustus corrected the error around 10 BCE.

Even in establishing the reform calendar, Julius seemed a bit arbitrary. Besides inserting the regular intercalary month in February that would have made 46 BCE 378 days long, he added two more extraordinary intercalary months in November and December to make up for the ones he had failed to insert previously. The insertion of 3 intercalary months in one year made 46 BCE the longest year in recorded history with 445 days. No calendar, even the most primitive, has ever had a year this long.



FORT (Forward Observing Recon Team)

By Lisa and Ken Lester (special operations team)

REPORT FROM THE FORT—by Lisa Lester

Several weeks ago I received an email from Kaycie Sullivan. For those of you who don't recognize the name, Kaycie is the head of the Outdoor School at Texas Tech at Junction. Several years ago JSCAS helped Kaycie and her staff by getting a vendor to take back some inferior telescopes that Tech had purchased. After they purchased better scopes, we assisted in training their staff to operate the new scopes. Also, several club members traveled to Junction to put on a star party for the Junction elementary students when they were attending a program at the Outdoor School.

Kaycie asked if Ken and I would be willing to put on a star party for the teachers from Big Lake, Texas on Monday, August 20th. There would be about 85 teachers attending a two-day workshop and they'd requested a star party. We worked out the details and Ken and I agreed to do it. We drove to Junction and set up our 8 inch Dobsonian scope and our 16 inch truss tube scope.

While we were setting up, the teachers were listening to a cowboy poet around a campfire. As dusk settled around us, the teachers went on an owl walk then about 30 of the teachers arrived at the telescope field (an astro-turf putting green) just in time to spot the Hubble Space Telescope. None of the teachers taught astronomy and only two of the teachers had telescopes of their own but they were all very interested in observing and learning.

The Outdoor School had two brand new green laser pointers which Ken and I were happy to break in. We showed the teachers a number of constellations and asterisms throughout the evening. The teachers enjoyed looking at the Moon, Jupiter, and the Ring Nebula and comparing the images of these objects between the two telescopes. They also observed M13, Albireo, the double star in the handle of the Big Dipper, M7 and M22. The teachers were getting tired and had a busy schedule for Tuesday so we finished off the evening on a very appropriate note: observing the ISS with the Space Shuttle following behind it. Everyone clapped and cheered and wished the astronauts a safe landing!

As the teachers headed off to the bus, they were talking about what they'd observed and about their fellow teacher up in space. What a fitting ending to a JSCAS star party for teachers.

STARSCAN ARTICLE FROM THE FORT—by Ken Lester

This year's Perseid meteor shower promised to be a good one, with the peak occurring during a new moon. With such favorable conditions, it didn't take much to convince Lisa and me to observe this neat event.

We decided to do our observing from the fort's observing field (I still have trouble calling it the parade grounds). Those of you who attended the last Fort McKavett Star Party and came out to the ranch for burgers might think that the ranch would have been a better observing site because of the reduced light pollution.

We quickly rejected observing from the ranch for several reasons. Just like our friends in the Greater Houston Area, we have had lots and lots of rain this year. With all the rain, the vegetation has grown tall and wild. With the increase in vegetation, there is a huge increase in the insect population, including the dreaded mosquito! We correctly figured that the fort would have fewer insects.

Another consideration is the over abundance of slithering reptiles this year. We have been keeping the fort grounds mowed low which helps minimize the chances of encountering one of those bad boys in the middle of the night.

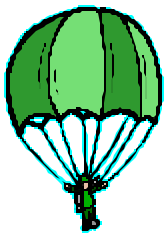
We arrived at the fort just after dark. We arranged our reclining lawn chairs facing east. Within about 10 minutes there were two really bright Earth grazers separated in time by just a few minutes that streaked in from the northeast. A quick re-orientation of the chairs aligned us with the rest of the night's activities. The meteor shower started out slow, with a fairly bright zinger every 10 to 15 minutes or so. Most had long ion trails, which quickly dissipated.

By midnight, the frequency of the meteors was increasing. By 12:30 it was starting to get good, with zingers coming every few minutes. However, knowing I had to open up the fort at 8 am the next morning, we reluctantly called it quits.

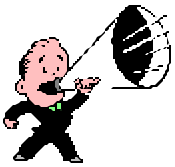
At work the following day, I talked to 2 ranchers who happened to comment on all the shooting stars the previous night. They didn't plan to go out observing shooting stars, they just happened to be outside looking up. Both talked at length about what they saw.

Even though I had to call it quits early, I really enjoyed sitting out under the stars at the fort. It was so peaceful. There were all kinds of subtle noises to be heard. We even heard an owl in flight although we never saw it. There were thin clouds all around the horizon, making for fuzzy stars until you looked above about 30 degrees. Even though it had been hot during the day, it cooled off quite nicely. There was just the slightest of breezes. The occasional lightning bug made for some "false sightings" followed by some embarrassing laughter.

I am sure looking forward to seeing all our JSCAS friends at the October star party!



Need volunteers



What's Happening at the George!!!

Cynthia Gustava

School's back in session and that means the George will be seeing busy Friday nights again.

Bookings for the month of September are as follows. Houston amateur astronomers with telescopes and laser pointers are needed to show night sky objects and help the kids identify constellations.

September 7 – 7:30 p.m. – Aerospace Overnight
September 14 – 7:30 p.m. – Girl Scout Sky Search
September 28 – 8:00 p.m. – Rubicon Academy

Special Event on Sunday, September 2:

The Scottish Space School is a long-time visitor to the George Observatory, coming out a couple times each year to stargaze. September 2 is their next event and they usually treat the volunteers to dinner between 6:00 and 7:00 p.m. Viewing starts at 8:00 and runs until 10:00 p.m.

If you are interested in helping out any of these nights or need more information, send an email to me at cynm31@comcast.net …

Clear skies!

SEPTEMBER OBSERVING

★ **SSO**: (Solar System Objects) Summary for the 15 Sep 07

Object	Const	Mag	% Ill	Rise Time	Transit	Set Time
Sun	Leo	-26.7	100	07:05	13:15	19:25
Moon	Lib	----	18	10:44	16:06	21:28
Mercury	LVir	-0.1	77	08:53	14:38	20:28
Venus	Cnc	-4.5	20	04:31	10:56	17:21
Mars	Tau	0.1	86	00:19	07:16	14:13
Jupiter	Oph	-2.1	99	13:16	18:25	23:39
Saturn	Leo	0.9	100	05:30	12:00	18:29
Uranus	Aqr	5.7	100	19:09	00:56	06:44
Neptune	Cap	7.8	100	17:44	23:14	04:41
Pluto	Sgr	14.0	99	14:04	19:30	00:53

Highlighted times denote daylight events.

Lunar phases for September 07

Third	New	First	Full
03rd 21:32	11th 07:44	19th 11:48	26th 14:45

Central Daylight Time

BSO: (Bright Sky Objects)

NGC 7078 (M 15) - Globular Cluster in Pegasus, Magnitude 6.3 Size 18.0'.
NGC 7099 (M 30) - Globular Cluster in Capricornus, Magnitude 6.9 Size 12.0'.
NGC 6934 (C 47) - Globular Cluster in Delphinus, Magnitude 8.9 Size 7'.
NGC 6981 (M 72) - Globular Cluster in Aquarius, Magnitude 9.2 Size 6.6'.

DSO: (Dark Sky Objects)

NGC 7023 (C 4) – Bright Nebula in Cepheus, Magnitude 6.8 Size 14' x 14'.
NGC 7009 (C 55, Saturn Nebula) – Planetary Nebula in Aquarius, Magnitude 8.3 Size 44" x 23".
NGC 7027 – Planetary Nebula in Cygnus, Magnitude 10.4 Size 60".
NGC 7006 (C 42) - Globular Cluster in Delphinus, Magnitude 10.6 Size 3.6'.

CDMP: (Chris' Don't Miss Pick)

NGC 7089 (M 2) - Globular Cluster in Aquarius, Magnitude 6.6 Size 16.0'.

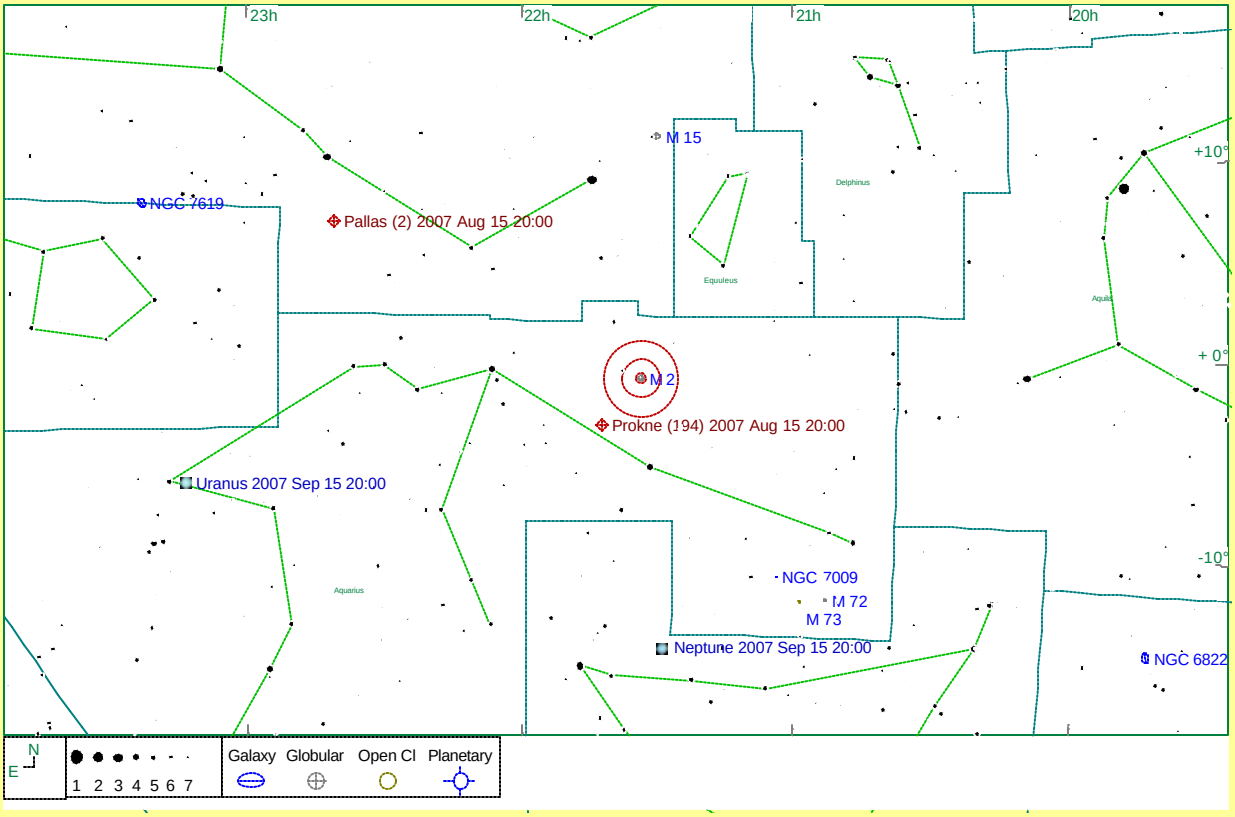
It was discovered by Jean-Dominique Maraldi on September 11, 1746. Charles Messier independently rediscovered and cataloged it exactly 14 years later, on September 11, 1760, as a "nebula without stars." William Herschel was the first to resolve it into stars.
M2 has a diameter of about 175 light-years, contains about 150,000 stars, and is one of the richer and more compact globular clusters, as its classification in density class II indicates. At about 37,500 light years (according to W.E. Harris' database), it lies well beyond the Galactic Center. Visually it is of apparent magnitude 6.5 and about 6 to 8 minutes of arc in diameter, with a bright, compressed central region of about 5'. On typical photographs it can be traced to about 12.9 arc minutes, and deep photos reveal that it extends out to a diameter of 16.0 arc minutes.

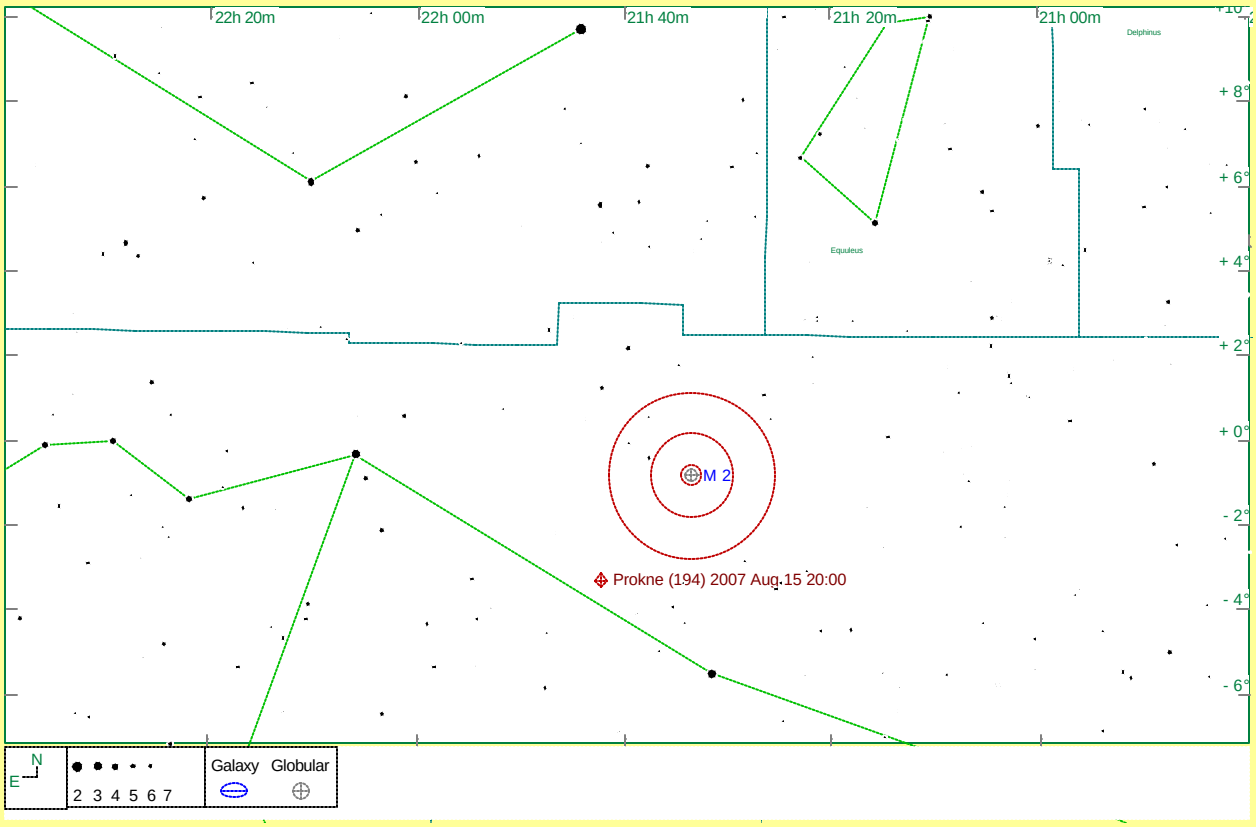
M2's brightest stars are red and yellow giants of magnitude 13.1, while its horizontal branch stars have an apparent brightness of 16.1. The cluster's overall spectral type has been given with F0, its color index as -0.06; modern values are spectral type F4, B-V = 0.66.

From its color-magnitude diagram, Halton Arp (1962) has estimated the age of M2 as about 13 billion years and to be about the same as that of globular clusters M3 and M5. M2 is approaching us at the low velocity of 5.3 km/sec. Situated in the Galactic halo, it has been classified as an "H2" halo globular by Woltjer (1975) and Nincovic (1983); the latter estimating its orbital eccentricity at 0.60.

With its visual magnitude of 6.5 mag, M2 is a difficult object for naked-eye observing, but an easy target for the slightest optical aids like binoculars or opera glasses, in particular as it is situated in a star-poor field. A four-inch obstruction-free telescope doesn't resolve this cluster, but only shows some of the brightest member stars spread over the mottled nebulous background image caused by the unresolved stars. With an 8-inch, this globular cluster is partly resolved into stars, well into the center under good viewing conditions. Larger scopes, 10-inch up, are required to fully resolve this cluster. A peculiar dark lane crosses the north-east edge of the cluster, suggestions of which are visible in our image; larger telescopes (16-inch up) show several other, less prominent darker features or regions.

For this and more information go to http://seds.org/





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Star Party Dates—2007

By John Erickson

September 8, 2007 Haak Winery

September 15, 2007 Moody Gardens

October 11 – 14, 2007 Fort McKavett

October 19, 2007 All Clubs Meeting

October 20, 2007 Astronomy Day at the George Observatory

November 10, 2007 Haak Winery

PLANS FOR THE GREAT SPRING GRAZING OCCULTATION OF EPSILON CANCRI

By Paul Maley
International Occultation Timing Association (IOTA)

FIRST ANNOUNCEMENT AUGUST, 2007

It has been 25 years since a grazing lunar occultation of a reasonably bright star last crossed right through the middle of Houston. A grazing occultation is an eclipse of a star by the moon at either the north or South Pole of the moon as the star seems to be tangentially 'clipped' by the moon in its slow motion around the earth. In 1973 a graze of a Pleiades star was seen and timed by many observers from the Rice University campus. The next big event occurs on SATURDAY **NIGHT, May 10, 2008 at 1006pm, as a 6.3 magnitude star will graze the darkened north polar edge of the 38% waxing moon.** The moon will be located 44 degrees elevation above the western horizon at that time. The path runs northwest to southeast from Tomball, through Houston, Pasadena, Seabrook, San Leon, and Galveston Island (Bolivar side). Arguably, the best zone for watching the star disappear and reappear is between -0.1 and 2.0km south of the graze center. The name of the target is **Epsilon Cancri**, the 5th brightest star in the constellation of Cancer. We hope to field a large observer team for this very important event and for once, even a small telescope can be employed to observe this interesting lunar phenomenon.

The purpose of watching and timing the star as it disappears and reappears from behind invisible mountains is to determine the absolute heights of lunar mountains and the depth of valleys between them. It is a fun and scientifically valuable adventure. The object is to use a small 3-inch (75mm) or larger aperture telescope preferable (but not mandatory) to have a motor drive so you can keep your hands free, to call out as the star disappears (call out 'D') and then returns ('R'). One would normally use a tape recorder to record your voice and time signals or if you have a sensitive video camera that can record 6th magnitude stars through a telescope, that is event better. The star may disappear and reappear once or several times. Each person will see something completely unique from every other person. The additive combination of all timings from sites placed 50 feet apart will enable us to map these features with considerable accuracy. You will be watching for a 6 minute period starting at 1002pm and ending at 1008pm.

My goal is to have no more than 2 people stationed 50 feet apart with a 3-inch telescope or larger, portable tape recorder or a video system that will record it. The tape recorder must record continuously and not be voice activated. It needs to be a standard micro cassette recorder. One person acts as the observer, the other as the assistant. In addition you will need a shortwave time signal receiver. These can be found at places like Radio Shack and we recommend one that is digitally tuned; for those who do not have them we intend to rebroadcast time signals on an FM frequency. So, please bring either a high quality FM portable radio with fresh batteries or consider using your car radio. At this point it is not clear if cars will be allowed onto the golf course area so finding a portable FM receiver may be the best solution. The frequency to receive time signals will be provided about a month before the occultation on the web page http://www.eclipsetours.com/events . This astronomical event is so easy, anyone can do it and hence, it makes a good educational opportunity to get new people involved.

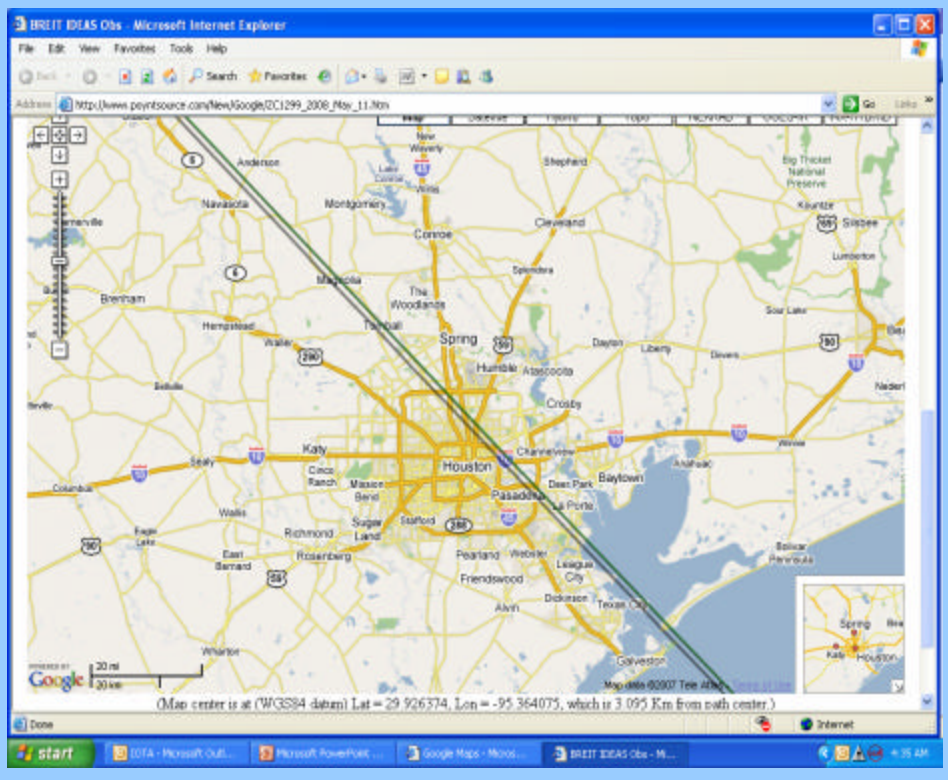


Figure 1. The path as it goes over the Houston area. The observation zone lies ONLY between the parallel black lines. South and west of the lines a total occultation can be seen. North and east of the lines no occultation occurs.

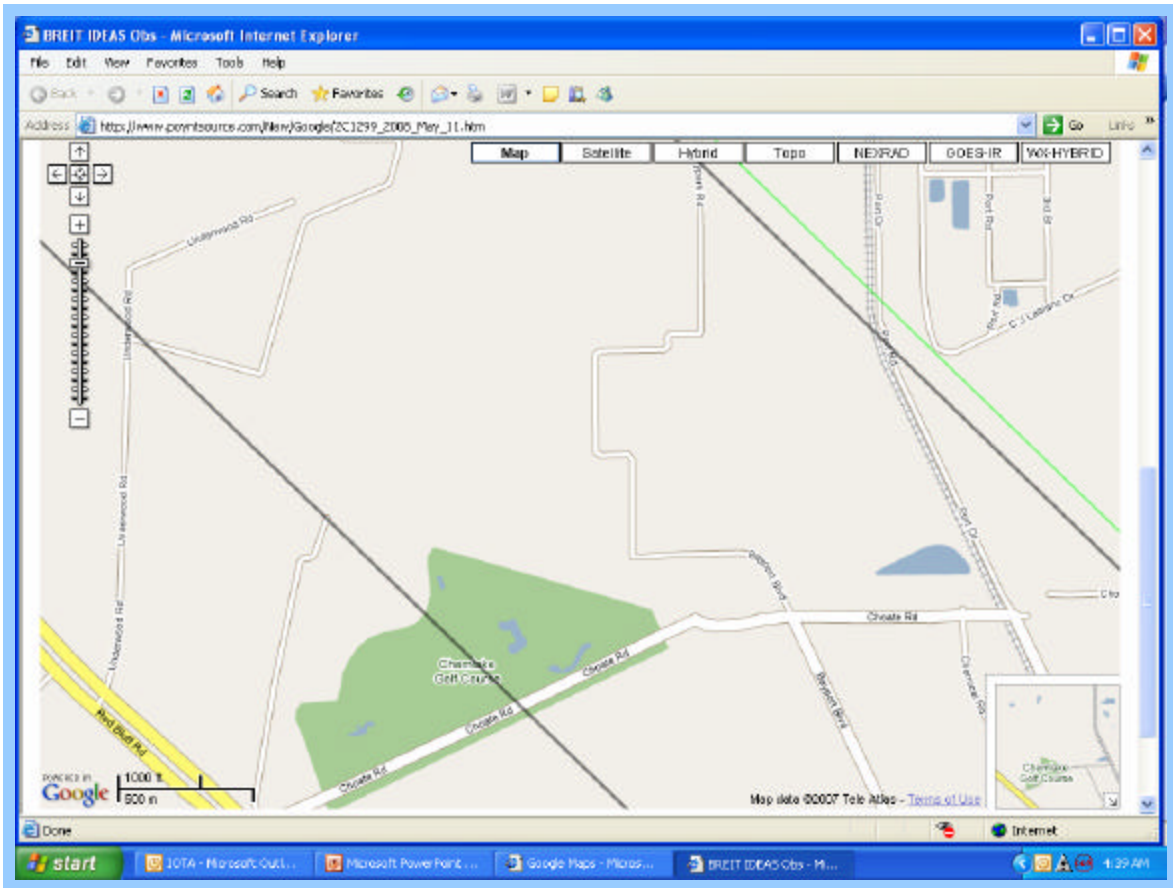


Figure 2. The path goes over the Chemlake golf course off Choate road and Red Bluff. Clear lake observers should consider this as a site. Visual observers here only and just for the southern part of the path. This location has yet to be approved.

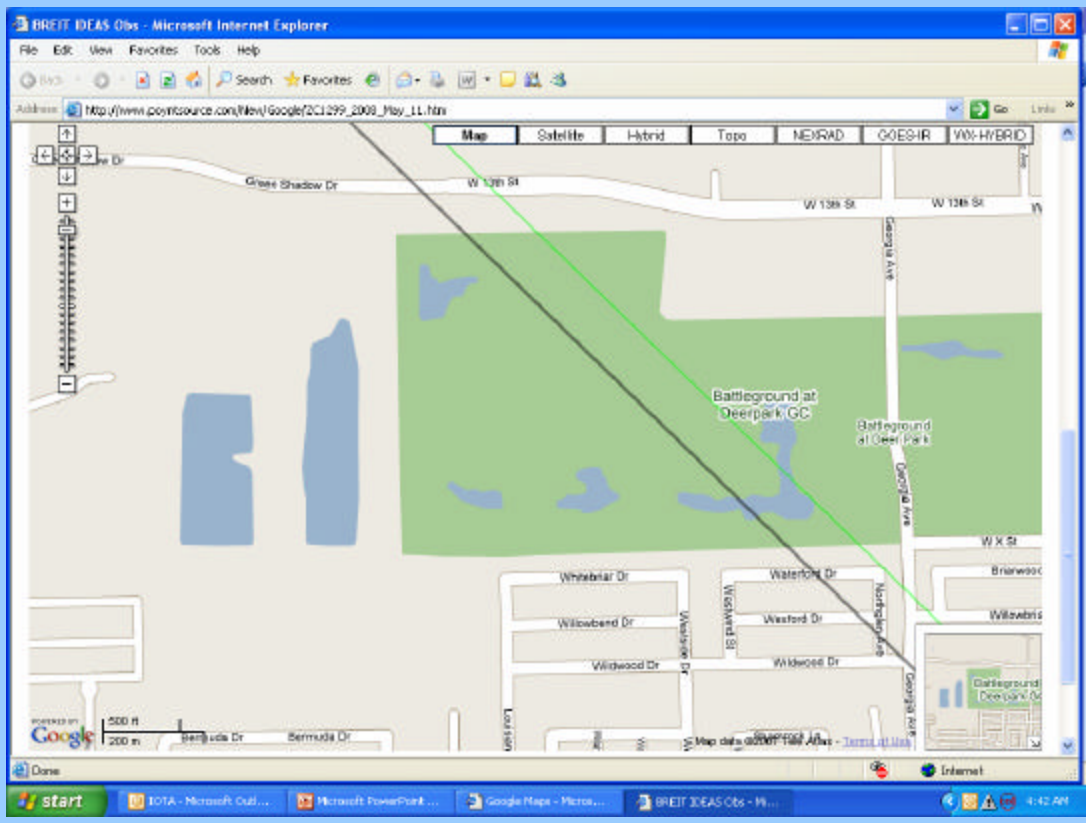


Figure 3. The path as it goes over the Deer Park Battleground golf course. A better spot for video observers but not approved yet. Even though this is in an area with chemical plants and lights, the moon will be easy to spot and in a telescope, the star should also be easy given its elevation and magnitude

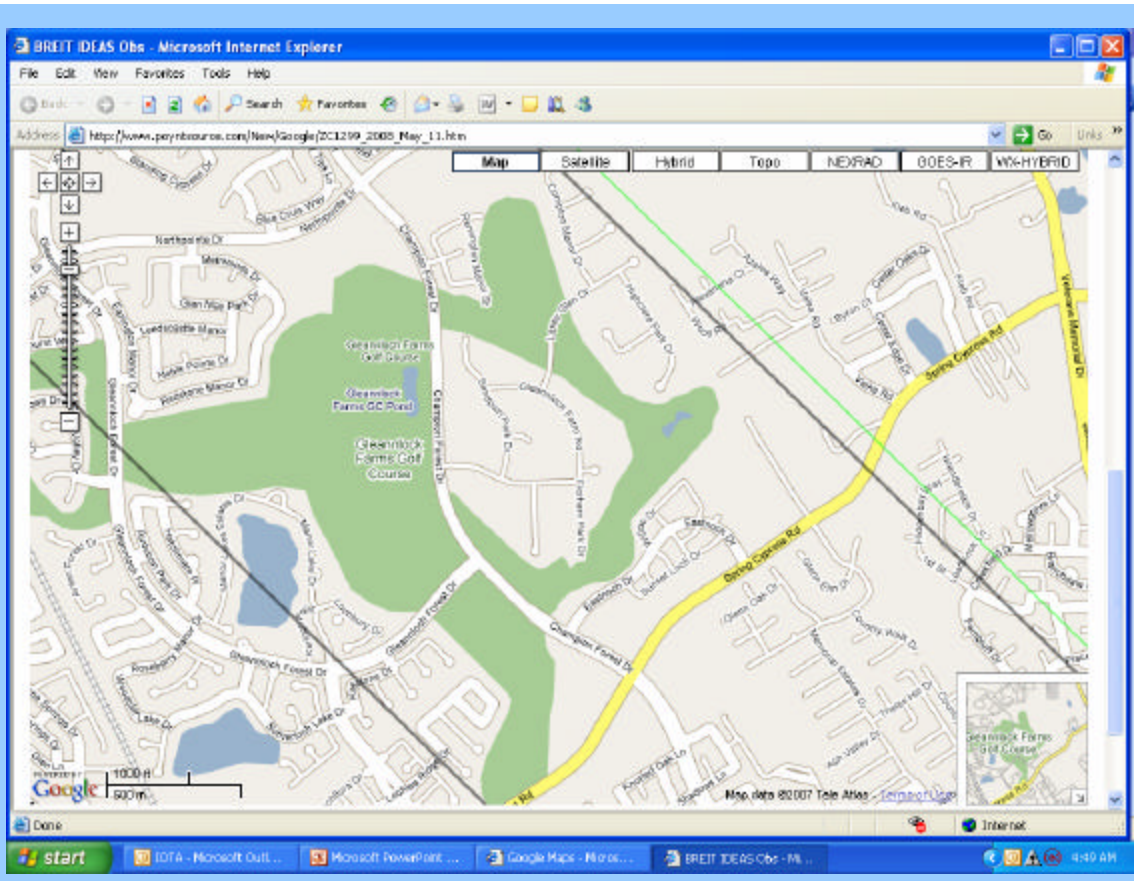


Figure 4. The Gleannloch Farms golf course near FM249 and Spring Cypress--our prime site.

As seen in figure 4, sites will be designated between the two black parallel lines. The above location is our planned site for Houston area observers. Its location traverses the entire range of mountains on the lunar surface where the occultation will occur. That range is shown by two parallel black lines separated by 1.9 kilometers (1.18 miles or 6234 feet). I have arranged with Club management to permit our teams to set up on the course property. As we move closer to May 10, instructions on how to get to this location on the north side of Houston, the timeline for observation and instructions on what to do with your data will be posted on the web page: http://www.eclipsetours.com/events.

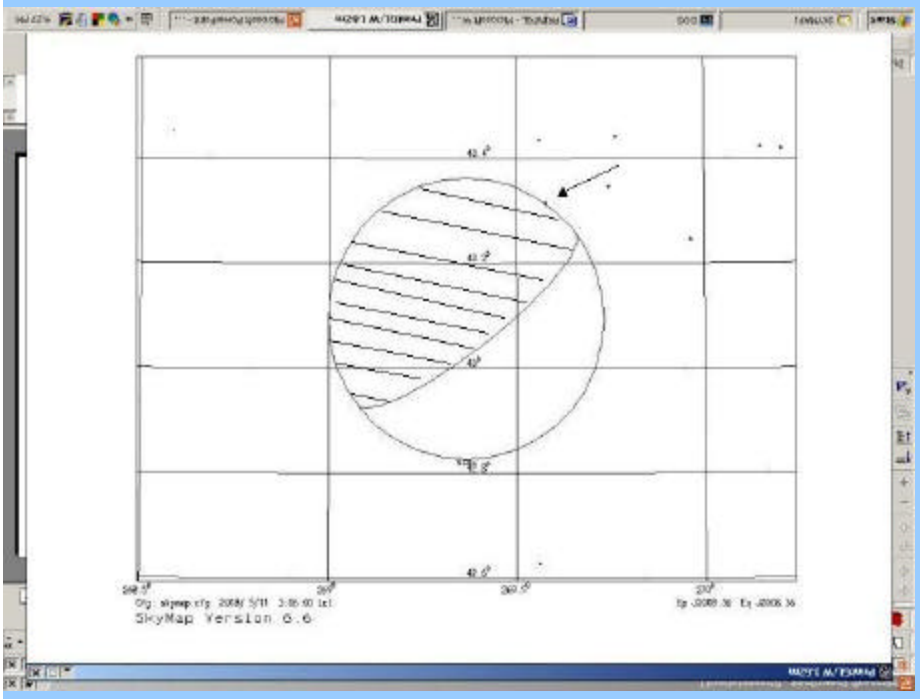


Figure 5 The above map shows how the moon will look to the naked eye at the time of occultation. The dark side is shown shaded and the arrow points to the position of the star just before things start to happen. There are elevation and azimuth markers that are depicted along the axes of this graphic.

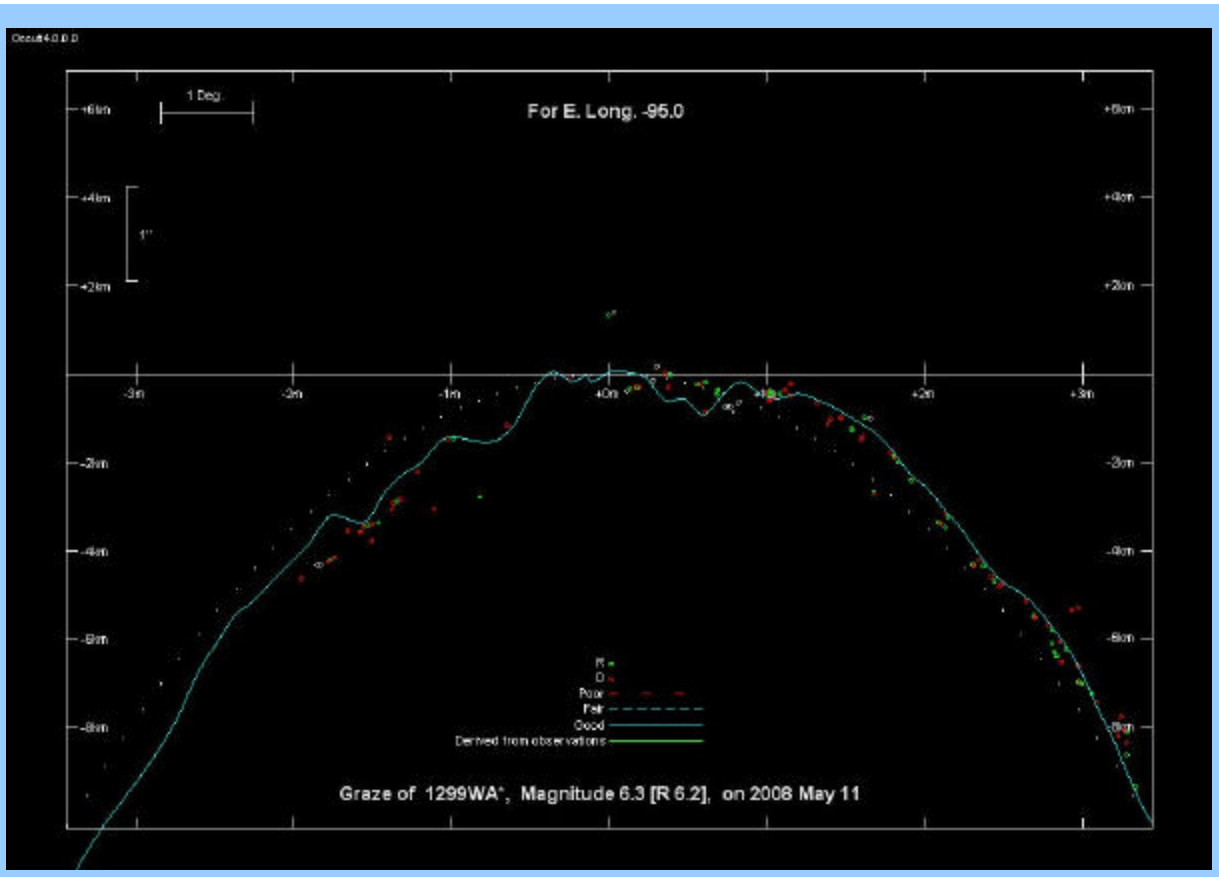


Figure 6. The known profile of the dark side where the star will undergo its disappearing act. This area is not known with a high degree of precision. The wavy line is simply an estimated view of the mountain and valley profile. Our observations will provide a much more accurate refinement of those slopes and elevations. The larger dots are representative of past observations of features in this area, while the small uniformly spaced dots describe an average surface elevation value and should be ignored.

Never seen a grazing occultation before, and perhaps just a bit nervous about trying to time something completely new? Not to worry. You can get a first hand look by going on line to watch a great video of a real occultation of a star grazing the moon as seen from near Hockley, TX this summer. The link is:

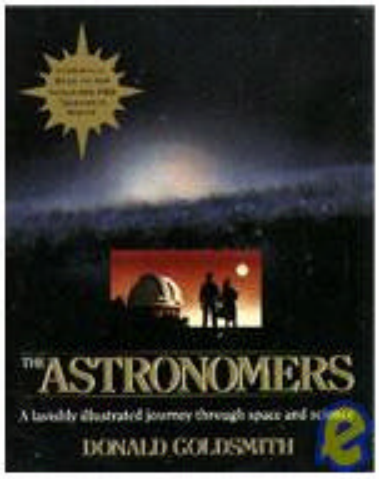
http://iota.jhuapl.edu/MuArietis_N%20station.avi

and requires a media player like RealPlayer to view. You can see in real time as the star is covered and uncovered repeatedly as the moon passes between us and the star. The field of view is similar to what you can see in an eyepiece, though you want to keep as much of the bright limb out of the field as you can. Some of the events (an 'event' is either a disappearance or reappearance) are rather quick, some take many seconds. Some may be instantaneous; some may take a fraction of a second to occur. A 'blink' or 'flash' is also possible as the star appears to clip the top of a mountain. Hence, it is important to watch and not to talk (except for calling out D or R) during the 6 minute observing window nonstop until the occultation is over. It is also possible to appreciate how important it is to focus the telescope properly. This video was easily recorded on the very sensitive and relatively inexpensive Supercircuits PC164 video camera (available from http://www.supercircuits.com located near Austin) which operates from DC power; the video output of the camera feeds into a camcorder which acts as the VCR. A lot of camcorders may not accept video input so be sure your camcorder has that feature. Video is much more accurate than the human eye and of course, the disc or tape can be analyzed, replayed and preserved. Time signals must be recorded in order for the data to be of use. So, if you do not have a digital short wave radio (e.g. from Radio Shack capable of receiving WWV on 5.0 and 10.0 MHz), don't worry as we will rebroadcast those signals for you on FM for a short period of time beginning prior to and ending shortly after the graze. If you think you might want to come out for this and help us record data or would be willing to help out with logistics such as site marking, tape pickup, etc., we really need your assistance. We are looking mainly for observers, but also those willing to help check telescopes for new observers to be sure they are looking at the correct star and troubleshoot equipment problems. Please contact me at pdmaley@yahoo.com or at 281.2440208 during the day.

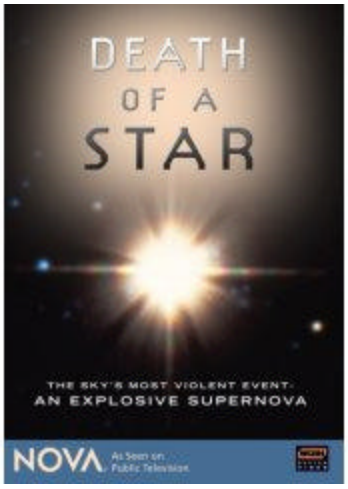
JSCAS LIBRARY

From Library Journal

Published in conjunction with the PBS television series of the same name, this book explores some of the major areas of contemporary astronomy. Although there are numerous, brief biographical sketches of individual scientists, the emphasis is chiefly and properly on their works. Topics include cosmology, stellar evolution, dark matter, quasars, the search for planets beyond the solar system, and the Voyager missions to the outer planets. The author is a professional astronomer turned skillful popularizer (Supernoval: The Exploding Star of 1987, LJ 10/1/89); accordingly, the scientific details are accurate, and the narrative is very readable. Occasionally, the historical sections are a bit misleading or unreliable as found in the discussion of Lord Kelvin's speculations on the age of the earth. Color photographs make this book visually spectacular. Recommended for public and college libraries. *– Jack W. Weigel, Univ. of Michigan Lib., Ann Arbor*



Has anyone seen this?

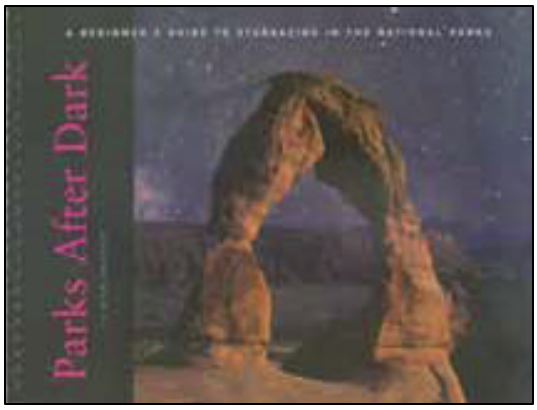


Synopsis: Why do stars explode and how is the energy generated? What is the effect of all those little "aftermath" particles floating through space? Nova: Death of a Star is a 60-minute science documentary that explores rare astronomical events in all their dimensions. The film features the 1987 explosion of a supernova -- first observed by a Canadian astronomer in Chile -- and discusses its impact on the universe. Witness the celestial phenomena that baffles the scientific community as you travel from South America to Japan to Cleveland. A discussion of supernova neutrinos is a special highlight of the tape. ~ Kathleen Wildasin, All Movie Guide

DVD Release Date: Oct 3 2006

Association of Partners for Public Lands

2007 Media and Partnership Awards



Winner
Parks After Dark: A Beginner's Guide to Stargazing in the National Parks
Western National Parks Association
Rick Shaffer - Author
Steve Phillips - Editor
Melanie Doherty Design - Designer
Judges' comments: high production value, excellent design, well written, full of information, useful for all levels of knowledge

Book Report by Lisa Lester

A friend of ours visited a couple of national parks earlier this summer. They bought us the book Parks After Dark: A Beginner's Guide to Stargazing in the National Parks by Rick Shaffer.

This book gives the reader a basic understanding of astronomy terms and concepts. The author covers most of the concepts a beginner would need but sometimes he assumes that the reader might know something that wouldn't be basic knowledge to someone not familiar with the night sky. For example, the author states: "Earth satellites orbit just above our atmosphere, and you can see many of them from a dark-sky locations." In the next few sentences he mentions planets (including Pluto), asteroids, meteors, and comets but he doesn't use the term "Earth satellites" again for several pages, nor does he define it. Some beginners might be confused and think Pluto, asteroids, etc are "Earth satellites". On another page, the author begins to talk about the constellations and refers to both the Big Dipper and the Little Dipper as constellations instead of asterisms.

After the introduction, there are six all-sky maps, which break the sky down into two-month increments. On one page is a star chart and across from it the author describes key objects in the sky and lets the reader know if they can be observed with binoculars or a telescope. The book is spiral bound and designed to be used while observing in the national parks in the western United States. The only problem with the charts is that some of the items are labeled in red, which would be invisible with a red light flashlight!

The book is fairly easy to read and the author has a sense of humor but a Bob Taylor he's not! At the end of the book there is information on the Moon and light pollution and how to get people involved in protecting our night skies. The book ends with a good list of resources and several pages for journaling. The concept for this book is great but I don't think that I would recommend it because of some of the unclear terminology and the fact that the sky charts can't be used completely with a red light flashlight.

Houston Area Astronomy Clubs

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

Sesame Seared Tuna on Star Fruit—Recipe courtesy HRH Catering, 2005

Prep Time: 30 minutes
Inactive Prep Time: 30 minutes
Cook Time: 4 minutes
Yield: 16 servings at 20 ounces per slice

2 pounds sashimi grade tuna loin
1 cup sesame seed oil
1 cup black sesame seeds
1 cup white sesame seeds
2 tablespoons coarse ground black pepper
2 tablespoons coarse ground kosher salt
4 tablespoons olive oil

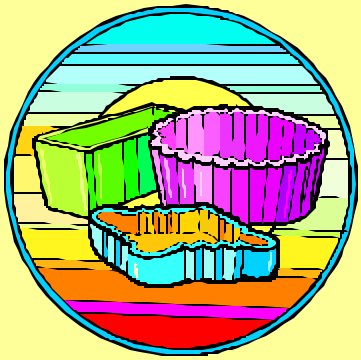
Wasabi Citrus Aioli:
4 egg yolks
2 cups extra-virgin olive oil
2 garlic cloves
2 lemons, zest finely grated
2 limes, zest finely grated
3 tablespoons lime juice (recommended: Rose's)
1 teaspoon kosher salt
1/2 teaspoon white pepper
6 heaping tablespoons dried wasabi

4 star fruits

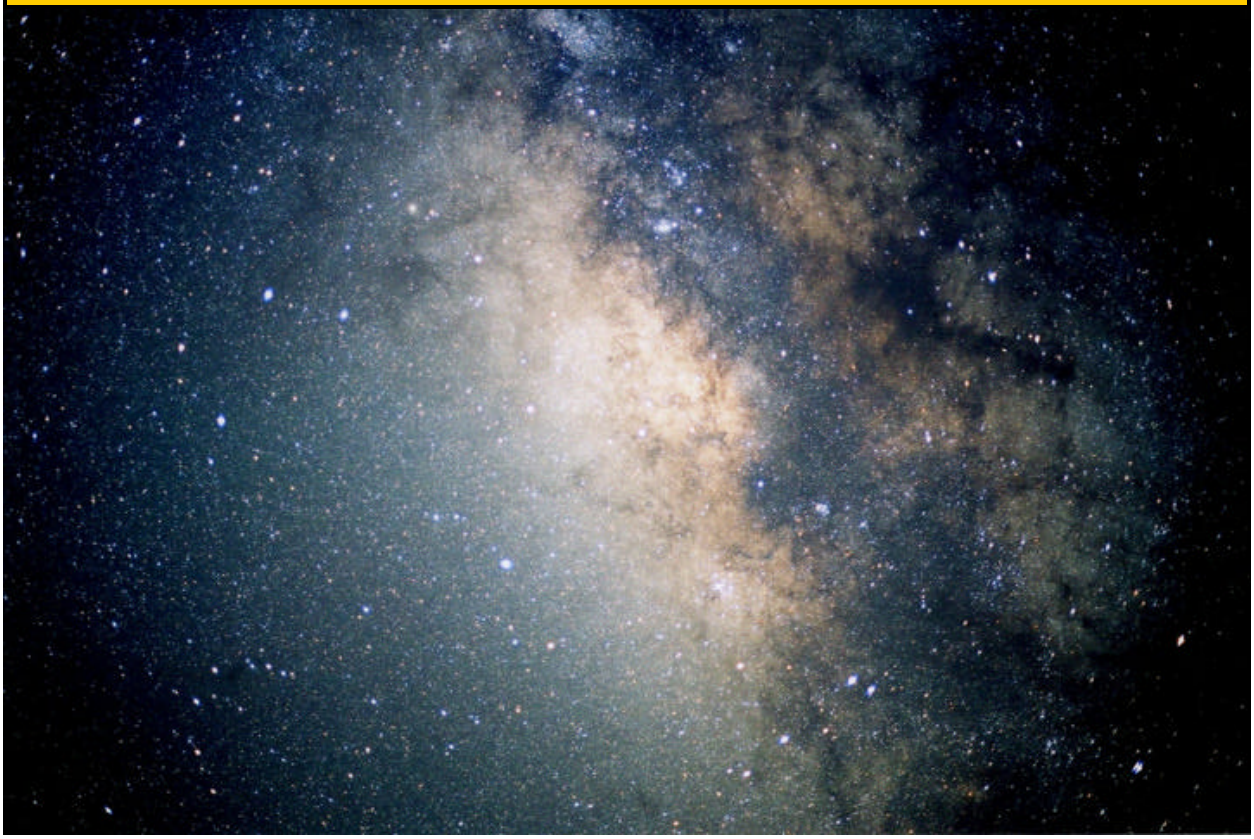
Cut tuna loin into quarters lengthwise. Marinate tuna loin in sesame oil for approximately 30 minutes. Mix together all dry ingredients, roll and coat tuna strips in dry ingredients, pressing firmly so they adhere to the tuna. In a large saute pan heat olive oil, sear tuna for approximately 2 minutes on each side. Remove from heat and set aside.

To make wasabi citrus aioli: In a food processor, beat yolks until pale yellow. Drizzle in olive oil to thicken mixture also adding garlic cloves. Add citrus zest, lime juice, salt, pepper, and wasabi and continue beating. Add more olive oil, if necessary, for desired consistency.

Slice star fruit into thin slices. Slice cooled tuna into 1/8-inch thick slices and top on star fruit. Top with a dollop of wasabi citrus aioli.



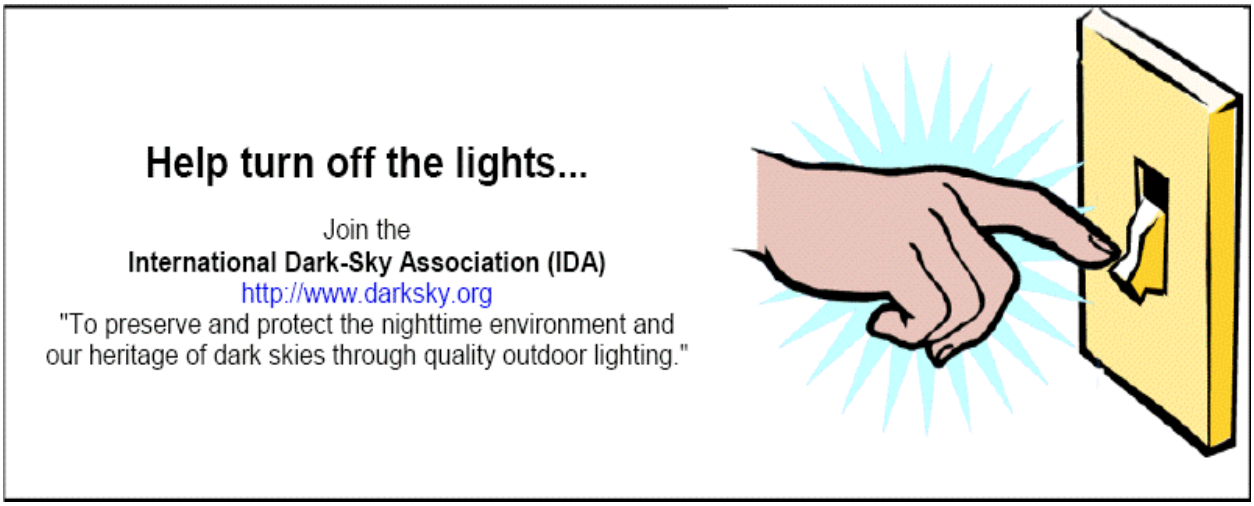
Members' Gallery
September 2007
By Becky Ramotowski



A rich Milky Way shot with NO AIRPLANES!!!!!

And it's on film.
(This was scanned from the print and is not tweaked)

Pentax K1000
Losmandy G8
5 minutes
ASA 200
F/1.7



Johnson Space Center Astronomical Society

Club Officers

President – Bob Taylor
Vice President – David Haviland
Secretary – David Haviland
Starscan Editor – Connie Haviland
Star Party Chairperson – John Erickson
Librarian – Bob and Karen Taylor
Historian – Susan De Chellis
Scientific Expeditions – Paul Maley
Web Master Chris Randall

SIGS

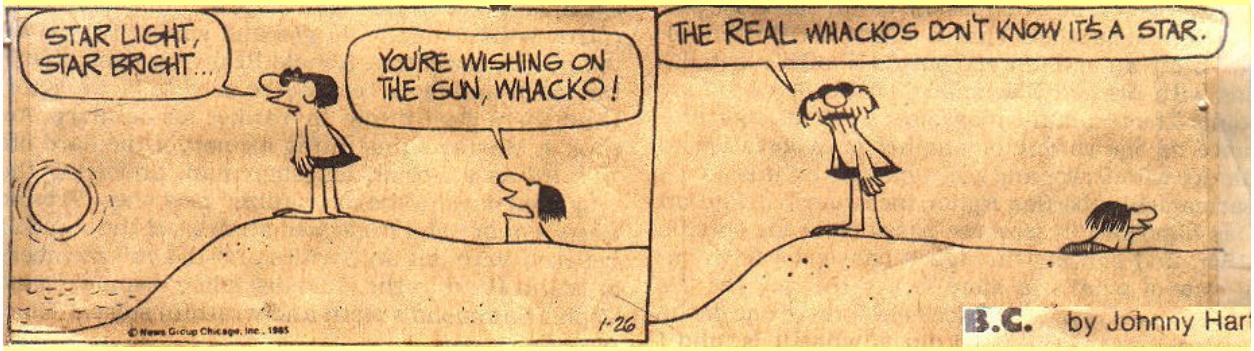
Observing Awards – Triple Nickel
Astronomy 101 — Triple Nickel
CCD Imaging – Al Kelly
Binocular Observing – Leslie Eaton
Telescope Making – Bob Taylor

Starscan Submission Procedures

Original articles of some relation to astronomy will be accepted up to 6 p. m. (1800 hrs) on the 25th of each month. THE most convenient way to submit articles or a Calendar of Events is by email 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.

Please send all submissions to:
txconstance@houston.rr.com

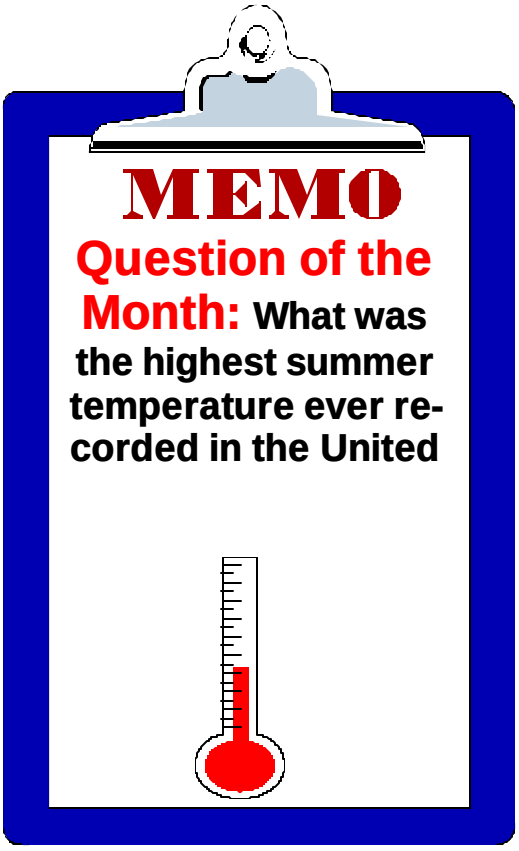
The author of individual articles bears all responsibility for publishing any e-mail addresses in the article on the World Wide Web

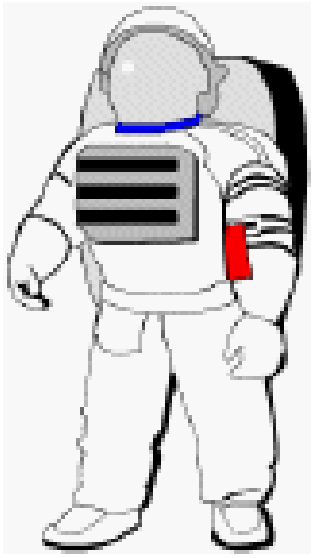


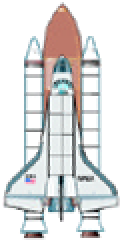
I THOUGHT I WOULD TREAT THE CLUB TO TWO CARTOONS THIS MONTH

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







DID YOU KNOW???

The areas between strands of galaxies are completely empty. You would have to travel HUNDREDS of miles to find just one atom!!!

PUZZLES AND SOLUTIONS

E O L U R M E W S F Q C P N N

B L H U E O Q D F B A M O S O

R B G Y M X N P E N B I Q U I

I E W N P I R I I G T X R I T

G D S L A O N S M A R A R R A

H U S Y C I M O C S E E A I L

T T W Y A A R I S Y I R E S L

N I O H J D F T T I E N N S E

E N F O U I G H R M T E A E T

S G R K N W G O M E J Y M C S

S A Y G N I K U D K T L D E N

Q M A N L E S P R I A N P O O

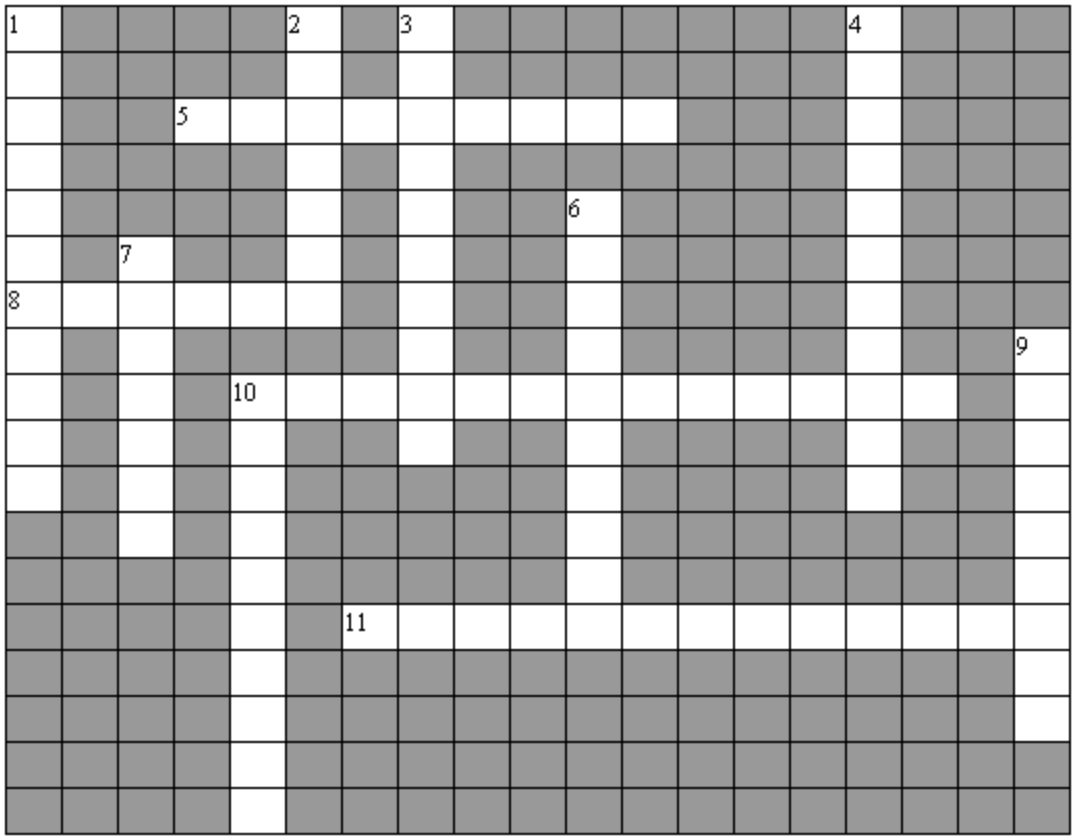
J M E S U E G L E T E B I H C

T E M P E R A T U R E W S W M

M P O L O N I U M X C D H J I

BETELGEUSE
BRIGHTNESS
CANISMAJOR
CANISMINOR
CONSTELLATION
DEGREES
DOGDAYS
LIGHTYEAR
LUMINOSITY
MAGNIFICATION
MAGNITUDE
POLONIUM
PROCYON
SIRIUS
SUMMER
TEMPERATURE
WINTERTRIANGLE

SEPTEMBER'S CROSSWORD PUZZLE



ACROSS

5. A logarithmic brightness scale
8. The brightest star in the night-time sky
10. Various groups of stars to which definite names have been given
11. Betelgeuse, Procyon and Sirius form this.

DOWN

1. The genuine brightness of a star
2. The measurement used to designate the separation between two points of light on a celestial sphere
3. _____ is dependent on luminosity and distance.
4. The Great Dog, a southern constellation between Puppis and Orion
6. A first-magnitude red supergiant in the constellation Orion
7. A first-magnitude star in the constellation Canis Minor
9. The distance that light travels in a vacuum in one year, approximately 9.46 trillion (9.46 × 1012) kilometers or 5.88 trillion (5.88 × 1012) miles.
10. The Little or Lesser Dog, a small southern constellation west of Orion

Solutions for —AUGUST

WORD SEARCH

ACROSS

2—> Enterprise

4—> Atlantis

5—> Columbia

6—> Discovery

8—> Mir

9—> Shuttle

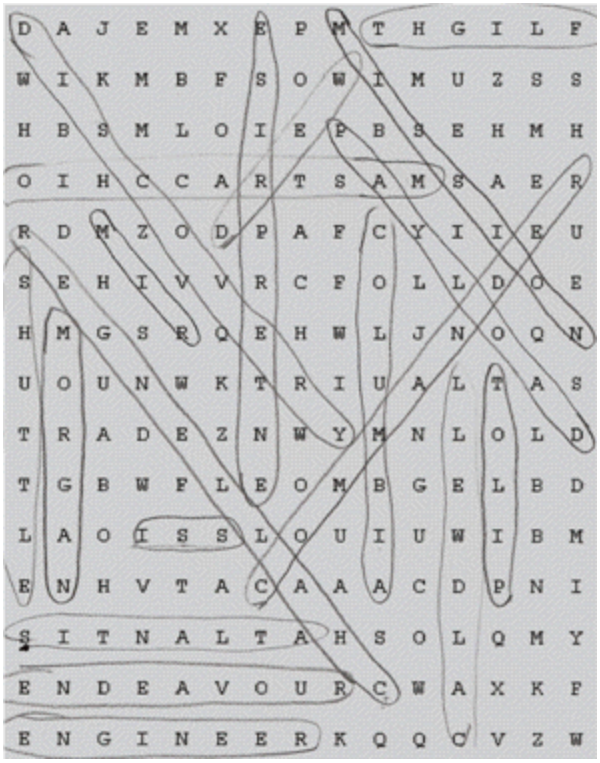
10—> Hickey

DOWN

1—>Endeavour

3—> ISS

7—> Challenger



ANSWER TO THE QUESTION OF THE MONTH

Question: How long has NASA been using the Space Shuttle?

Answer: The U.S. Space Shuttle Columbia completed its first mission in April 1981 and made several successive flights. It was followed by the Challenger, which made its first mission in April 1983. There after, there have been many successful flights in a number of different shuttles.

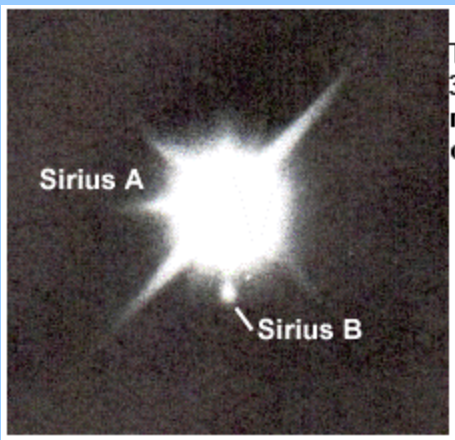
A LITTLE FYI

Did anyone see the launch and/or landing of the space shuttle Endeavour? I was in Orlando when it landed a day earlier than it was scheduled. The Endeavour landed at the Kennedy Space Center this time. When the space shuttle Endeavour touched down at the Kennedy Space Center August 21, University of Texas Medical Branch at Galveston microbiology and immunology department chairman David Niesel was waiting by the runway, looking forward to a reunion with some of its passengers.

The space travelers Niesel was meeting weren't astronauts. They were Streptococcus pneumoniae bacteria. A big word for what you might know as a very nasty sore throat that makes you feel really bad. It likes to sit in your throat and mouth, or what your parents would call; your upper respiratory tract. In this case, it was riding in sealed experimental containers in the shuttle's mid-deck.

Streptococcus pneumoniae is what's known as an "opportunistic bacterium," one that's normally harmless but always ready to exploit the right circumstances and cause full-blown disease. For infants, the elderly and others with weaker-than-normal immune systems -- possibly including astronauts on long space flights -- it can be quite dangerous.

(Credited: Science Daily: http://www.sciencedaily.com/releases/2007/08/070822132134.htm for “A little FYI” information)



The Lick Observatory's 3-meter telescope reveals the faint companion of Sirius A.

Terms & Definitions

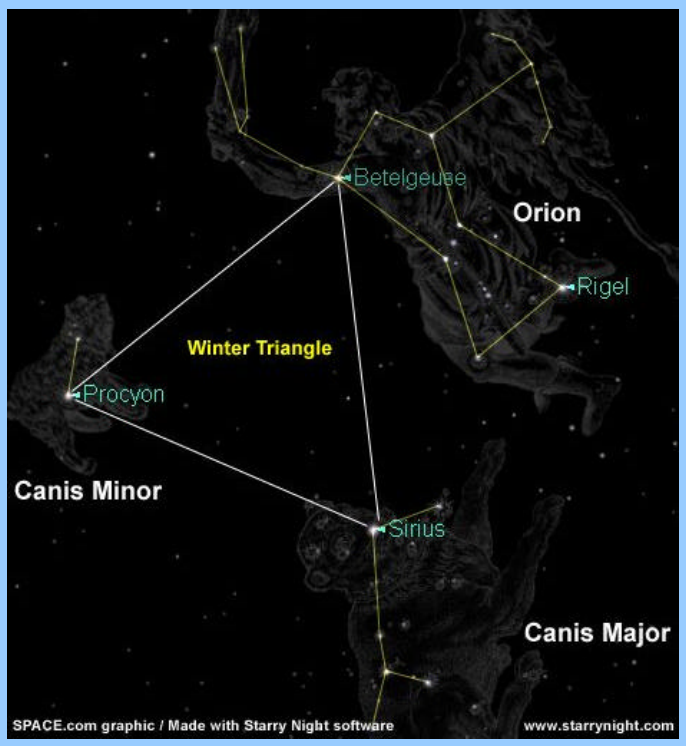
Luminosity: The intrinsic brightness of a star -- as it would appear if you orbiting it -- compared to the Sun. The Sun's luminosity is 1. Sirius has a luminosity of 23 and Betelgeuse 55, 000.

Magnitude: A logarithmic brightness scale; the difference between magnitude 1 and magnitude 5 is 100 fold. The larger the magnitude, the fainter the object. The lower the magnitude, the brighter the object. The brightest stars have negative magnitudes.

Brightness: A measure of a star's magnitude or brightness as seen from the Earth. Brightness is dependent on luminosity and distance.

Degrees: The separation between two points of light on the celestial sphere is measured in degrees. A closed fist held at arms length is about 10 degrees while a finger would be 1 degree or two moon widths.

SIRIUS THE DOG STAR



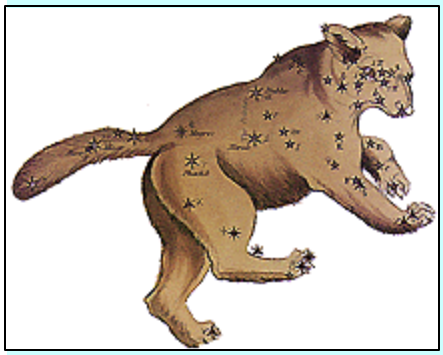
(compliments of space.com)

ASTRONOMY MYTHS

Star watching has occupied humans from the earliest times. Our ancestors studied the night sky and saw shapes and patterns among the stars. They often made up stories to explain what they saw. The same star constellation was seen very differently by people from different countries, or even different parts of the same country. When looking at the constellation Capricornus, for example, the ancient Aztecs saw Cipactli, the Whale. In India, Makaram, an antelope, was seen in the same constellation. The Assyrians thought the constellation looked more like a goat-fish while the ancient Greeks thought it appeared to be a gate for the Gods to pass through. Below you will find a collection of constellation myths from different cultures as well as pictures of the star patterns which inspired them. Read the myths, then match each with the star picture you think it describes. Once you have finished, check to see which culture(s) saw the same constellations as you do.

1. A Shawnee Indian Myth
A group of young sisters happily danced in a circle in the sky. They were seen from Earth by a brave and magical hunter named White Hawk who wished to have one of them for his wife. White Hawk disguised himself as a field mouse, went to the heavens, and crept close to the dancing sisters. He decided on the youngest one whom he grabbed and took away. White Hawk was very kind to the young girl and she quickly fell in love with him. Though she was happy with her husband, the youngest sister still wished to dance in the sky with her sisters. White Hawk gave her a magical white hawk's feather that allowed her to travel in a silver basket between Earth and the sky. Viewers from Earth always see a gap in the star circle. This is the place reserved for the youngest sister; it can be filled only when she travels to the sky to join the dance.

2. A Greek Myth Cassiopeia, a queen of ancient Ethiopia, was a very beautiful woman. Unfortunately, she was also very vain and spent much of her time bragging about her beauty. She even boasted that she was far more beautiful than the maidens who attended Poseidon, the god of the sea, in his underwater kingdom. When Poseidon's maidens learned of this, they were very angry indeed. The maidens demanded that Poseidon punish Cassiopeia for daring to compare herself to them. Poseidon agreed that Cassiopeia should be punished. He placed her in the heavens to be scorned, not honored. Cassiopeia swings every half night around the North Star. She is seated in a chair, but the chair is placed upside down. Cassiopeia must hang on with both hands to keep from falling out. Her sky position is most humiliating for one who was so proud of her beauty.



3. A Woodland Indian Myth
Late in the spring, a bear awakened from its long winter sleep and wandered out of its hillside den in search of food. Soon three hunters spotted the bear and began to chase it. Just like the bear, the hunters were hungry after the long, cold winter. The first hunter carried a bow and arrow with which he hoped to kill the bear. The second hunter carried a big pot in which he hoped to cook the bear. The third hunter came behind the others. He was collecting wood for the huge fire which would be needed to cook such a large meal. All summer the hunters chased the bear through the sky. In the fall, the bear started to get weak and the first hunter was able to shoot it with an arrow. The arrow killed the bear and it fell over on its back. The hunters ate the bear and left its skeleton behind. As fall turned to winter, the weather became colder and colder. The bear's skeleton was still visible in the sky, but the life spirit of the bear had entered a new body -- the body of another sleeping bear. All through the long, cold winter the bear slept. When spring came again, the bear awakened and went out in search of food. Once again it was hunted and killed. Its life spirit entered the body of yet another sleeping bear in the den. And so it happens every year.

4. An East Indian Myth

Long ago in India there were five princes who left their kingdom to search for the kingdom of heaven. They took food and drink for their journey, and Prince Yudistira brought his dog, Svana. Yudistira was the eldest. His brothers were Sahadeva the all-wise, who was learned beyond all men; Nakula the all-handsome, famed for his grace and beauty; Arjuna the all-powerful, who had never been defeated in any contest of arms; and Bhima the all-joyful, known for his good humor and love of pleasure. After many days' journey, the brothers came to a fair where music was playing and people were feasting and dancing. Bhima the all-joyful said to his brothers, "I will rest here today and be happy and seek the kingdom of heaven tomorrow." Yudistira, his brothers, and the dog Svana went on without him. Several days later, the travelers arrived at a large plain where a great army was drawn up in ranks facing the enemy. When Arjuna the all-powerful saw this, he said to his brothers, "I will fight for my country today and seek the kingdom of heaven tomorrow". Yudistira, his brothers, and the dog Svana continued without him. Many days and nights passed. The travelers came to a magnificent palace surrounded by a garden full of flowers and fountains. In this garden, a beautiful princess was walking with her attendants. When she saw Nakula the all-handsome, she was seized with love and longing. Nakula too was struck with love. He said to his brothers, "I will stay with the princess today and seek the kingdom of heaven tomorrow." Nakula went into the garden and Yudistira, his brother Sahadeva, and the dog Svana continued without him. Many weary days and nights later, the travelers came to a great temple where the holy men lived. Sahadeva the all-wise desired to join them in prayer and study. He told his brother Yudistira, " I will stay here today and seek the kingdom of heaven tomorrow." Sahadeva went into the temple and Yudistira and Svana continued without him. At last Yudistira reached Mount Meru, the doorway to heaven. Indra, the Lord of Past and Present, appeared before him and invited him to ascend. Yudistira bowed low and replied, "Very willingly I will do so if I may bring my dog, Svana." "That may not be," said Indra. "There is no place in heaven for dogs. Leave him and enter into eternal happiness."

"I cannot do that," said Yudistira. "I do not wish for any happiness for which I must leave so dear a companion."

"You traveled on without your four brothers," said Indra. "Why will you not ascend to heaven without your dog?"

"My lord," replied Yudistira, "my brothers left me to follow the desires of their hearts. Svana has given his heart to me. Rather than renounce him, I must renounce heaven."

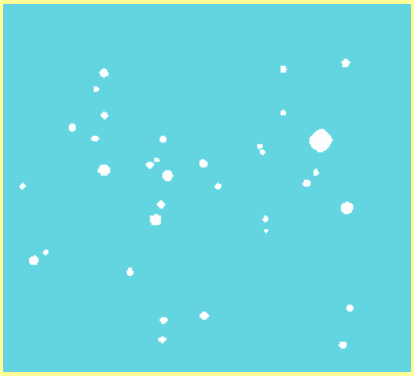
"You have spoken well," said Indra. "Come in, and bring your dog with you." So Yudistira and Svana ascended into paradise. In recognition of their devotion to one another Indra set in the sky the constellation of the Great Dog whose star Sirius is the brightest of them all.

Instructions

In the following pictures you will find the constellation that inspired each of the previous myths. Look at the star groups carefully. Beside each picture, you will find a space in which to enter the number of the myth which you feel describes the constellation. After you have made your choice, press the button to see how your imagination compares with those of stargazers from other cultures.

Pictures of: Ursa Major, Cassiopeia, Canis Major, and Corona Borealis

1.



Myth number_____

2.

Myth number_____

3.

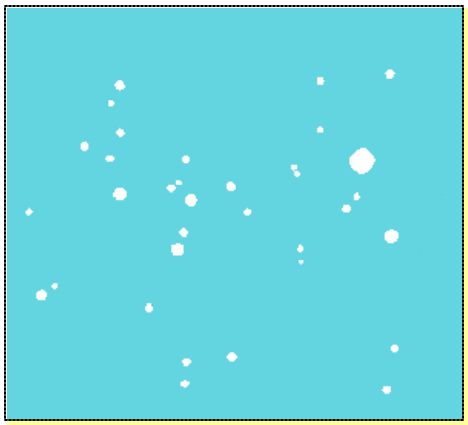
Myth number_____

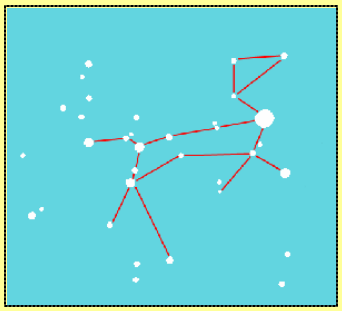
4.

Myth number_____

YOU WILL FIND YOUR ANSWERS AT THE END OF THE NEWSLETTER...DON'T PEEK!!!

FOR AN EXTRA CHALLENGE—NAME EACH CONSTELLATION





4. An East Indian Myth

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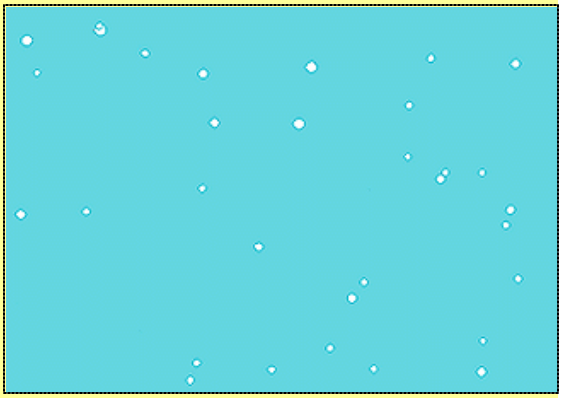

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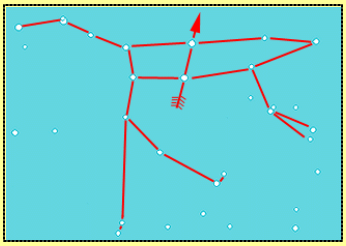
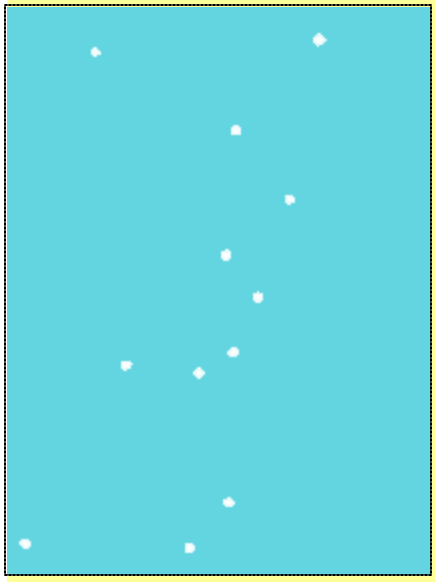
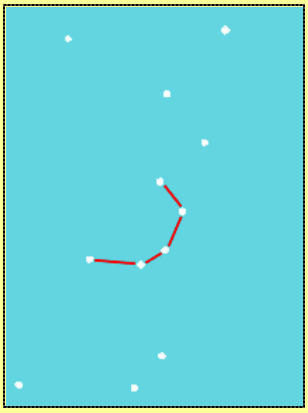
3. A Woodland Indian Myth







1. A Shawnee Indian Myth

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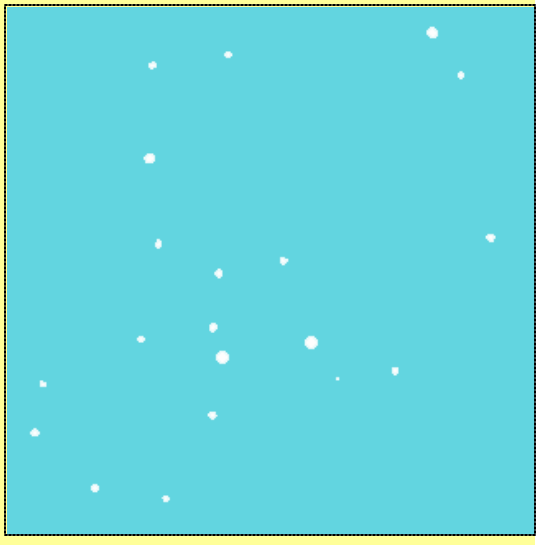

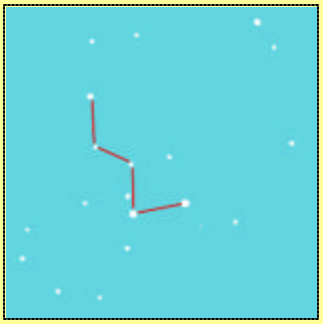

2. A Greek Myth

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