

AT THE JANUARY 8 MEETING...

## ***A Tour of Historical Observatories and Telescopes***

***Gordon Houston, HAS Vice Pres.***

This presentation stems from my recent tour of famous observatories, including:

- Theodore Jacobsen-University of Washington
- Dominion Astrophysical Observatory-Victoria, BC
- Lick Observatory-Mt. Hamilton, California
- Chabot Observatories - Oakland, California
- Fremont Peak Observatory-San

## ***Installation of New Officers***

The HAS officers for 2010 will be installed at the January meeting. See the next page for the list of the new officers for 2010.

Thanks to all the HAS members who served us as officers and committee members last year and to those who will serve us this year.

### **HIGHLIGHTS:**

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### **HAS Web Page:**

<http://www.AstronomyHouston.org>

See the *GuideStar's* Monthly Calendar of Events to confirm dates and times of all events for the month, and check the Web Page for any last minute changes.

### **Schedule of meeting activities:**

All meetings are at the University of Houston Science and Research building. See the inside back page for directions to the location.

Novice meeting: ..... 7:00 p.m.

*A "A Brief Tour of the Winter Constellations!"  
by Justin McCollum*

General meeting: ..... 8:00 p.m.

*See last page for directions*

## The Houston Astronomical Society

The Houston Astronomical Society is a non-profit corporation organized under section 501 (C) 3 of the Internal Revenue Code. The Society was formed for education and scientific purposes. All contributions and gifts are deductible for federal income tax purposes. General membership meetings are open to the public and attendance is encouraged.

### Officers & Past President

President: Ken Miller .....C:713-826-1049  
 Vice Pres: Gordon Houston.....  
 Secretary: Gitte Barchas .....  
 Treasurer: Alan Grissom .....  
 Past President: Bill Leach .....H: 281-893-4057

### Additional Board Members

Bill Flanagan.....  
 Don Pearce .....713-432-0734  
 Bram Weisman .....  
 Jay Levy .....  
 John Missavage.....

### Committee Chairpersons

Audit..... Tom Blocker.....  
 Education ..... Richard Nugent.....  
 Field Tr./Obsg..... Mike Edstrom.....281-347-7267  
 Novice ..... Justin McCollum.....  
 Observatory..... Bob Rogers .....281-460-1573  
 Program ..... Brian Cudnik .....  
 Publicity ..... John Missavage.....  
 Telescope..... Bram Weisman .....  
 Welcoming..... Open.....

### Ad-Hoc Committee Chairpersons

Historian .....  
 Librarian .....  
 Logo Mds Sales.....  
 Long Range Plan.....  
 Parliamentarian .....  
 Publ. Star Party .....  
 Rice U. Coord.....  
 Schedule Obs'v'ty .....  
 Texas Star Pty..... Steve Goldberg.....713-721-5077

### Special Interest Groups & Help Committees

These are now listed on the inside of *GuideStar* (not every month). See the Table of Contents

### Advisors

Dr. Reginald DuFour, Rice Univ.  
 Dr. Lawrence Pinsky, U. of H.  
 Dr. Lawrence Armendarez, U. of St. Thomas

### Dues and Membership Information

Annual Dues:Regular .....\$36  
 Associate.....\$6  
 Sustaining .....\$50  
 Student.....\$12  
 Honorary .....N/C

All members have the right to participate in Society functions and to use the Observatory Site. Regular and Student Members receive a subscription to *The Reflector*. Regular, Student, and Honorary Members receive *The GuideStar*. Associate Members, immediate family members of a Regular Member, have all membership rights, but do not receive publications. Sustaining members have the same rights as regular members with the additional dues treated as a donation to the Society. *Sky & Telescope* and *Astronomy* magazines are available to members at a discount.

**Membership Application:** Send funds to address shown on last page of *GuideStar*. Attention - Treasurer, along with the following information: Name, Address, Phone Number, Special Interests in Astronomy, Do you own a Telescope? (If so, what kind?), and where you first heard of H.A.S.

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## Special Interest Group Listing

*Any member who wants specific information on a SIG listed below may call the listed individual. Also, see the "Ad Hoc Committee Chairpersons" on the inside front cover and the "Special Help Volunteers" listing (not in every issue).*

Advanced ..... Bill Leach ..... 281-893-4057  
 Comets ..... Don Pearce ..... 713-432-0734  
 Lunar & Planetary ..... John Blubaugh .. 713-921-4275

## Other Meetings...

**Fort Bend Astronomy Club** meets the third Friday of the month at 8:00 p.m. at the First Colony conference Center. Novice meeting begins at 7:00, regular meeting begins at 8:00. Web site: <http://www.fbac.org>

**Johnson Space Center Astronomical Society** meets in the the Lunar and Planetary Institute on the 2nd Friday of each month. Web site: [www.jscas.net](http://www.jscas.net)

**North Houston Astronomy Club** meets at 7:30 p.m. on the 4th Friday of each month in the Teaching Theatre of the Student Center at Kingwood College. Call 281-312-1650 or E-mail [bill.leach@nhmccd.edu](mailto:bill.leach@nhmccd.edu). Web site: [www.astronomyclub.org](http://www.astronomyclub.org)

## January / February Calendar



Date	Time	Event
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### January

1		New Year's Day
8	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
7	4:39 a.m.	Moon at last quarter
15	1:11 a.m.	New Moon
16		Prime Night, Columbus Site
23	4:53 a.m.	Moon at first quarter
30	12:18 a.m.	Full Moon

### February

5	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
	5:48 p.m.	Moon at last quarter
13	8:51 p.m.	New Moon
21	6:42 p.m.	Moon at first quarter
28	10:38 a.m.	Full Moon

Send calendar events to Doug McCormick  
- skygazer10@sbcglobal.net

Check the web site:  
[www.astronomyhouston.org](http://www.astronomyhouston.org)  
Webmaster: Kay McCallum  
[kaym@mcclibrary.net](mailto:kaym@mcclibrary.net)

The Houston Astronomical Society Web page has information on the society, its resources, and meeting information. Want your astronomy work and name on the Internet for the whole world to see? Have some neat equipment? Pictures in film, CCD, hand drawings or video format are all welcome on the page. Do you have an idea to improve the page? I'm listening. Send me Email at [kaym@mcclibrary.net](mailto:kaym@mcclibrary.net).

★ ★ ★ ★ ★  
★ *GuideStar deadline* ★  
★ *for the February* ★  
★ *issue* ★  
★ *is January 15* ★  
★ ★ ★ ★ ★

## Observations... of the editor

by Bill Pellerin, *GuideStar* Editor

.....

### Happy New Year

Happy New Year and welcome to the year after the International Year of Astronomy. Those of us who are in the 'astronomical community' were well aware of the IYA, but I don't know how many others were involved.

There were significant efforts made to let the world know about the IYA, one of which I worked on – the Citizen Sky project. The idea was to engage the public in the observation of a bright variable star that would be going into eclipse in 2009. I gave a presentation on this subject at the HAS, at FBAC, and at Astronomy Day. I'm scheduled to do this presentation in January at the JSCAS.

It's fair to say, I think, that those astronomy wonks among us (and I count myself) can get interested in events that are less than thrilling to the previously uninterested member of the public. I spent a night several weeks ago watching a dimming cycle of Algol (an eclipsing variable in Perseus). I found it quite interesting since I had never seen a full cycle before, but to many other folks it's probably about as exciting as watching paint dry.

If you go about engaging the general public in astronomy, keep in mind those 'wow' objects that you can show them through a telescope. The first quarter moon, Saturn, and Jupiter come to mind. A few deep sky objects probably qualify – the double cluster, the ring nebula (from a fairly dark place), the Andromeda Galaxy, the Orion nebula – but these require more explanation. What's a cluster? What's a planetary nebula? What's a galaxy? What's a star-forming region?

### Computers –

I took the plunge into Windows 7 recently. Having been a Windows Vista user for a few years (and being underwhelmed at its performance and reliability), I'm more favorably disposed to liking Windows 7 (so far).

I did what's called a 'clean install'. That is, I started with a blank hard drive, installed the operating system, and installed the applications. I've been hitting it pretty hard for the last couple of days, and almost everything is working. Performance is better, too.

For doing the *GuideStar* I'm switching from Adobe InDesign to Microsoft Publisher. The economics are in the favor of Publisher. InDesign is a professional level application that will handle full magazines or books. Publisher is ok for smaller documents, like our *GuideStar*, and it should be a bit easier to use, once I learn it. Then, there's the economics of it. An upgrade of my existing version of InDesign is

\$200, and an upgrade of (actually a new product for me) Publisher is \$85. If you have MS-Office, purchasing Publisher is considered an 'upgrade'.

Over time, the *GuideStar* look may change a bit. I'll be happy to get the January issue out the door using the new (to me) software. Design improvements may come, but not right away.

### Holiday goodies –

I hate complicating things. The simpler the setup, the better I like it. So, it was with some hesitation that I purchased a dew-heating system. Yeah, it's something else to fiddle with, hook up, and repair if needed, but the last two observing outings I've had were made much more problematic by dew forming on the telescope optics and on the finder. So, it comes down to which problem do you want – dealing with dew, or dealing with dew removers.

I hope you got what you wanted, or needed, to keep your astronomical activities going. December hasn't been a particularly good month for observing, but it was a great month for reading. I recently finished *What the Dog Saw*, by Malcolm Gladwell. The book is a set of previously published articles, but most of them make you think, "I never thought of (that subject) that way."

*Until next time...*

*clear skies and new moons!*

*..Bill*

## Just Looking

### A GuideStar Interview by Clayton L. Jeter

## Lonnie Mosley - Telescope Builder



Last year while speaking at various astronomy clubs throughout Texas (cleaning optics correctly), I had the pleasure of talking to the Beaumont club; "Astronomical Society of Southeast Texas" (ASSET). They were a very cordial group and I really made some great friends there.



*Lonnie Mosley with his homebuilt 10" Dob*

One member who I met and befriended was none other than their president, Lonnie Mosley. He made me feel right at home during the presentation. I like the way he runs the meeting too... very casual.

Like I've said before here in this newsletter interview column, I enjoy getting to know about other amateur astronomers and what makes them "tick". Enjoy this month's interview.

You're going to like Lonnie...

### The Lonnie Mosley Bio...

I was born in May of 1956 in Port Arthur Texas. I have lived in the Golden Triangle area most of my life. I joined the U.S. Air Force in 1975 to see the world. I was stuck in San Antonio. After active duty I joined the Texas Air National Guard and served a total of 21 and ½ years. I enjoyed everything about the air force and retired an E8. I have been married for 30 years and have two sons. My oldest son bought me a small refractor from Wal-Mart for my birthday about 6 years ago. I tried to use it but about all I could see was the moon. It got me to looking at telescopes on the web and I ran across Obsession's web site. I thought how cool it would be to have a large telescope like those. I decided that I would build a scope I could really see something with, so I built a 6"F5 dob. I bought the mirrors and focuser, along with a couple of eyepieces off of E-bay and proceeded to build and learn about reflectors. When I finished it (took about 2 weeks), I brought it outside and started pointing it at stars. About the third star I pointed it at the star didn't look right, it was

blurry and out of focus. I turned the focuser and there was Saturn and its rings. What a site and I was hooked. I later bought a 6" F8 mirror and rebuilt my scope. The poles were golf club shafts so it was easy. I still use that scope and I built a 10" F6 dob which won an ATM Achievement Award at TSP in 2007. In 2005 our local astronomy club was having a star party so I went and brought my 6" dob. I wanted someone to tell me what I could do to improve it. I met several club members and was invited to their next meeting. I joined the club that meeting and have been a member since. I have been Astronomy day and club picnic coordinator. I was elected ASSET club president a year and a half ago and really enjoy that. I enjoy star parties with my favorite being Okie-Tex. I am strictly a push my scope kind of observer and enjoy doing Astronomical League programs. I have completed three so far and am working on two now. I encourage everyone in our club to do a program from the Astronomical League because it makes you a better observer. I recently got into bins and I think they give you a completely different view of the skies.

### The Lonnie Mosley interview...

**Clayton:** It is a real pleasure for me knowing that you will take the time in this busy world for this interview. I always get positive feedback from HAS members that read my monthly interview column, expressing that they love reading about other amateurs in the area. So now that I have you cornered, tell me a bit about the ASSET club in Beaumont. How did you get talked into becoming president there?

**Lonnie:** We are a group of around thirty families, when one member of a family joins, everyone in their family is a mem-

*(Continued on page 6)*

*(Continued from page 5)*

ber. We have several very young astronomers to several retired members. I enjoy the mix of experienced and new members we have. We have very good participation, at last year's all clubs meeting over half of our members attended. It had been about six years since our club had elections and I decided I would give being president a try. It has been very rewarding as our club has great members.

**Clayton:** I have attended 15+ TSP's and a handful of OkieTex star parties. I too am very impressed with the Oklahoma party. Tell us why it is your favorite.

**Lonnie:** I think the skies are better than TSP and the people are super friendly. Okie-Tex is very laid back. The area is great, with a lot to see. The cooler weather is a definite plus. Watching the big dipper lay down on the Black Mesa every night is really cool. On those cold nights the Cosmic Café has great hot chocolate.

**Clayton:** My first scope was a 6" f4.25 "Chicago Optical" RFT. In 1986 I built a Dob mount around the OTA and it was the perfect reach-and-grab scope. It sounds very similar to the 6" Dob that you built. Is coma a big problem when observing with it? Do you still use it regularly?

**Lonnie:** No, coma is not a problem because its focal ratio is F8. I still use it a lot, especially on the moon and planets. With a longer focal length telescope you see a narrower field of view, but your magnification is increased.

**Clayton:** Ever dabble in astrophotography

**Lonnie:** Not yet, but maybe in the future. It requires different equipment than what I use. I have seen some really spectacular amateur photography. It amazes me what an amateur can do with all of the new technologies. It is exciting to see amateurs discovering comets, impacts on Jupiter and other things that used to be for the professional.

**Clayton:** Have you dreamed of building a home observatory?

**Lonnie:** If I lived in a location that had dark skies, I would definitely have an observatory. Since I like to build things, I am sure it would be home built. I think an observatory built on top of a house would be great. I could go upstairs and observe.

**Clayton:** I see that you enjoy using (and building) Newtonian telescopes. What are your thoughts on the refractor, SCT, and Maksutov designs?

**Lonnie:** Refractors are great, the best views I have seen of

Jupiter and Saturn have been through a refractor. But they can be expensive. I have a 5" Mak that I won as the grand prize at the Deep South Regional Star Gaze in Louisiana. It is a good scope but because it has such a long focal length, you must have a stable mount. SCT's are good scopes and because most have tracking built in their mount, it is easy to locate objects.

**Clayton:** Which is the most memorable observation that you have ever made? There are many I'm sure.

**Lonnie:** My first was finding Saturn on my own. I bet I looked at it for at least an hour. The Eskimo nebula is a great target; you want to keep adding power to see as much detail as possible. Galaxies and Planetary Nebulas are my favorites.

**Clayton:** Which eyepieces do you keep reaching for while observing? Got a favorite ocular?

**Lonnie:** I use a 26mm for locating an object and then I will switch to a 10.5 mm for most of my viewing. I live in an area that has a lot of dew so when it is cold, I keep the eyepiece I'm not using in my pocket. That keeps it warm and dry.

**Clayton:** Are you an eyepiece filter user? What filters do you own and use regularly?

**Lonnie:** I occasionally use an OIII filter. I like using color filters on the planets. I find you can see some details better. I like using filters to darken the moon when it gets more than a crescent.

**Clayton:** When observing in the field, what star atlas do you use? Hardcopy or electronic?

**Lonnie:** I have Megastar on my laptop and I have the Sky Atlas 2000, but I really like the Pocket Sky Atlas, I like carrying it to my telescope and it's great for binocular use.

*(Continued on page 7)*

## ***What If We Threw a (Star) Party and Nobody Came?***

*A poem by Aaron Clevenson*



It was the night of the Geminids,  
In the year two thousand and nine.  
The announcements and emails were sent,  
According to the grand design.

I am at the Observatory,  
Ready for the crowds to arrive,  
Without a moon, with an open sky,  
This year the meteors should thrive.

Sunset is here, but the clouds won't part.  
And to top it all off, heavy fog.  
What if nobody decides to come?  
That will not look good in the log.

With fingers crossed and my hopes not lost,  
I anxiously sit without fear.  
For although it looks quite foreboding,  
The Canadians said it would clear!

Yet here I sit, lest someone should come,  
Without even one star to see.  
For hours and hours, with roof closed;  
The lonely astronomer me.

Even the other astronomers,  
Who stayed warm, at home, without blame,  
On the night we threw a star party,  
And the night that nobody came!

*(Continued from page 6)*

**Clayton:** Do you have any helpful advice to pass on to observers just starting out in astronomy?

**Lonnie:** Don't be in a hurry to buy a telescope. Go to your clubs star parties and members will be happy to explain their telescope and let you observe through it.

When you decide on what type of telescope you want, remember the mirror or lenses are the heart of a telescope. If you don't have a quality mirror or lens you cannot have a good telescope.

Get to know the older (smarter) members, they are a wealth of hands-on knowledge and most are more than happy to share their knowledge with you. When I joined ASSET, Howard Minor and Bill Christian probably got tired of all of my questions, but I learned a lot more from them than I could ever have from a book.

**Clayton:** Is there an email address that you have that a Houston Astronomical Society member could contact you for an additional question or two?

**Lonnie:** You can go to our clubs web site: <http://www.asset-astronomer.org/> and click on contact us. We have links to all of our officers. Thanks to Eddie, he has done a great job on our web site.

**Clayton:** Thanks Lonnie for taking the time to share your interest and thoughts with us for our monthly HAS newsletter, the *GuideStar*. We wish you luck with all of your astronomy interests. Please come visit our society when in the Houston area, we'd love to see you. Bring along several (or all) of your ASSET club members too.  
Clear skies always, Clayton

**Lonnie:** I will try and visit one day and your members are always welcome at our club meetings.

Thanks

# Remote Astronomy

By Bill Pellerin, GuideStar editor

Cloudy outside?  
A work-night? No  
problem. If you're  
doing remote  
astronomical ob-  
serving / imaging  
you can continue  
to do your observ-  
ing at (almost)  
any time of day.

I am aware of  
several of these  
pay-as-you-go  
telescope rental  
services, but the  
one I tried re-  
cently is called  
Global Rent a  
Scope (at  
[www.global-rent-a-scope.com](http://www.global-rent-a-scope.com)). I  
heard about it  
when I read an  
article about an  
astronomer who  
is disabled and  
unable to get to  
an observing site.  
This guy was able  
to do variable star  
photometry, which happens to be my interest, using the remote  
observatory.

The Global rent a scope (GRAS) system provides a trial period  
during which you can take images with two of their telescopes,  
GRAS-3 and GRAS-13. GRAS-3 is a single shot color setup using  
a Tak TOA-150 refractor with a 8.3 megapixel camera. GRAS-13  
uses a Tak Sky 90 refractor with a 1.9 megapixel camera.

So far, I've taken exactly one picture with the system. Last month,  
my shallow sky object was WZ Cas, a beautiful double star and I  
was curious about the remote system's ability to capture the color  
of the system.

Here's the picture. I did one 30 second exposure to get this image,  
and this is the low-resolution version of the result. Stars dimmer  
than 13th magnitude are clearly visible in the image. Not too  
shabby.

If you want to do photometry, you have to subscribe to the system,  
meaning that you have to pay for the service, so I haven't tried this  
yet.

Like any new system, there's a lot to learn to become proficient  
with it. Some consideration needs to be given to the cost of using



the system for your projects. Their web site pro-  
vides an economic argument for using the sys-  
tem instead of setting up your own high end  
observatory.

I don't expect that I'll be setting up a RCOS 12"  
telescope on a Paramount any time soon. The  
cost of the telescope and the mount approaches  
\$40,000, camera not included.

You could see this coming... Technology and  
the Internet have enabled this capability. I'm not  
recommending this service provider over others,  
but I *am* recommending that you consider this  
kind of service. It's pretty cool.

# Observatory Corner

*By Bob Rogers, Observatory Chairman*

Hello everyone.

Happy New Year to everyone. I hope that everybody had a safe and Happy Holiday season. I can't wait to see all the new "Toys" that Santa brought everyone for observing at the site.

The 2010 Star Party dates are as follows –

- 1/16 HAS members only
- 3/13 All clubs with B-B-Que
- 4/17 All Clubs with B-B-Que
- 9/11 All Clubs with B-B-Que
- 10/9 All clubs annual picnic
- 12/4 HAS members only

I plan to have the Observatory Committee meeting at the site on January 16<sup>th</sup>. This Committee meeting is to discuss the plans for what needs to be done at the site for 2010.

The only big plans that I have for 2010 is the replacement of the North fence. As stated at the November business meeting, I'm asking for donations of time and money to help offset the cost of the fence replacement. The plans are to recess both the entrance and exit gates so vehicles are not out in the road when entering or exiting the property. We also will be replacing all the barbed wire and fence post along the North road. The last estimate that we had was around \$2,000.00 in supplies. Any and all donations toward the Observatory fund would be very much appreciated. If writing a check, please put in the memo section "Observatory Committee" or "HAS Fence Replacement". All donations towards the HAS Observatory Committee is tax deductible and I will provide a tax deductible letter for your records. Any member of HAS is welcome to attend the meeting and put in their ideas and comments. I plan to start the meeting at 2:00 pm. Hope to see you there.

If you have a Randalls card, and have not done so, please have it coded for the Houston Astronomical Society. Our number is #6618. The Society gets 1 percent of the gross sales that members spend at Randalls. Randalls totals up the amount spent each quarter and will send us a check if the amount goes over \$2,500.00, otherwise the total roles over to the next quarter or zeros out at the end of the calendar year. So please link your Randalls card to the Houston



Astronomical Society so that the society can benefit from this Randalls program. Our number is #6618. This is very easy to do, just go to the Courtesy Booth and tell the person there what you want to do.

If you have any suggestions or thoughts for the site, let me know.

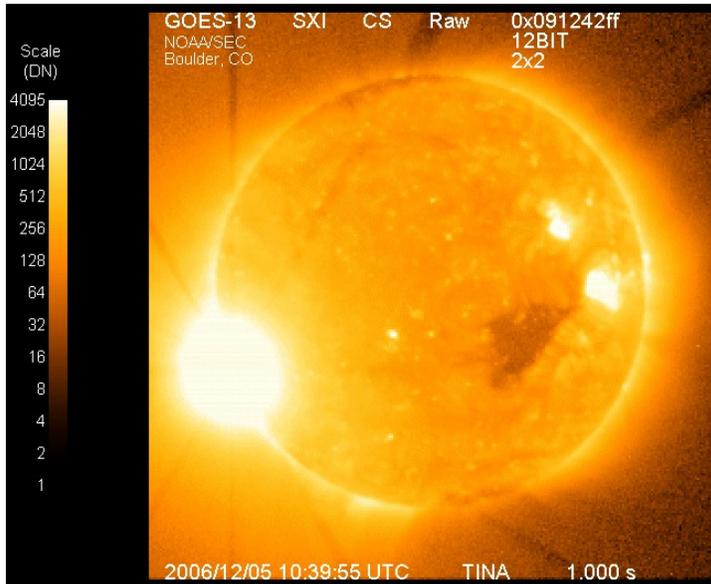
**Thanks,**

**Bob Rogers**  
**Observatory Chairman**  
**281-460-1573**  
**siteworkerbob@hotmail.com**

## Sunglasses for a Solar Observatory

By Patrick Barry

In December 2006, an enormous solar flare erupted on the Sun's surface. The blast hurled a billion-ton cloud of gas (a coronal mass ejection, or CME) toward Earth and sparked days of intense geomagnetic activity with Northern Lights appearing across much of the United States.



*X-9 class solar flare December 6, 2006, as seen by GOES-13's Solar X-ray Imager. It was one of the strongest flares in the past 30 years.*

While sky watchers enjoyed the show from Earth's surface, something ironic was happening in Earth orbit.

At the onset of the storm, the solar flare unleashed an intense pulse of X-rays. The flash blinded the Solar X-Ray Imager (SXI) on NOAA's GOES-13 satellite, damaging several rows of pixels. SXI was designed to monitor solar flares, but it must also be able to protect itself in extreme cases.

That's why NASA engineers gave the newest Geostationary Operational Environmental Satellite a new set of sophisticated "sunglasses." The new GOES-14 launched June 27 and reached geosynchronous orbit July 8.

Its "sunglasses" are a new flight-software package that will enable the SXI sensor to observe even intense solar flares safely. Radiation from these largest flares can endanger military and civilian communications satellites, threaten astronauts in orbit, and even knock out cities' power grids. SXI serves as an early warning system for these flares and helps scientists better understand what causes them. "We wanted to protect the sensor from overexposure, but we didn't want to shield it so much that it couldn't gather data when a flare is occurring," says Cynthia Tanner, SXI instrument systems manager for the GOES-NOP series at NASA's Goddard

### NASA Space Place

Space Flight Center in Greenbelt, Maryland. (GOES-14 was called GOES-O before achieving orbit). Shielding the sensor from X-rays also reduces the amount of data it can gather about the flare. It's like stargazing with dark sunglasses on. So NASA engineers must strike a balance between protecting the sensor and gathering useful data. When a dangerous flare occurs, the new SXI sensor can protect itself with five levels of gradually "darker" sunglasses. Each level is a combination of filters and exposure times carefully calibrated to control the sensor's exposure to harmful high-energy X-rays. As the blast of X-rays from a major solar flare swells, GOES-14 can step up the protection for SXI through these five levels. The damaged sensor on GOES-13 had only two levels of protection—low and high. Rather than gradually increasing the amount of protection, the older sensor would remain at the low level of protection, switching to the high level only when the X-ray dose was very high. "You can collect more science while you're going up through the levels of protection," Tanner says. "We've really fine-tuned it." Forecasters anticipate a new solar maximum in 2012-2013, with plenty of sunspots and even more solar flares. "GOES-14 is ready," says Tanner.

For a great kid-level explanation of solar "indigestion" and space weather, check out [spaceplace.nasa.gov/en/kids/goes/spaceweather](http://spaceplace.nasa.gov/en/kids/goes/spaceweather).

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

# Mintaka—Delta Ori

By Bill Pellerin, GuideStar Editor

**Object:** Delta Ori (Mintaka)  
**Class:** B0 Giant  
**Magnitude:** 2.2  
**R.A.:** 5 h, 32 m, 00 s  
**Dec:** -00 degrees, 17 minutes, 57 sec  
**Constellation:** Orion  
**Size/Spectral:** B0—Blue  
**Distance:** 900 ly  
**Optics needed:** Naked eye

## Why this object is interesting.

Mintaka is a star that lies halfway between the north polar star (Polaris) and the south pole. That is, it lies on the celestial equator. The celestial equator is simply the projection of the Earth's equator into space. This fact may be of practical importance to you as a telescope user.

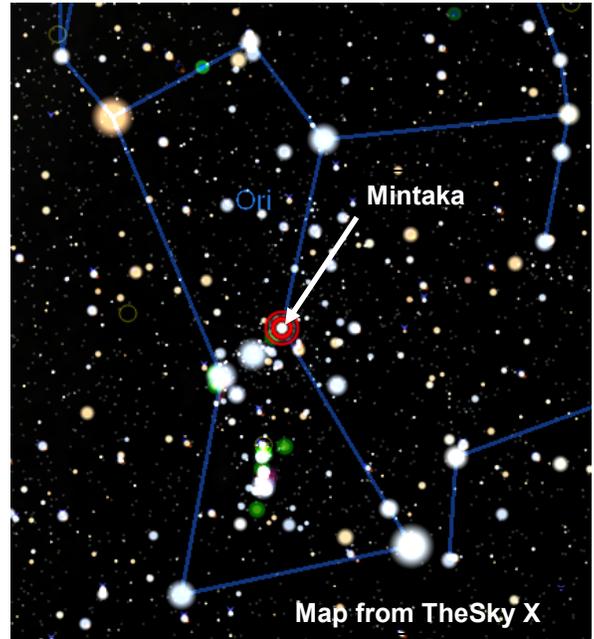
Some telescope mount alignment processes require that you find a star on the celestial equator (and, sometimes, simultaneously near the meridian). Mintaka meets that need. By mid January, Mintaka transits (crosses the meridian) at about 15 minutes past midnight. As we move through 2010, the star will cross the meridian earlier in the evening.

Mintaka is the right-most belt star in the constellation Orion, and its name reflects that. It shines at a bright second magnitude, but it has the misfortune to be in a constellation that contains numerous bright stars (Betelgeuse and Rigel being the best known), so a magnitude 2 star is easily overlooked.

About an arc-minute away from the primary star sits a secondary blue star of 6th magnitude. This secondary should be easily visible in a telescope almost exactly due north of the primary. I'll let you know if I see it.

In reality, though, this is a quadruple star system. The other two stars are far too close to the main star to be picked out. They can only be confirmed by doing a spectral analysis of the star. This would not be unusual except for the fact that the light reaching us from this system passes through what we now call the 'interstellar medium', the stray material that permeates space.

In the early 1900's, J.F. Hartmann, a German astronomer, found that some of the absorption lines that they detected spectroscopically when observing this system did not change position as would be expected by the Doppler shift. That is, some of the absorption lines were created in-transit, as the light travelled from the star system to the astronomer's instruments. It is these absorption lines that permitted astronomers to identify the chemical components of the interstellar medium (ISM).



The interstellar medium is the collection of whatever gas and dust exists between the stars, planets, and other objects that comprise the universe.

The density of this medium is very low, as you might expect. On average the ISM density is about one atom per cubic centimeter. The ISM density in our neighborhood is much lower, however, at about .1 atom per cubic centimeter.

Can you see the ISM? Yes! If you look at the dark regions of the Milky, such as the Cygnus rift, you're seeing the effect of the ISM. Other dark nebulae, such as the famous Horse Head Nebula in Orion consist of high concentrations of the ISM.

## Cold Enough for You?

By Bill Pellerin, GuideStar editor

How do you like observing in the cold weather? Yeah, me neither. I'm writing this on December 21, the day on which winter started.

Since observing is a relatively sedentary activity we don't generate a lot of extra heat during observing sessions. Here are some ideas that may help you keep your winter sessions enjoyable.

- Dress in layers—T-shirt, shirt, sweater or sweat-shirt, heavy coat. It's the air layers that keep you warm.
- Cover your head—I find that if my ears are cold, I'm cold, so I use ear-muffs. The ones that I have are 180s brand ([www.180s.com](http://www.180s.com)), but I'm sure there are others. A hooded jacket or another cover can help, too.
- Hands- (and feet). Chemical hand warmers are available at camping stores. These work great. I open one and keep it in my coat pocket, so when my hands are in my pocket they're warm. I also have a pair of gloves that leave the fingertips exposed so I can operate the equipment.
- Feet—There are special chemical warmers that you can insert

in your shoes to keep your feet warm. Insulated shoes (boots?) are great, too.

- Torso— If you go to a sporting goods store this time of the year you can get ski suits that'll keep you warm as toast. I have a multi-layer jacket that has a very nice hood for keeping my head warm. I also have a pair of ski pants that keep my legs warm. Blue jeans don't get the job done!
- An insulated container with a hot beverage is nice to have along.
- Take breaks— go inside a warm room to get out of the chill from time to time.

I find that if I allow myself to get cold, my observing session is over, so rather than end the evening early, I try to prepare for the cold.

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# Houston Astronomical Society

P.O. Box 20332  
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[www.astronomyhouston.org](http://www.astronomyhouston.org)

## General Membership Meeting

The Houston Astronomical Society holds its regular monthly General Membership Meeting on the first Friday of each month, unless rescheduled due to a holiday. Meetings are in Room 117 of the Science and Research Building at the University of Houston. A Novice Presentation begins at 7:00 p.m.. The short business meeting and featured speaker are scheduled at 8:00 p.m.

Parking is NOW across from Entrance 14, by the stadium.

## Board of Directors Meeting

The Board of Directors Meeting is held on dates scheduled by the board at 7:00 p.m. at the Houston Chronicle office, downtown. Information provided to *GuideStar* will be published. The meetings are open to all members of the Society in good standing. Attendance is encouraged.

## GuideStar Information

The H.A.S. *GuideStar* is published monthly by the Houston Astronomical Society. All opinions expressed herein are those of the contributor and not necessarily of Houston Astronomical Society. The monthly Meeting Notice is included herein. *GuideStar* is available on the HAS web site to all members of H.A.S., and to persons interested in the organization's activities. Contributions to *GuideStar* by members are encouraged. Electronic submission is helpful. Submit the article in text, MS-Word format via email [BillPellerin@sbcglobal.net](mailto:BillPellerin@sbcglobal.net). Copy must be received

by the 15th of the month for inclusion in the issue to be available near the end of

the same month. Or, bring copy to the General Membership Meeting and give it to the Editor, or phone to make special arrangements.

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The Houston Astronomical Society welcomes you to our organization. The HAS is a group of dedicated amateur astronomers, most of whom are observers, but some are armchair astronomers.

The benefits of membership are:

- Access to our 18 acre observing site west of Houston -- a great place to observe the universe!
- A telescope loaner program -- borrow a HAS telescope and try observing for yourself!
- A monthly novice meeting, site orientation meeting, and general meeting with speakers of interest.
- Opportunities to participate in programs that promote astronomy to the general public (such as Star Parties at schools)
- A yearly all-clubs meeting for Houston area organizations
- Meet other amateurs and share experiences, learn techniques, and swap stories

***You're invited to attend our next meeting.  
You'll have a great time.***

## ***Houston Astronomical Society Meeting on Friday, January 8 (Second Friday) 7:00 Novice & Site Orientation 8:00 General Meeting***

### **University of Houston**

#### **Directions to meeting:**

#### **From I-45 going south (from downtown)**

- exit at Cullen Boulevard
- turn right on Cullen
- turn right into the parking lot (by the stadium)
- Science and Research is across the street (2nd building back)

#### **From I-45 going north (from NASA/Galveston)**

- exit at Cullen Boulevard
- turn left on Cullen
- turn right into the parking lot (by the stadium)
- Science and Research is across the street (2nd building back)

#### **Parking:**

There is Free Parking, **BUT DO NOT PARK IN ANY RESERVED PARKING SPACES AT ANY TIME.**

U of H parking enforcement will ticket your vehicle.