



Starscan

Johnson Space Center
Astronomical Society

Volume 26, Number 12 December 2010

**The APPEL-JSC Astronomy class with JSCAS
at the LPI**



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CONNIE HAVILAND

Un mensaje del Presidente (A message from the President)

Greetings:

OK Folks... this will be a very busy week for us. If you didn't make it to the APPEL-JSC astronomy event at the LPI you missed a treat. This time there were in excess of 60+ people there with questions. We gave them quick talks, and showed them the heavens. We also managed to get about 30-40 names on a clipboard to send them a meeting reminder.

Who knows what Friday's event at the Gilruth will bring? Well it came and went and we had a steady stream of people. Attendance was lower than planned by JSC but when Jim Wessel presented a clipboard with about 15-20 names on it, I'll take the event as a success if garners this club a few new members.

I have a note further in the Starscan this month in which I need to thank many people. Rarely is an endeavor or job done by only one person and I have many folks to thank for the support and help in running this club over the last three years. At last month's meeting we had an uncontested election for both President and Vice President and the newly elected officers are Chris Randall for President, and Aldora Louw for Vice President. I can't think of a better team to lead this club for the next few years. There are still a lot of things facing this club but mainly I hope avenues continue for local star parties, especially with the CCISD and FISD schools, University of Houston, JSC, and Space Center Houston. Any avenue that can lead to new membership will have my support.

I don't intend to go anywhere soon, although I may take a second Friday of the month off now and then as I get to sit in the cheap seats again. I hope to continue with the novice program, deep sky, and helping Connie with the Starscan. I will do whatever I can for these programs and support the new administration all that I can.

It has been my honor, and pleasure being your President for the last three years...

David Haviland



LETTER FROM THE EDITOR By Connie Haviland

Hi everyone!!

Nothing has changed. I will be back in January with new things for the kids section and Dave and myself doing the Starscan. Until next month....

Hope you have clear skies,

Connie Haviland

LETTER TO THE EDITOR



Star Parties for 2010

Bob Taylor

Dec 3rd, Gilruth

January 22nd, 2010 at the LPI (tentative)



What's Happening at the George!!!



Need volunteers



Saturday Public Observing – All times are dusk to 11:00 p.m..Please contact the following building manager teams to volunteer:

December 4 – Building Managers: Jessica Kingsley / Mary Lockwood gnjkingsley@att.net / mplockwood@att.net

December 11 – Building Managers: Cynthia Gustava / Joe Mills cynm31@att.net / k5jmm@yahoo.com

December 18– Building Managers: Barbara Wilson / Buster Wilson gobserve@consolidated.net



No Family Space Days for December... BUT, we'll be Having a star party there January 22nd, 2011

For more information e-mail Spaceday@lpi.usra.edu or call 281-486-2106.

For more information, go to
http://www.lpi.usra.edu/education/space_days/
Or call Katy at (281) 486-2106
3600 Bay Area Boulevard, Houston, Texas



After thoughts.... I have a lot of people to thank for the last three years... mainly all of you in the club for your support, help and advice over the years. However, first and foremost I thank Connie for being there, giving me her views on matters of the club. Sweetie, you got me to think about things from a different perspective at times - all for the benefit of the club. John Cavuoti and Sarah Haviland had their times too. In addition to Connie, a few unofficial advisors of the "cabinet" were instrumental in rendering advice... Bob Taylor was always available, Chris Randall my VP, Ken & Lisa Lester, Becky Ramotowski - never more than an email away, Jim Wessel, and Ron Sterlekar all played separate but no more or less independent roles. I am in your debt.

Historically, I found my way to this club after searching a bit around in 98/99. A friend at work (UT Health Science Center) had recommended JSCAS. From the website, I hooked up by email with Becky Ramotowski where after a torrid email exchange of questions, she encouraged me to attend the next star party at Challenger Park. At that time I had (and still have) a Celestron Starhopper 6" that I had assembled but to that point had only looked at the moon. At that time had no idea about red dot finders and Telrads. Without such a device, it took me about 20 minutes just to cue up Betelgeuse and I was disappointed once I actually found it. However, it was that Challenger star party where I eventually met Becky, Triple, Ken and Lisa Lester, and Ed and Eleta Malewitz, I learned a lot of things that night and especially what a Telrad was and what it was for! My first meeting was the next month and under Hernan's reign where Triple had invited astronaut David Wolfe to speak about his time on Mir. The comedic interplay as well as what was talked about had pretty much convinced me this was the club for me. Oddly, I never made it to a meeting in time to be able to raise my hand and acknowledge that I was a "first timer". After acquiring the Telrad, one morning something got me up at about 0430 one morning and Orion was hanging perfectly, crisp and clear in the eastern sky off my back patio. My nemesis Betelgeuse was there but so was M42. The Orion nebula was the first object, outside of the moon, that I found in scope by myself and my heart was pounding as I was looking at it. My love affair the M42 hasn't stopped since.

Again, there are too many to thank for where I am today in an astronomical sense, but shortly after getting the Telrad I crossed paths with Kurt Mauer who gently convinced me that I might not be using a star chart correctly when I explained my problem in trying to locate M31. I kept checking this chart but couldn't locate it even with binoculars. Invalidating all my degrees, Kurt gently suggested that the part of the star chart that says "This arrow to North" is something I might want to pay attention to. Yes, I had in fact been looking for M31 on the wrong side of Pegasus. In addition to Kurt, Triple's words of always emphasizing the basics are prudent every day and always force me to keep perspective. Lessons learned the hard way are rarely forgotten but his help and having people like these two are an asset to the club.

This club has always had a broad depth of resources in the people that comprise it. This was influential when I came to Fort McKavett for the first time in April of 01. An impassioned plug a month prior for the Fort by Triple Nickel convinced me I had to go. I had a blast and crossed paths with this crazy guy named Bob Taylor in the course of an educational outreach in Brady that year (little did I know I'd end up his VP later on!). In October of 2001 I also convinced a cute gal named Connie to come with me. She and I hooked up through the net and when I found she had a love of camping and the stars what better way to make a connection. From there on out, we tried to make nearly every Ft. McKavett trip including the cloud and rain doused one where only about 8 people showed up. That was the infamous March trip where we, and the ladies, were serenaded by the rather inebriated Elvis impersonator at the old "Outback" restaurant.

I could go on for another few pages, but I'll call it here. All I can say is thank you, to every one of you. If you had told me that way back at Challenger that I would eventually end up as president of JSCAS, I would have you that you were certifiably nuts. Funny thing about fate and above all being involved, one never knows where it is going to take you. I wouldn't trade a minute of my involvement with this club over the last 10-11 years for anything in the world. I thank you, and it has been my honor.

David

This Month: Construction of the Astronomers stool support. (by Jim Wessel)

A good leg (or four) to stand on (part 4)

Earlier, I outlined the construction of the pedestal that forms the adjustable support for the seat, but that structure alone is insufficient to prevent the stool from falling over. In Rod Nabholz's original design, he used four 14", 2 x 4s attached on each of the bottom sides of the pedestal to increase the size of the footprint and add to the overall stability. John and I scaled up the legs for my considerably larger stool to 18" apiece and rounded the upper outside corner of the legs. One thing that I have noticed and utilized post hence is that the top surface of the legs are a ready and available built-in mini step stool, even for someone of my height, when the chair is nearing maximum extension. Here's a picture of the four legs:



We felt that my weight at the top of the stool against the limited surface area of the connection point between the 4 legs and the pedestal (and the limited

screws) was just setting the scene for a leg to either start loosening causing the whole stool to become unlevel or the leg breaking off entirely. Both from a safety standpoint and from a stability issue, we wanted a bit more security in our design. So we made four plywood buttresses that were equal in height to the central pedestal and went roughly 2/3rds the way out to the distal tip of the legs. The picture below gives an idea of their shape.



The next step was to attach the buttresses to the legs. We used glue and eight 1 1/2" woodscrews, and regularly spaced them out along the length of the leg. Two of these leg and buttress combinations were permanently attached to the central pedestal through the use of glue and 3" wood screws. The picture below shows a single leg and buttress unit attached to the pedestal.



For the purpose of clarity let's call these permanently attached legs the 'Lateral Legs' (primarily because they lay down in a side-to-side position in my car's trunk). I'll cover the 'Vertical Legs' in a bit more detail, later. This entire unit (the two permanent [lateral] legs and the central pedestal) plays an important role. This solidly constructed backbone is the strongest part of the entire stool assembly, and is the logical place for drilling the height adjustment holes, as the heavy hex bolt passes through 4 pieces of wood. The layers of wood are reinforcements for each other, and they along with the pin support the weight of chair and my 230lbs. I am confident in our robust construction effort, and the fear of a catastrophic failure is absent in the resultant product. The image below shows the entire permanently assembled unit - complete with the pin placement holes, and the pin itself in the middle height position. Not shown are a pair of handles (for ease of carrying) that were later attached near the top after the picture was taken.



A following picture shows the opposite side where the height adjustment pin protrudes. You can see the pin itself has been drilled to accept a retaining pin, which locks into place preventing the bolt from being able to be removed easily, and a large flat washer that protects the surface of the wood.

Now I return to the vertical legs. They were cleverly designed to be entirely removable (so that my trunk lid can close) for transport to distant dark sites. The vertical legs are the same exact construction as the lateral legs – nothing is changed there, but they have been drilled through the legs' 2" x 4"s (and the center pedestal too,) to accept 4 threaded rods (1/4-20 X 8 1/2"). These threaded rods are below the lowest possible setting of the height adjustment pin, so there is no chance of conflict. Both ends of the rods have appropriate sized flat washers and wingnuts which are only finger tightened for final setup prior to observing. The plywood buttress portion of the legs is considerably



thinner, and for attachment here we used 4, 1/4-20 X 5 1/2" bolts which were drilled into positions so that they would not impede the placement of the height adjustment pin which is perpendicular to the axis of the bolts. Shown below is a view providing the best angle for emphasizing the removable legs and their hardware.

Next : Making a sketch desk and painting the assembly.

This Month: Building a sketch desk and the decision of paint. By Jim Wessel (Part 5) **Even Rembrandt needed an easel...**

I really enjoy drawing what I see through the eyepiece. In my pursuit of this facet of my hobby, I have learned that using a clipboard isn't ideal for recording my observations, and a little more room to spread out will help me a lot. The idea of a sketch desk was not something I originally set out to make, and it sort of naturally fell into place as a logical extension of the armrests. One afternoon, I was sitting in the built out chair, remarking to John that it 'just felt right', and that the only thing I was missing was a way to make my drawing effort easier. I reached out, grabbed a reasonable piece of plywood, held it at an angle that seemed comfortable to rest my forearms against, and poof, the initial concept of the sketch desk was born. Please be aware that I can't provide accurate measurements of any of the wood parts of the sketch desk as a definitive plan for interested do-it-yourselfers, as it is completely contingent on your particular chair and its respective armrests.

The following description should be taken as a representative method for building your own desk and any measurement I may give is unique to my own situation. That original piece of scrap plywood actually turned out to be the large flat surface of the desk, with a few minor modifications, of course. As it has occurred time and time again through this project, John just happened to have some Plexiglas lying around that would work just fine as a hard smooth writing surface. A very meager amount of scrap 1" x 6" and 2" x 4" provided the basis for the side supports and the underside structurally bracing ribs. John also had the needed wood screws in his workshop, so the only thing I was out of pocket on was the small screws needed to secure the Plexiglas to the plywood and the final overcoat of paint. If you decide to build your own version of a desk, I included a reasonable approximation of the costs in the parts breakdown earlier in this description.

The first thing necessary is that the piece of plywood be wider than the width of the armrests so that it can



span the gap between them. The armrests on my chair are 21.5" apart to the external edges (18.5" to internal edges), and the top of the desk is just under 24" wide (and about 15" deep), so this detail is covered. Here in southeastern Texas, with our nearly perpetually cloudy summertime skies, most of my observing is in the somewhat cooler months. Any seasoned observer will remark that if you are cold, you are going to be uncomfortable, and likely shorten your observing. To prevent this, you wear layers of clothing or a heavy coat, and those items have a volume associated with them, which in turn, makes your circumference larger.

If you are larger around, you have to extend your arms further to reach. To help counter this problem, John and I elected to cut a notch out of the edge of the sketch deck (and the corresponding Plexiglas edge) that would normally rest against my abdomen. The picture below shows the top of the desk with the screws securing the Plexiglas, and the notch removed.

The final, comfortable angle for the total sketch desk assembly was conceptualized in much the same manner as was previously described in the section for determining the armrests' height. After that angle was decided upon, what would become the two pairs of side pieces of wood were cut at the desired angle and heavily sanded. It's important to do a good job of sanding here, because doing so will reduce the chance of marring the surfaces of the armrests. In fact, I have taken this one step further, and put the soft part of some Velcro stripping (with adhesive on the other side) on this wood to protect the armrests even more (the picture of Velcro placement is not shown). The following close-up picture shows the side design better than I can explain in words.

The next image shows the total underside of the desk with the side supports and the cross braces. All of this wood was connected together with finishing nails and wood glued to the underside of the plywood that forms the desk-top. The distal pieces of wood are the aforementioned 1 x 6s. Taken together, they form the side edges of a shell that fits over and to the outside of the armrests, and ultimately prevents the desk from moving side to side. The two interior pieces of wood, just proximal to the larger outside 1 x 6s, are the pieces of wood that actually rest directly onto the upper surface of the armrests. Care was taken so that the position of the cross brace was placed so that it's closest edge did not break the plane of the two pieces of wood that rest on the armrests, otherwise over time you would end up scalloping the inside edge of your armrests. A second cross bracing piece forms the front edge of the sketch desk.



The sketch desk is rigid, light (about 5 lbs), fits my chair perfectly, and is totally functional for my needs as a beginning astronomical sketcher. A three quarters view of the completed sketch desk, in its typical position on the armrests is seen in the image below. The careful observer will notice the reflectivity of the Plexiglas writing surface. What is not shown in the picture are the later additions of an screw eye and rope to

the side of the desk (used to retain the desk while entering or exiting the chair), a modified clipboard holder to keep my log sheets held in place, and my post-construction lighting system for the illuminating the writing surface.



To paint, or not to paint? That is the question.

My original intent was to give the wood a nice rich stain to accentuate the inherent grain. After seeking a few external opinions, I was convinced that paint was a better choice. I settled on a high quality exterior latex, and actually carried the boat seat into the paint store to get the best match possible. Two thick coats later, and all the wood surfaces almost identically match the lighter grey color of the seat. John had on hand a can of rust inhibiting metal paint to be used as a primer, and I purchased a black satin rust inhibiting paint to act as a sealant. This was used almost exclusively for the metal that formed the supports for the armrests. I decided that I would go ahead and paint over the pipe floor fittings, and the protective metal channel and 90° angles, knowing that it would have to be periodically touched up due to abrasion between the hanging footrest and the edges of the plywood legs. The sketch desk was painted as well. Since the lighting system was constructed after the painting was completed, I had a series of minor touch-ups to the painting afterwards.

Next Month: A Red LED lighting system.

Discovery of "Arsenic-bug" Expands Definition of Life

From: http://science.nasa.gov/science-news/science-at-nasa/2010/02dec_monolake/

Dec. 2, 2010: NASA-supported researchers have discovered the first known microorganism on Earth able to thrive and reproduce using the toxic chemical arsenic. The microorganism, which lives in California's Mono Lake, substitutes arsenic for phosphorus in the backbone of its DNA and other cellular components.

"The definition of life has just expanded," said Ed Weiler, NASA's associate administrator for the Science Mission Directorate at the agency's Headquarters in Washington. "As we pursue our efforts to seek signs of life in the solar system, we have to think more broadly, more diversely and consider life as we do not know it."



A microscopic image of GFAJ-1 grown on arsenic.

This finding of an alternative biochemistry makeup will alter biology textbooks and expand the scope of the search for life beyond Earth. The research is published in this week's edition of *Science Express*.

Carbon, hydrogen, nitrogen, oxygen, phosphorus and sulfur are the six basic building blocks of all known forms of life on Earth. Phosphorus is part of the chemical backbone of DNA and RNA, the structures that carry genetic instructions for life, and is considered an essential element for all living cells.

Phosphorus is a central component of the energy-carrying molecule in all cells (adenosine triphosphate) and also the phospholipids that form all cell membranes. Arsenic, which is chemically similar to phosphorus, is poisonous for most life on Earth. Arsenic disrupts metabolic pathways because chemically it behaves similarly to phosphate.

"We know that some microbes can breathe arsenic, but what we've found is a microbe doing something new -- building parts of itself out of arsenic," said Felisa Wolfe-Simon, a NASA Astrobiology Research Fellow in residence at the U.S. Geological Survey in Menlo Park, Calif., and the research team's lead scientist. "If something here on Earth can do something so unexpected, what else can life do that we haven't seen yet?"



The Mono Lake Research area in central California.

The newly discovered microbe, strain GFAJ-1, is a member of a common group of bacteria, the Gammaproteobacteria. In the laboratory, the researchers successfully grew microbes from the lake on a diet that was very lean on phosphorus, but included generous helpings of arsenic. When researchers removed the phosphorus and replaced it with arsenic the microbes continued to grow. Subsequent analyses indicated that the arsenic was being used to produce the building blocks of new GFAJ-1 cells.

The key issue the researchers investigated was when the microbe was grown on arsenic did the arsenic actually become incorporated into the organisms' vital biochemical machinery, such as DNA, proteins and the cell membranes. A variety of sophisticated laboratory techniques was used to determine where the arsenic was incorporated.

The team chose to explore Mono Lake because of its unusual chemistry, especially its high salinity, high alkalinity, and high levels of arsenic. This chemistry is in part a result of Mono Lake's isolation from its sources of fresh water for 50 years.

The results of this study will inform ongoing research in many areas, including the study of Earth's evolution, organic chemistry, biogeochemical cycles, disease mitigation and Earth system research. These findings also will open up new frontiers in microbiology and other areas of research.

"The idea of alternative biochemistries for life is common in science fiction," said Carl Pilcher, director of the NASA Astrobiology Institute at the agency's Ames Research Center in Moffett Field, Calif. "Until now a life form using arsenic as a building block was only theoretical, but now we know such life exists in Mono Lake."

The research team included scientists from the U.S. Geological Survey, Arizona State University in Tempe, Ariz., Lawrence Livermore National Laboratory in Livermore, Calif., Duquesne University in Pittsburgh, Penn., and the Stanford Synchrotron Radiation Lightsource in Menlo Park, Calif.

NASA's Astrobiology Program in Washington contributed funding for the research through its Exobiology and Evolutionary Biology program and the NASA Astrobiology Institute. NASA's Astrobiology Program supports research into the origin, evolution, distribution, and future of life on Earth.

Editor: [Dr. Tony Phillips](#) | Credit: Science@NASA

Follow up: **Get Your Biology Textbook...and an Eraser!**

From: <http://astrobiology.nasa.gov/articles/thriving-on-arsenic/>

One of the basic assumptions about life on Earth may be due for a revision thanks to research supported by NASA's Astrobiology Program. Geomicrobiologist Felisa Wolfe-Simon has discovered a bacterium in California's Mono Lake that uses arsenic instead of phosphorus in its DNA. Up until now, it was believed that all life required phosphorus as a fundamental piece of the 'backbone' that holds DNA together. The discovery of an organism that thrives on otherwise poisonous arsenic broadens our thinking about the possibility of life on other planets, and begs a rewrite of biology textbooks by changing our understanding of how life is formed from its most basic elemental building blocks. [Astrobiology Magazine](#) has the story.

Wolfe-Simon's research is supported by [NASA's Exobiology and Evolutionary Biology \(Exo/Evo\) Program](#) and the [NASA Astrobiology Institute](#). Among the goals of these programs is determining the evolution of genes, metabolic pathways, and microbial species on Earth in order to understand the potential for life on other worlds. Wolfe-Simon's discovery represents the first time in the history of biology that an organism has been found to use a different element to build one of its most basic structures. The paper appears in today's issue of "[Science Express](#)" and will subsequently be published in the journal *Science*. 12



Geomicrobiologist Felisa Wolfe-Simon, collecting lake-bottom sediments in the shallow waters of Mono Lake in California.

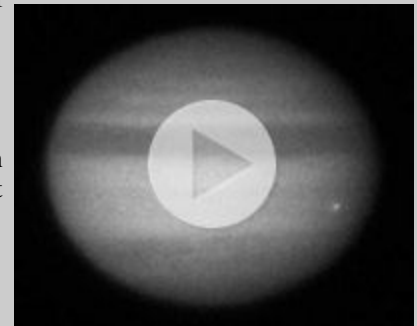
Fireballs Light Up Jupiter

From: http://science.nasa.gov/science-news/science-at-nasa/2010/09sep_jovianfireballs/

Sept. 9, 2010: In a paper published today in the *Astrophysical Journal Letters*, a group of professional and amateur astronomers announced that Jupiter is getting hit surprisingly often by small asteroids, lighting up the giant planet's atmosphere with frequent fireballs.

(To View a movie of the June 3rd impact recorded by Christopher Go of Cebu City, the Philippines go to http://science.nasa.gov/media/medialibrary/2010/06/11/jupiterimpact_chrisgo.wmv)

"Jupiter is a big gravitational vacuum cleaner," says co-author and JPL astronomer Glenn Orton. "It is clear now that relatively small objects left over from the formation the solar system 4.5 billion years ago still hit Jupiter frequently." The impacts are bright enough to see through backyard telescopes on Earth. Indeed, amateur astronomers were first to detect them, recording two fireballs in 2010 alone—one on June 3rd and another August 20th.



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Professional astronomers at NASA and elsewhere have followed up on the amateur observations, hoping to learn more about the impacting bodies. According to today's *Letter*, first-authored by Ricardo Hueso of the Universidad del País Vasco in Spain, the June 3rd fireball was caused by an object some 10 meters in diameter. When it hit Jupiter, the impact released about 10^{15} Joules of energy. For comparison, that's five to ten times *less* energy than the Tunguska event of 1908, when a meteoroid exploded in Earth's atmosphere and leveled millions of trees in a remote area of Russia. Scientists continue to analyze the Aug. 20th fireball, but think it was comparable in scale to the June 3rd event.

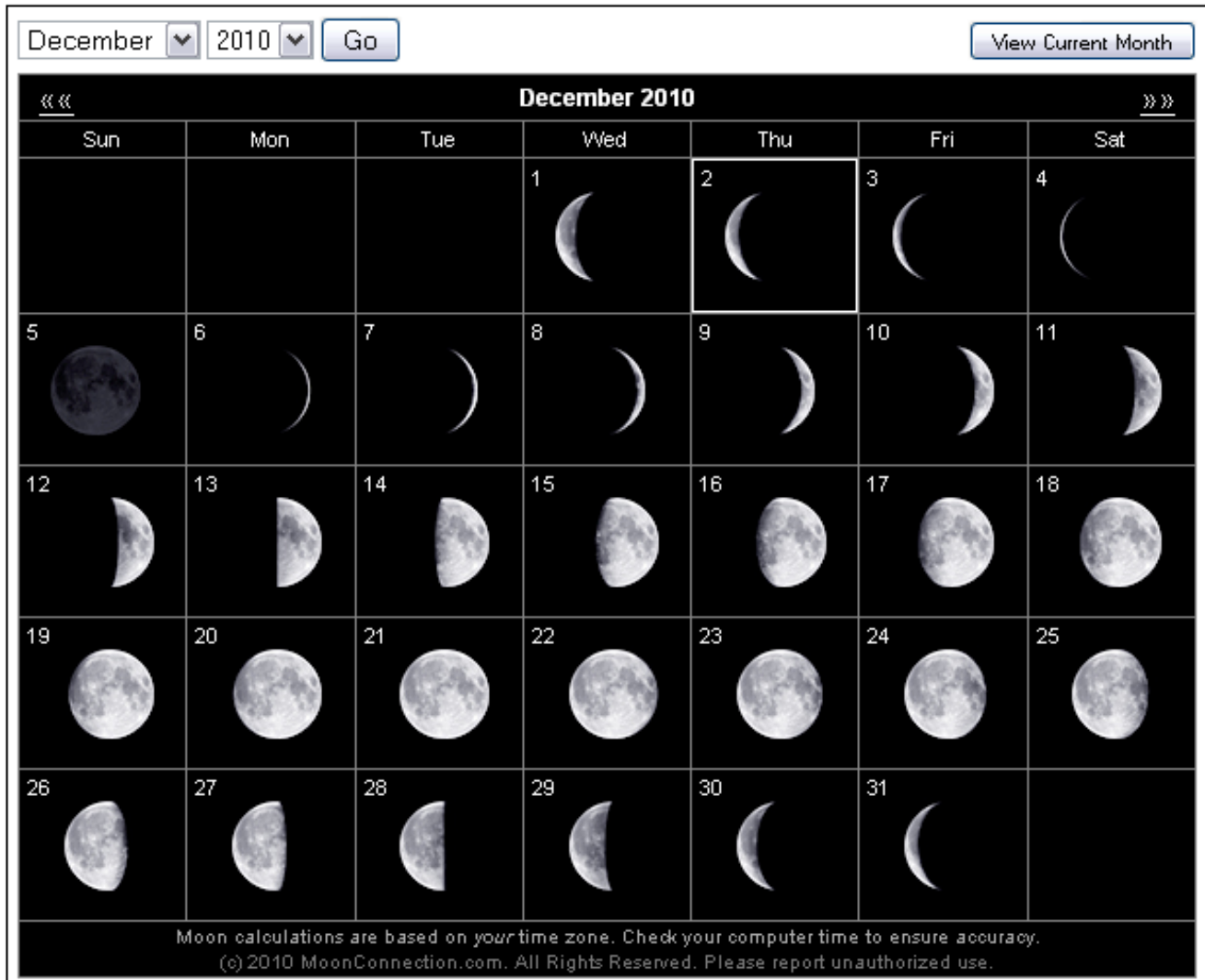
Before amateurs spotted these fireballs, scientists were unaware collisions so small could be observed. The first hint of their easy visibility came in July 2009 when Anthony Wesley, an amateur astronomer from Australia, discovered a dark spot on Jupiter. It was clearly the swirling debris of an impact event that he had only just missed. Next time, however, his luck would improve. On June 3, 2010, he caught a fireball in action. "I was watching real-time video from my telescope when I saw a 2.5-second-long flash of light near the edge of Jupiter's disk," says Wesley. "It was clear to me straight away it had to be an event on Jupiter." Another amateur astronomer, Christopher Go of the Philippines, confirmed that the flash also appeared in his recordings. Professional astronomers, alerted by email, looked for signs of the impact in images from larger telescopes, including NASA's Hubble Space Telescope, the European Southern Observatory's Very Large Telescope in Chile, and Gemini Observatory telescopes in Hawaii and Chile. Scientists saw no thermal disruptions or typical chemical signatures of debris, which allowed them to put a limit on the size of the object. The second fireball on Aug. 20th was first detected by Japanese amateur astronomer Masayuki Tachikawa of Kumamoto city and quickly confirmed by another Japanese amateur, Aoki Kazuo of Tokyo. This one flashed for about 1.5 seconds and, like the June 3rd fireball, left no debris observable by large telescopes. "It is interesting to note that while Earth gets smacked by a 10-meter-sized object about every 10 years on average,



it looks as though Jupiter gets hit with the same-sized object [as much as] a few times each month," comments Don Yeomans, manager of the Near-Earth Object Program Office at JPL, who was not directly involved in the study. Learning how often Jupiter is hit can tell astronomers something about the meteoroid population throughout the solar system—a matter of considerable interest right here on Earth. Just yesterday on Sept. 8th, a 10-meter class asteroid named 2010 RF12 flew past our planet without hitting. A somewhat smaller space rock, 2008 TC3, actually burned up in the atmosphere above Sudan two years ago. "The Jupiter impact rate is still being refined," adds Yeomans, "and studies like this one help to do just that." To learn more about the original research, read "First Earth-based Detection of a Superbolide on Jupiter" by R. Hueso et al, in the *Ap J Letters*, 2010, 721, L129

Editor: [Dr. Tony Phillips](#) | Credit: Science@NASA

PHASES OF THE MOON FOR THE MONTH OF DECEMBER -2010



SUNRISE AND SUNSET SCHEDULE FOR

DECEMBER -2010

December 2010

Houston, Texas

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1 Sunrise: 6:59 Sunset: 17:21 Moonrise: 2:41 Moonset: 14:13	2 Sunrise: 6:59 Sunset: 17:21 Moonrise: 3:46 Moonset: 14:53	3 Sunrise: 7:00 Sunset: 17:21 Moonrise: 4:52 Moonset: 15:39	4 Sunrise: 7:01 Sunset: 17:21 Moonrise: 5:57 Moonset: 16:29
5 Sunrise: 7:02 Sunset: 17:21 Moonrise: 7:00 Moonset: 17:24 New Moon: 11:36am	6 Sunrise: 7:02 Sunset: 17:21 Moonrise: 7:58 Moonset: 18:23	7 Sunrise: 7:03 Sunset: 17:22 Moonrise: 8:49 Moonset: 19:22	8 Sunrise: 7:04 Sunset: 17:22 Moonrise: 9:34 Moonset: 20:22	9 Sunrise: 7:05 Sunset: 17:22 Moonrise: 10:13 Moonset: 21:19	10 Sunrise: 7:05 Sunset: 17:22 Moonrise: 10:47 Moonset: 22:14	11 Sunrise: 7:06 Sunset: 17:22 Moonrise: 11:18 Moonset: 23:07
12 Sunrise: 7:07 Sunset: 17:22 Moonrise: 11:47 Moonset: 23:59	13 Sunrise: 7:07 Sunset: 17:23 Moonrise: 12:16 Moonset: none First Qtr: 7:59am	14 Sunrise: 7:08 Sunset: 17:23 Moonrise: 12:46 Moonset: 0:52	15 Sunrise: 7:09 Sunset: 17:23 Moonrise: 13:16 Moonset: 1:46	16 Sunrise: 7:09 Sunset: 17:24 Moonrise: 13:50 Moonset: 2:39	17 Sunrise: 7:10 Sunset: 17:24 Moonrise: 14:28 Moonset: 3:36	18 Sunrise: 7:10 Sunset: 17:24 Moonrise: 15:12 Moonset: 4:35
19 Sunrise: 7:11 Sunset: 17:25 Moonrise: 16:02 Moonset: 5:34	20 Sunrise: 7:12 Sunset: 17:25 Moonrise: 16:59 Moonset: 6:33	21 Sunrise: 7:12 Sunset: 17:26 Moonrise: 18:01 Moonset: 7:29 Full Moon: 2:14am	22 Sunrise: 7:13 Sunset: 17:26 Moonrise: 19:07 Moonset: 8:20	23 Sunrise: 7:13 Sunset: 17:27 Moonrise: 20:14 Moonset: 9:08	24 Sunrise: 7:14 Sunset: 17:27 Moonrise: 21:21 Moonset: 9:48	25 Sunrise: 7:14 Sunset: 17:28 Moonrise: 22:26 Moonset: 10:26
26 Sunrise: 7:14 Sunset: 17:28 Moonrise: 23:30 Moonset: 11:02	27 Sunrise: 7:15 Sunset: 17:29 Moonrise: none Moonset: 11:38 Last Qtr: 10:19pm	28 Sunrise: 7:15 Sunset: 17:30 Moonrise: 0:34 Moonset: 12:14	29 Sunrise: 7:16 Sunset: 17:30 Moonrise: 1:38 Moonset: 12:53	30 Sunrise: 7:16 Sunset: 17:31 Moonrise: 2:43 Moonset: 13:35	31 Sunrise: 7:16 Sunset: 17:32 Moonrise: 3:47 Moonset: 14:22	

Standard/Winter Time for entire month.
Courtesy of www.sunrisesunset.com
Copyright © 2001-2008 Steve Edwards

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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Webpage is under construction, but will be up soon and I take PayPal as well.



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Light pollution:

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

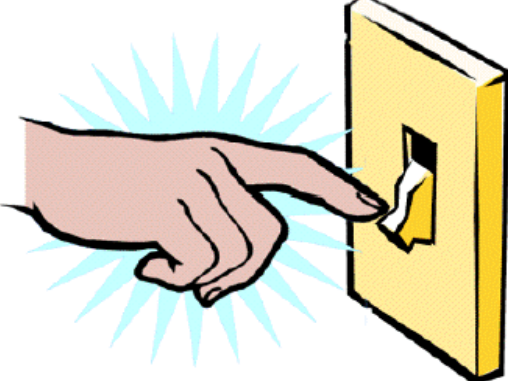
.Do you have a question about light pollution, protecting the night sky, or IDA's resources? **Get Help from IDA** <http://www.darksky.org/mc/page.do?sitePageId=56399>

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.
Houston Community College Southwest Campus—Main Lecture Hall
10141 Cash Rd
Stafford, Texas 77477

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 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:
comiestarscanaccount@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

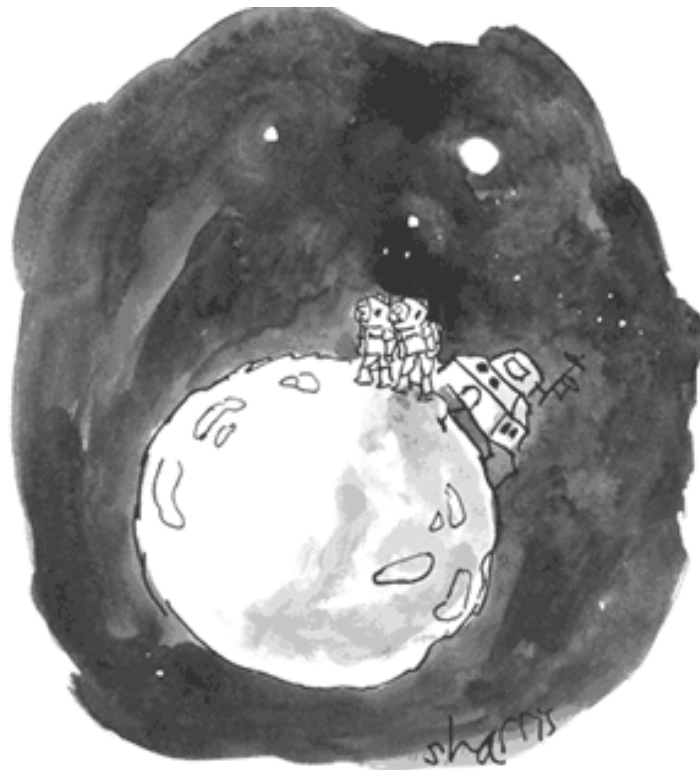
2008-Club Officers

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

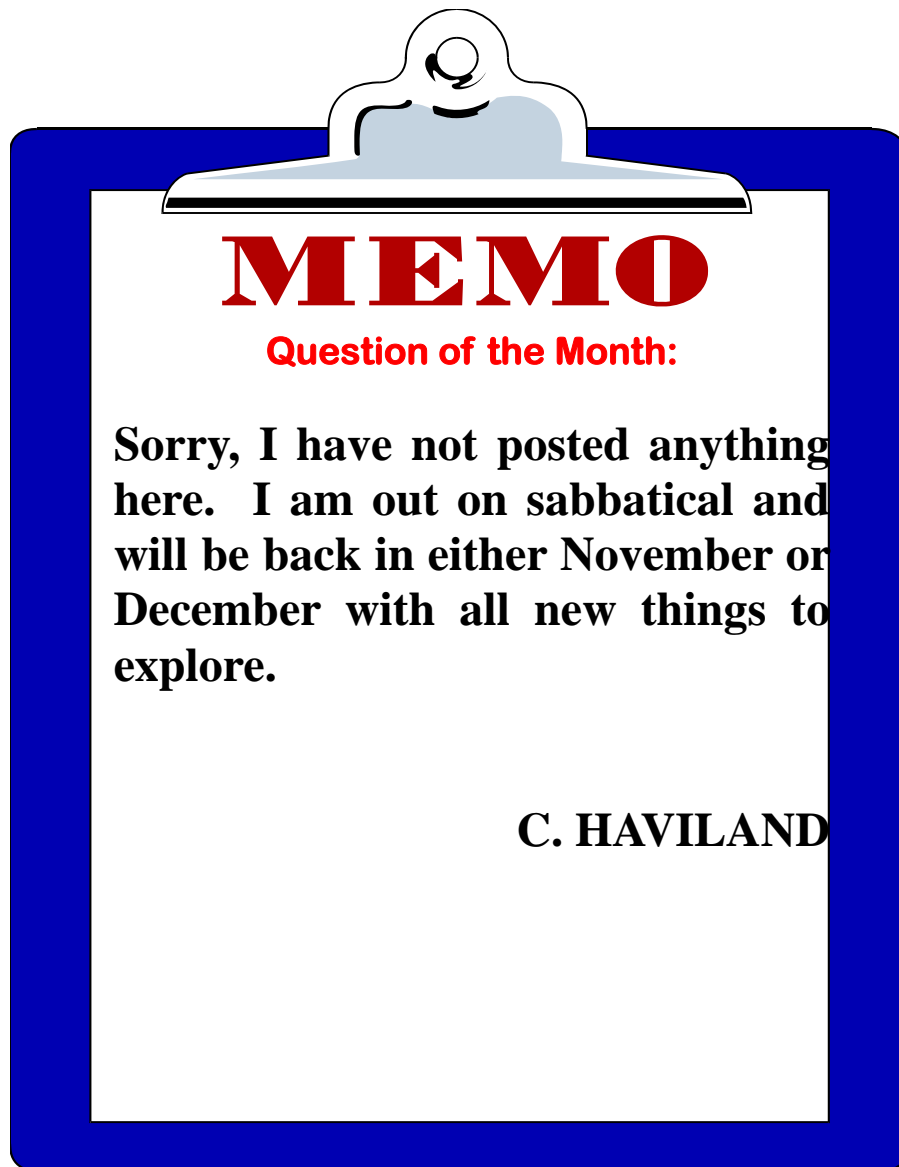
WHO SAID ASTRONOMERS DO NOT HAVE A SENSE OF HUMOR?



**"Another one uninhabited. That's three
down and several hundred billion to go."**

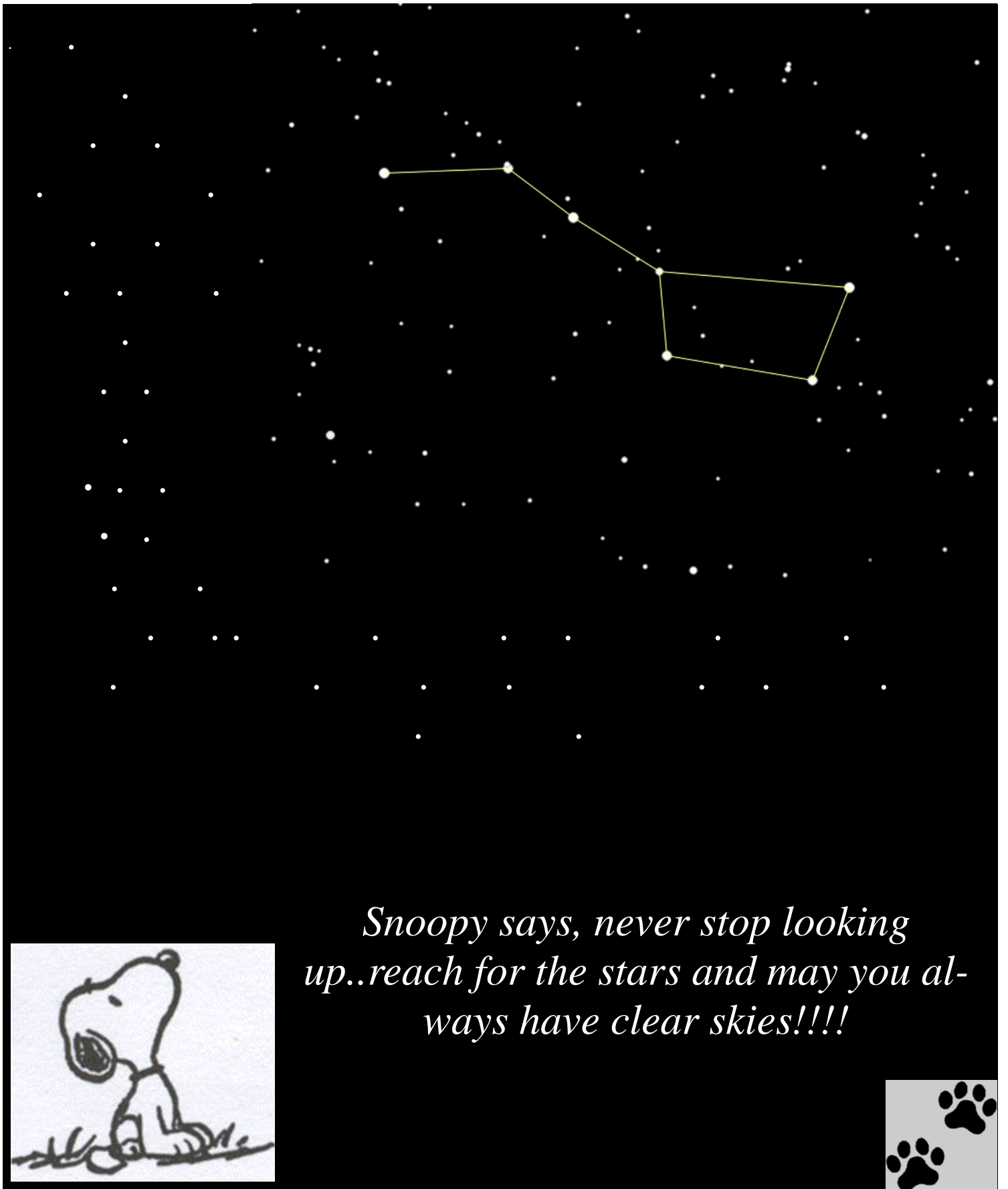
Astronomy and Kids

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!!



LEARN YOUR CONSTELLATIONS





Snoopy says, never stop looking up..reach for the stars and may you always have clear skies!!!!

