Houston Astronomical Society

August, 2015

GuideStar

August, 2015

Volume 34, #8

At the August 7 Meeting

Space Medicine: from Houston to Kazakhstan

Dr. Cedrick Senter, ret. NASA flight surgeon

Dr. Cedric Senter will speak to HAS about his experiences as a flight surgeon with NASA. In particular, Dr Senter will review:

- Preflight, inflight and post flight medical activities
- Long-duration space flight medical issues and their countermeasures
- Long-duration space flight environmental issues and their countermeasures
- Postflight medical issues
- Questions welcomed after the talk

Dr. Senter graduated from UNM School of Medicine 1984 and began an internship that same year at St. Joseph's Hospital and Medical Center in Phoenix, Az. He entered US Naval Flight Surgeon Training in July 1985 and received his Naval Flight Surgeon Wings in Feb 1986.

In 1998 he joined Wyle Laboratories, Houston as a Medical Operations Physician supporting Astronaut Training in Star City, Russia while also training for ISS Surgeon Console position in the MCC-Houston.

In 2003, he was chosen as the first contractor flight surgeon to act as a Deputy Crew Surgeon for ISS Expedition 4 after completing the certification to become an ISS flight controller in the Mission Control Center –Houston.

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.

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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.

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.

Clayton Jeter — "Collimating a Schmidt-Cas Telescope"

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.

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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.

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GuideStar deadline for the September issue is August 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

Novice Presentation—August 7, 2015

Collimating a Schmidt-Cas Telescope

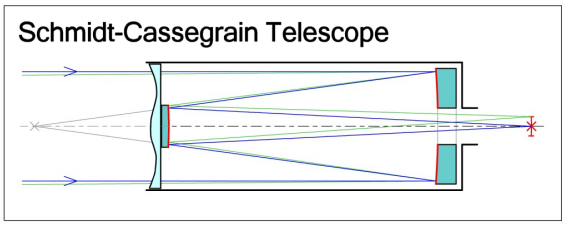
By Debbie Moran

In August we welcome Clayton Jeter who will reveal the mysteries behind collimating or aligning the optics of a Schmidt-Cassegrain telescope. If you own a Schmidt-Cas or are considering buying one for its compact shape and excellent optics, don't miss this talk. Clayton is well known as a telescope dealer and repairman. His web site can be found here:

http://www.pegasusoptics.com/contact-advantage-telescope-repair.html

Also a note about the upcoming Perseids meteor shower which peaks early morning August 13th. This is usually the best meteor shower of the year. You need a dark sky and time to observe after midnight when the earth's atmosphere is facing into the particle stream for the best view. Since the moon will not interfere this year, it is worth the effort. Here is more information: http://earthsky.org/?p=165416

Finally, in September it will be time once more for me to give a simple constellation and sky identification talk for the autumn sky. See you then!



From Wikipedia.org

President's Message

by Rene Gedaly, President

The weather is hot and the nights are short but this is the time of year many of us can get to the observatory and dark site to do some imaging or observing and a little picnicking with the family. It wouldn't be nearly as enjoyable if it weren't for the dedication of *Allen Wilkerson* maintaining the grounds. Fortunately there's a motley grounds crew that pitches in, but for some time now it's been Allen at the helm. If it's Saturday and you don't see Allen on the field, look for him elsewhere on the site, maybe the observatory where he's likely maintaining some of the equipment there. We can't thank you enough, Allen. And in case you new members don't know, Allen is also our Telescope Chairman, an elected position at the Annual Meeting. Want to check out a telescope from the loaner library? Find Allen's contact info on page 2 and see what he's got available.

Allen Wilkerson cutting the observing field at the dark site atop the new tractor

Board shorts...it's summer

New tractor. That new tractor Allen's sitting on in the photo is a beauty and has enough power to handle the field grass. Mike Edstrom quickly found a buyer for the old tractor to offset the cost, which was supplied by an anonymous donor. Thank you!

Nominating Committee. As is our tradition, the Vice President chairs the nominating committee and *VP John Haynes* is already ramping up the search—look for his article elsewhere in this *GuideStar*. Make this the year you join a committee, head one up, or join the board.

Astronomy Day 2015. *Jessica Kingsley* is our HAS liaison for A-Day 2015. At each membership meeting from now until October, she'll be going over how you can volunteer for what's billed as *The Biggest Astronomy Event in Southeast Texas!* She also has an article in this issue so check it out. A-Day is Oct 24.

All Clubs Meeting Oct 23, 2015. Another tradition we have at the HAS is to hold the October membership meeting coincident with the All Clubs meeting when it falls in October, which it does this year. We'll be voting on this change at the August 7 membership meeting. If you haven't made it to an All Clubs yet, give it a try. It's fun seeing folks from the other clubs, and the speakers are great, too. And then there's the door prizes …

Horkheimer Library Telescope. **We won!** HAS has won one of ten Orion 4.5 inch StarBlast Dobsonian Telescopes equipped with a Celestron 8-24 mm zoom eyepiece and commemorative plate given by the Horkheimer Charitable Fund. Thanks, *Doug McCormick* , for tipping us off about the Astronomical League drawing, *Bill Pellerin* for completing the winning entry, and *Bram Weisman* who will be modifying the scope to make it indestructible. The scope will be available for check out from the Houston Public Library System. Talk about outreach!

Video Meetings. The board approved using video conferencing technology to conduct committee meetings and board meetings. Regularly scheduled board meetings will continue to be held face-to-face.

AstronomyHouston.COM That's right, soon everyone will be able to find us using top level domains .com, .net, and .org. Thanks to everyone who helped make this happen.

With fond memories of Star Hustler Jack Horkheimer

Keep Looking Up

..Rene Gedaly

President

August/September

Calendar

Date	Time	Event
August		
6	9:03 p.m.	Last Quarter Moon
7	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
8		Novice Night Star Party, Columbus
13	1:00 a.m.	Perseid meteors
14	9:53 a.m.	New Moon
15		Prime Night Star Party, Columbus
22	2:31 p.m.	First Quarter Moon
29	1:35 p.m.	Full Moon
September		
4	5:00 a.m.	Mercury at greatest elongation east
	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
5	4:54 a.m.	Last Quarter Moon
12		Prime Night Star Party, Columbus
13	1:41 a.m.	New Moon
21	3:59 a.m.	First Quarter Moon
22	7:00 p.m.	HAS Board Meeting, Houston Arboretum
23	3:21 a.m.	Autumn equinox
27	9:50 a.m.	Full Moon
		Total eclipse of the moon in evening

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

For the latest information on club events, go to http://www.astronomyhouston.org/

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 observ-
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.

Observations... of the editor

by Bill Pellerin, GuideStar Editor

In this issue of the *GuideStar* is the 100th article by our friend Clayton Jeter. His first article was in the August, 2006 issue of the *GuideStar* and he has continued to produce articles since that time.

Over the 100 articles, there are interviews with…. Becky Ramatowski, Dennis Webb, Tomm Lorenzen, Dr. Jill Tarter, Sue French, George Stradley, Don Pearce, Al Nagler, Emily Lakdawalla, Phil Harrington, Stephen O'Meara, and, this month, Jeff Kanipe.

I'll put the list on a separate page, and identify the *GuideStar* issue that contains the article. Many *GuideStar* issues are accessible from the HAS web site. I created the list to make sure that I didn't put the same interview in the *GuideStar* twice. There was one intentional re-publishing and that was the interview with Bob Rogers, our long time Observatory Director who passed away in 2013.

I also use the list to keep track of my 'Shallow Sky' objects, to avoid duplicates. There are now 109 of these items.

An Observing Night

Finally. Finally, I was able to get out and do some visual observing on the night of July 18. It was a pleasure, really.

This was one of those nights with no plan, except to confirm that my telescope was working and that I knew how to operate it. Yes, it has been that long.

I had a conversation with telescope expert (and our interview guy) Clayton Jeter about whether it's ok, during hot weather, to leave my 8" SCT in the observatory between observing sessions. Clayton said, no, it's not ok, and that he has repaired several SCTs that had been damaged by being kept in an overheated environment.

So… on to a new scheme. I'm going to leave my German Equatorial mount in the observatory (no optics), and attach the optics when I initiate an observing session. A GE mount requires a bit of setup to get polar aligned and to get the pointing model created. That's why I'll be leaving the mount in place all the time. It's mostly a big hunk of metal so the heat shouldn't bother it. Any lubricants can be replaced.

I've left the GE mount in place for extended periods in the past with no known ill effects.

It's So Dang Hot

If it's not the clouds, it's the oppressive heat that we've been having recently that's keeping us away from the telescope. I can remember many a night being out with the telescope while perspiring and while having mosquitoes buzzing my ears. Not a good experience. That said, for those of you brave enough to get outside, go for it. Tonight (July 31) is the night of the full (Blue) Moon, so perhaps a step outside to see this would be in order. It's not a good night for observing much else.

If You Write for the GuideStar

I have created a guide for writers in the *GuideStar.* So that material that is submitted is easy for me to drop into the publication and to keep the style of the publication the same.

If you want to write for the *GuideStar* I'd be pleased to accept your submissions. I'll send you the guide for writers if you ask for it.

Until next time...

clear skies and new moons!

..Bill

Just Looking

A *GuideStar* Interview by Clayton L. Jeter

Jeff Kanipe — Author

Although I haven't met Jeff Kanipe….yet, it seems I already know him via Dennis Webb. I have been friends with Dennis for decades and it turns out that he and Jeff have co-authored several books on astronomy. I have their first on Arp galaxies and can't wait on my next purchase of their newest set of books.

This guy is all over astronomy….even has an asteroid named after him! Let's see what Jeff has to say about himself and the night skies. Here's Jeff…

The Jeff Kanipe bio… Jeff Kanipe has been a science journalist for over 30 years, specializing in cosmology and astrophysics. He is the author of *Chasing Hubble's Shadows: The Search for Galaxies at the Edge of Time*; *The Cosmic Connection: How Astronomical Events Impact Life on Earth*; and *A Skywatcher's Year*. He has coauthored a number of books, including *Advanced Skywatching*; *Astronomy: The Definitive Guide*; *The Arp Atlas of Peculiar Galaxies: A Chronicle and Observer's Guide* (with Dennis Webb); and *Island on Fire* (with Alexandra Witze). He has worked as a top editor for both *Astronomy* and *StarDate* magazines, and written for publications including *New Scientist*, *Nature*, *The World and I*, and *Communications of the ACM*. He was the inaugural skywatching columnist for SPACE.com, and contributed numerous radio scripts for *StarDate* and *Earth & Sky. (Ed: see last month's interview with Deborah Byrd.)* Jeff served as an astronomy enrichment lecturer on cruise ships, and handled media and public outreach for the Astronomy department at the University of Texas at Austin.

In April 2015 he published the first two volumes of a multivolume series called *Annals of the Deep Sky: A Survey of Galactic and Extragalactic Objects*, coauthored with Dennis Webb. Already being hailed as the *Burnham's Celestial Handbook* for the 21st century, *Annals* is an up-to-date observing guide for amateur astronomers, which features in-depth astrophysical profiles of stars and deep-sky objects. Volumes 1 and 2 cover the constellations Andromeda through Caelum. When completed, the series will cover all 88 constellations.

Jeff is a member of the American Astronomical Society and its Historical Astronomy Division. He received his Messier certificate (#55) in October 1969 while a member of the Corpus Christi Astronomical Society. Asteroid 84447 Jeffkanipe is named in his honor for his role in identifying the earliest known image of that asteroid.

Jeff graduated from the University of Texas at Austin in 1976 with a degree in magazine journalism, and began working as an independent science writer shortly thereafter. He lives in the foothills northwest of Boulder, Colorado, where he observes with a 4-inch refractor, an 11-inch SCT, and a 15-inch Newtonian. For relaxation, he plays guitar and drums in his basement office.

Clayton: Jeff, it is a total pleasure being able to interview you here in the *GuideStar*.

Let's get started…

First off, how did you hook up with Dennis Webb? Is he a mess or what? How do you coordinate on writing books together? That could be quite a challenge!

Jeff: Dennis and I met back in 2004 (I think) at a presentation I gave for the Johnson Space Center Astronomical Society on

Dennis Webb and Jeff Kanipe

Halton Arp. I knew of his interest in the Arp galaxies and, without knowing else much about him, I asked if he'd be interested in coauthoring a book on Arp's

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Atlas of Peculiar Galaxies. Fortunately, we're both a tad crazy and we hit it off right away.

Clayton: Tell our readers about your newest publication, *Annals of the Deep Sky: A Survey of Galactic and Extragalactic Objects*, coauthored with Dennis.

Jeff: In a nutshell, it's an astrophysical observing guide that provides in-depth profiles of stars and deep-sky objects constellation by constellation. Our goal is to provide extensive scientific background into these objects, not just thumbnail descriptions of what they look like. The descriptions are a good thing, but we feel that amateur astronomy has grown so much in sophistication that many observers are hungry to understand the nature of the objects they observe.

Clayton: You write a lot for sure, but what about you're observing of the night skies? Tell us about a typical observing session. Are you visual only? Have you got dark skies in your area of Colorado?

Jeff: I have been an amateur astronomer since the Beatles came to town, and today I observe as often as I can. However, I live at 7,000 feet in the foothills of the Rocky Mountains — which sounds cool — but observers who live in the area will tell you the seeing isn't the best up here. The airflow over the mountains keeps the atmosphere pretty stirred up, so double stars are a challenge. Extended objects not so much. Still, on good nights, it's spectacular. My skies, particularly to the west and northwest, are very dark. I'm purely a visual observer, although, with this project, I've begun making what I call "reference images," very short exposures of the objects I write about. This not only helps with my descriptions, but also provides a reality check for how an object truly appears to the eye.

Clayton: Messier certificate in 1969 (#55), very impressive! Have you completed other Astronomical League observing programs through the years?

Jeff: Not a one, though I suppose, unofficially, I could qualify for an Arp certificate. I've just never applied myself in that particular direction. I certainly applaud anyone who completes an AL observing program, because it encourages and enriches the observing experience. The League has always been a real engine in powering and promoting observational astronomy, and I salute them.

Clayton: Curious, you include very detailed, factual data within your astronomical publications. Where does a lot of this information come from? Finding specific info on a certain object, is this similar to searching for a needle in a haystack?

Jeff: Several needles in several haystacks. I get the information from any number of sources: NASA/ADS for papers (both recent and historical), the SIMBAD, VizieR, and NED databases, online data sources like WEBDA, reference books, and a lot of other sources too numerous to mention here. I also have a rapport with many astronomers and sometimes I query them about what I'm working on. Someone on one of the astronomy forums commented that they could get the same information off the Internet. To which my reply (had I replied) would be, "Go ahead. Have fun storming the archives." If this were as easy as scanning a few websites, someone would have done it a long time ago.

Clayton: We are all interested in your hunt for asteroid 84447. Tell us how this came to be.

Jeff: After we published the Arp book, one of our observing acquaintances, Rick Johnson, took us up on our challenge for Arp 192 (NGC 3303). In the *Atlas* image, a small spike-like appendage protrudes from the NNW body of the galaxy. This feature is also widely reported in the observational archives. Our challenge to readers was to observe or image that spike. To our surprise, Rick imaged the galaxy beautifully, but reported that the spike was gone! What happened to it? Galactic features might subtly change over millions of years, but not 40. I queried many of my astronomy acquaintances — including Chip Arp — and got various responses. Plate flaw was the most popular explanation. I played with the *Atlas* image, contrast-enhanced it, adjusted the brightness and saturation, but the thing just looked real to me, not like a plate flaw. But how could it just evaporate? Then I checked the coordinates and found that the galaxy was well within the ecliptic. So I contacted Brian Marsden and asked him if it could possibly be an asteroid trail. He did a little research and confirmed that it was, indeed, an asteroid trail. Minor planet (84447) 2002 TU240 was located near the coordinates for Arp 192 on the night Arp imaged the galaxy, which was 19 February 1964. The amazing coincidence of an asteroid trail being captured as it transited a small peculiar galaxy led to the erroneous

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conclusion —for decades — that it was a real feature. I immediately emailed Chip and congratulated him on discovering an asteroid, but I don't think he was amused.

Clayton: What's your attraction to the night skies? What got you hooked on astronomy as a youngster?

Jeff: I really cannot recall a single event spurring my interest in astronomy. As far back as I can remember I was always a skywatcher. I suppose the apparition of Comet Ikeya-Seki in 1965 galvanized my interest. I was born in Corpus Christi and my mother took me down to the bay front one clear, cold October morning to look for the comet (which, to this day, I'm not sure I really ever saw). When I learned that two amateur astronomers discovered it, I was hooked.

Clayton: Tell us about your three telescopes. Why 3?

Jeff: And not 4? Lack of spending money, I think. But seriously, although it may sound flippant to say, one of my duties as an astronomy writer is to observe celestial objects. Since that's how I make a living, I need a suite of telescopes for different types of observing. I use the go-to capability of a CGEM 11-inch so I can observe as many objects as possible in one night. The 4-inch refractor is for double stars and wide-angle observing and imaging (like M31). And the 15-inch is for galaxies.

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

Jeff: Amateur astronomers are some of the most compulsive autodidacts* in the world. That's how I see myself and how I hope to continue. It's the journey not the destination, as they say. At a young age, when I began to think about why galaxies and stars looked the way they do, I started down this road of exploration. By itself, observing the night sky is only a small part of the journey. Learning about the nature of what one observes is really the mind-blowing aspect of astronomy. In writing astrophysical profiles of stars and deep-sky objects for this series, that's almost a daily occurrence for me, and Dennis, too.

Clayton: What's new on the horizon — a new book or two? Have you got something new that you're working on?

Jeff: Right now, I am devoting all my attention to the *Annals*. I'm on volume 4 and will soon begin volume 5. (Wait till you see Carina!) Dennis is furiously working on volume 3, and that one should be out sometime next year.

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

Jeff: Saddle up to a friendly and agreeable mentor, someone you can talk to and ask questions of; and don't be afraid to make mistakes, since that's how you learn. Also, don't be too shy. Way back in 1965, no one in my astronomy club snickered or made fun of me when I brought along my 60mm refractor to a public star watch and proudly set it next to the 10-inch Newtonian. That's the kind of people you need to seek out. You'll encounter the occasional snob, of course, but fortunately, in amateur astronomy, they are few and far between.

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

Jeff: Yes indeed. It's jeffkanipe@gmail.com. Questions welcome.

Clayton: Thanks Jeff 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 visit our society when in the Houston area, we'd love to see you.

Jeff: My pleasure. I often visit the Texas Gulf Coast. I miss the fishing, and I love those southern skies.

Clayton: Clear skies always…

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

* Autodidact — a self-taught person

HAS Elections Coming

By John Haynes, Vice President

It's hard to believe it's that time of year again. But we are now coming upon election season for the leadership positions of the Houston Astronomical Society.

As the chairman of the nominating committee, it is my duty to lead a committee responsible for accepting nominations and preparing a list of candidates for our annual election. These candidates will be presented to the club at the October Meeting. Because the October meeting typically is held with the All Clubs meeting, It is my intention to make a quick general announcement at the meeting and post the nominations to the HAS Website for you to review.

If you would like to be a part of helping choose the people who will chart the course for our organization for the next year, please contact me at jhaynes921@att.net.

Additionally, if you have someone you would like to nominate for a position, please contact me at the same address.

Progress on the Hobby-Eberly Telescope

By Matt Shetrone, Research Scientist, McDonald Observatory

The big news for us this week is the lift of the wide field corrector to the top of the telescope. This involved removing the old test mass and the hexapods. The hexapods were serviced and put back on. The corrector was sealed up, rolled out of the clean tent into the dome floor and then lifted up to the top of the telescope.

In addition the the installation of the corrector some work with the laster tracker was done and we determined the position of the base of the hexapods and see how much they may need to be shimmed to get into proper position for the corrector. At the same time we confirmed the distance to the CCAS instrument from the primary mirror and found it to be well within specifications for this corrector's design focal distance.

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.

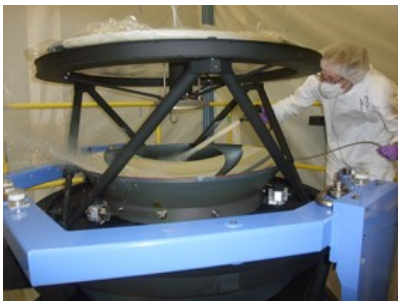
'Crown Jewels' Ready for Telescope

By UT Astronomy

Sophisticated set of mirrors will sharpen, widen HET's view of the sky.

The "crown jewels" of the Hobby-Eberly Telescope upgrade — a set of four mirrors designed to sharpen the view to pinpoint precision — have been installed on the telescope. They soon will allow scientists to take their first views of the night sky with the refurbished HET.

Together, the mirrors form the Wide-Field Corrector. The assembly sits at the top of the telescope, where it will capture light reflected from the primary mirror. Because of the mirror's spherical surface, the image it produces is "roughly the size of a fist when it reaches the corrector, but it has to come down to about the width of a human hair," says Gary Hill, principal investigator of the Hobby-Eberly Telescope Dark Energy Experiment (HETDEX). "It's very, very challenging to do that."



A technician uses carbon dioxide to clean the mirrors after the corrector arrived at McDonald Observatory.

[JerryMartinPhotography.com]

The corrector is designed to meet that challenge. Its four mirrors — three of which are roughly one meter (three feet) in diameter — were carefully shaped to sharpen the view. They also increase the telescope's field of view to 22 arcminutes, so HET will see a region of sky that covers roughly half the size of the Moon — more than five times larger than its original field of view.

Finally, the corrector will allow scientists to use the full 10 meters (33 feet) of HET's primary mirror. Originally, they could use no more than 9.2 meters during any single observation. "We got a bonus from the corrector — the telescope just got bigger," says Hill.

The corrector was built by the University of Arizona College of Optical Sciences in Tucson — a process that took five years. Much of the time was required for alignment and testing. "This is the most complicated optical assembly ever built for astronomy," says Hill. "The components had to be aligned within one-tenth the diameter of a human hair, which is extraordinary. So the complexity of the testing was quite impressive."

Since engineers couldn't test the corrector on the telescope itself, they developed a sophisticated test rig that used laser light, holograms, and computer algorithms to simulate the primary mirror.

Hanshin Lee, the optical engineer with HETDEX, played a key role in analyzing the alignment data and predicting the on-sky performance of the corrector. The assembly passed its final tests in Tucson in May.

Transporting the corrector from Tucson to McDonald Observatory — a trip of more than 500 miles — required careful planning and preparation as well. The corrector was sealed against dust and humidity and wrapped inside a thermal blanket to keep its temperature constant during the long drive, mounted atop shock-absorbing springs, and housed inside a custom-built shipping container. "It was a lot of effort, but for something that cost about $6 million, it was worth it," says Hill.

The package left Tucson on the evening of May 27, escorted by HETDEX personnel and a University of Texas at Austin police car.

After arriving at McDonald, it was carefully unpacked inside the HET dome. Lee then led the site testing of the corrector to ensure that it had arrived unscathed. The installation crew spent several weeks choreographing and rehearsing the steps required to raise the corrector to the top of the telescope and lock it in place inside the new tracking system.

Final testing will start when the refurbished HET takes its first look at a star. When that process is completed, the scientific instruments will be tested and verified, allowing HET to return to service — with a sharper and wider view of the sky.

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

Observatory Corner

By Mike Edstrom, Observatory Director

During the very hot week of July 6th the observatory in Columbus was power washed, primed and painted thanks mainly to Fred Cyrway with a lot of help from Joel and Becky Brewer, Walt Cooney, Bill Flanagan, Ed Fraini, Dave Masera, Don Selle, Don Taylor and Rob

Torrey. This was much needed and looks GREAT!!! Please come out and see the difference yourself.

On Friday and Saturday July 10th and 11th several private observatory owner purchased the paint and Fred and others painted their observatories for them.

We are coming into the hotter time of the year so be sure to drink plenty of fluids when you come and take advantage of HAS's most valued asset the Dark Site. 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

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UT Astronomy

For Astronomers' Sake, Some Drillers Cut Their Lights

By Jim Malewitz, The Texas Tribune

Fort Davis — As a cool breeze blew across the 6,800-foot mountain that Coyne Gibson stood on, he gazed at a night sky dotted with constellations, planets and meteors — all visible to the naked eye, thanks to the surrounding darkness.

The McDonald Observatory in Fort Davis on June 18, 2015.

A satellite streaked across the celestial backdrop. Orange-red light from Betelgeuse, a star and supernova candidate more than 640 light-years away, glimmered, too. Not bad on a Thursday night that was far cloudier than normal.

Just how dark are the night skies at the McDonald Observatory, the West Texas destination for world-renowned astronomers? Dark enough to occasionally disorient experts who aren't used to seeing so many constellations at first glance.

“They can’t recognize anything, because there are so many stars,” said Gibson, a research engineer at the University of Texas at Austin observatory, which was built in the 1930s.

Touting some of the darkest skies in North America and one of the world's largest telescopes — the Hobby-Eberly — this secluded outpost draws about 75,000 amateur stargazers each year, along with professionals who have made major discoveries, including, in 2012, the most massive black hole ever detected. The Hobby-Eberly is undergoing a $30 million upgrade as part of a project focusing on dark energy, the mysterious force propelling the accelerated expansion of the universe.

But an encroaching glow from an earthly source just a couple hundred miles away is threatening the dynamic view and hindering research on an entire section of sky.

Look northeast from this perch atop Mount Locke, and a band of scattered light from the Permian Basin drowns out the stars. It has grown brighter in recent years as more companies — using lighted drilling rigs, light towers and other equipment — tap some of the nation’s most productive oilfields and flare off the gas they can’t market.

Ordinances in the seven counties surrounding the observatory require home and business owners to cut their light use at certain times. Most residents follow the rules, sometimes knocking on neighbors' doors if too much light shines from their homes. It's a different story at the 24-7 drilling operations far off in the horizon, where a drilling boom in the past decade, Gibson said, has made the glow about 30 percent brighter.

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"We care about 90 photons in a sea of scattered light from all these sources. It's a big deal to us," he said. "It's not just research and science that are at issue. It's your right to see the stars."

But astronomers are now counting new allies in protecting the night skies: the petroleum folks themselves. Companies and industry groups are partnering with the observatory to educate operators, drillers and other service providers on how to reduce their glow relatively cheaply – and potentially save money in the long run.

Largely leading the industry efforts is Pioneer Energy Services, whose president and CEO, Stacy Locke, waxes poetically about the few remaining dark skies above fast-growing Texas.

"When I go to West Texas, it's just something I cherish and appreciate there," said Locke, whose wife owns ranch land in Marathon, a speck of a town in Brewster County. "Any place that has a dark sky should strive to protect it generally. And those who have lost it should strive to get it back, because it's just magical."

Light pollution on the horizon from oil fields north of the McDonald Observatory in Fort Davis on June 18, 2015.

And the observatory? "It's a gem, and we cannot – we cannot put it in jeopardy. I mean, absolutely can't be done. It's too important to the world."

Locke learned about the problem when Bill Wren, a spokesman for the observatory, approached him last year. Since then, Pioneer has invested in shields on its drilling rigs that direct light down, keeping it from scattering into the sky. The company also plans to roll out three new $24 million rigs that shine far more efficient LED lights.

"There's no reason to waste light up in the sky," Locke said. "It just needs to get reinforced and reinforced. But operators like to do the right thing."

Wren said other companies clearly want to help, but Pioneer's efforts stand out, in a "very productive relationship" between the observatory and driller. Still, not every company knows about the problem.

Locke has encouraged other companies to address light pollution, joining Wren in visiting work sites and authoring a report, published in April, about best lighting practices for drillers. The report largely focuses on shielding lights, pointing fixtures down and investing in LEDs – efforts that cost little or nothing. And advocates say those changes also improve lighting on the ground, making work sites safer.

Ben Shepperd, the president of the Permian Basin Petroleum Association, has taken that message to heart. In April, he sent a letter to nearly 500 group members asking for their help in cutting down light pollution.

"The response has been great," he said. "Everybody recognizes what a treasure McDonald Observatory is, but we especially do, because it's in our backyards."

But fully solving the problem will mean dimming the glow from more than just drilling rigs. Other oilfield service companies, including frackers, emit plenty of light. And so do the many natural gas flares that dot the landscape outside of Midland, Odessa and beyond. Curbing flaring – and bringing gas to market rather than burning it – is something most

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everyone wants to do, but companies still haven't built enough pipelines to make it feasible.

In the past few months, preliminary data shows that McDonald's skies have grown a tad darker, but Wren said it was not clear whether that change was because of industry efforts to limit light pollution or the drilling slowdown triggered by low oil prices.

Meanwhile, advocates will continue to push his dark skies message, but cautiously, and without chaining themselves to the nearest light post.

"We're in favor of good lighting," Wren said. "We don't want to come across as foaming at the mouth."

Disclosure: The University of Texas at Austin and the Permian Basin Petroleum Association are corporate sponsors of The Texas Tribune. A complete list of Tribune donors and sponsors can be viewed here.

The Texas Tribune is a nonpartisan, non-profit media organization that informs Texans — and engages with them – about public policy, politics, government and statewide issues.

This article originally appeared in The Texas Tribune at http://www.texastribune.org/2015/06/30/mcdonald-observatorys-plea-drillers-cut-lights/

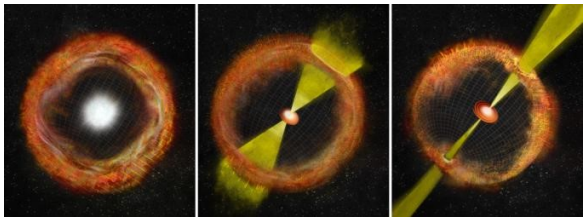
Pegasus Optics and ADVANTAGE Telescope Repair have teamed to serve the astronomy community!

Strange Supernova is

"Missing Link" in Gamma-Ray Burst Connection

By: the CFA Newsroom, https://www.cfa.harvard.edu/news/latest

Cambridge, MA— Astronomers using the National Science Foundation's Very Large Array (VLA) have found a long-sought "missing link" between supernova explosions that generate gamma-ray bursts (GRBs) and those that don't. The scientists found that a stellar explosion seen in 2012 has many characteristics expected of one that generates a powerful burst of gamma rays, yet no such burst occurred.



"This is a striking result that provides a key insight about the mechanism underlying these explosions," said Sayan Chakraborti, of the Harvard-Smithsonian Center for Astrophysics (CfA). "This object fills in a gap between GRBs and other supernovae of this type, showing us that a wide range of activity is possible in such blasts," he added.

The object, called Supernova 2012ap (SN 2012ap) is what astronomers term a core-collapse supernova. This type of blast occurs when the nuclear fusion reactions at the core of a very massive star no longer can provide the energy needed to hold up the core against the weight of the outer parts of the star. The core then collapses catastrophically into a superdense neutron star or a black hole. The rest of the star's material is blasted into space in a supernova explosion.

The most common type of such a supernova blasts the star's material outward in a nearly-spherical bubble that expands rapidly, but at speeds far less than that of light. These explosions produce no burst of gamma rays.

In a small percentage of cases, the infalling material is drawn into a short-lived swirling disk surrounding the new neutron star or black hole. This accretion disk generates jets of material that move outward from the disk's poles at speeds approaching that of light. This combination of a swirling disk and its jets is called an "engine," and this type of explosion produces gamma-ray bursts.

The new research shows, however, that not all "engine-driven" supernova explosions produce gamma-ray bursts.

"This supernova had jets moving at nearly the speed of light, and those jets were quickly slowed down, just like the jets we see in gamma-ray bursts," said Alicia Soderberg, also of CfA.

An earlier supernova seen in 2009 also had fast jets, but its jets expanded freely, without experiencing the slowdown characteristic of those that generate gamma-ray bursts. The free expansion of the 2009 object, the scientists said, is more like what is seen in supernova explosions with no engine, and probably indicates that its jet contained a large percentage of heavy particles, as opposed to the lighter particles in gamma-ray-burst jets. The heavy particles more easily make their way through the material surrounding the star.

"What we see is that there is a wide diversity in the engines in this type of supernova explosion," Chakraborti said. "Those with strong engines and lighter particles produce gamma-ray bursts, and those with weaker engines and heavier particles don't," he added.

"This object shows that the nature of the engine plays a central role in determining the characteristics of this type of supernova explosion," Soderberg said.

Chakraborti and Soderberg worked with an international team of scientists from five continents. In addition to the VLA, they also used data from the Giant Meterwave Radio Telescope (GMRT) in India and the Inter-Planetary Network (IPN) of spacecraft equipped with GRB detectors. The team is reporting their work in a paper accepted to *The Astrophysical Journal*.

This release is being issued jointly with the National Radio Astronomy Observatory.

Headquartered in Cambridge, Mass., the Harvard-Smithsonian Center for Astrophysics (CfA) is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

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List of Interview and Shallow Sky Articles

By Clayton Jeter and Bill Pellerin

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December 2007	HIP56948 - A Star Like Ours	Chris Peat - Heaven's Above Creator
January 2008	Mars - the Red Planet	Ben Jones - SWARL Vice Chairman
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May 2008	R Cor Bor	Tom Williams
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January 2009	Collander 70 / Orion Cluster	Alan Hale
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June 2009	Epsilon Aurigae	Doug McCormick
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Month	***Shallow Sky***	***Interview***
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October 2010	Eta Peg -- a G Star	The Havilands - David & Connie
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February 2011	Procyon (nearby star) (also a double star)	Alan Rossiters
March 2011	Beta Mon -- a Triple Star	Stephen O'Meara
April 2011	Regulus	Phil Harrington
May 2011	Melotte 111	Diane and John Klebenow
June 2011	North Galactic Pole	Jim Gilliam
July 2011	Barnard's Star	Eric Berger
August 2011	Ring Nebula	Barry Simon
September 2011	Mu Dra (double star)	Jerry Oltion
October 2011	NGC6210	Glen Sanner and Bob Kepple
November 2011	Almach—a Lovely Double Star	Atilla Danko
December 2011	Double Cluster	Chris Westall & Lennie Brown
January 2012	Venus	Dick Miller - Astroimager
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March 2012	The Ecliptic	Lynn Dippel
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January 2015	Alpha Com	Greg Bragg
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March 2015	Blue Stragglers - NGC188	Gotlieb
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May 2015	Lambda Boo	Randy Hemann
June 2015	Eta Aql - Cepheid Variable	Debbie Moran
July 2015	100 Her (double star)	Deborah Byrd
August 2015	V1427 Aql - What is this?	Jeff Kanipe

Shallow Sky Object of the Month

V1427 Aql –What is this?

By Bill Pellerin, GuideStar Editor

Object: V1427 Aql
Class: Not sure
Magnitude: 8.0 to 10 (depending on who you believe)
R.A.: 19 h, 13 m, 59 s
Dec: 00 degrees, 07 minutes, 32 seconds
Distance: 3000 ly to 18000 ly
Constellation: Aql
Spectral: G5
Optics needed: Small telescope

Why this object is interesting:

This object was brought to may attention by the book *Annals of the Deep Sky* by Jeff Kanipe and Dennis Webb. So, in this issue we have an interview with Jeff Kanipe and an object of interest identified by Jeff and his working partner Dennis Webb.

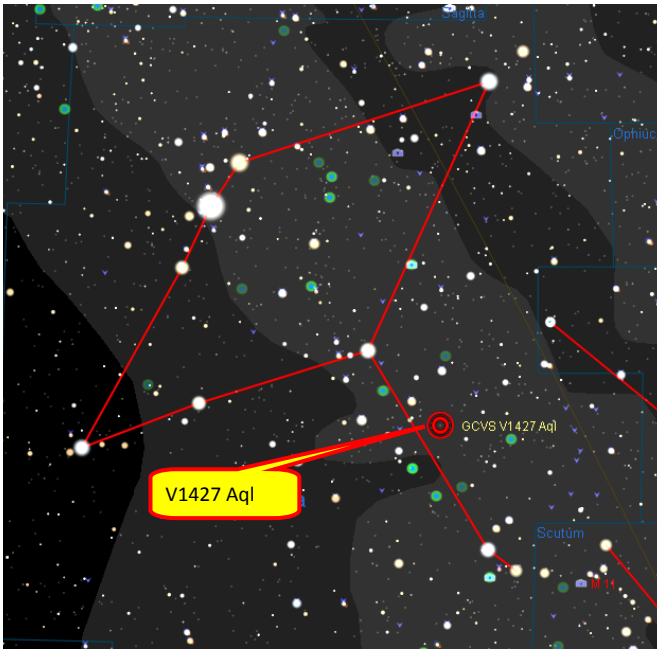
There is some controversy about what this star really is. If it is a low mass star, similar to our Sun, it is entering a phase of its existence prior to becoming a planetary nebula; if it is a high mass star it is on a path to becoming a supernova. If it's a low mass star it's about three thousand light years away; if it's a high mass star it is about 18000 light years away.

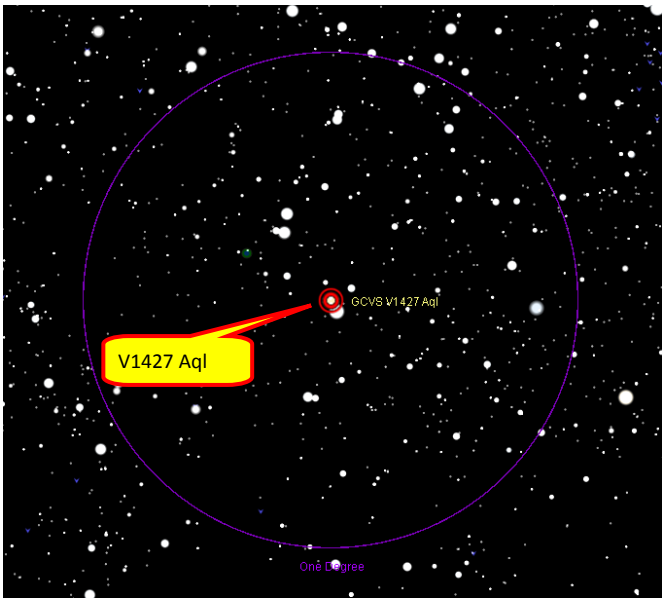
The star is metal deficient (lacking chemical elements heaver than helium). So, as you might guess there is plenty of hydrogen and helium, and there are traces of oxygen, carbon, and nitrogen. This collection of elements would be unusual for similar G class giant stars. Also, the bipolar structure of the envelope surrounding the star is typical of a protoplanetary star.

Understanding what this star is requires knowing the distance to the star. Once that is known, the status of the star will be determined because its mass can be determined.

Otherwise, we have to wait for the star to identify itself as a low-mass end-of-life star by becoming a planetary nebula or as a high mass star by becoming a supernova.

The item about this star in *Annals of the Deep Sky* begins on page 20 and ends on page 24, so there's a lot more information in that book.





Finder and detail charts — north is up. Circle on detail chart is 1degree on the sky.

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

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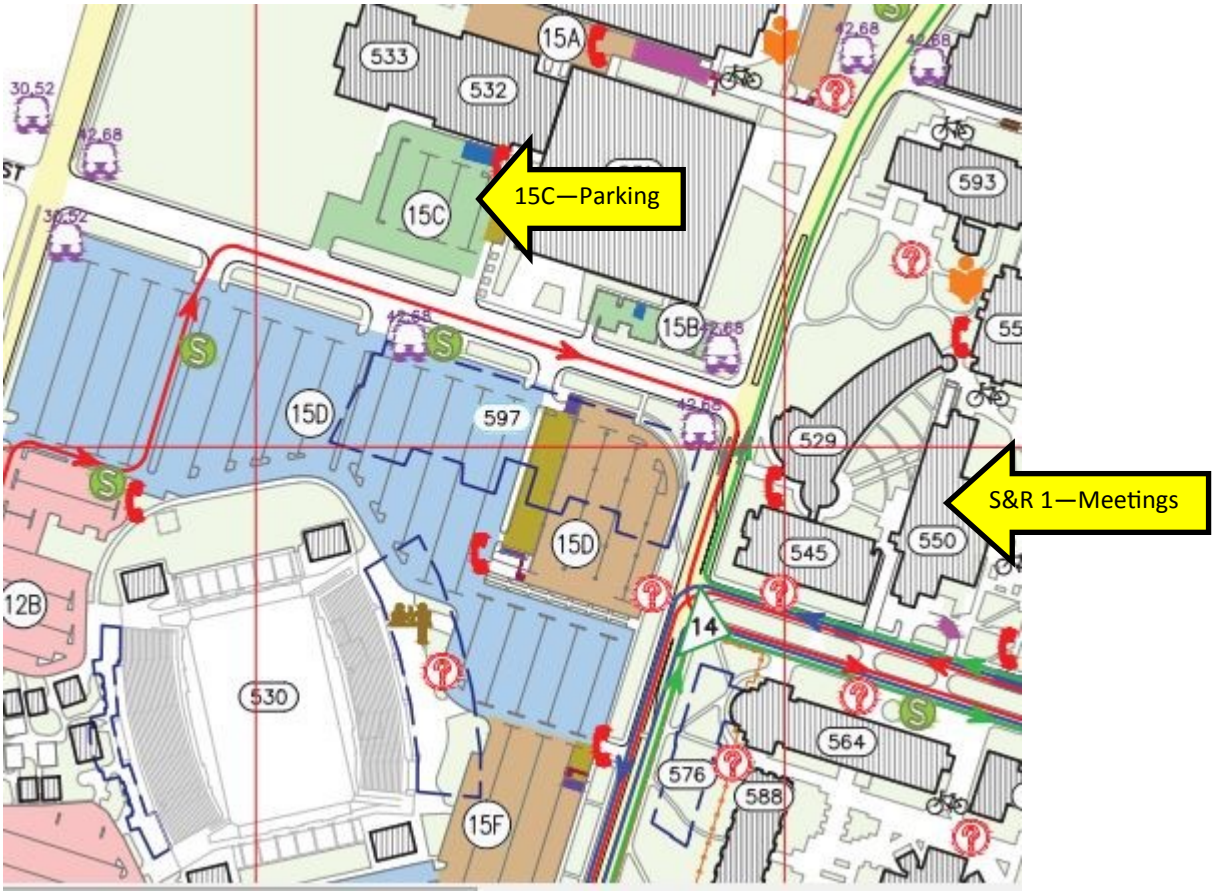
Parking at the University of Houston Main Campus

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

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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.

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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. 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, August 7, 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.**