Houston Astronomical Society

December, 2015

GuideStar

December, 2015

Volume 34, #12

At the December 4 Meeting

Rosetta & Philae - A Spacecraft's Journey to a Comet!

Justin McCollum Physics Laboratory Coordinator , Physics Department, Lamar University (a.k.a. Professor Comet)

The Rosetta Spacecraft is a predominantly ESA Mission developed by a league of European countries with the purpose of achieving the first ever robotic craft to orbit the nucleus of a comet.

Rosetta has an amazing suite of Scientific instruments and packages to investigate the structure, composition, and morphology of a comet in all of its intertwined components - the tails, the coma, and the nucleus along with its interactions with interplanetary dust and the interplanetary medium. Rosetta also has a second robotic vehicle; the Philae lander which piggybacks on the orbiter with the purpose of surface investigations of three nuclei.

An extension of the mission would allow the Rosetta Orbiter to remain in orbit well into 2016. The United States through NASA has a minimal participation in this project via the contribution of three scientific instruments for research into 67P.

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

The *GuideStar* is the winner of the 2012 Astronomical League Mabel Sterns Newsletter award.

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.

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

Novice meeting: ····· 7:00 p.m.

Allen Wilkerson - "All About Eyepieces"
See page 13

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

President	Rene Gedaly	president@astronomyhouston.org C: 281-300-3559
Vice President	John Haynes	vp@astronomyhouston.org
Secretary	Bill Flanagan	secretary@astronomyhouston.org 713-699-8819
Treasurer	Don Selle	treasurer@astronomyhouston.org

Directors at Large

Mark Holdsworth	markh@netslyder.com H:713-478-4109
Jessica Kingsley	gnjkingsley@att.net
Debbie Moran	debbiemoran@earthlink.net H:713-774-0924, C:713-562-7670
Bram Weisman	bram@weisman.us
Bill Kowalczyk	bill.kowalczyk.has@gmail.com
Bill Pellerin (Past president)	C:713-598-8543 billpellerin@sbcglobal.net

Committee Chairpersons

Audit	Scott Mitchell	H:281-293-7818
Education & Outreach	Bram Weisman	outreach@astronomyhouston.org education@astronomyhouston.org
Field Tr./Obsg	Stephen Jones	FTO@astronomyhouston.org
Membership	Steve Fast	membership@astronomyhouston.org 713-898-2188
Novice	Debbie Moran	novice@astronomyhouston.org H:713-774-0924, C:713-562-7670
Observatory	Mike Edstrom	observatory@astronomyhouston.org 832-689-4584
Program	Justin McCollum	program@astronomyhouston.org
Publicity	Bram Weisman	publicity@astronomyhouston.org
Telescope	Allen Wilkerson	telescope@astronomyhouston.org 832- 265-4773

Ad-Hoc Committee Chairpersons

AL Coordinator	Doug McCormick	astroleague@astronomyhouston.org
Audio/Visual	Michael Rapp	AV@astronomyhouston.org
GuideStar	Bill Pellerin	guidestar@astronomyhouston.org C:713-598-8543
Texas 45 Coordinator	Rene Gedaly	texas45@astronomyhouston.org
Texas Star Party	Steve Goldberg	tsp@astronomyhouston.org H: 713-721-5077
Observatory & Trailer Spot Booking	Steve Goldberg	booking@astronomyhouston.org H: 713-721-5077
Video	Rob Morehead	vrt@astronomyhouston.org
Web Technology	Mark Ferraz	webmaster@astronomyhouston.org
Urban Observing	Steve Munsey	urbanobserving@astronomyhouston.org

Advisors

Dr. Reginald DuFour	Rice University
Dr. Lawrence Pinsky	University of Houston
Dr. Lawrence Armendarez	University of St. Thomas

Annual Dues and Membership Information

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:

You can join (or renew at the organization web site, www.astronomyhouston.org. Click the 'Join HAS' Tab.

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.

Table of Contents

GuideStar deadline for the January issue is December 15th

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 Houston Community College Southwest Campus in Stafford, Texas http://www.fbac.org/club_meetings.htm. Novice meeting begins at 7:00 p.m., regular meeting begins at 8:00 p.m. Website: 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-mailbill.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

Check the web site: www.astronomyhouston.org

The HAS website not only has news and information about our society, but also a variety of features to manage your membership and connect with other club members. Current members can post photos, trade gear, pay dues, manage discount magazine subscriptions, swap stories in the forum, and more.

Questions about the site? Need a hand to get your account set up?
Contact webmaster@astronomyhouston.org.

The HAS web site is the winner of the 2012 Astronomical League award for excellence.

President's Message

by Rene Gedaly, President

My first year as president is wrapping up but no rest for the weary; the leadership team has many projects on deck for 2016. A friend calls me the chief idea thinker upper and delegator. That delegator part is not quite by design. As soon as I believe I've come up with something original I find someone else on the team has already run with it. At the risk of mixing too many sports metaphors, I'm convinced the role I truly serve is not as quarterback but as head cheerleader.

Yes, I know that sounds gender specific. It's not. I've read a number of accounts in the business press of chief executives who describe themselves the same way. It's an exciting, and sometimes scary, position to find yourself in. But it's working. Go team!

Farewell and Welcome

Rolling off the board this year are Bill Flanagan and Bill Pellerin. Affectionately known as "the Bills," they're indomitable. Thank you, both. On hiatus is VP John Haynes. John will continue to run the dark site orientation each month until he squeezes time to get that online version ready.

New to the team are Evelyn Penilla and husband Onias Penilla as Membership Co-chairs. The Penillas head up a full committee; with 600^{+} of us, we need one. Ed Fraini also joins the team as vice president. Using his particular expertise, Ed will be helping the leadership draft a 21st century charter as facilitator.

We do have one player trading off: Steve Fast. Steve is moving to Oklahoma and we will sorely miss him. If you don't know Steve personally, catch most any President's column and you'll see why we feel such a loss. Good luck, Steve. HAS is always your home away from home.

***Plans begin for 2016 at the November 2015 budget meeting**: Bill Kowalczyk, Mike Edstrom, Jessica Kingsley, Bill Flanagan, Evelyn Penilla, Onias Penilla, Bram Weisman, Debbie Moran, Bill Pellerin, Rob Morehead, Allen Wilkerson, Ed Fraini, Steve Munsey, Don Selle, Mark Holdsworth, Rene Gedaly (behind camera).*

International Dark-Sky Association

The board has joined the IDA on behalf of HAS and named Debbie Moran our representative. You've seen her calls to action battling light pollution in Houston. The time is now and we may not get another. Answer the call.

Support your team

One of the chief ways we support the society is through membership dues—and what a bargain each level is. Consider re-joining as a sustaining member this year; one of six of us already do. We've got great plans—just see Mike Edstrom's Observatory Corner. Major donations will be required but many of us can also help with an extra $14/year.

***Silent Sky After Show Discussion**: E&O Chairman Bram Weisman introduces speakers Dr. Thomas Williams, Dr. Bonnie Dunbar, and Dr. Carolyn Sumners following *Silent Sky* at Main Street Theater.*

Say cheese

I include photos whenever I can in this column and on the website. As you see, I don't take the best shots, so send me yours! We'd all love to see what's going on around HAS.

Keep Looking Up

..Rene Gedaly

President

December/January

Calendar

Date	Time	Event
December		
3	1:40 a.m.	Last Quarter Moon
4	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
5		Novice Night Star Party
11	4:29 a.m.	New Moon
12		Prime Night Star Party, Columbus
14	8:18 a.m.	Geminid meteors
18	9:14 a.m.	First Quarter Moon
21	10:48 a.m.	Winter solstice
22	8:00 p.m.	Ursid meteors
25		Christmas
	5:11 a.m.	Full Moon
28	9:00 p.m.	Mercury at greatest elongation east
January		
1	11:31 p.m.	Last Quarter Moon
8	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
9	7:31 p.m.	New Moon
		Prime Night, Columbus
16	5:27 a.m.	First Quarter Moon
23	2:00 p.m.	HAS Leadership & Board Meetings, Moran residence
	7:46 p.m.	Full Moon
31	9:29 p.m.	Last Quarter Moon

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

For the latest information on club events, go to http://

HAS Board Meeting

HAS Board meetings are scheduled regularly (see the calendar, above). All members are invited to attend these meetings, but only board members can vote on issues brought before the board. Meetings are held at the Houston Arboretum at 7:00 p.m. on the date specified.

Follow the *GuideStar* on Twitter at:

GuideStar_HAS

Join Facebook and look for:

Houston Astronomical Society

Starline

Call 832-go4-HAS0 (**832-464-4270**) for the latest information on the meeting and other information about activities within the HAS.

Event Notification or Cancellation

HAS uses RAINEDOUT.NET to communicate late breaking updates about our various events. . Message delivery is via text messaging and e-mail. There are several ways to subscribe. If you would like to receive these notices via text messaging directly to your phone, subscribe to any of the sub-groups which interest you as follows:

To receive text messages, send any or all of the following (one at a time) to **84483**

You will receive a confirmation message back for each successful enrollment.

Text Message	***Alerts about...***
OUTREACH	Public Outreach Events
STARPARTY	Members Only Star Parties (HAS observing site)
URBAN	Urban Observing Events
MEETINGS	HAS Meetings

You may also enroll your phone numbers or individual e-mail addresses via the website:

Here's a shortened link to get you there: http://goo.gl/evrGsR

For more information, please visit www.RainedOut.net.

RainedOut notices will also automatically be sent to our e-mail list. Note that regular e-mail list conversations are not part of RainedOut communications and will not be sent to your phone as part of this service. Instructions to sign up for the e-mail list (a great way to keep your finger on the pulse of the club) are found here:
http://www.astronomyhouston.org/about/email-list.

The Most Popular HAS Member Benefit

The HAS Dark Site—Part 2, Observing Etiquette

By Amelia Goldberg

Last month I briefly covered a little of the history of our greatest asset, the HAS dark site. This month, I want to discuss observing etiquette. The primary reason that Columbus was chosen for our dark site was that it was far from the lights of Houston. We wanted a "dark" place to observe. The name, Houston Astronomical Society Dark Site, was chosen for a reason. Proper observing etiquette will insure that we always have as dark a site as possible.

Tail Light Tape

We have all gone through the site training. However, so much information is covered during that short training session that it is easy to miss or simply not retain a few things. Even seasoned observers need a refresher from time to time. In order for all our members to enjoy the site, there are certain rules that must be followed.

There is a reason that we use dim red light for observing. Dim red light does not destroy our night vision. When exposed to white light it takes thirty to forty-five minutes to become fully dark adapted again. White light, and even bright red light, is a real problem when you are trying to observe difficult objects or do astrophotography. A moment of white light can wipe out hours of effort for a visual observer on the brink of seeing an object that is nearly impossible to see. A photograph can be ruined in an instant by white light.

If you use a computer while observing, cover the screen with red gel, Plexiglas or shield it from other observers. Be aware of the screen's brightness. Also, check the brightness of your table light or any other light that you use while observing, including flashlights. Red lights worn on the forehead are a real problem. When you raise your head to look at your charts or to talk to someone, you blind nearby observers with your light, even if it is dim. A dim red flashlight that aims the light down to the ground is a much better option.

Car lights, both interior and exterior ones, are a serious problem. Most of the newer cars have interior lights that cannot be turned off. Many have day running lights that cannot be turned off. The only options are to pull the fuse to your lights or cover the lights. I just recently found out that there is a red tape designed for just that purpose. It's called Tail Light Tape. Cool stuff! It can easily be placed over all the lights in as many layers as necessary to block out all the white light. Make sure that you get everything covered and check to see that no white shows before it gets dark.

During prime night star parties, there are always 10 minute light windows called during the night so members who do not wish to stay all night can leave. During these light windows, white light is allowed. For safety reasons, use your headlights to drive off the field. These light windows are announced ahead of time to give you plenty of time to get your equipment dismantled and packed away. Do not wait until the window is called to start packing. Be ready drive off the field when the window is called.

If you plan to observe for just a short time and will leave before a light window is called, you need to be able to pack up your things and drive off the field without giving off any white light. It is a good idea to practice at home until you can pack up using only a dim red flashlight. For safety, have someone with a red flashlight guide you to the exit. You might also consider parking your vehicle in the picnic area near the exit road to minimize the damage should any white light accidently escape.

If for some reason you are not comfortable with the strict light rules at the dark site, there are a couple of other alternatives for you. Many of our members observe at George Bush Park where there are no light restrictions. Some go there to get help with new equipment, learn how to set up and collimate, etc. It is a convenient location with low travel time. Your best option, however, would be to take advantage of the "novice" star parties held on other than prime nights at the dark site. These star parties are designed to help the novice observer cope with light restrictions, work out the problems they may be having with car lights or equipment, learn observing techniques such as star hopping, choose what star charts to use, get advice on dew heaters or warm clothing for winter. You may not remember what the dob shed is or how to

(Continued on page 11)

Observations... of the editor

by Bill Pellerin, GuideStar Editor

Happy Holidays, and Happy New Year

Looking forward to 2016, we all create 'resolutions' or goals for the new year. In the corporate world they would talk about SMART goals (look this up) and stretch goals (ones that were difficult for us to achieve). And so on. It's probably enough to make your goals Specific and Measurable, such as, "complete 3 Astronomical League observing programs in 2016". That'd be specific enough and measureable enough. Go for it.

In January and February of any year I see people show up at the YMCA (where I'm a member) that I've never seen before. These are the 'New Years Resolution' folks. By March, they're nowhere to be found.

I hope that whatever you resolve to do in 2016 you keep at it, enjoy it, and accomplish it.

I saw 'The Martian' movie

Did you see the movie, 'The Martian'? I did. If you saw the movie 'Gravity' that came out a couple of years ago, the arc of the story is essentially the same. You probably already know this from having seen the movie or you assume it because of the way these things go. Here's the complete summary in one sentence (which you can skip if you don't want a spoiler). Movie hero finds himself or herself in a perilous situation and overcomes great odds to survive. That's it.

It was nice in 3D, however, and the images were nice. I recommend the film, just don't expect any surprises.

Publisher 2016 now in use

I'm now using MS-Publisher 2016. Notice anything different? Me neither, at least not yet. It starts up a bit faster than Publisher 2013, but I haven't found much in the way of added functionality. I have a MS-Office 'subscription' which provides me with all new updates as they become available. And, I can install the applications on up to 5 computers. It's a pretty good deal, I think.

The good news is that all the previously created Publisher files still work. Microsoft is good about making things backwards compatible.

What I've been Working On

Ok… this is pretty nerdy, I admit, but I've been playing around with a microcontroller called a PICAXE. It comes in various configurations, some more powerful than others. The next step up the scale in the controller world is an Arduino, and then there's the $30 computer called a Raspberry Pi.

Anyway, what can be done with a PICAXE? It's a controller chip so those of us with observatories may wish to automate some functions of the observatory. Suppose you want your observatory to automatically shut down if it's rainy or cloudy or windy. Let's say that you have an instrument that detects one or more of these conditions and can report to the PICAXE. The controller can look at the data it gets and 'decide' to take action on it (i.e. shut down your observatory).

The other thing is that the PICAXE is programmed in BASIC language, which has been around for a long time and which is, as you might imagine, pretty basic.

The chip has analog inputs (and outputs) and digital inputs (and outputs). An analog input reads a voltage on the input, whereas a digital input reads a yes/no signal on the input. The program that you write decides what to do with this information. You can also connect a OLED display to the controller to tell you what's going on.

It's kinda neat… a solution looking for a problem. Check it out at PICAXE.com

My personal best wishes to you and yours for a happy holiday season and a great 2016.

Until next time...

clear skies and new moons!

..Bill

Just Looking

A GuideStar Interview by Clayton L. Jeter

Bruce and Laura Cowles

When attending various star parties across America, I usually becomes acquainted with other amateurs. Hey, it's a party isn't it? A star party is not only an observing happening, but it's a social event too.

Several years ago, I did just that… making new friends under a brightly lit Milky Way in West Texas. Those new friends were Bruce and Laura Cowles from Fort Worth. It seems every time I attend a star party, these two are always there too.

Laura and Bruce At the Eldorado 2015 Star Party

Bruce is the current President of the Fort Worth Astronomy club. Behind his scope, he works both visual and astrophotography. His wife Laura is a visual observer. Both are avid in their hunt for faint fuzzies.

Let's meet this month's dynamic observing duo…here's Laura and Bruce Cowles!

The Laura and Bruce Cowles bio…

Laura…

I grew up in Fort Worth, and have always lived in a busy city area. I remember all of my field trips to the Fort Worth Museum of Science and History Planetarium, either with school, or Campfire Girl trips.

I remember thinking, wouldn't it be wonderful if the night sky actually looked like that! Little did I know that if you are able to get away from the city lights, the night sky can look like that.

If I had ever had the chance to look through a telescope, I'm sure I would have begged for one for Christmas.

My husband had been in an astronomy club several years ago, and enjoyed it, so we decided to go to an astronomy club meeting, with the Fort Worth Astronomical Society.

We love it. We have been members for the past five years. We love going to the big star parties (TSP, Okie-Tex, El Dorado) and we also love doing public star parties. We have both been very involved in the FWAS activities.

I have a 10" Meade Dobsonian telescope. I love the manual Dobsonian scopes, because they are easy set up, and use. I enjoy looking up and finding objects that I have never seen.

Even though we both work full time, I am a bank loan assistant, we try to take our scopes out, and make it to a few star parties every month. We plan to observe the night sky for many years to come.

Bruce…

Even though I grew up on a farm where I am sure the sky was very dark, I was never interested in the stars and the night sky until my daughter was studying the solar system in the 4th grade. She was really excited about learning astronomy. So, that year I wondered what we could do for a vacation that would be astronomy oriented. On the internet we found the McDonald Observatory and the Davis Mountains State Park that is just down the road. We saw that McDonald had public star parties and we could even sign up to view through the 107". Needless to say it was a fantastic vacation and my daughter and I were hooked. 28 years later, I am still hooked. My daughter has passed her interest in astronomy onto her kids who are all teenagers now.

Back in the early 80's I joined an astronomy club and was active for a few years. My first telescope was a little red 3" Jason reflector. After about a year I moved up to an orange tube Celestron C8. I thought I could see the whole universe with that scope. I really enjoyed the outreach events, especially going to schools and talking to the kids. Then life changed and I was out of the amateur astronomy world for several years.

(Continued on page 9)

(Continued from page 8)

My job at the time didn't leave much time for hobbies. But after a while my job title and description changed and it allowed me to have more free time. So, again I became interested in astronomy and bought another telescope. After observing on my own for about 3 years, my wife and I decided to join a local astronomy club. We joined the Fort Worth Astronomical Society. The members were really friendly and helpful and we loved the outreach events. After one year of membership, I qualified and was elected to be on the board. Then about a year and a half ago I was elected president.

The Laura and Bruce Cowles interview…

Clayton: It's really a pleasure Laura to have you and Bruce here for this month's issue of the *GuideStar*. Thanks for taking the time to share your ideas here.

Let's start… Were you interested in astronomy as a child? I know Bruce had been very interested, but just how did you two click into this hobby together?

Laura: My only interest in astronomy as a child was getting to go to the Fort Worth Museum of Science and History Planetarium. We really became excited about the hobby after we went to our first meeting with the Fort Worth Astronomical Society.

Everyone was really nice, and we both enjoy going to star parties and letting people look through our scopes.

Clayton: Do you think that by becoming involved in astronomy, it has somehow changed a direction in your life?

Bruce: Yes, I have slowed down some. Being in the dark looking up at all of the wonderful things is really relaxing. I have also gained a lot of good friends.

Clayton: Tell us a bit about the Fort Worth club? Where and when do they meet?

Laura: We meet the third Tuesday of every month at 7:00 pm at the UNT Health and Science Center building at 3500 Camp Bowie Blvd in Fort Worth.

Clayton: Is the Fort Worth club proactive in trying to save the night skies from the encroaching light pollution?

Bruce: We haven't gone so far as going to city councils or any officials but at all of our many outreach events we constantly explain why you can't see as many stars in town as you can out in the country and what they can do about it with the right kind of lighting or with shielding.

Clayton: Tell us a bit about a typical observing session. Do you two always observe together? Where at usually?

Laura: Yes, we usually observe together, but there have been several times where I will take my scope out in the backyard and observe on my own. We love to go to the big star parties, (TSP, Okey Tex, El Dorado, etc.) But we really enjoy going to our club's dark sites and observing with other club members.

Clayton: I understand you're into visual and astrophotos, but have you also interest in sketching, A.L. observing programs, armchair, etc.?

Bruce: I have always admired the sketches I see in books and magazines but I can't even draw good stick people. I have earned one A.L. pin and am currently working on the Globular Clusters program. I do enjoy the A.L. programs and the observing lists at the big star parties.

Clayton: What's your attraction to the night skies? Got a favorite object?

Laura: I love trying to look for objects I have never seen before. I love looking at globular clusters, and nebulas. The ring nebula is one of my favorite objects.

Clayton: How would you like to see your own astronomy grow?

Laura: My plan it to start taking astronomy photos. I would like to get really good at processing the pictures.

Bruce: I would really like to get better at astrophotography but it does take a lot of time and patience and we have a long way to go. Other than that I would just like to have more time for observing at the club's dark sites. But as everyone knows, so many other things come up that need to be done. Hopefully both things will get better in a few years when I retire.

Clayton: I'd like to know a little about your telescope(s).

Laura: I have a 10 inch Meade Dobsonian telescope. I enjoy searching the night sky.

Bruce: My main scope is a CPC 1100. This gives me good aperture, is fairly portable, has good goto capabilities and

(Continued on page 10)

(Continued from page 9)

the quick alignment and tracking works great for outreach events.

Laura and I share the astrophotography setup. The scope is a 6" Astro-Tech RC that Laura won at Okie-Tex in 2014. OK so we share Laura's scope. Anyway, it is on an iOptron iEQ30 mount, with an Orion Mini 50mm guide scope with an Orion StarShoot autoguider. We use 2 different main cameras. A Canon DSLR or an Orion StarShoot G3 CCD.

Clayton: It seems in recent years that the younger people are not that interested in amateur astronomy, or any of the sciences. Are you attaining any young club members? How can we turn this around?

Bruce: 5 or 10 years ago it was hard to get and keep kids interested in space and astronomy. Especially teenagers. But today, there is more going on at NASA and a lot more astronomy information (good and bad) on TV, on the internet and in the movies. We are seeing an increase in the kids joining our Young Astronomers club and a noticeable increase in the 20 year olds joining at the monthly club meetings.

This and a couple other things are helping the rapid growth of our club. First is our social media presence. We have a member, Shawn Kirchdorfer, that does an outstanding job on our website, on our Facebook page and on Twitter.

The other is from our outreach events. Teachers seem to really want help learning and teaching astronomy these days. They are excited about it and pass that excitement on to their students. We held 62 out reach events in 2014. The number of events for 2015 is down some because of the spring rains but the numbers of people at each event have increased from last year. So, I actually think the interest in amateur astronomy is growing with young people and we just need to have our club information out there where they are going to look for answers.

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

Laura: Yes, I would tell them to get a pair of binoculars, a tripod, and a star chart, and learn the constellations and what you can see within each one.

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

Laura: blcowles@gmail.com

Bruce: Yes there is. Our club email is: info@fortworthastro.com

Clayton: Thanks Laura and Bruce for taking the time to share your interest and thoughts within our HAS newsletter, the *GuideStar*. We wish you guys luck with all of your astronomy interests. Please come visit our society when in the Houston area, we'd love to see you both.

Laura and Bruce: You are very welcome. If ever you are up our way, we would love to have you at our club meeting as well. Hopefully we will see you next year at the star parties.

---

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

Observatory Corner

By Mike Edstrom, Observatory Director

Fall is finally here with a low of 30 degrees at the site this morning please remember to bring warm clothing when you come to observe. The fall skies are some of the clearest skies we will have all year so please take advantage of the cool weather and the clear skies at the dark site.

As I have stated in previous articles the observatory committee is in the process of putting together a large project to upgrade the observatory telescopes and the dark site itself. One of those upgrades is new focusers for the f/5 and f/7 telescopes which were ordered this week Ed Fraini is heading up this project. We are also looking into a new "GOTO" mount for one of the scopes in the main observatory Don Selle is heading up this project.

Some of the dark site projects will be painting the interior of the rest room, some road additions, some parking additions, additional trailer sites, and additional bunkhouse for families. All these additions are expensive and we will need to look for donations to fund these.

Please remember to fill out your observing log and put it in the center box on the observing field if you should forget we have them available on the website for your convenience just look on the Observatory page fill it in and submit it electronically.

As a safety reminder please read the sign posted on the side of the metal building at the Dark Site which has directions to the hospital and contact information for the sheriff's department it also has the address to the site in case of a medical emergency.

An Easy Fund Raiser

If you have a Randall's card, and have not done so, please have it coded for the Houston Astronomical Society. Simply go to the Customer Service Booth and ask them to code your card to the Houston Astronomical Society's "Good Neighbor" account.

Mike Edstrom

Observatory Chairman
medst22531@msn.com
hasobschair@astronomyhouston.org

(Continued from page 6)

report restroom problems. Seasoned observers are always there to help with whatever you need. It's the perfect way to learn the ropes.

Between the observing pads and the private observatories are three large concrete pads. Although they cannot be "locked up", they are privately owned and not for use by the general membership. Please make sure the owners will not be arriving later and ask their permission before using them.

Many of our members now have private observatories. A lot of these members do astrophotography or other serious astronomy. It is always fun to visit with them, but keep in mind that they can be quite busy at times. If possible, arrange for a visit ahead of time so they will be expecting you. If you have not arranged a visit, please ask if it is a convenient time for company before entering their observatory.

We have a great picnic area with tables and benches under the trees. This area is also for tent camping. Please do not set up your tent on the observing field.

Last month I mentioned the two large pads on the outer circle. If you meet the use criteria and would like to reserve one of those pads, contact Steve Goldberg. He is also the person to contact to reserve one of the two weekend RV spots. His address is: hasbooking@astronomyhouston.org.

We want all members, old and new, to be able to successfully use the site for their own interest, whether it be just casual observing or serious astronomy. That is why we have these rules. Let us all do what we can to insure that our dark site will stay as dark as we can possibly make it.

McDonald Dark Energy Experiment

From UT Astronomy Program, Eric Berger (Houston Chronicle)

Unless you're an astrophysicist, you probably don't sit around thinking about dark energy all that often. That's understandable, as dark energy doesn't really affect anyone's life. But when you stop to ponder dark energy, it's really rather remarkable. This mysterious force, which makes up the bulk of the Universe but was only discovered 17 years ago, somehow is blasting the vast cosmos apart at ever-increasing rates.

Astrophysicists do sit around and think about dark energy a lot. And they're desperate for more information about it as, right now, they have essentially two data points. One shows the Universe in its infancy, at 380,000 years old, thanks to observations of the cosmic microwave background radiation. And by pointing their telescopes into the sky and looking about, they can measure the present expansion rate of the Universe.

The Hobby-Eberly Telescope at the McDonald Observatory has been configured with new instrumentation to enable astronomers to discover the history of dark energy. — Credit: UT

But astronomers would desperately like to know what happened in between the Big Bang and now. Is dark energy constant, or is it accelerating? Or, more crazily still, might it be about to undergo some kind of phase change and turn everything into ice, as ice-nine did in Kurt Vonnegut's novel Cat's Cradle? Probably not, but really, no one knows.

The Plan

Fortunately astronomers in West Texas have a $42 million plan to use the world's fourth largest optical telescope to get some answers. Until now, the 9-meter Hobby-Eberly telescope at McDonald Observatory has excelled at observing very distant objects, but this has necessitated a narrow field of view. However, with a clever new optical system, astronomers have expanded the telescope's field of view by a factor of 120, to nearly the size of a full Moon. The next step is to build a suite of spectrographs and, using 34,000 optical fibers, wire them into the focal plane of the telescope.

"We're going to make this 3-D map of the Universe," Karl Gebhardt, a professor of astronomy at the University of Texas at Austin, told Ars. "On this giant map, for every image that we take, we'll get that many spectra. No other telescope can touch this kind of information."

With this detailed information about the location and age of objects in the sky, astronomers hope to gain an understanding of how dark energy affected the expansion rate of the Universe 5 billion to 10 billion years ago. There are many theories about what dark energy might be and how the expansion rate has changed over time. Those theories make predictions that can now be tested with actual data.

In Texas, there's a fierce sporting rivalry between the Longhorns in Austin and Texas A&M Aggies in College Station. But in the field of astronomy and astrophysics the two universities have worked closely together.

(Continued on page 13)

Novice Presentation—December 4, 2015

All About Eyepieces

By Debbie Moran

Ever wonder why it is a meaningless question to ask what "power" a telescope is? What in the world is "eye relief" or "exit pupil?" Come learn all about eyepieces in December with a talk for novices and experienced observers too by Loaner Telescope Chair Allen Wilkerson. Learn how eyepieces function, how to choose the right eyepiece for the object you are looking at, how to choose eyepieces that will work best with your telescope and why you may someday want to splurge.

In January, we will have our long awaited talk about variable star observing from Bill Pellerin who will tell you everything you wanted to know about why some stars vary in brightness, why astronomers watch them, and how you can contribute to the science of variable stars. Walt Cooney will fill us in on his recent discoveries of two previously unknown variables.

(Continued from page 12)

And perhaps no one is more excited than A&M's Nick Suntzeff about the new data that will come down over the next four years from the Hobby-Eberly telescope.

Suntzeff is most well known for co-founding the High-Z Supernova Search Team along with Brian Schmidt, one of two research groups

Dark skies: the Hobby-Eberly Telescope sits atop Mount Fowlkes in the Davis Mountains of West Texas

Credit: Bill Nowlan Photography

that discovered dark energy in 1998. This startling observation that the expansion rate of the Universe was in fact accelerating upended physicists' understanding of the cosmos. They continue to grapple with understanding the mysterious force—hence the enigmatic appellation dark energy—that could be causing this acceleration.

Dawn of the cosmos

When scientists observe quantum mechanics, they see tiny energy fluctuations. They think these same fluctuations occurred at the very dawn of the Universe, Suntzeff explained. And as the early Universe expanded, so did these fluctuations. Then, at about 1 second, when the temperature of the Universe was about 10 billion degrees Kelvin, these fluctuations were essentially imprinted onto dark matter. From then on, this dark matter (whatever it actually is) responded only to the force of gravity.

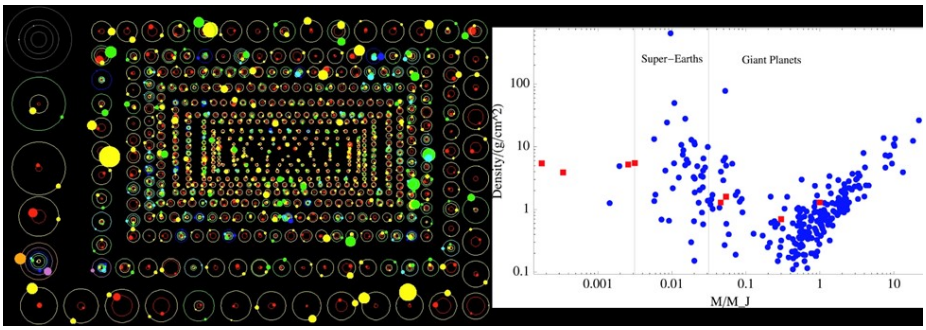
Courtesy The University of Texas at Austin McDonald Observatory, publisher of StarDate magazine
http://stardate.org/magazine

Our Solar System Is Almost Normal ...But Not Quite

by Ethan Siegel

It was just over 20 years ago that the very first exoplanet was found and confirmed to be orbiting a star not so different from our own sun. Fast forward to the present day, and the stellar wobble method, wherein the gravitational tug of a planet perturbs a star's motion, has been surpassed in success by the transit method, wherein a planet transits across the disk of its parent star, blocking a portion of its light in a periodic fashion. Thanks to these methods and NASA's Kepler spacecraft, we've identified many thousands of candidate planets, with nearly 2,000 of them having been confirmed, and their masses and densities measured.

The gas giants found in our solar system actually turn out to be remarkably typical: Jupiter-mass planets are very common, with less-massive and more-massive giants both extremely common. Saturn—the least dense world in our solar system—is actually of a fairly typical density for a gas giant world. It turns out that there are many planets out there with Saturn's density or less. The rocky worlds are a little harder to quantify, because our methods and missions are much better at finding higher-mass planets than low-mass ones. Nevertheless, the lowest mass planets found are comparable to Earth and Venus, and range from just as dense to slightly less dense. We also find that we fall right into the middle of the "bell curve" for how old planetary systems are: we're definitely typical in that regard.



Images credit: NASA / Kepler Dan Fabricky (L), of a selection of the known Kepler exoplanets; Rebecca G. Martin and Mario Livio (2015) ApJ 810, 105 (R), of 287 confirmed exoplanets relative to our eight solar system planets

But there are a few big surprises, which is to say there are three major ways our solar system is an outlier among the planets we've observed:

- All our solar system's planets are significantly farther out than the average distance for exoplanets around their stars. More than half of the planets we've discovered are closer to their star than Mercury is to ours, which might be a selection effect (closer planets are easier to find), but it might indicate a way our star is unusual: being devoid of very close-in planets.
- All eight of our solar system's planets' orbits are highly circular, with even the eccentric Mars and Mercury only having a few percent deviation from a perfect circle. But most exoplanets have significant eccentricities, which could indicate something unusual about us.
- And finally, one of the most common classes of exoplanet—a super-Earth or mini-Neptune, with 1.5-to-10 times the mass of Earth—is completely missing from our solar system.

Until we develop the technology to probe for lower-mass planets at even greater distances around other star systems, we won't truly know for certain how unusual we really are!

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology.

*Visit **spaceplace.nasa.gov** to explore space and Earth science!*

SkyWord Newsletter

Taft Armandroff, Director of the McDonald Observatory

In this SkyWord newsletter, we are sharing with you, the friends and supporters of McDonald Observatory, some of the Observatory's most recent research results, outreach news, and a view of some of our team.

Our featured research result concerns an Earth-sized exoplanet revealed by the Kepler Space Telescope and aided by the Harlan J. Smith Telescope at McDonald Observatory. The study of exoplanets is perhaps the fastest growing and most exciting area of astronomy today. October 2015 marked the 20th anniversary of the discovery of the first exoplanet. Before that, astronomers struggled without success to find unequivocal evidence of planets beyond our own solar system. Finding and studying exoplanets is a technical challenge because they are so much less massive and so much fainter than their parent stars, plus they are projected on the sky incredibly close to their parent stars. However, more than 1,800 exoplanets have now been confirmed, which is a tribute to advances in astronomical techniques and the passion of exoplanet hunters. McDonald Observatory is a major player in the field of exoplanets, with vital contributions coming from astronomers Bill Cochran and Mike Endl and their colleagues, using the Hobby-Eberly Telescope, Harlan J. Smith Telescope, Kepler, and other facilities.

Through SkyWord and other means, we enjoy keeping you current with progress on the Giant Magellan Telescope (GMT), which the University of Texas at Austin is developing in partnership with 10 other world-class educational and research institutions. GMT will be the largest telescope in the world when it comes online in 2021, and its revolutionary capabilities will enable observational data on astronomical targets that are completely inaccessible today. GMT has reached the critical milestone of its groundbreaking, which is taking place at the GMT site in Chile on November 11.

Also in this issue is a spotlight on Craig Nance, McDonald Observatory superintendent based in West Texas. Many of you may have met Craig on your visits to the Observatory. With Craig's engineering rigor, deep experience in observatory operations, and love of the night sky, we are very fortunate to have his leadership in West Texas.

As a scientific field, astronomy benefits immensely from the interest of the public. This enables wonderful outreach opportunities to share broadly all that we are learning about the universe. In Texas, popular public outreach institutions include our own Frank N. Bash Visitors Center and *StarDate* radio, plus the Texas Star Party, the planetariums across Texas, and the many Texas astronomy clubs. There is a new force in Texas astronomy outreach: Astronomy On Tap, which features speakers and astronomy news alongside craft beer and cocktails monthly in Austin. This wholly new environment for scientific outreach is attracting a diverse crowd of astronomy enthusiasts. The event — and the two postdocs who are the creative force behind it, Rachael Livermore and Jeffrey Silverman — are featured here as well.

Lastly, this summer we were honored to host University of Texas System Chancellor Bill McRaven at McDonald Observatory. The Chancellor toured the McDonald telescopes, saw the latest hardware for HETDEX, viewed the night sky, and interacted with astronomers, other Observatory staff, and friends of the Observatory. Chancellor McRaven has a passion for science in general and astronomy in particular. As a strong advocate for the University of Texas, science, and higher education, the Chancellor's words were inspiring to everyone who met him at the Observatory.

Courtesy The University of Texas at Austin McDonald Observatory, publisher of StarDate magazine
http://stardate.org/magazine

The entire *SkyWord* newsletter is available online at:

http://mcdonaldobservatory.org/support/skyword/skyword_november_2015#406

If you're reading the PDF version of this *GuideStar* the link above (as well as many links in this issue) can be clicked to open your browser and take you to the web site.

Shallow Sky Object of the Month

Mirzam—A Beta (β) Cepheid Star

By Bill Pellerin, GuideStar Editor

Object: Mirzam, sometimes spelled Murzim, β CMa
Class: β Cepheid Star
Constallation: Canis Major (CMa)
Magnitude: 1.98
Period: 6 hours
R.A.: 6 h 22 m 42 s (2000 coordinates)
Dec: -17 deg 57 min 21 sec
Size/Spectral: B1
Distance: 500 ly
Optics needed: Unaided eye or small telescope

When your eye gets anywhere near Sirius, the brightest star in the sky (not counting our sun), you'll be dazzled by it. Look again, and to the west-southwest, about 5.5 degrees away you'll find the β star of the constellation, Mirzam. It's bright, shining at a magnitude of 1.98 and you should be able to find it easily.

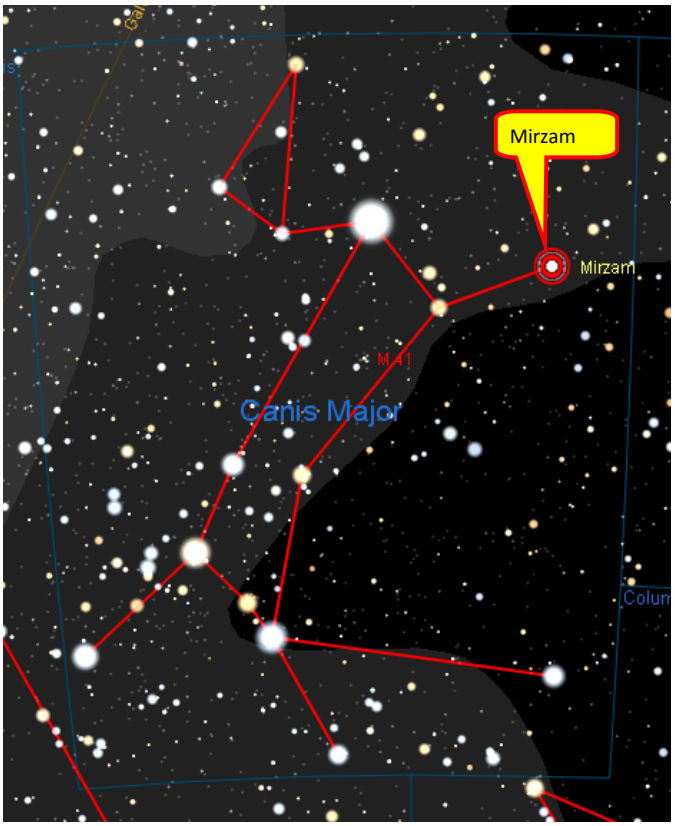
This star is a β Cepheid star (the designation, β CMa is simply coincidental with the β Cepheid category). Interestingly, this star is sometimes considered the prototype for the β Cepheid category of variable stars, but, more commonly, and easier to understand, the star β Cephei (β Cep) is considered the prototype. The *General Catalog of Variable Stars* (GCVS) identifies these type of stars as BCEP variables.

Do not confuse this type with Cepheid variables (discussed last month), whose prototype star is Delta (δ)Cep.

Characteristically, a β Cep star is low amplitude (in magnitude), short period variable. You would likely have to make measurements with a CCD imager or photometer to detect the variations in these stars. The variability of β CMa is from 1.97 to 2.01 magnitude, so measurements that can resolve magnitude differences of .01 mag are required. Typically, visual observations can resolve, at best, differences of .1 magnitude.

These changes in magnitude are caused by pulsations within the star, and scientists believe that there are three pulsations that are active simultaneously. Sometimes, the pulsations coincide in such a way as to amplify the variation in magnitude of the star. This effect is seen about every 50 days.

β Cep stars are typically much larger than our Sun with masses of 7 to 20 solar masses. Our subject star, β CMa is about 13 solar masses and has a surface temperature of about 23,000 K. This compares with the Sun's temperature of about 6,000 K.



Finder chart — north is up.

Star chart generated by TheSkyX © Software Bisque, Inc. All rights reserved.

www.bisque.com

As has been discussed before, color and temperature are the same thing (see Wein's Law), so this star is a blue-white in color.

One of the leading researchers on this type of stars was Otto Struve (1897-1963), who has a family heritage of observing variable stars. He was the director of the Yerkes Observatory and the founding director of the McDonald Observatory near Fort Davis, TX.

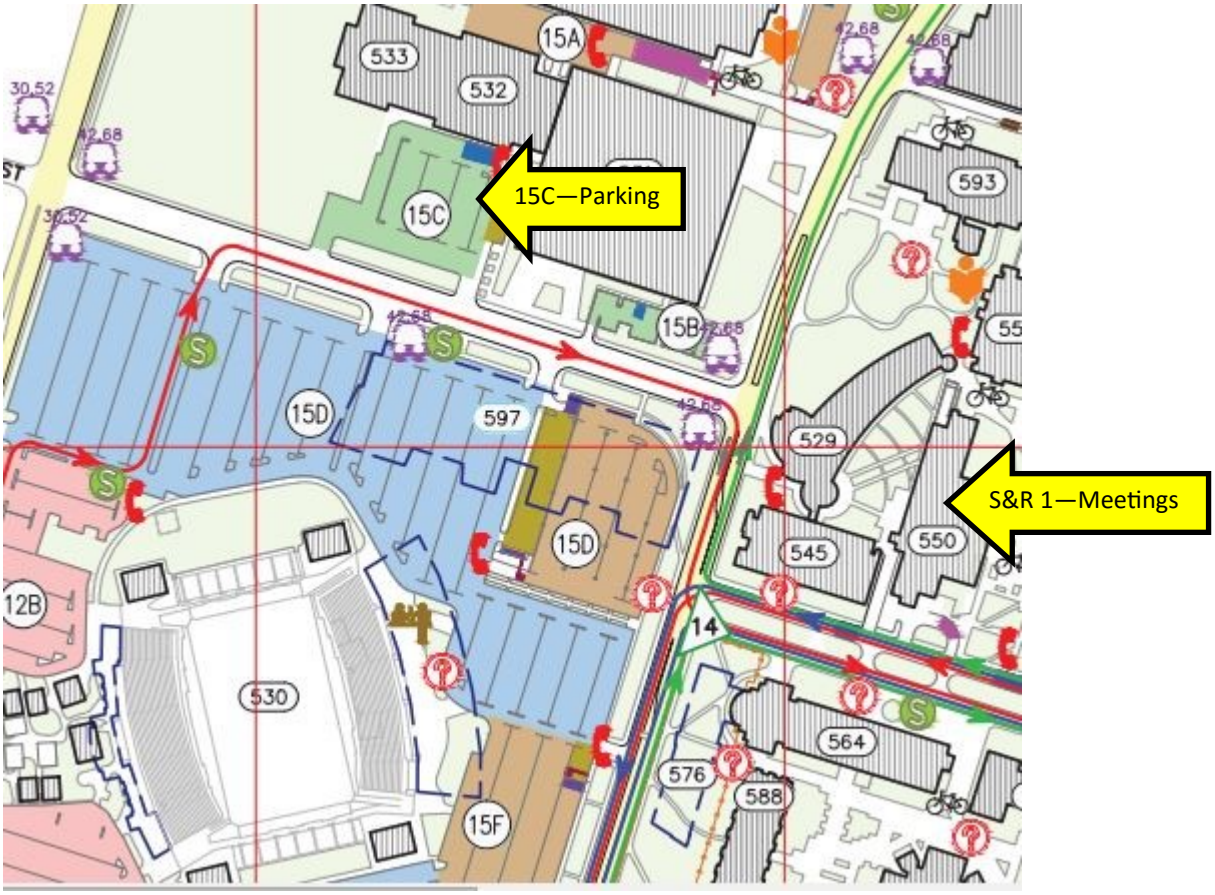
Parking at the University of Houston Main Campus

For the monthly Houston Astronomical Society Meeting

The map below shows the location of the 15C parking lot, west of Cullen Boulevard on Holman Street..

The map is from the University of Houston web site and identifies the lot that is available for parking while attending the Houston Astronomical Society monthly meeting. This parking is available from 6:30 p.m. until 10:00 p.m. on the Friday night of the HAS meeting (usually the first Friday of the month).

This parking is free. If you get a notice from the UH campus police on the night of the meeting, call the UH Security office and let them know that this area has been made available on HAS meeting night by the Parking Department.



Houston Astronomical Society

P.O. Box 800564

Houston, TX 77280-0564

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 and at locations scheduled by the board. 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, unformatted MS-Word format via email GuideStar@astronomyhouston.org. 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.

Contact the editor for writing guidelines.

Editing & Production: Bill Pellerin,

713-880-8061

Email: GuideStar@astronomyhouston.org

Advertising: Advertisers may inquire concerning ad rates and availability of space.

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. Access to meeting videos on the HAS web site.
- 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, December 4, 2015

7:00 Novice Meeting, room 116 Science & Research 1 Bldg

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 on Holman Street; the parking lot is past the Hofheinz Pavilion
- 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 on Holman Street; the parking lot is past the Hofheinz Pavilion
- Science and Research is across the street (2nd building back)

Parking:

There is Free Parking**. See Parking map and detailed information on parking on the preceding page.**