Houston Astronomical Society

GuideStar

February, 2007

At the February 2 meeting...

The Martian Radiation Environment and the Implications for Human Space Travel to the Red Planet

Dr. Prem Saganti

Dr. Prem Saganti

One of the problems to be solved in a mission to the planet Mars will be how to deal with the different radiation environment. Dr. Prem Saganti will tell us about his work on this problem.

Highlights:

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 cover for a map to the location.

Novice meeting: ..... 7:00 p.m.
Allen Gilchrist -- "Know Your Gear and Find Objects Without Fear".

Site orientation meeting: ..... 7:00 p.m.
Classroom 121

General meeting: ..... 8:00 p.m.
Room 117

See last page for a map and more information.

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: Bill Leach ..... H: 281-893-4057
Vice Pres: Ken Miller ..... H: 936-931-2724
Secretary: Doug McCormick ..... H: 281-996-0177
Treasurer: Bill Flanagan H:713-699-8819
Past President: Steve Sartor .....

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Liaison responsibility

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Brian Cudnik .....
Allen Gilchrist .....
Don Pearce 713-432-0734
Bram Weisman .....

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Education ..... Richard Nugent .....
Field Tr./Obsg. ..... George Stradley 281-376-5787
Novice ..... Justin McCollum .....
Observatory ..... Bob Rogers 281-460-1573
Program ..... Don Pearce .....
Publicity ..... John Missavage .....
Telescope ..... Bram Weisman .....
Paul & Kay McCallum .....
Welcoming ..... Open - Please Volunteer .....

Ad-Hoc Committee Chairpersons

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Librarian ..... Peggy Gilchrist 281-443-8773
Logo Mds Sales ..... Judy Dye 281-498-1703
Long Range Plan ..... Bill Leach 281-893-4057
Parliamentarian ..... Kirk Kendrick 281-633-8819
Publ. Star Party ..... Richard Nugent 713-524-1993
Rice U. Coord. ..... Matt Delevoryas 713-666-9428
Schedule Obs'v't'y ..... Steve Goldberg 713-721-5077
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 $36.00
Associate $6.00
Sustaining $50.00
Student $12.00
Honorary ..... None

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* mag $32.95/year, *Astronomy* mag $29/year -- see club treasurer.

Membership Application: Send funds to address shown on outside cover 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
Occultations & Grazes ..... Wayne Hutchison 713-827-0828

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: http://www.ghg.net/cbr/jscas/

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-mailbill.leach@nhmccd.edu. Web site: www.astronomyclub.org

January/February Calendar:

Photo by Scott Mitchell

Date	Time	Event

February

1	11:45 p.m.	Full Moon
2	7:00 p.m.	Novice Meeting - U of H
	8:00 p.m.	General Meeting - U of H
	evening	Saturn just south of Moon
10	3:51 a.m.	Last Quarter Moon
	1:00 p.m.	Saturn at opposition
12	evening	Jupiter 6 degrees north of Moon
17	10:14 a.m.	New Moon
19	early evening	Venus south of Moon in west
23	evening	Moon 1 deg. north of Pleiades
24	1:56 a.m.	First Quarter Moon

March

2	8:00 p.m.	HAS Meeting - U of H
3	5:17 p.m.	Full Moon - Total Lunar Eclipse
11	2:00 a.m.	Daylight Savings Time begins
		Move clocks ahead 1 hour
18	8:43 p.m.	New Moon
		Partial Solar Eclipse - not visible from Houston
21	7:07 p.m.	Equinox - Spring begins
22		Mercury at greatest western elongation
		Look in morning sky
25	12:16 a.m.	First Quarter Moon

Send calendar events to billpellerin@sbcglobal.net

***GuideStar* deadline for the March issue is February 15**

Check the web site:

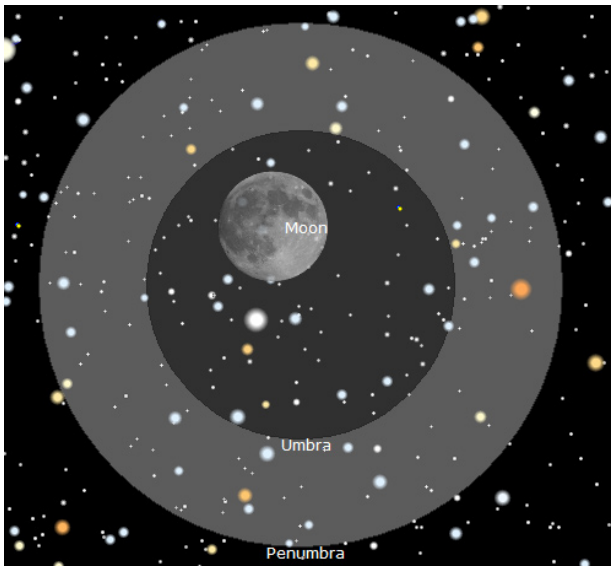
www.astronomyhouston.org

Webmaster: Bob Rogers

siteworkerbob@hotmail.com

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 siteworkerbob@hotmail.com.



Moon at full eclipse on 3/3/07, 5:17 p.m.

(14 degrees below the Houston horizon)

Houston moonrise at 6:25 p.m., i eclipse n a partial phase.

Image from TheSky V6

President's Message

Greetings!

We had a great meeting last month at the University of Houston. The saga of Buster and Barbara Wilson in their hunt for pallasites in a Kansans field was intriguing. Thanks, Barbara, for sharing your adventures. Much of the thanks goes to Don Pearce and his program committee for continuing to bring us excellent programs. If you have any ideas about speakers please bring them to Don's or my attention.

Any new president comes in with a vision of where he thinks the group should be heading

We have a new board of directors and a new president. That usually means to expect some changes. Any new president comes in with a vision of where he thinks the group should be heading, and I am not different. Those of you that know me know that I don't usually sit back and let time pass. My professional interest in astronomy is in the academic and it is manifest in the manner in which I operate. A healthy mix of observation and theory is our goal. There's always a better way of doing things. I know from my past experiences that most members of an astronomy group prefer a minimum amount of visible governance or "parliamentary volleyball".

We go to our monthly meetings for three reasons. We first go for the fellowship, to see some friends and catch up on the tales of a friend's latest adventure. In our busy lives it is sometimes difficult to get around and see everybody that we'd like to talk to. We also go to learn something about a hobby that we enjoy. There's always some new and amazing discovery in astronomy that you might hear about that could inspire a little post-meeting research. Also at meetings, we lean about upcoming events that provide all of us opportunities to learn from someone or for someone learn from us. Banquets, star parties and BBQ's provide all of us with events where learning is abundant.

There are some major events coming up in 2007 for astronomy club members from all over Houston and Texas. The annual H.A.S. banquet will be on Saturday, April 14. This is a fun opportunity to dress up, eat a good meal, maybe have a nice cabernet, learn some astronomy and commune with some friends. See Judy Dye for details or go to the society website at www.astronomyhouston.org. I rarely have an opportunity to dress up, but for this event I will. Judy and Michael Dye have organized the annual banquet since 2001. Michael and Judy have also been the chief organizers for many years of other major events in the past including Astronomy Day, the annual picnic, observing site director, logo sales and GuideStar distribution. They have given a lot of their personal time to the society and we owe them our greatest appreciation. The Texas Star Party is scheduled for May 13 – 20. I have been for the last five years. In my youth I spent a lot of time in the mountains of west Texas climbing around and it is always good to get back into that historic area of the state. The skies are the darkest that I have seen and remind me of the many nights that I spent out under New Mexico skies when I first started learning astronomy as a teenager. The 7th Annual Houston/Beaumont Regional Astronomy Meeting will be on Friday, October 19 at Houston Community College and the next day, Saturday, October 20 will be "Astronomy Day" at the George Observatory, so mark you calendars. Both of these evens are an excellent opportunity to meet and work with the other area astronomy clubs.

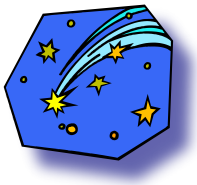
Grab a new Houston Astronomical Society brochure, share it with a friend and bring them to the next meeting.

Take a look at the notice in this issue of the *GuideStar* that we will be electing 1) a board member 2) observatory director and 3) welcome committee chairperson at the Feb. 2 meeting.

Hopefully this spring will bring us some cool dark evenings to get reacquainted with the "stars".

Bill Leach
H.A.S. President

Observations... of the editor



by Bill Pellerin, GuideStar Editor

The cost of owning stuff --

In the last few months we've been working on remodeling our house. One of the things that happens when you do a remodel is (as when you move to a new house) that you have to do some significant clean-outs. I've had to consider almost everything that I own to decide whether I need to keep it, I need to discard it (sell it or throw it away), or I can use it. It's a bit of a struggle to look at a book with an interesting title and an interesting theme on the shelf and ask and answer the question, "Am I ever going to read this?" If the answer is 'no', the book needs to go.

Books can go to a book reseller, can be donated to a library, or can be given to the Houston Astronomical Society library

You can go through the same exercise with anything -- telescopes, eyepieces, finders, electronic devices, and so on.

Often times, the cost of something is not best represented by the cost of purchasing it. Many times, it's better to understand the cost of *owning* something. A lot of things have a high maintenance cost (cars and houses come to mind). Other things require a lot of time either doing the maintenance yourself, learning how to use the item, or sorting out problems with using the item. Sometimes, smaller and simpler is better.

I'll freely admit to being fascinated with gadgets, and I have plenty of them. Some of which have been replaced with improved versions of the gadget. What to do with the older version? Throw it away? (Too good for that.) Sell it? (Takes time.) Nowadays, I think about the ownership cost of something when I consider acquiring it. This is something we all ought to consider when the latest-and-greatest astronomy item appears on the market.

Congrats to George Stradley

Congratulations to our friend George Stradley who was recognized at the January meeting for his 5 years of service as Novice Coordinator. I was fortunate to be able to give a presentation (twice) while George was in charge. Great job, George!!

Come to the March Novice Meeting

I'll be giving the Novice presentation in March, on a new topic. The topic will be something like, "The Amateur Astronomer's Career" and I'll talk about all the things you and I can do as amateurs. The more I consider this topic, the more ideas I come up with. I look forward to giving this presentation, and I hope to see you there.

Will we ever have clear skies again?

I'm writing this on January 18 and it feels like forever since we've had clear skies. The week after New Year's Day was lousy, and it remains lousy to this date. According to the weather forecast, it'll be cloudy with a chance of rain this weekend. Guess what; new moon is *today*. It figures. Maybe all the clear weather is being saved for the Texas Star Party!!

Great articles in this issue

I'm pleased to be able to publish a 'President's Message' this month, as well as a very nice article by Don Pearce on comet McNaught, illustrated with images from Loyd Overcash. Clayton Jeter continues his contributions with a very interesting interview of Chuck Shaw. Our secretary, Doug McCormick comes through with his minutes of the January meeting, Judy Dye has more information on the banquet coming up and Leland Dolan has provided us with a very nice article about the planet Venus. Bob Rogers, who has taken over the role of Observatory Chairman includes his comments in the 'Observatory Corner'. Thanks, everyone!

Until next time...
clear skies and new moons!

..Bill

billpellerin@sbcglobal.net

Logo Sales

The *Observer's Handbooks* for 2007 are in. They sell for $25.00. If you would like to have one or more, please e-mail me at judyadye@aol.com, call me at 281-498-1703, or see me at the meeting... *Judy*

Just Looking

A *GuideStar* Interview by Clayton L. Jeter

Chuck Shaw - observer, NASA director

Here's my latest interview with a fellow Houston area amateur astronomer that has a NASA background. I first met Chuck Shaw at a JSCAS meeting years ago. At several TSP star parties in the 1990's, I observed with him and others from that society (they have some real zany members….a true riot to visit). This interview was fun to do and I learned a lot about Chuck that I never knew.

Chuck Shaw in his home observatory.

Being a longtime local amateur astronomer, I suggest you to visit the NASA club to meet Chuck and the membership for a fun filled evening. Now let's enjoy Chuck's fascinating story….

Bio:

I was born in Dallas, TX. Family moved to Memphis, TN when I was about 8. Attended Southwestern (now called Rhodes College), for undergraduate school (physics), and then graduate school at USC. I became interested in astronomy in undergraduate school. Joined USAF, and while stationed at Vandenberg AFB, CA, was selected to come to Houston to train for Space Shuttle Operations. My USAF plans were to send us to Colorado Springs, CO to fly classified missions out of a secure Mission Control there. To get ready for that, we would become flight controllers for NASA at JSC and learn by actually doing the jobs. One of the tasks was the Flight Director Position. I applied and was selected as the first non-NASA Flight Director in 1983. After Challenger, the USAF moved their primary payload operations back to expendables from the Shuttle. Rather than being transferred away from NASA, I retired from the USAF and Gene Kranz hired me, which allowed me to continue on as a Flight Director. I was Flight Director for 32 Shuttle Missions. Afterwards I accepted an assignment as Operations Manager for the Astronaut Office, and then Project Manager for the Crew Escape System for the Orbital Space Plane. When the OSP was cancelled in favor of the Constellation Project (returning to the Moon and then on to Mars), I accepted a position with the Space Shuttle Program office, coordinating the impact testing program as part of the return to flight effort. After STS-114 (the return to flight mission) I was asked to serve in my current position as Mission Director, for the Hubble Space Telescope Servicing Mission 4 (final Shuttle repair mission to the HST). Needless to say, it was an easy question to answer!!! I am currently coordinating the efforts in support of the decision process for adding the servicing mission back into the Shuttle manifest.

Past President of the Johnson Space Center Astronomical Society, an avid observer and amateur telescope maker (ATM) and astro-imager (film a long while ago, CCD imaging now). Hobbies also include sailing (42 years of racing, sail making, and cruising). I'm heavily involved in local community activities.

Clayton: Thank you Chuck for taking time out of your busy schedule to answer a few questions for our society. It is always fun and interesting to learn how other observers became involved in amateur astronomy as a hobby. What makes this interview even more interesting is that you have chosen a similar field as a career.

Clayton: What first sparked your interest in astronomy and when?

Chuck: The head of the Physic Department where I attended college specialized in infrared spectroscopy, and lured me away from being a math major to being a physics major. Fellow students shared their interest in amateur astronomy, and I was hooked for life…

Clayton: Tell me about your first telescope?

Chuck: As part of an optics project, we figured 6"f/8 primaries (isn't that what EVERYONE started on??? <grin>) and silvered them. It gave what I considered GREAT images, and the hook was simply set deeper!!!

Continued …

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Joining the USAF, starting a family, graduate school, and coming to JSC and learning Shuttle Flight Operations provided a significant string of distractions away from participating in amateur astronomy until the last return of Halley's comet, when I obtained a small scope to show the comet to our oldest daughter (and for me too!!). I also joined the JSCAS about that time, and was back into amateur astronomy again before I knew it.

Clayton: What scope do you generally use and what kind of observing do you prefer (visual or astrophotography)?

Chuck: These days, my two main scopes are a 14.5" f/5 Newtonian on an alt/az mount, and a 10" SCT on a GEM. I much prefer visual observing of deep sky objects, but from my home in Clear Lake City (subject to terrible urban sky pollution), deep sky visual observing is virtually impossible. Work does not allow getting away to dark sky sites very often. But in 1995 when I built my Cookbook245, CCD imaging provided a portal to deep sky even from my light polluted skies! The result has been that CCD'ing has ended up becoming my central focus in amateur astronomy, and has fueled my ATM efforts to provide better optics and mounts to better support CCD imaging.

Clayton: Working at NASA as a flight director for many years, do you find other associates at your work interested in amateur astronomy?

Chuck: Yes. I am the JSC Employee Association Representative for the JSCAS, and I get a lot of calls from employees at JSC and folks in the Bay area (you do NOT have to work at JSC to be in the JSCAS!!) concerning how to get involved in amateur astronomy. Being assigned as the HST SM4 Mission Director is like Brer Rabbit asking to be tossed into the briar patch!!!

Clayton: Through the years, I've seen you use your home made reflecting telescope at many star parties. It seems every time I see this instrument, you have made another upgrade. Can you tell us about its specifications and construction? What's next for this scope?

Chuck: My poor long suffering 14.5"f/5 scope is what I call a classic example of "evolutionary engineering". The primary started life as an old full thickness Coulter optic. Initially, it lived in a Sonotube, and was on a makeshift equatorial mount when I purchased it from Paul Maley. I re-mounted it as a Dob, where it served me well for many years! Many years ago I had obtained a 10"f/6 optic, and it eventually was rebuilt into a double truss tube configuration, which served as the prototype for the 14 also becoming a truss tube system. CCD imaging demanded a tracking system, and I designed a tracking platform that could be easily built at home, with no special tools more sophisticated than a hand drill and a saw. The tracking system also made visual observing a LOT more fun, and I enjoyed sharing the design with hundreds of folks. Then I met a guy named Mel Bartels, and became fascinated with home-built computer controlled tracking for an alt/az mount because that made tracking for CCD imaging much more accurate than the tracking platform. All of these things resulted in incrementally modifying the 14" scope. Somewhere along the line I developed a secret passion for LEDs also…. So I make sure that each modification for the 14 results in the total number of LEDs on the mount always increasing…. <grin>

Since building my backyard observatory and setting up my old rebuilt and converted (to computer control) "Starliner" GEM, I do most all of my imaging using that system, so the 14 will next appear at TSP as a light(er) weight alt/az system more suitable to being easily taken to star parties and used for visual observing and only occasional ccd imaging. It will also use Dan Gray's new Servo motor control system, and will also (of course) have a suitable number of LEDs to improve its performance!

Clayton: What is your favorite object?

Chuck: The easy answer is whatever is currently in the eyepiece or CCD FOV. To narrow things down however, I think it would tough to decide between M42 and the Virgo Cluster. I can spend hours wandering through the nooks and crannies and folds and shadows in M42, using every magnification and FOV available to me, and see something new virtually every time I slow down and "observe" (rather than just "look"). Same goes for the Virgo Cluster. I never cease to be astounded by the number and diversity of what I see under a dark sky exploring though the cluster! And the thought that each of those objects are entire galaxies of stars that each has uncountable treasures that I "know" are there but I cannot even begin to see is both awe inspiring and exciting at the same time…. This universe is a very special place!

Clayton: Do you sketch what you observe?

Chuck: Yes! Many years ago, as I was working my way through the Messier's, and on

Continued ...

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into the Hershel's I learned that keeping a logbook, and sketching as well as writing about your eyepiece impressions enabled you to "observe" rather than just "look". And the best of all was doing that in the company of other observers doing the same thing, where you could each be looking though your own scopes at the same time, while talking to each other about what you were seeing. I still do a good job of maintaining a logbook, but as I have moved into CCD imaging, my sketching has changed character. I now find I do my sketching by working to pull out more and more subtle details from the CCD images I take, rather than with my pencil at the eyepiece. It has none of the magic of being under a dark sky with good friends, but it does do a good job of making me even more anxious to get back out to a dark sky whenever I can!

Clayton: Where is your favorite observing site….or is this a secret?
Chuck: Boy, you ask TOUGH questions!!! I think it would have to be Fort McKavett, TX. The skies can be quite good, but are certainly nowhere near like being at the TSP. However, it's far enough away to not have the luxury of going there very often, so that makes you have to look forward to going. The locals all come out for a big BBQ and a star party when the JSCAS comes out, and seeing them again and their enthusiasm for both the sky and for seeing us there is as enjoyable as seeing old friends appear in the eastern sky as the seasons change. Nothing will ever have the magic of the TSP however. The friends I have met and look forward to seeing again out there, and the astounding observing sessions I have had are really impossible to really ever equal and really also impossible to ever really adequately describe in words! Then of course, there is the "Prude Food" to always look forward to……

Clayton: Do you have an amateur observing mentor?
Chuck: Well, this one is pretty simple…. It would have to be Al Kelly. I was astounded when I first met him that anyone could totally memorize the ENTIRE sky and all objects (and their names) in it….. And be able to quickly and accurately find ALL of them on demand……And to be able to point out features that were simply not there, till he pointed them out, and then were totally obvious….. If I have ANY observing skills, it is because Al showed us the joy of becoming friends with the sky, and how much joy there is in sharing it. And it was Al that first introduced a number of us to CCD imaging, and then also into color CCD imaging…… and it is those paths I now walk till I can have the time and opportunity to get back to those quiet magic nights with an eyepiece and sketch pad.

Clayton: You told me recently that you will soon be retiring from NASA. What are your plans? Do you think your observing time behind an eyepiece will be more frequent?
Chuck: Connie, my bride of 36 years, and I had always hoped to move up to the mountains after I retire from NASA, but having a grandson has changed all of that. Now we are planning on moving to Merritt Island, FL to be near our daughter, her husband, and our grandson. That won't happen till late 2008 however, after we get finished with the HST servicing mission earlier that year. The skies on south Merritt Island are not "great", but are significantly better than suburban Houston skies, and our retirement home there already has a concrete pad out back that will be the basis for my backyard observatory.

Clayton: If you could roll the clock back, what would you do differently in this hobby?
Chuck: Even though I really love to do CCD imaging, it simply cannot equal the "magic" of visual observing. So, looking back on things, an alternate path may have been to optimize my equipment and ATM efforts more along the lines of visual observing once a month from a dark sky site rather than CCD imaging more often from a suburban site. Hopefully, retirement will allow me to have the best of both worlds with my CCD imaging system set up alongside my 14, and then also to have the time to do BOTH!!

Clayton: Thanks Chuck for sharing your interest and thoughts with us for our monthly HAS newsletter, "The *GuideStar*". Good luck on your next mission and your retirement. Please come visit HAS, we'd love to see you. Thanks again.

Erratum --

Due to an editing error the early posting of the January *GuideStar* omitted part of the interview with John Wagoner. The correct version is available from the HAS web site:

www.astronomyhouston.org

Shallow Sky Object of the Month

Betelgeuse

by Bill Pellerin, GuideStar Editor

Object: Betelgeuse
Class: Star
Magnitude: .45 (variable from .4 to 1.2)
R.A.: 5h 55m 10s
Dec: 7 deg 24m 24s
Constellation: Orion (the Hunter)
Optics needed: Naked eye

Why this object is interesting.

Many astronomers believe that Orion is the most beautiful constellation in the sky. Could be. This constellation contains some of the best deep-sky objects in the sky, including the Orion Nebula and the Horsehead. When you see Orion you can't miss Betelgeuse at the northeast corner of the main part of the constellation.

The name is Arabic and means either "hand of the central one" or "armpit of the central one", depending on which reference material you wish to accept.

You won't have any trouble finding this star since it is the 7th brightest star in the skies (it shines at magnitude .45) and is clearly a reddish star that stands out in the constellation. It's also given the designation alpha Ori, which *should* mean that it's the brightest star in the constellation. The brightest star is Rigel at the opposite corner.

Betelgeuse is visible from most of the world since it lies only a bit over 7 degrees north of the equator. Compare Betelgeuse (class M) with Rigel (class B), and you'll see the color contrast quite vividly. Betelgeuse is a variable star... and is near magnitude 0 at its brightest and near magnitude 1 at its dimmest. It's period is approximately 5.8 years.

Betelgeuse is a red giant star that is near the end of its life. It is now fusing helium into carbon and exhibiting variable brightness by creating an obscuring dust shell. After a while the dust shell acts like a blanket and the star heats up and blows away the shell. There is reason to believe that Betelgeuse will go supernova sometime in the next few thousand years. When this happens, the star could be as bright as the full moon for a few months.

This star has the distinction of being the first one whose 'surface' (if stars can be said to have a surface) has been imaged by the Hubble Space Telescope. The angular size of the star is .045 arc seconds, measured using optical interferometry at the Mount Wilson (California) observatory in 1921. Optical interferometry uses long baseline optics (possible multiple telescopes) to increase the effective size of the telescope and, therefore, the resolution of the telescope. Remember that the resolution of a telescope, all things being equal, is improved as the size of the telescope is increased.

When we say that Betelgeuse is a 'red giant', we mean GIANT. If our Sun was replaced by Betelgeuse the edge of the star would extend 2.8 AU (one AU = the distance from the Earth to the Sun). Mercury, Venus, Earth, and Mars would be inside the star. The radius of Betelgeuse to its edge is about half the distance to Jupiter.

Orion and Betelgeuse

From TheSky v6

How can I learn more about the Astronomical League?

Amateur astronomers from across the country benefit from perusing the many pages of the Astronomical League's website, www.astroleague.org. Naturally, this is the place to go if you're looking for information about upcoming events and League news. But there is so much more...

Want to learn all about one of the great League observing programs? Go to www.astroleague.org/observing.html.

Do you know of a worthy candidate for one of the many League awards? Look at http://www.astroleague.org/al/awards/awards.html.

Are you interested in buying a particular book about our fascinating hobby? Then go to www.astroleague.org/al/bookserv/bookserv.html.

There is even something to help your club function better. Try www.astroleague.org/al/socaids/socaidid.html

Make the most of your Astronomical League membership! **To find out more about what the Astronomical League offers you, why not log on to www.astroleague.org today?**

Membership Renewals...

Your membership is renewable on January 1 of each year.

Total yearly dues are $36.

If you paid your dues any time in 2006, your payment for 2007 is due as of January 1, 2007.

Magazine subscriptions can be renewed at any time and the renewal does not need to be synchronized with your HAS dues.

Membership in the Houston Astronomical Society is one of the great bargains in Astronomy.For a regular membership of $36 you get the opportunity to support an active and growing organization, you get the monthly *GuideStar* newsletter, and you get access to the outstanding H.A.S. observing site near Columbus, Texas. (You must attend an orientation, given monthly, to use the site.) And, after two months of membership you can borrow, at no charge, one of the Society's loaner telescopes. It's the best deal in town, we think. Please renew your membership when it expires.

Encourage other astronomy enthusiasts to join the organization as well. It's a great group.

Thanks!

Want Ads

For Sale: 17.5" Newtonian
Perfect for imaging or visual star parties. 17.5" f4.5 Newtonian telescope with highly accurate microprocessor-controlled, stepper-based alt-az drive system with focal plane rotator. Designed and built by Andy Saulietis and the owner. Accepts ST4-compatible inputs for autoguiding. Mechanical and calibration work done by the owner to optimize system accuracy for autoguided CCD imaging. Original 1981 Coulter mirror refigured to smooth 1/8th-wave surface by Sky Optrical in late 80's. Primary and secondary recoated with enhanced coatings group by PAP in early 90's. Optics in excellent condition. 80mm f5 finder. Breaks down to numerous major pieces for transport. With modest effort, can be a traveling scope, but better as a semi-permanent observatory. See my website for many images made with this system over the last decade.

Price negotiable. For pickup/delivery, maybe can meet you halfway.

Call 281-482-5190 or E-mail Al Kelly.

For Sale: Celestron Nexstar 8
Like New Condition...Celestron Nexstar 8, Used only 2 times in back yard. Some extras include Solor filter, 1 1/4" star diagonal, 40 mm multi-coated nexstar plossel, 8-24 mm Z00 eyepiece, variable polarizing filter, 2X multicoated Barlow. $ 850.00 Jack DeNina, Willis,Texas 936-856-0704, jjack9485@cs.com

For Sale: Celestron Sky Master binoculars
11 X 80 Astronomical Binocular with original carrying case. Celestron Photographic Tripod (crank up) in original box. Both items purchased new and gently used a few times. $250 or best offer. George Sellnau
713-978-7774, gsellnau@aol.com

Email your ads to Bob Rogers, our Webmaster, at siteworkerbob@hotmail.com

Notice to members --

At the February 2, 2007 meeting we will be conducting an election to fill the following vacancies:

1. **Board member at large**
2. **Observatory director**
3. **Welcome committee chairperson**

Publicity Suggestion Box

I welcome any suggestions that *any* member has to offer. It doesn't matter how trivial you think your idea may be. All input will be reviewed and welcomed.

Let's grow.

Please drop me a note at the following address.

itjdm0@yahoo.com

John Missavage- HAS Publicity Chair

Remember --

All HAS memberships are due for renewal in January. Pay your 2007 dues now!! Our membership year now corresponds to the calendar year.

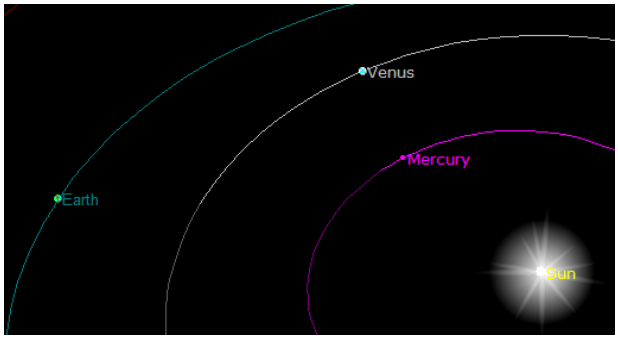
Mail your dues to the address on the last page of this *GuideStar* or bring your payment to the meeting.

It's 2007; Venus is Back

by Leland Dolan

On New Years Day, as I was headed to a local cafeteria, I caught my first glimpse of Venus in nearly a year. For me, the western sky had been barren, except for an occasional crescent moon, a first magnitude star, or one of the less luminous planets. But now, for the first half of this year, Venus will grace our twilight skies after sunset.

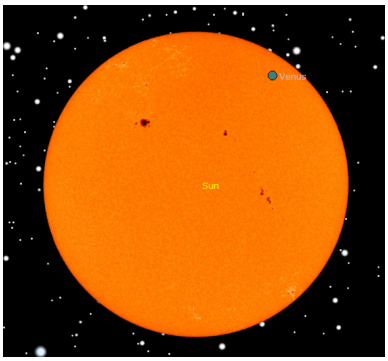
Venus never reaches more than 47° degrees east, or west of the Sun. This angle, as seen from Earth, is known as the "angle of elongation". And when a planet sets after the Sun, the angle is of "eastern elongation". On the evening of June 8, 2007 Venus reaches greatest elongation, 45° east of the Sun. As viewed through a telescope, Venus appears as a first-quarter moon, 24″ (arc seconds) in diameter.



Arrangement of the planets on June 8, 2007
Image from TheSky v6

It is at this stage that I like to hunt for this planet in broad daylight. If you have good eyesight and the sky is fairly clear of pollution, it is visible to the unaided eye. Now that I'm in my seventies, I prefer to look at it through binoculars or a telescope. My technique is to determine the time that Venus transits my local meridian (using computer software). I then go outdoors shortly before transit time and begin sweeping in altitude, that is up and down, along a the east side of a building that approximates the meridian until I find Venus in the field of view. On several occasions I have shown my neighbors that you can (indeed) see Venus in the daytime.

Venus will get brighter as its diameter increases, though its phase becomes a thinner and thinner crescent. Greatest brilliancy occurs on July 12, 2007, at which time its angular diameter is 42″ and it is a dazzling object without a scope. However, by the end of July Venus becomes more difficult to view and by August 18, 2007 this planet is in conjunction with the Sun. Because Venus's orbit is tilted to that of Earth, Venus will pass 8° south of the Sun, making it invisible for several weeks near conjunction. During this conjunction, Venus favors earth's Southern Hemisphere. Therefore, if you were in Australia, South America, or New Zealand you could see Venus during daytime at opposition. This contrasts with the Jan. 16, 1998 conjunction in which Venus passed about 6° north of the Sun, and which I observed about Noon here in Houston. You can see my article by visiting the HAS web site, and reading "Articles of Interest", then selecting the third article from top. Furthermore, if you can wait until Jun. 5, 2012, you can watch Venus cross the face of the Sun, in a "Transit of Venus". What's nice is that it will even be visible from Houston.



Venus transit on June 5, 2012
Image from TheSky v6

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Minutes
of the January, 2007 Meeting of the
Houston Astronomical Society

The January, 2007 meeting of the Houston Astronomical Society was called to order at 8:05 p.m. by HAS President, Bill Leach.

General Announcements:

- Bill Leach welcomed everyone to the meeting and provided some general information about the society and our observing site near Columbus, TX.
- Bill recognized and welcomed the new member and three guests present at the meeting.

Announcements:

- Bill Leach announced that Bob Rogers is resigning his position as Web Master and asked for volunteers to take over this important service to the society.
- Bill conducted a vote by the general membership, which resulted in the April 2007 General Membership meeting moving from Good Friday to the preceding Friday, March 30th.
- Bram Weisman reviewed the **Loaner Telescope program** for those unfamiliar with it.
- Amelia presented member, **Gordon Houston, with the Astronomical League's Planetary Club Certificate #45** and Pin in recognition of his having completed 25 of the solar system observing projects on the Planetary Club list.
- Judy Dye announced that the 2007 HAS **banquet is scheduled for April 14th at the Hilton Houston Southwest**. The speaker will be Dr. Mary Kay Hemenway speaking on the life of Galileo. Registration is ongoing and registration forms and instructions are up on the HAS website at http://www.astronomyhouston.org
- Bill Leach recognized Bill Pellerin for his excellent work as the editor of the HAS newsletter, the *GuideStar*. Bill also announced that there were some excellent Spitzer Telescope images available to the audience courtesy of Bill Pellerin.
- Steve Goldberg announced that the 2007 **Texas Star Party** will be held May 13th – May 20th. Anyone interested in attending must submit a TSP Registration Request form by January 20th. These forms can be submitted online at http://www.texasstarparty.org .
- Bill Leach presented George Stradley with a beautiful plaque in **recognition of George's service to the society** as Chair of the Novice Program for the past five years.
- Bill related that Doug McCormick had the Treasurer's duties for the evening and was accepting dues from members.
- Bill announced that member, Lee Lankford, had volunteered to serve as Welcoming Committee Chair for 2007, to the gratitude of all present.
- Bill announced that a meeting of the **Observatory Committee** would be held at 2 p.m. on Sunday, January 14th at the Columbus site. All members were welcome to attend.
- Bill announced that the next **Board Meeting** would be held on Thursday, January 25th at the Houston Chronicle building.
- Don Pearce gave the **Comet Report** highlighting C/2006 P1 McNaught making a close perihelion passage on January 12th. For information on this comet and other comets of interest, see Don's Comet Corner on the HAS website.

Program

Don Pearce introduced the **featured speaker for the evening, Barbara Wilson**, HAS member and Director of the Houston Museum of Natural Science's George Observatory. Barbara recounted the museum's recent successful expedition to Kansas where the team (which included Barbara and her husband, Buster) utilized ground penetrating radar to discover a large pallasite meteorite. Upon completion of her presentation, Barbara answered questions and was presented with a gift of appreciation from the society.

Closing Announcements

Bill Leach announced that we would be conducting an **election at the February 2nd Meeting** of the General Membership to fill the open At-Large Board Member position created by Bob Rogers transition to the Chair of the Observatory Committee.

Bill pronounced the meeting adjourned at 9:35 p.m.

HAS 2007 BANQUET

AT

Hilton Houston Southwest

6780 Southwest Freeway

Monterrey Room

April 14, 2007

Speaker: Dr. Mary Kay Hemenway

The Life of Galileo

AGENDA

6:30-7:30	Registration & Cash Bar
7:45	Meal
8:30	Featured Speaker

Dinner

Texas Breast of Chicken with Wild Mushroom Glaze

Chef's Choice of Vegetables

Garden Salad

Cheesecake with Strawberry

Registration sheets will be at the next meeting.

Price of meals will be $32.00 each. All checks should be made out to:

Houston Astronomical Society

Attn: Judy Ann Dye, Banquet Chairman

12352 Newbrook

Houston TX 77072

281-498-1703

judyadye@aol.com

Committee Chairman: Judy Dye,

Committee Members: Michael Dye, Don Pearce, Laura Overturf, Lee Lankford

Houston Astronomical Society
Annual Banquet
April 14, 2007

Registration Form

Name: _____
Address: _____
City: _____
State: _____ zip: _____

Number of people in your party: _____

Home Phone: _____
Work Phone: _____

Club Affiliation: ☐ HAS ☐ FBAC ☐ NHAC ☐ JSCAS ☐ ASSET

Names of other persons in your party:

_____ _____
_____ _____
_____ _____

Dinner choices (mark the number of each meal)

Texas Chicken w/mushroom Glaze _____
Total number of meals: _____
Total Due: (# of meals x $32.00) _____

Dinner includes Chef's choice of vegetable, dessert, coffee or tea, gratuity, tax

Make checks payable to Houston Astronomical Society.

Mail this form to:
Houston Astronomical Society
Attn: Judy Dye, Banquet Chairman
12352 Newbrook
Houston TX 77072-3910
281-498-1703
judyadye@aol.com

Dress Code: Business Casual to Semi-Formal

A Great Big Wreck

By Dr. Tony Phillips

People worry about asteroids. Being hit by a space rock can really ruin your day. But that's nothing. How would you like to be hit by a whole galaxy?

It could happen. Astronomers have long known that the Andromeda Galaxy is on a collision course with the Milky Way. In about 3 billion years, the two great star systems will crash together. Earth will be in the middle of the biggest wreck in our part of the Universe.

This GALEX UV image of the colliding Antennae Galaxies shows areas of active star formation, which is not in the tidal tails as one might expect.

Astronomer John Hibbard isn't worried. "Galaxy collisions aren't so bad," he says. A typical spiral galaxy contains a hundred billion stars, yet when two such behemoths run into each other "very few stars collide. The stars are like pinpricks with lots of space between them. The chance of a direct hit, star vs. star, is very low."

Hibbard knows because he studies colliding galaxies, particularly a nearby pair called the Antennae. "The two galaxies of the Antennae system are about the same size and type as Andromeda and the Milky Way." He believes that the Antennae are giving us a preview of what's going to happen to our own galaxy.

The Antennae get their name from two vast streamers of stars that resemble the feelers on top of an insect's head. These streamers, called "tidal tails," are createdby gravitational forces—one galaxy pulling stars from the other. The tails appear to be scenes of incredible violence.

But looks can be deceiving: "Actually, the tails are quiet places," says Hibbard. "They're the peaceful suburbs of the Antennae." He came to this conclusion using data from GALEX, an ultraviolet space telescope launched by NASA in 2003.

The true violence of colliding galaxies is star formation. While individual stars rarely collide, vast interstellar clouds of gas do smash together. These clouds collapse. Gravity pulls the infalling gas into denser knots until, finally, new stars are born. Young stars are difficult to be around. They emit intensely unpleasant radiation and tend to "go supernova."

GALEX canpinpoint hot young stars by the UV radiation they emit and, in combination with other data, measure the rate of star birth. "Surprisingly," Hibbard says, "star formation rates are low in the tidal tails, severaltimes lower than what we experience here in the Milky Way." The merging cores of the Antennae, on the other hand, are sizzling withnew stars, ready to explode.

So what should you do whenyour galaxy collides? A tip from GALEX: head for the tails.

To see more GALEX images, visit www.galex.caltech.edu . Kids can read about galaxies and how a telescope can be a time machine at:

spaceplace.nasa.gov/en/educators/galex_puzzles.pdf.

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The Great Comet of 2007

by Don Pearce

This is a tale of a bright comet...

... whose original elusiveness made it difficult to observe, and how it sneaked up on most of the astronomical community. To understand why, we have to trace its history back even before its discovery. Long before recorded history, perhaps several million years ago a comet was nudged out of the Oort Cloud, and began its long journey towards the inner solar system. It was approaching from well below, "south" of the ecliptic, and at a very steep angle so that it was coming from almost straight "down", being inclined over 77° to the ecliptical plane. About May 29th of 2006 it finally reached its ascending node, while perhaps about 18-19th magnitude, and still almost 4 A.U. from the Sun. At that time it wasn't too far from being at opposition from the Earth and its orbital speed was about 21 kilometers/ second. Then, on Aug. 7th, 2006 Ron McNaught discovered it on images from the .5-meter Uppsala Schmidt telescope at Siding Spring in Australia, while still at mag. 17.3, and about 3 A.U. from the Sun. It was located in Ophiuchus and given a name, Comet C/2006 P1 (McNaught). The preliminary orbital elements were way off and gave a q (perihelion distance) value of 1.55, but by the end of August a good orbital determination had been made and gave a q of .17 A.U. At this point, comet watchers became aware that this comet had the potential to either become very bright and/or develop a significant tail around time of perihelion.

Comet McNaught
January 12, 2007
West Texas
Photo by Loyd Overcash

However, there were two problems, one natural and one due to human error. First let us discuss the natural, which turned out being a problem of geometrical perspective. After reaching its ascending node Comet McNaught began to climb, gaining speed as it raced toward the Sun. By December 8th it reached its maximum height (.4 A.U. above the plane of the ecliptic), but by this time the Earth was on the other side of the Sun, so that the comet was approaching from the same direction as the Sun's location. At this time the solar elongation had closed to about 14.4°, and the prospects for observing it would only be good if the comet were to become very bright. The comet reached its maximum solar altitude of 84° on Jan. 8th, 2007, in other words it was almost directly above the Sun on that day. The reason this did not occur near Dec. 8th was the same reason that an airplane flying towards you from the horizon would appear lower than when it is directly overhead. After Jan. 8th, the comet continued plummeting south, and on Jan.12th it reached perihelion at .1707 A.U. and its orbital speed increased to its maximum of 102 kilometers/ second (228,000 mph) The elon-

Continued...

gation further decreased until it reached a minimum of 5.4° on Jan. 13th, one day later. It also reached its descending node on the 13th and started becoming more favorably placed for southern hemispheric observers, except for one important factor, which I will explain a little later. On Jan. 15th the comet reached its closest approach to the Earth, (.8179 A.U.) only 3 days after perihelion. So we had the very fortunate confluence of perihelion and perigee occurring at about the same time. To summarize why this comet's orbital geometry made it so difficult to observe, as it brightened approaching the Sun, it was approaching (from our perspective) from behind and over the Sun, never exceeding a solar elongation of about 16° since Dec. 1st. What all of this meant was that the comet, when at its brightest, would never be observed in a dark sky.

Comet McNaught (Detail) January 12, 2007 West Texas Photo by Loyd Overcash

All of the information discussed in the previous paragraph was known from the end of August. What was not known, as has become apparent, was its intrinsic brightness. The IAU assigned an absolute magnitude value of 10 and an n value of 4 (inverse 4th power) for the brightening parameter. (usually displayed as10 in software for brightening factor, i.e. 2.5x 4) It should have become apparent at least by November 1st that these values were seriously in error, for it was running about 2.5 magnitudes brighter then and about 3 magnitudes brighter by the 1st of Dec. However, there are other considerations. Once it was suspected that this comet was making its initial trip from the Oort Cloud, I am sure that red flags went up at the IAU in terms of the fear of overestimating a "virgin's" magnitude. With the experience with Kohoutek and Austin, to name two comets, and the very real possibility that an original Oort visitor would have surface volatiles that could, initially, sublimate at a rate that would indicate the comet is brighter than it would turn out to be, I am sure that caution was utilized. Whatever the reason, the 10 absolute magnitude value was ultimately found to be about 5 magnitudes too faint. Just recently, the IAU changed it to 6, but I believe 4.7 is a better fit. Even this value would not yield the results that were ultimately observed. Earlier I mentioned the fact that after Jan. 8th, it began passing in front of the Sun, meaning that it was now crossing between the Sun and the Earth. This would produce an effect known as forward-scattering of sunlight by the comet's dust grains. The amount of forward-scattering would be dependent on the scattering angle (the smaller that angle the greater the magnitude enhancement). According to one study (J. Marcus) on about Jan. 14th the comet's magnitude increase would be at a maximum of about 2.3 magnitudes from forward-scattering, yielding a total magnitude of –5.2 for the comet's total magnitude. This is almost exactly the observed value on that date, and the brightest that the comet ultimately attained.

That, of course would make this comet the brightest since Ikeya-Seki in 1965. But let us return to the comet's elusiveness. During most of Dec. of 2006 the comet eluded observers, however, the comet was imaged using CCDs. Finally, towards the end of the month, traditional images and scattered observations began coming in. However, due to its proximity to the Sun and its still relative faintness, there was disagreement as to how bright it was. It was also late in Dec. before the forward-scattering concept began to be seriously discussed. In early Jan. more images and observations began pouring in from northern latitudes. Then, on the first weekend of January, "all hell broke loose", astounding reports and images began coming in like a flood, still mostly from the northern latitudes. From the Houston, Texas area I attempted on Friday and Sat. (Jan. 5th & 6th) to observe McNaught, under clear skies, but to no avail. Then on Monday Jan. 8th, at 10 minutes after sunset I saw McNaught for the first time in binos. I knew, immediately, that it was the brightest comet I had ever seen. To see a comet in bright

Continued...

The Great Comet of 2007... from previous page

civil twilight, only 5° from the horizon and only about 13° from the Sun was a startling experience. I estimated its magnitude at –2.0. It also had an obvious narrow fan tail about one half degree long. I also observed it on the next two nights under poorer conditions, and on Wed. the 10th I was again startled to see McNaught, this time through murky skies, and still shining like a beacon through tree limbs less than one degree from the horizon. This time I estimated its magnitude at –3.9, about as bright as Venus. Unfortunately for observers in Texas, the veil came down at this point. Although there was some sunshine on Friday, the 12th, perihelion day, there were still too many clouds around the Sun for me to be able to see the comet. I have not seen the Sun (and obviously not the comet) at all since that Friday. Meanwhile, all over the world observers were seeing the comet naked eye, it seems that the most reliable maximum magnitude estimates reached were about -5.0 to -5.2, more than 6 times brighter than Venus. Amazing images were also taken with the NASA SECCHI HI-1B instrument and the SOHO LASCO C3 camera. Observed tail lengths varied for several reasons. The perspective was not that good around perihelion, and observed tail lengths were also hampered by observations being made during broad daylight to during bright civil twilight and close to the horizon. Generally, reported tail lengths did not exceed much more than a degree with the exception of some observations made earlier in Jan. from northern latitudes. Of course, as its elongation grows and the perspective improves southern hemisphere observers will undoubtedly see longer tails. As a side note, McNaught currently has a hyperbolic orbit and will likely escape the solar system altogether in the distant future. It has only spent a little over 7 months above the ecliptic during its entire span of existence.

Was McNaught a great comet? For us in the northern hemisphere, if your definition requires a "great comet" to be seen in a dark sky with a long flowing tail, then the answer may be no. Undoubtedly, observers from the southern hemisphere will see extensive tail structure. But I would submit that McNaught is indeed a truly great comet because of its astounding brightness, the like of which we may not experience again for a long time.

Comet McNaught - Observation Report

by Brian Cudnik

I observed the comet for a total of approximately 5 seconds during its apparition. The observation was made just above a layer of cirrus clouds at 37,000 feet over the Texas Panhandle on the way back from the American Astronomical Society meeting in Seattle, Washington. The observation was made at 6:25pm CST on 10 January (that's 0:25UT on 11 January) with the naked eye. The head was stellar and a narrow-fan-shaped tail was observed to gently curve back away from the head for 30 arc minutes.

The entire object had a white, with maybe the slightest hint of yellow color (although my seat-mate whose seat I borrowed to make the observation commented that the tail looked orange). It looked like a well-formed little comet. Clouds prevented further observations, both in the air, and on the ground to date.

Observatory Corner

By Bob Rogers, Observatory Chairman

Hello everyone. As announced at the HAS January meeting, I'm the new Observatory Chairman. Most of you know me as the HAS Web Master or have been through my Site Orientation class. I want to say Thank You to everyone for your support on my new endeavor. I hope that I can serve you well. I have two goals for the Observatory site, first, increasing the membership for HAS and second, an increase in usage of the Observing site.

The Observatory Committee had a meeting at the site on January 14th to discuss the goals for 2007 and 2008. I will list these goals in next month's Observatory corner. I do want to say thank you to the Committee for showing up at the site despite the weather. With Kirk Kendrick's help, John Missavage has been working on improving the inside of the Bunk house. New "Crown Molding" has been installed where the ceiling and walls meet. Also, John has been very busy taping and floating the sheet-rock. John plans to finish the rest of the taping and floating and then plans to paint the inside. The Bunk house even smells better. Thank you John and keep up the good work. We are also planning to replace the old mattresses with newer ones. So, next time you're out there, check it out.

With closing here I want to say, Folks, this is your Observing site. You pay your dues every year to have a place away from city lights to do observing. My challenge to you is, I would like to see more members at the site doing what we all enjoy – Astronomy. So, come on out. If you have any suggestions or thoughts, let me know.

Thanks,
Bob Rogers
Observatory Chairman

Observatory Duty Roster

by Bob Rogers, Observatory Chairman

The site is in great shape thanks to the many, many volunteers who help maintain the site. Ken Miller, Bob Rogers, Ed Szczepanski, and the site teams did a great job.

February Supervisor Bob Rogers 281-460-1573

Volunteers:
Logan Rimes
Eric Rothgeb
Kay Sandor
Gary Delzer
Henery Schneider

Projects:
Site Cleanup
North Fence Repair
Field Maintenance

- Please volunteer to help us keep the site in great shape! Contact Bob Rogers with your desires and let him know of any special skills you have that the club could leverage. Thanks!

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. Also typically included are Committee Reports, Special Interest Group Reports, current activity announcements, hardware reviews, an astrophotography slide show by members and other items of interest. 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 University of St. Thomas. 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 iinterested 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. 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.

Editing & Production: Bill Pellerin, 713-880-8061; FAX: 713-880-8850;
Email: BillPellerin@sbcglobal.net

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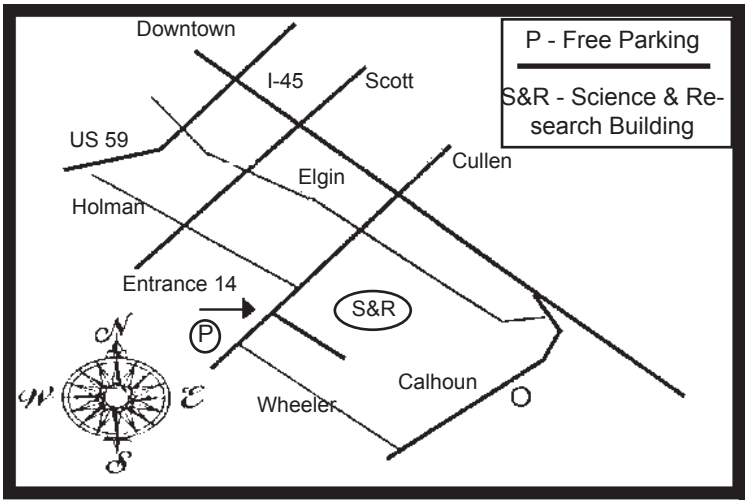

Houston Astronomical Society
Meeting
February 2, 2007

7:00 Novice & Site Orientation

8:00 General Meeting

University of Houston

Houston Astronomical Society

P.O. Box 20332 • Houston, TX 77225-0332

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 banquet with a special guest
- ☐ 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.