

GuideStar

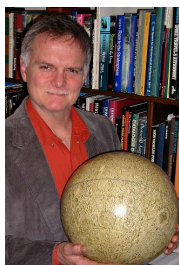


January, 2012
Volume 30, #1

At the January 6 Meeting

Exploring the Moon with a Webcam

Robert Reeves



Robert lives in San Antonio and is a pioneer in the field of astroimaging and the author of several books about the subject. His books include *Wide Field Astrophotography*, *Introduction to Digital Astrophotography*,

Introduction to Webcam Astrophotography He as written articles for *Astronomy* magazine and for other publications. Robert has been a featured speaker at the Texas Star Party, the Okie-Tex Star Party, the Winter Star Party, and at Astronomical League Conventions.

Robert Reeves regularly creates new techniques for image creation and processing and has always been willing to share his expertise with others. His images are often made with common off-the-shelf components. At this meeting he will tell us about using inexpensive webcam cameras to create stunning lunar images.



The Houston Astronomical Society is a member of the Astronomical League.

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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.

Justin McCollum

General meeting: 8:00 p.m

**See last page for directions
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

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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*. *The GuideStar*, the monthly publication of the Houston Astronomical Society is available on the web site. 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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Other Meetings...

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

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>

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. Web site: www.astronomyclub.org

Brazosport Astronomy Club meets the third Tuesday of each month at the Brazosport planetarium at 7:45 p.m. The Brazosport planetarium is located at 400 College Boulevard, Clute, TX, 77531. For more information call 979-265-3376

President's Message

by Gordon Houston, President

Happy New Year HAS!!

First, I want to thank you for placing your trust in me to serve as your President for the coming year. Volunteering in America is widely recognized as a worthwhile endeavor. I believe that many things happen in America through and by volunteers that are never recognized. There is an old saying that 80% of the work is done by 20% of the people and I have observed this to be the case in many volunteer organizations. I want to encourage each of you, old member and new, to consider giving some time to our organization. Together we can create a vibrant organization, fulfilling our mission of astronomy education and outreach.

My Focus for 2012...

My focus this year will be two fold. I believe we need to substantially **increase our membership** and doing so brings new challenges for us to welcome and support new members. Secondly, we need to develop a **new set of observers** within the club. The use of our Columbus Observatory has declined in recent years and although many would point to the economy, the fact is we have not been developing new observers. An informal poll of the 30 plus new members at the last meeting indicated that around 90% said they wanted help with their telescopes and observing techniques.

In an effort to support both goals — new members and new observers, we will start a new basic observational astronomy class, establish urban observing sites, and facilitate a mentoring program, geographically matching new members with experienced observers. The dates of the first basic observational astronomy class have been set and are on two consecutive Tuesdays, January 24th and 31st. See the announcement article in this *GuideStar* with further details. The first urban observing date will be January 26th (weather permitting) at either Bear Creek Park or George Bush Park, further details to be announced via the list server. I encourage all members to sign up for this list. You can sign up on the HAS web site (www.astronomyhouston.org).

Finally, in an effort to encourage our members as observers, I am implementing the **Two Minute Drill** (OK, I stole this from football jargon), but each month we will have a drawing of three globes, Earth, Moon, and celestial. The winners of this drawing will be asked to provide an observing tip at the next meeting on planetary viewing, lunar viewing, and deep sky viewing. I do have plans for a fourth category. A drawing held at the 2012 Leadership Team meeting in November, the following people will be the first TMDs,

Amelia Goldberg-Lunar, Doug McCormick-Planetary, and Mark Holdsworth-deep sky. At the January meeting, the following will be our TMDs for February, Brian Cudnik-Lunar, Bill Flanagan-Planetary, and Dana Lambert-deep sky. As a reminder to all, these are to be a quick, memorable observing technique or information, no longer than two minutes. (Otherwise, you will enter the event horizon and be stretched by the tidal forces for eternity, suspended in spaghettification.)

To enhance our members observing and astronomy capabilities, I also want to implement some special interest groups to meet at the same time as the novice meeting. The first group that I feel has the greatest need is astrophotography. Beyond observing, I am asked more about how to take pictures with a telescope than any other subject. I am currently seeking a moderator for this group and hope by the January meeting to announce that individual or group of individuals to start this in February.

I have tried to cover a lot of territory, but want you to know the directions I am trying to take us in and ask for your support.

Ad astra,

..Gordon Houston

President HAS

Observations... of the editor

by Bill Pellerin, GuideStar Editor

Happy New Year to You

As we start a new club year, we have a new set of officers and several new committee leaders. Congratulations and thank you to everyone who has been elected to serve, or who has volunteered to serve. And while we welcome these new volunteers, we say thanks very much to those members who served the organization last year.

Our new president, Gordon Houston, has agreed to write a monthly president's message for the *GuideStar*, and his first message appears this month. In this message, he tells us about his goals as president and invites us to help. Please do. Contact any of the officers or committee leaders to volunteer. There are no prerequisites!

Clayton Jeter continues to provide us with interviews of amateur and professional astronomers for the *GuideStar*. Clayton's contributions of these articles over the years (his first article was in the August, 2006 issue) has been significant. We enjoy reading these every month and learning about our fellow enthusiasts.

Bob Rogers is back with his Observatory Corner report. Good to hear from Bob again.

The NASA Space Place organization has sent the HAS a 'Certificate of Appreciation' for valuable contributions to (the) community in the areas of science, technology education, and inspiration. We thank the Space Place group for their contributions of articles to our newsletter, and for sending us handouts for the kids at Astronomy Day.

The AAVSO writers bureau provides articles that we can use in the *GuideStar*. There's one this month on eclipsing white dwarfs. Check it out. Thanks to all the AAVSO writers.

See you soon...

I apologize for missing the December meeting. I've also moved my novice presentation from January to May. All of this is because I'm continuing my recovery from a small skin repair on my nose. It's all a big nuisance but it'll be resolved soon.

The Sun's Heartbeat...

And Other Stories from the Life of the Star That Powers our Planet
By Bob Berman

Bob Berman writes for *Astronomy* magazine and has written this book to help us understand the role and responsibility of the Sun for us as residents of planet Earth. Bob's writing is easy and enjoyable to read. He often adds humor to his writing, which sometimes works and sometimes doesn't, but the information contained between the covers of this book is worth your time and effort. There are chapters about the dangers of sunlight, about the benefits of sunlight, the color

of sunlight, how the sun works, about its distance from us, and a lot more.

I read this book on my Kindle, and it works well on this device. There aren't a lot of detailed charts or images that must be closely examined to supplement the writing.

I recommend this book.

Grote Reber?

I'm working on a new article for the Astronomical League web site (www.astronleague.org). It's about a pioneer radio astronomer named Grote Reber. Never heard of him? Not surprised. I hope that you'll find the article interesting.

Goals for 2012

Do you have goals for your observing program in 2012? You should, because these goals will motivate you to get them done. How about completing one or more Astronomical League observing programs? The HAS is a member of the AL, and you'll get an award if you complete a program.

How about participating in public star parties. There's plenty of opportunity to share the sky.

The HAS can always use some help with new projects in 2012. Help your home club.

Travel in 2012

There's the Venus transit in June, a total solar eclipse in the Pacific Ocean in November. Observatories to visit, and more. The Astronomical League conference, the AAVSO conference, and other observing get-togethers. Don't forget the Texas Star Party and the Okie-Tex Star Party. Plan it!

Until next time...

clear skies and new moons!

..Bill

Basic Observational Astronomy Class

by Gordon Houston, President

For: HAS Members

Dates: Jan 24 and Jan 31

Time: 7:00 to 9:30 p.m.

Location: HEB community room, I-10 at Bunker Hill

Did you get a new telescope or pair of binoculars over the holidays? The Houston Astronomical Society is offering a two-night introductory class for new observers. You will learn about the sky, what's waiting for you to see, and how you can enjoy the night sky.

Our first class to be offered will be held starting on January 24, 2012 and January 31, 2012, from 7:00 to 9:30 PM. The classes will be held at the HEB community room located at Bunker Hill and Interstate 10 (Katy Freeway). The HEB is at the northwest corner of that main intersection, just turn north and turn left at the first light, which is actually controls cross traffic from the parking lots on either side of Bunker Hill. The community room is outside on the main sidewalk between the two store entrances, so you don't even need to go inside the store. The bathrooms are inside however.

The first night, we will touch on a very short section on the history of astronomy, but the bulk of the class will concentrate on equipment, including types of telescopes, mounts, eyepieces, barlows, filters, flashlights, and viewing techniques. The second night will be all about observing techniques, constellations, astronomical programs, starhopping, sky conditions, recording your observations, and lunar and planetary viewing. A third segment of the class will be actual observing, which will be held at the scheduled monthly urban observing times, which for January will be the 26th at Bear Creek park. (Watch the list server for more specific information, times, and location of this event.) To sign up for the list server, go here:

<http://www.astronomyhouston.org/about/email-list>

The only requirement for attendance is being a paid member of HAS, so I encourage you to pay your dues early or at our first meeting in January. Preference will be given to new members, but all members are welcome. The class size for this first class will be limited to 30 participants.

To register or other question, send an email directly to me, Gordon Houston at [seagordoa \(at\) aol.com](mailto:seagordoa@comcast.net).

Just Looking

A GuideStar Interview by Clayton L. Jeter

Dick Miller—Astroimager



The annual club membership dues at the Johnson Space Center Astronomical Society are... FREE! Needless to say, I've been a member there for more than a decade and have never griped about paying. The club produces great speakers, modern facilities, star parties, and great folks. Hence... while attending there years ago, I met and befriended Dick Miller. But I



really clicked with him while observing at past TSP's and their bi-annual star parties at Fort McKavett. It's always fun to laugh with him and others like Chuck Shaw, Dennis Webb, Al Kelly, among others. This club is chocked full of fun guys.

I have interviewed Chuck, Al, and Dennis in the past and knew that I needed to hear what Dick Miller had to say. I know you're going to enjoy reading about this passion-driven

amateur. This is one nice gentleman.... Here's Dick!

The Dick Miller bio...

I was born and grew up in Indiana, and have been interested in astronomy since late elementary school. My first telescope of any size was a 3-inch Japanese artillery spotting scope. It was alt-az and the tripod had to be tilted to view above 45 degrees -- the zenith was unreachable. It was adequate for good views of the moon, a few planets, and my first 10-15 Messier objects. When I was 13 or 14, I ground a 6-inch mirror. It was supposed to be f/8 but turned out f/10.5. At that focal ratio, my crude parabola still gave very decent images. Those were the days when it was still necessary to re-silver mirrors every 6 months or so, and I got a lot of practice at that. With that scope, I saw all the planets except Pluto, and another 10-15 Messier objects.

Astronomy faded into the background between late high school and graduation from MIT in 1963, except for making a couple of eyepieces in the college hobby shop. This was the first of several cycles where I was very active for 5 years, or so, and then inactive for a similar period. After college, I moved to the Philadelphia suburbs, married, had three children, and worked for Sun Oil and then Amoco. I upgraded to a 6-inch f/8 Coulter mirror -- aluminized!! I kept adding Messiers but could never find my way through the Virgo galaxies.

In 1976, we moved to the Chicago suburbs. The local high school had an adult education program which allowed access to the machine shop, with band saws, lathes, welders, etc. I bought a 10-inch full thickness Coulter mirror, a 12 1/2-inch Parks tube, and built a sturdy fork mount. The head is 1/2-inch steel plate, with 2-inch pillow blocks and shaft, and the fork is 2 x 4 x 1/4 steel box. With some modifica-



tions, it's still my primary scope today. I added more Messiers to my list but was still stuck in Virgo.

We moved to the Houston area, near Johnson Space Center, in 1984. For about eight years, my only observing was a trip to view Halley's Comet. In 1991, I built a Dobsonian base for the 10-inch optical tube, planning to make it portable for trips to dark sky locations. When I tried it at my home, I was pleasantly surprised. Very few galaxies were visible but Open and Globular clusters, and Planetary nebulae, were easy. And variable stars were almost unaffected by the light pollution, so they became the focus of my

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home observing. Also in 1991, I joined the Johnson Space Center Astronomical Society and attended my first Texas Star Party in the spring of 1992. I've only missed three since. I completed my Messier list at that first TSP and then started the Herschel 400, completing it in 1995. Also in 1995, I built a Cookbook 245 and have been hooked on CCD imaging ever since. I retired from Amoco (now BP) in 1997. The following year, we built a log cabin and observatory in West Point, TX. Most of my imaging takes place there but I do a bit with a small scope at our current home in The Woodlands.

The Dick Miller interview...

Clayton: Hi there Dick, great to have you here for this informal interview. I hope you don't mind me asking a few astronomy related questions...

It seems you really became involved into this hobby in 1991. By joining JSCAS at that time, don't you feel that you learned much more in a shorter time, rather than trying to learn astronomy from a book?

Dick: JSCAS was my first club membership, and I should have located one much earlier. I learned more in my first year or two there than in all the previous years on my own. You mentioned Chuck Shaw, Dennis Webb, and Al Kelly in your introduction, and I would add Don Halter, Hernan Contreras, Becky Ramatowski and Andy Saulitis as other major inspirations and resources.

Clayton: By the way, how is the Johnson Space Center Astronomical Society coming along? I haven't made a meeting there in several years. Is the membership numbers up? What's new with you guys?

Dick: Actually, I am, like you, one of the "long distance" members, of which there are many. I haven't been to a meeting since I moved to The Woodlands three years ago. I see the group at TSP and twice a year at our Ft. McKavett star parties, keep in constant e-mail contact, meet people for lunch whenever I'm down in the Clear Lake area, and see Dennis Webb when we are passing through each other's new towns. The membership has been fairly stable, which is good considering what is happening at NASA. I also belong to North Houston now, and have members of the Colorado Valley club out to my cabin.

Clayton: In your bio above, you stated that you have made eyepieces. Wow, with a capital "W". I don't think I know a soul who has made their own (excluding Uncle Al Nagler). What design are they? Do you still use them?

Dick: One is a 13mm orthoscopic and the other a 25mm Plossl. I used lenses from Edmund Scientific, and turned the metal parts from aluminum and brass -- no threads, just snap rings and press fits. They give pretty good views but were put out

to pasture years ago.

Clayton: Being a dedicated astrophotographer, how much of your time at the scope do you actually look through an eyepiece (percentage wise that is)? Do you still enjoy faint fuzzies projected onto the back of your eye?

Dick: On my own scopes, the eyepiece time approaches 0%, unless you count the finder. I do still enjoy looking, and leech photons from Dennis Webb's or Don Halter's scopes when we're at star parties.

Clayton: I know you use your observatory at your country place in LaGrange, but do you have other observing locations? I'm guessing the skies are washed out at your home in the Woodlands.

Dick: About 90% of my images are made at my observatory or at star parties, but open clusters and narrow band objects show up well from my back yard. I've even had success with bright galaxies like M32 but dark skies make the job much easier.

Clayton: That's some 10" sitting in that fork mount you fabricated. It's a beautiful instrument. Tell us about its construction. Good optics? Is this the telescope that you use for your astrophotos?

In the photo (previous page) is that a roll-away observatory?

Dick: The mirror is very good. When it was used in a Dob, I got lots of "best view I've seen" comments at star parties. My bio describes the original construction. It is a work in progress, and almost nothing except the base and fork is original. The tube cage was bought used at TSP, the focuser has been upgraded to a JMI Moto-focus, the tube was replaced about a year ago, etc. The "doghouse" rolls over the scope to protect it when not in use. Most of my images are made with this setup, although I have an AT66 that I use for wide field targets.

Clayton: Why the fascination with CCD astrophotography? What drives an amateur from visual to photo taking (I've not taken that plunge yet)?

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Dick: For me, it is the amount of detail I can see. Even a 10 second Find image shows more than I can see at the eyepiece, especially with 72 year old eyes. As an example, those of you who search out challenging targets know how difficult it can be to even detect the Cocoon (IC 5146). This image is just short of three hours total exposure and shows detail that could not be seen visually even in professional class scope, plus it shows it in color.



I'm also forced to admit that visual observing takes a lot more out of me as I get older. When imaging, I spend 15 minutes to get everything set up and then can spend an hour or so sitting in my chair, watching the individual exposures click up and shooting the bull.

Clayton: Do you have an amateur astrophotographer mentor?

Dick: No question about that -- almost everything I know I learned from Al Kelly. And while Al has been (still is) my mentor, Dennis Webb was my inspiration. He got me started on the Arp galaxies, and that was what made the power of CCD imaging really hit home.

Clayton: Ok.... I know you're a Texas Star Party groupie like me? I've seen you there many times through the years. Are there other star parties that you attend? Or would like to go to?

Dick: I mentioned Fort McKavett earlier, and I have been to Stelafane twice. I also hope to make Okie-Tex, El Dorado, and the Winter Star Party someday -- and maybe something in the Southern Hemisphere.

Clayton: How do you envision amateur astronomy in the next 25 years?

Dick: That's a tough one. Twenty-five years ago, I would never have imagined the CCD cameras, GoTo scopes, solar scopes, and general optical quality we can choose from today. We are blessed with all that but cursed by light pollution. I'm

not sure which is going to win. I do suspect that in 25 years, amateurs will have real-time access to orbiting telescopes.

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

Dick: Start with binoculars and learn the sky before you start relying on electronics. For imagers, don't overprocess. It's very easy to overstretch, oversharpen, oversaturate, etc.

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

Dick: My e-mail is rfmjr@aol.com. You can see my color images at www.dickmillerimages.com and my images of all 338 Arp galaxies (mostly monochrome) at www.338arps.com.

Clayton: Thanks Dick for taking the time to share your interest and thoughts within our HAS newsletter, the *GuideStar*. We wish you luck with all of your astronomy interests. Please come and attend a meeting at our society when you can, we'd love to see you.

Clear skies always!

Dick: Thanks for the opportunity to share what I love, Clayton. Come join me for imaging at my observatory some night and I'll drag you over to the Dark Side!

Clayton L. Jeter is an avid Schmidt Cassegrain visual observer and a longtime member of the Houston Astronomical Society. Contact him at: stonebloke@gmail.com

Kids Outreach & Star Parties, January-March 2012

By Alan Rossiter, alan@rossiters.org

Event: Fleming Elementary Math/Science Night

Type: Elementary School Science Night. Numerous organized activities.

Date: Thursday, 1/26/2012

Time: 6:00 PM - 8:00 PM

Location: Fleming Elementary, 14850 Bissonnet, Houston, TX 77083

Event: Heritage Rose Science Night

Type: **Elementary School Science Night. Numerous organized activities.**

Date: Thursday, 2/2/2012

Time: 6:00 PM - 9:00 PM

Location: Heritage Rose Elementary School, 636 Glendale Lakes Drive, Rosharon, TX 77583

Event: Tents in Town

Type: Urban Overnight Camp for Kids & Parents. Numerous organized activities.

Date: Saturday, 3/24/2012

Time: 6:00 PM - 9:00 PM

Location: Zindler Park, 7008 South Rice, Bellaire, TX 77401

Name: The Houston Arboretum Spring Star Party

Type: Mostly Adults – Arboretum Members. An evening at the Arboretum. Food & Drink!

Date: Saturday, 3/24/2012

Time: 7:00 PM – 9:00 PM

Location: Houston Arboretum, 4501 Woodway Drive

Note: These last two, Tents in Town & The Houston Arboretum Spring Star Party, are on the same night. We need extra help! Please come to one of the events if you can. You'll be glad you did!

Anahuac Star Party – Wish You Were There!

By Alan Rossiter

We held a star party at the Anahuac Wildlife Refuge for staff and volunteers on Saturday December 17th. It is a great location with no obstructions on the horizon and bird watching available before the event. Volunteers included Richard Nugent, Allen Wilkerson Jr., Alan Rossiter, Sara Carter, Steve Goldberg, Arnie Hauswald, and Debbie Moran. If you weren't there you missed a treat! Here are comments from a couple of our volunteers:



Ready for observers at Anahuac.

Well done by all participants. – Sara Carter

What a great Star Party! Clouds curled round the horizon, but when we arrived at Anahuac, the dome had nothing but contrails. There was a fine assortment of scopes and mounted binoculars. Our visitors saw deep sky objects, constellations, and planets. It was a cooperative Houston/Beaumont night sky show deliciously graced by hot cocoa and cookies.

I really enjoyed setting up my giant binoculars and hope to do it again at Anahuac in the future. As I was last in the line, I really appreciated all the viewers that took the time to stop by. There were many of all ages. It was truly an enjoyable evening. – Arnie Hauswald

There are plenty of opportunities coming up for outreach star parties – watch for notices in The *GuideStar* and on the listserver. They're always fun, and provide a great opportunity to share the skies with our neighbors. Join in when you can!

Observatory Corner

By Bob Rogers, Observatory Chairman

Hello everyone.

I wanted to thank everyone for your support and kind words over the last several months. I had some issues regarding some decisions that were made about my duties and felt it was time to step down from my position as Observatory Chairman, but since then, these issues have been worked out and it is nice to be back on as Committee Chairman to serve everyone in the Society to provide you a great place to go and observe.

Now on to business. I will be going into the hospital in the second week of January to have surgery done on my foot. It seems that I have gotten an infection in my forever wound from 3 ½ years ago and ended up losing about a years worth of growth. What a set back. In the mean time, I will have somebody from the Committee filling in for me with Site Orientation classes at the meetings if I can't make it there. Starting with the January Membership meeting, I will be passing out the new gate combination to the site that will go into effect on April 7, 2012. To get the new combination, you will need to have your 2012 dues paid and have taken the Site Orientation class since joining HAS.

Also, I will be having the yearly Observatory Committee Planning Meeting on January 21, 2012 at the HAS Observing site at 2:00 pm. Any member of HAS is welcome to attend the meeting and is encouraged to do so. This is also new moon weekend at the site. If you have any ideas for the site, this would be the time to speak up about it. If you can't make it, please email me at siteworker-bob@hotmail.com and I will add them to the agenda for discussion.

I do need to remind everyone that we need to start filling out Log Reports at the site so I can give this information to the Fondren Foundation. The property is on a 99 year lease and part of the Lease agreement is that HAS needs to report every year to the Fondren Foundation that the Property is being used. The Log Reports are located in the box in the middle of the field. Just open the cover, fill out the report and then slide it into the slot that is in the inside of the cover and then close the box. It is very important that everyone fill out a Log Report so that we are showing that the Observing site is being used. Your help on this is very much appreciated.

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% 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

Dawn Takes a Closer Look

By Dr. Marc Rayman

NASA Space Place

Dawn is the first space mission with an itinerary that includes orbiting two separate solar system destinations. It is also the only spacecraft ever to orbit an object in the main asteroid belt between Mars and Jupiter. The spacecraft accomplishes this feat using ion propulsion, a technology first proven in space on the highly successful Deep Space 1 mission, part of NASA's New Millennium program.

Launched in September 2007, Dawn arrived at protoplanet Vesta in July 2011. It will orbit and study Vesta until July 2012, when it will leave orbit for dwarf planet Ceres, also in the asteroid belt.



This full view of the giant asteroid Vesta was taken by NASA's Dawn spacecraft, as part of a rotation characterization sequence on July 24, 2011, at a distance of 5,200 kilometers (3,200 miles). Credit: NASA/JPL-Caltech/UCLA/MPS/DLR/IDA

Dawn can maneuver to the orbit best suited for conducting each of its scientific observations. After months mapping this alien world from higher altitudes, Dawn spiraled closer to Vesta to attain a low altitude orbit, the better to study Vesta's composition and map its complicated gravity field.

Changing and refining Dawn's orbit of this

massive, irregular, heterogeneous body is one of the most complicated parts of the mission. In addition, to meet all the scientific objectives, the orientation of this orbit needs to change.

These differing orientations are a crucial element of the strategy for gathering the most scientifically valuable data on Vesta. It generally requires a great deal of maneuvering to change the plane of a spacecraft's orbit. The ion propulsion system allows the probe to fly from one orbit to another without the penalty of carrying a massive supply of propellant. Indeed, one of the reasons that traveling from Earth to Vesta (and later Ceres) requires ion propulsion is the challenge of tilting the orbit around the sun.

Although the ion propulsion system accomplishes the majority of the

orbit change, Dawn's navigators are enlisting Vesta itself. Some of the ion thrusting was designed in part to put the spacecraft in certain locations from which Vesta would twist its orbit toward the target angle for the low-altitude orbit. As Dawn rotates and the world underneath it revolves, the spacecraft feels a changing pull. There is always a tug downward, but because of Vesta's heterogeneous interior structure, sometimes there is also a slight force to one side or another. With their knowledge of the gravity field, the mission team plotted a course that took advantage of these variations to get a free ride.

The flight plan is a complex affair of carefully timed thrusting and coasting. Very far from home, the spacecraft is making excellent progress in its expedition at a fascinating world that, until a few months ago, had never seen a probe from Earth.

Keep up with Dawn's progress by following the Chief Engineer's (yours truly's) journal at <http://dawn.jpl.nasa.gov/mission/journal.asp>. And check out the illustrated story in verse of "Professor Starr's Dream Trip: Or, how a little technology goes a long way," at <http://spaceplace.nasa.gov/story-prof-starr>.

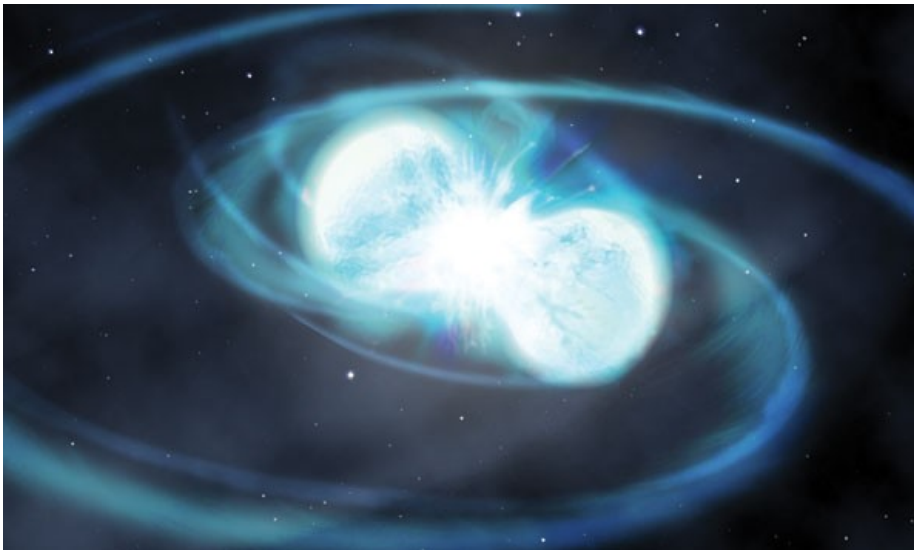
This article was provided courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

Eclipsing (Helium) White Dwarfs

By Tom, Tom's Astronomy Blog, <http://tomsastroblog.com>

Researchers at the University of Warwick have found a unique feuding double white dwarf star system where each star appears to have been stripped down to just its helium.

We know of just over 50 close double white dwarfs but this was only the second ever eclipsing close white dwarf pair to be found. The University of Warwick astronomers Steven Parsons and Professor Tom Marsh were able to use the fact that the stars eclipse each other when seen from Earth to make particularly detailed observations of the system.



An artist concept of a binary system.

Credit: Nature.com

These observations revealed that uniquely both the white dwarf stars in this pairing are composed largely of helium. Most white dwarfs tend to have largely inert cores of carbon and oxygen that have formed over the star's long life when it has used up most of its hydrogen and helium. Helium white dwarfs are a sure sign that the star has undergone some extreme mass loss at some point. To find two such helium white dwarf stars is a clear sign to astronomers that both stars have had an exotic and mutually destructive past.

What was originally the most massive star of the pair had once actually begun to expand to become a red giant but its outer hydrogen envelope was ripped off by its companion. This meant the star never got an opportunity to start fusing its helium and it was left as a helium white dwarf. When the companion star then began expanded it also had its expanding layer torn off by the first star – but as the first star was already reduced to a white dwarf it could not use that new material. That

hydrogen was therefore simply lost to the star system leaving behind helium white dwarfs.

In just over 1 billion years, the two stars feud will end as they will spiral together and merge, finally igniting each other's helium to become an object known as a hot subdwarf which should last for 100 million years

The University of Warwick researchers found this star system CSS 41177 (which is over 351 parsecs, or 1140 light years, away – in the constellation Leo) using a combination of data from the robotic 2m Liverpool Telescope in the Canary Islands and the 8m Gemini Telescope on Hawaii.

The full paper has been accepted for publication in the *Astrophysical Journal* and is entitled *A deeply eclipsing detached double helium white dwarf binary* Authors: S. G. Parsons, T. R. Marsh, B. T. Gänsicke, A. J. Drake, D. Koester

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AAVSO Writer's Bureau

Shallow Sky Object of the Month

Venus — the Evening Star

Object: Venus

Class: Planet

Constellation: Aquarius until the 11th, then in Capricornus

Magnitude: -4, very bright

Size/Spectral: 14 arc-seconds

Optics needed: Easy to see with unaided eye, requires a small telescope to see the phases.

Why this object is interesting:

The dance of the planets is always interesting, and it can be confusing. Venus is between us and the Sun so it only appears to us in the evening or the morning sky. In January, in fact, Venus will set later in the day on every night from January 1 to the end of April and it's not until June that it drops out of the evening sky entirely.

Date	Set time	Phase
Jan 1	20:10	82%
Jan 15	20:35	79%
Jan 31	21:02	74%

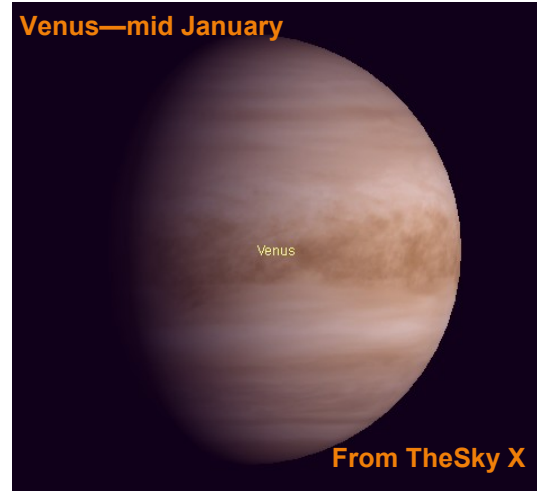
For the month of January, Venus stays at -4th magnitude, the brightest thing in the sky after the Sun and the Moon, and it will be easy to find on a clear night. You may even get questions from friends and family about that "bright thing" in the sky.. Be prepared.

Through a telescope you will see phases of Venus, and these won't change much over the month of January (see table above). If you look at Venus again in April, you'll see something different.

Date	Set time	Phase
April 15	23:25	39%

Its brightness will have gone up to -4.5 even though the amount of illuminated surface we can see is smaller. This is because in April Venus will be closer to us (about 30 arc-seconds in diameter compared to 14 arc-seconds in January).

It was Galileo who made observations of Venus' phases and used these observations to demonstrate that the Copernican model of the solar system, with the Sun at the center, was the right one. The observations of Galileo could only make sense if this model better described the



solar system than the earth-centered solar system (Ptolemaic) model.

For the last half of 2012, Venus will be in the morning sky. Its earliest rise time will be in mid August, when, from Houston, Venus will rise at 3:25 a.m.

Venus' diameter is 95% of the diameter of the Earth, so they can be considered 'sister' planets. The similarity ends quickly when you consider that the temperature at the surface of Venus is over 800 F.

The cause of this high temperature is the planet's proximity to the Sun, but is primarily driven by the high density (mostly carbon dioxide) clouds that surround the planet.

Venus is at .7 AU (about 65 million miles) from the Sun, so it's closest approach to the earth would leave it about 28 million miles away.

This year is the last chance in our lifetimes to see a transit of Venus across the face of the Sun. The event will occur in early June, of 2012, and, if you miss this one the next one won't come around until December of 2117. Don't wait.

Houston Astronomical Society

P.O. Box 20332

Houston, TX 77225-0332

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 or a conflict with other events at the University of Houston.

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. 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 6, 2012

7:00 Novice Meeting

8:00 General Meeting, room 117 Science & Research 1 Bldg

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.

UPDATE — Due to construction in the stadium parking lot, use entrances 15D and 15F. You can park in this area, but NOT in a RESERVED space.