



GuideStar

November, 2009

At the November 6 meeting...

H.A.S. Officer Elections

Annual election

At the November meeting the membership of the Houston Astronomical Society will vote on a set of candidates proposed by the nominating committee. As always, additional nominations may be made from the floor. The candidates for this election are:

- President Ken Miller
- Vice President Gordon Houston
- Secretary Gitte Barchas
- Treasurer Alan Grissom
- Board of Directors at Large Bill Flanagan
- Don Pearce
- Bram Weisman
- Jay Leavy
- John Missavage
- Observatory Chairman Bob Rogers
- Program Chairman Brian Cudnik
- Publicity Chairman John Missavage
- Telescope Chairman Bram Weisman
- Education Chairman Richard Nugent
- Observing/Field Trips Chairman Mike Edstrom
- Audit Chairman Tom Blocker
- Novice Chairman Justin McCollum
- Welcoming Chairman OPEN

Novice Presentation

DSLR Astrophotography.

If you are thinking about trying DSLR astrophotography, watch as Steve Grimsley shows us how. His results are impressive!!

Highlights:

- Then Encounter (with Galileo).....5
- Bill Pellerin - *GuideStar* editor.....9
- The Sun's Sneaky Variability.....13
- Staring at Lightning.....14
- VY CMa - the Largest Star.....17

HAS Web Page:

<http://www.AstronomyHouston.org>

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

Schedule of meeting activities:

All meetings are at the University of Houston Science and Research building. See the inside back cover for a map to the location.

Novice meeting: 7:00 p.m.
A Hands - On Demonstration of DSLR Astrophotography Imaging!”, by Steve Grimsley

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

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

See last page for a map and more information.

The Houston Astronomical Society

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

Officers & Past President

President: Bill Leach.....H: 281-893-4057
 Vice Pres: Ken Miller.....C: 713-826-1049
 Secretary: Open
 Treasurer: Bill Flanagan.....H:713-699-8819
 Past President: Steve Sartor.....

Additional Board Members

Steve Goldberg.....713-721-5077
 Don Pearce.....713-432-0734
 Doug McCormick.....
 Allen Grissom.....281-617-9813
 John Missavage.....

Committee Chairpersons

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

Ad-Hoc Committee Chairpersons

HistorianLeland Dolan.....713-688-0981
 Librarian.....Peggy Gilchrist.....281-443-8773
 Logo Mds Sales.....Judy Dye.....281-498-1703
 Long Range Plan.....Bill Leach.....281-893-4057
 Parliamentarian.....Kirk Kendrick.....281-633-8819
 Publ. Star Party.....Richard Nugent.....713-524-1993
 Rice U. Coord.....Matt Delevoryas.....713-666-9428
 Schedule Obs'v't'y.....Steve Goldberg.....713-721-5077
 Texas Star Pty.....Steve Goldberg.....713-721-5077

Special Interest Groups & Help Committees

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

Advisors

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

Dues and Membership Information

Annual Dues:Regular\$36
 Associate\$6
 Sustaining\$50
 Student\$12
 HonoraryN/C

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

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

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Special Interest Group Listing

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

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

Other Meetings...

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

Johnson Space Center Astronomical Society meets in the the Lunar and Planetary Institute on the 2nd Friday of each month. Web site: www.jscas.net

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

November/December Calendar:



Photo by Scott Mitchell

Check the web site:
www.astronomyhouston.org
Webmaster: Kay McCallum
kaym@mcclibrary.net

The Houston Astronomical Society Web page has information on the society, its resources, and meeting information.

Want your astronomy work and name on the Internet for the whole world to see? Have some neat equipment? Pictures in film, CCD, hand drawings or video format are all welcome on the page. Do you have an idea to improve the page? I'm listening. Send me Email at kaym@mcclibrary.net.

Date	Time	Event
November		
1	2:00 a.m.	Daylight Savings Time Ends Move clocks back one hour
	9:00 a.m.	Mars 0.23 deg. NNE of center of Beehive Cluster
2	1:14 p.m.	Full Moon
6	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
9	9:57 a.m.	Moon at last quarter
14		Prime Night, Columbus Observing Site
16	1:13 p.m.	New Moon
17		Leonid meteors peak
24	3:38 p.m.	Moon at first quarter
26		Thanksgiving Day

December		
2	1:31 a.m.	Full Moon
4	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
8	6:15 p.m.	Moon at last quarter
12		Prime Night, All Clubs Star Party/BBQ Columbus Observing Site
14		Geminid meteors peak
16	6:02 a.m.	New Moon
18	11:00 a.m.	Mercury at greatest elongation east
19		HAS Observing Field Trip (site)
21	11:47 a.m.	Winter solstice
22		Ursid meteors peak
24	11:35 a.m.	Moon at first quarter
25		Christmas Day
31	1:13 p.m.	Full Moon

Columbus Field Trips 2009

Mike Edstrom
Field trip/Observing committee chair

The schedule is as follows:

-December 19 – HAS Observing

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

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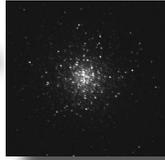
**GuideStar deadline
 for the December
 issue
 is November 15**

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Observations... of the editor

by Bill Pellerin, GuideStar Editor



Astronomy Day, 2009...

The skies over the Astronomy Day 2009 event could not have been better! There was lousy weather prior to the event and after the event, but during the event the skies were great.

There was an excellent turnout for the event which opened to the public at 3:00 p.m. There were several solar telescopes on the observing deck, some with white light filters and some with Hydrogen-alpha filters. The Sun, as if on queue, helped the show by developing a set of sunspots near the solar equator and well placed for viewing.



Several telescopes were set up for solar viewing. Some in white-light others in H-alpha.

By nightfall, the crowd had grown substantially and the research dome tickets sold out quickly. By the time I got my little refractor set up for night viewing and pointed it at Jupiter there was a line of observers queued up to look through the telescope.

What better to show them than Jupiter! I printed out a map showing the positions of the Galilean moons so I was able to tell them about those objects and which one was which.

Later I pointed at the moon, followed by Albireo. There were enough visitors that I didn't have to move the telescope to a new object the remainder of the evening.

By the end of the evening, the Pleiades had risen above the trees and the 5" refractor next to me was aimed at this beautiful star cluster. The folks who observed this (including me) were dutifully impressed.

We live in a great place...

I am very impressed at how many resources we have available to us in the Houston area and as members of the H.A.S.. In addition

the telescopes at the George observatory, there are the telescopes, and other equipment in the H.A.S. loaner program. As a member, you have access to this equipment and to an excellent observing site near Columbus, Tx (kudos to Bob Rogers for maintaining the site and to Bram Weisman for managing the loaner telescope program). There are books in the club library and more books in the public library. The Half Priced Bookstore on Westheimer near Montrose has a large selection of astronomy books for those of us on a budget.

Beyond all this, we have the opportunity to hear lectures from some of the best experts in their fields. Just this week I heard Dr. Fritz Benedict of the University of Texas talking about extra-solar planets. This talk was at the Houston Museum of Natural Science. On the same subject, a few years ago, I heard a talk from Geoff Marcy at Rice University (for FREE). Dr Marcy is one of the pioneers in the discovery of extra-solar planets.

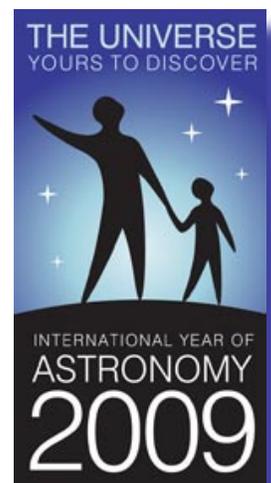
Our monthly speakers at the HAS meetings are quite good too!!

Have a great Thanksgiving holiday.

Until next time...

clear skies and new moons!

..Bill



The Encounter

By Peter Nolan

I was on the return leg of one of my favorite bicycle rides in the Hill Country when my mind started to wander. I was thinking about Clayton Jeter's "Just Looking" series and what it would be like to have a dialogue with an interesting scientist of the past. As I had been doing some research on Galileo, he popped into my mind as a candidate. What a great experience that would be! There is so much written about him and his major works are readily available and very readable. I had read a couple of his biographies, and more recently translations of his works. The first translation was *Sidereus Nuncius*, by Albert Van Helden, Professor of History at Rice University. Then I had read *Discoveries and Opinions of Galileo*, and I was currently reading Galileo's *Dialogue Concerning the Two Chief World Systems*, both translated by the late Stillman Drake.

Before I tell you of my encounter, it might be helpful to cover a bit of background information. Four hundred years ago two separate events changed the fabric of astronomy forever. The International Year of Astronomy, 2009, celebrates contributions to the science made by two very different men. These two giants of mathematics, Kepler and Galileo, never met and rarely corresponded. That is unfortunate as closer collaboration between these two scientists might have resulted in more major advances made during the early seventeenth century.

Albert Einstein, late in his life, took notice of this, and commented on the vanity of many scientists by saying, "It has always hurt me that Galileo did not acknowledge the work of Kepler."

Johannes Kepler, the Imperial Mathematician and Astronomer to Emperor Rudolf II of the Holy Roman Empire, published *Astronomia Nova* (The New Astronomy), in 1609. It was a difficult read. But the meat of the tome revealed that the yet unresolved variations of Mars' movement in the night sky could be explained by a sun-centered system, and that the planetary orbits were not the perfect circles as previously thought, but ellipses.

Kepler learned of Galileo Galilei's first use of a telescope for astronomical observations a year after they were made. He wanted to get more details from Galileo, the Chief Philosopher and Mathematician to the Most Serene Grand Duke of Tuscany (both of these guys would have to have fold-out business cards with titles like that). Kepler was also hoping to get one of Galileo's wonderful "spyglasses" as the locally available telescopes were inferior. Instead, he received a copy of *Sidereus Nuncius* (The Sidereal Messenger), Galileo's wonderful description of his observations of the Moon, stars, the four moons of Jupiter, and Venus.

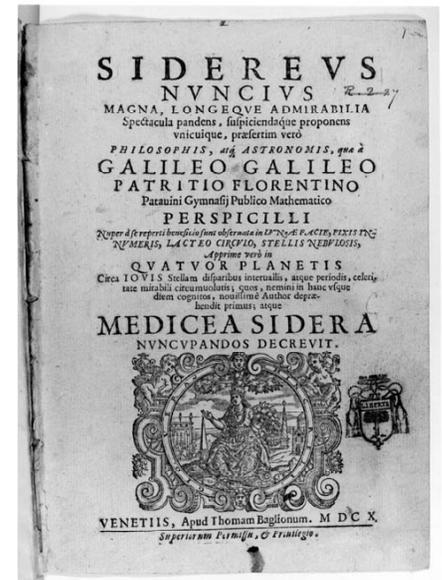
The *Sidereal Messenger* was an easy read (as long as you could read Latin). It was more like a pamphlet in comparison to Kepler's work. The book and news of Galileo's spyglass and his observations spread like wildfire. The first 500 copies sold out

in a week. About a month later it reached distant England, and soon readers as far away as China were exposed to the wonders it contained.

Both men were believers in the Copernican system. Nicholas Copernicus, born in 1473 at Torun, Poland, was learned not only in Greek,

mathematics and astronomy, but was also a jurist and a physician. His book, *On the Revolutions*, demonstrated that the planets orbited the Sun. This was not a new concept; it had been proposed by Greek philosophers. Copernicus was the first to attempt to develop it systematically. He was presented with an advance copy of his work and died the same day. So much for worrying about possible trouble for challenging divine perfection of the Ptolemaic view of the world!

As Copernicans, both Galileo and Kepler had journeyed into perilous waters. Any challenges to the geocentric universe were often seriously dealt with by the Church. Giordano Bruno, a Dominican friar, was burned at the stake in Rome in 1600, for his beliefs, including that there must be an infinite number of universes and that the stars are suns.



Continued ...

The Encounter... from previous page

I was thinking about life in the seventeenth century when I sat down in my library to cool down from the morning ride. I picked up my copy of Galileo's *Dialogue*, written in 1632. It demonstrates the truth of the Copernican system over the Ptolemaic one and was a major factor in Galileo being brought before the Inquisition.

It is in dialogue form, with two wise men and a third discussing the two "world systems." I started to read where I had left off when I heard my Weather Alert radio come on: "Severe thunderstorm watch for Gillespie and Kerr counties until 7 p.m." Springtime in the Hill Country. I read a few pages and nodded off in my chair. I awoke in a few minutes. Perhaps a few more pages.....

This time I awoke from a deep sleep. Though my eyes were still closed, I was aware that I was outside and seated on a hard bench. As I opened my eyes I realized by the golden sunlight that it was late afternoon. I looked down to check my watch. No watch? It was then that I saw a young man approaching me. He was dressed like one of the characters you might see at a Renaissance Festival. Wait a minute - so was I! My bench was near a large building, several stories, which looked vaguely familiar. Then it came to me - I had seen this building in one of the books on Galileo. It was the Tuscan Embassy, Villa Medici, and the regular quarters for Galileo when in Rome.

The young man said, "Signore, the Grand Master is ready to see you. Please follow me."

We entered the villa and climbed two flights of stairs. He led me to a large open room. In one corner I saw several men standing around a small telescope. One of the men had a full beard with a high forehead. He was wearing a robe that seemed to be befitting a Grand Master. He met me in the center of the room and shook my hand. His smile was warm and friendly.

"Welcome to Rome. I understand you wish to ask me some questions about my observations, and that you have traveled a long way," he said.



"Yes, *Professore*. I am most pleased that you have taken the time to speak with me." I was trying to comprehend what was going on, and yet didn't want to break whatever spell was in force.

"Excellent. Have you read *Starry*

Messenger?"

"I have, and the *Sunspot Letters*." I hoped we could discuss your wonderful sunspot drawings, too."

Galileo looked a bit confused. "Sunspot Letters, what is that?" I have only recently considered to begin observing the sun. I know not of what you speak."

I heard a distant rumble of thunder. I quickly looked outside, but the skies looked clear. Perhaps the storm was approaching from the other side of the villa.

I took a deep breath. I had little idea what date it was. How could I determine that without looking like a fool? It must be after 1610 and the publication of the *Starry Messenger*, but before 1612, when he corresponded with Mark Welser in three lengthy letters concerning his solar observations.

I noticed that Galileo looked a bit tired. He said, "You must excuse me," stifling a yawn, "last night's banquet was wonderful, but a bit too long!"

"A banquet, which occasion was that?" I probed.

"It was up on Gianicolo Hill. I brought my spyglass so the other guests might see some of the wonders I have enjoyed. One of the revelers was the Greek mathematician, Demisiani. He has an intriguing name for the spyglass. He calls it a *telescopum*! Greek for "distant" and "see." I like that name. I shall continue to use it."

Galileo had given me a hint I could use to determine the date. I remember reading of the banquet, one of the high points of Galileo's ascension to fame. He met Prince Federico Cesi, a wealthy and influential young man who founded the Academy of Lynxes, an important forum for scientific research. A few days later Galileo was admitted as the sixth member of the Academy. That meant that today's date was April 15, 1611!

Continued ...

The Encounter... from previous page

“Good food, good company, and excellent wine. Ah, wine - light held together by moisture!” Galileo mused. “Alas, perhaps a bit too much of a good thing.”

His reflection of the festivities seemed to have covered over my misspeak about the sunspots, so I decided to delve into the observations he had made.



“Please be so kind to tell me of your studies of our Moon and the planets,” I said.

Galileo smiled. “When I first examined the Moon with my

twenty-powered telescope I found the line between the light and dark parts to be very uneven. Chains of mountains and depths of valleys. Not unlike the surface of our planet! Not perfect as thought by the ancients. A land of wonders.

“On the 7th of January, 1610, I observed Jupiter with my newly constructed 30- power telescope. I ground the lenses myself and spared neither labor nor expense. It was worth it, for when I saw Jupiter he was accompanied by three small fixed stars. I noted their position. The next night when I fixed on Jupiter, I was amazed to see that the three stars were in a different position, all on the west side of the planet. Unfortunately, the next night was everywhere covered with clouds.

“Then the next night was clear. What did I see? Only two stars, both to the east of the planet. I continued to observe the evenings of the eleventh and the twelfth. On the fourteenth I saw four stars, one to the East and three to West!

“I have observed these four stars many times. I dedicated my discovery to the Grand Duke Cosimo II de Medici and his three brothers by calling them the Medicean Stars.

“I saw the wonders of the stars of Orion’s Belt and Sword, the Pleiades, and the myriad of stars in the Milky Way. I have been most curious about Saturn, which I began to observe in July. He consists of three bodies arranged in a line and side by side. The curiosity is that the two lateral components have diminished in size and brightness since I first saw them.

“After three months of observation of Venus I determined by the varying degree of her crescent form that none of the planets shines by its own light, and that necessarily Venus and Mercury revolve around the sun.

“Observing the sun is difficult and dangerous, his light is so great. I plan to perfect a manner to observe him later this year.”

I decided to change the subject as soon as possible to avoid reminding him of my sunspot error. “Please tell me of your telescopes; I see several here in this room.”

Galileo smiled and turned to a nearby table. There was a beautiful instrument, covered with fine brown leather, with bands of red and exquisite gold stamped markings. He handed it to me to examine.

“The tube is constructed from thin wood staves. As always, I ground the lenses myself. The objective is plano-convex. It is 21 power and has a field of view of 15 minutes.”

It was a work of art. Beautiful and at the same time functional as a mere tool. The exquisite object was a milestone in the history of Astronomy.

Next he handed me a less ornate telescope with a graduated tab that could be slid along the tube.

“I use this to measure the distance of the Medicean stars from Jupiter. I observe Jupiter’s system through the telescope with one eye, while with the other I watch the micrometer lit by a lantern. I then set the micrometer distance so as to make the interval between two divisions of the graduated scale coincide with the planet’s apparent diameter.”

“You have made so many wonderful instruments. Would not Kepler benefit from one for his research?” I asked.

Wrong question. Galileo frowned and then exclaimed, “It is time for some wine! You must join me. Giovanni, bring us some siracusano, the wine of my ancient teacher Archimedes! It comes from the area around Syracuse in Sicily.”

It was full-bodied and strong. So much for a telescope for Kepler.

Just then Giovanni returned to the room with a note for Galileo. The Grand Master scanned it quickly and said, “Prince Cesi wants to me to help him develop an observing plan for Jupiter. It is well placed in the evening sky. You will need to let me take my leave.”

Continued ...

The Encounter... from previous page

Perhaps the wine was stronger than I thought. I struggled what to ask next. Then I remembered reading about a curious incident during December 1612 and January 1613. Galileo, while observing the moons of Jupiter, saw and recorded a “fixed star” in the field of view that was actually Neptune! And this occurred over two centuries before the eighth planet was “officially” discovered. As I was formulating a way to discuss this with Galileo, I heard another rumble of thunder, closer, but still no clouds had appeared.



“Do you believe there are more planets beyond Saturn?” I began.

“Yes, there is a possibility that there may be some that have not yet been observed,” Galileo answered.

“Would they not travel in the same path across the sky as the other superior planets?” Thunder clap again, this time much closer. I could feel my pulse quicken as I awaited his answer.

“Yes, it is reasonable to assume so.” Galileo had a more intense look on his face.

“What if in your observations of Jupiter or Saturn you detected motion, however slight, of a background fixed star?”

I was looking intently at the Grand Master. He took a breath, opened his mouth to speak and then a blinding light filled the room. CRRRRRRRAAAAACKKKKK!!!!

The room had exploded. When I could see again I realized I was back in my library. Galileo’s *Dialogue* lay at my feet. A distinct ozone smell filled the room, and several items on the bookshelves had fallen over. The room seemed to be still rocking and gradually my hearing came back. It must have been almost a direct hit.

But wait, no wind, no rain; in fact the sky was cloudless.

By Jove, what had happened? By Jove, indeed. Lightning bolts from a clear sky? Had I violated some timeline prime directive in my dream? It was a dream, wasn’t it? This would require much thought. Tomorrow’s ride would have to be longer to allow time for my mind to wander and wonder about this encounter and plan for another!

VY CMa... from page 17

and a viewing of the data for this star disputes this. That said, some stars have multiple periodic changes in brightness, and there may yet be a very long period of variability.) The latest reported observation on the AAVSO.org web site puts the magnitude of the star at 7.7.

You are welcome to estimate the brightness of this star (see www.aavso.org for charts) and report your observations.

Like many objects on the sky there remains some uncertainty about this star. A minority opinion is that the star is about 600 times the size of the Sun. In any case the star is not perfectly spherical. It’s lumpy. Originally, these lumps were identified as separate stars in orbit around the main star. In other words, VY Cma was a multiple star system. Now, astronomers believe this to be a single star.

I first heard of this star by listening to a podcast of 'Astronomy Cast' (www.astronomycast.com). Episode 156: "Famous Stars". I highly recommend subscribing to this podcast which is done by Fraser Cain (of www.universetoday.com) and Dr. Pamela Gay. There’s no cost. Get it on iTunes or directly from their web site.



Bill Pellerin - GuideStar Editor

Have we got a great newsletter at HAS, or what? It is chocked full of astronomy data, pending events, new astronomy gizmos, and what's new with our club members. The *GuideStar* has been around since February 1983 (Vol. 1 No. 1). It contained 8 pages and was hardcopy only. To help you with the time frame of that first issue, the society's president was Art Ciampi and vice president was Fred Garcia. And...John Chauvin was the new editor. That was a couple of days ago!



Ever wonder who puts all of this information together now....month after month? It's our own Bill Pellerin, editor of the current *GuideStar*. Because I write this monthly article within these pages, working with Bill has become a real pleasure. On occasion we socialize over hot java discussing upcoming

issues in coffee houses in Houston. I really enjoy reading his articles... he is very gifted in his writing abilities... design and art work too.

It's my pleasure to introduce you (if you don't know him by now) to our newsletter editor and a very dedicated amateur astronomer, Bill Pellerin...

The Bill Pellerin bio...

Bill Pellerin has been active in amateur astronomy for the last 18 years. His primary interest is doing science from his observatory about 70 miles west of Houston. He does variable star photometry with a simple CCD camera, a V-band filtering and an 8" telescope.

He has been a presenter at the Houston Astronomical Society (talking about preparing for an observing session and about amateur astronomy and science) and at the Texas Star Party (2009) (talking about the building of a personal observatory).

He is currently the editor of the H.A.S. newsletter, the *GuideStar*. He writes a 'Shallow Sky Object of the Month' article for the *GuideStar* to encourage readers of all abilities to enjoy the universe. He believes that there are plenty of fascinating objects that are within the reach of small telescopes in less than ideal observing conditions. He has written for *Astronomy Technology*

Today and for other magazines, and is the co-author of four books including *Bicycling the Houston Area*.

There are several organizations that Bill supports, including the HAS, the IDA (International Dark Sky Association), the AAVSO (the American Association of Variable Star Observers), SETI (the Search for Extraterrestrial Intelligence), the McDonald Observatory, and the Houston Museum of Natural Science.

He just finished reading *The Day We Found the Universe* by Marcia Bartusiak, a history of astronomical science leading to Edwin Hubble's confirmation that spiral nebulae represented other galaxies outside the Milky Way.

Bill is an IT project manager and holds a PMP certification.

The Bill Pellerin interview...

Clayton: Well Bill, it looks like I finally nabbed you for a *GuideStar* interview... something that's been on my mind to do for over a year. How did you come to be editor? It must be a fast paced effort to complete an issue and yet still work and enjoy your family.

Bill: The opportunity showed up in my mailbox, in an issue of the *GuideStar*. There was a request in the *GuideStar* for someone to volunteer to be the editor. It has been long enough ago that I've forgotten the details, but anyway I volunteered and have been doing it ever since. In the 70's I was the editor for the newsletter for the Houston Bicycle Club. In those days I typed the articles on a typewriter and then pasted them on some art board so the newsletter could be reproduced and mailed.

Continued ...

Just Looking... from previous page

It's all done on the computer now, of course.

For quite some time we were doing the GuideStar in its old booklet format with Mike and Judy Dye doing the printing and mailing. They would have to come by my house to pick up the 'master' copy and take it to the printer.

Now, the H.A.S. doesn't print copies at all. It's posted on the web site in Adobe PDF format. This saves the club a lot of money that can go into observatory site maintenance or other projects. I changed the format from the original booklet to standard 8.5" x 11" paper, and began to use color in the publication since most readers were simply reading the GuideStar on their computer. The reader can print out a copy if he or she wants to.

Clayton: You told me a month or so ago that you sold your domed observatory and replaced it with a new roll off roof design. What's up with that? Why the change out?

Bill: It was all about the observatory size. I used the 6' dome for over 12 years and decided I needed something bigger if I was going to take my program to the next level. The 6' dome was too small for my little GM-8 German equatorial mount. It's hard to believe, but a GE mount gets in odd positions as it moves around the sky and there wasn't enough room in the observatory for the GE and for me. The dome was on a 7' x 7' box (49 square feet). The roll off roof observatory is 8' x 10' (80 square feet), so I've increased my floor space substantially.

I have been doing variable star photometry and being able to comfortably set up the GE mount will make that work easier to do.

Clayton: As owner of a home observatory, I know there is always something to modify, repair, replace, etc. So what's new at your observatory? What design of an 8" instrument is mounted inside?

Bill: I have a Meade LX-200 GPS (alt-az mount), which works great. There are some very innovative features to this telescope that make it work wonderfully. For the GE mount, I'll use a Celestron C-8 that I got several years ago at the Texas Star Party (and that you [Clayton] collimated for me). It's a good fit for the mount and big enough to grab sufficient light to get the data I need. I'm considering adding an auto-guider to the setup to improve the images, but image quality isn't that important if I'm doing photometry. It does help with very dim stars, though.

With the equatorial mount I'll be able to make longer exposures (without the field rotation that I'd have in an alt-az mount), and therefore dig deeper into the sky for the dimmer stars. Very dim variables are hard to estimate visually, but I should be able to do them with this setup. Stay tuned.

Clayton: Describe to us a typical observing session in your new observatory. Is it a dark site?

Bill: It's 70 miles west of Houston, and not pristine, by any measure. I can see the Milky Way easily on a dark, clear night, but there are light sources nearby that are problematic. You've heard the old saying that the best telescope is the one you use a lot. That's true for observatories, too. The best one is the one you can use more often. The convenience of this setup is superb, even if the skies are slightly less than superb.

Nothing unusual about the setup. Turn it on, carefully align it, take some dark frames with the CCD and start gathering data. If I get on a roll, and everything is working well, I can get data on a variable star in just a few minutes. So it's easy to get the data on quite a few stars in one session.

The analysis of the data is done later. If there's any doubt about the exposure, I confirm that the variable star to be measured is not over or under exposing the CCD. The best data is in the linear range of the chip.

Clayton: Tell us about your fascination with variable star photometry. How were you drawn into that element of astronomy?

Bill: I read David Levy's book on variable stars (the first edition), and decided that I could do this. So, I spent some time doing visual variable star observing, and reporting my results to the AAVSO. When some relatively inexpensive CCD imagers became available and I read an article in Sky and Telescope about one, with a sidebar from the AAVSO saying that the CCD would be usable for variable star measurements, I got one. I'm now using a Meade DSI monochrome imager, with about 1.5 M Pixels. Not that many years ago, a 1.5 MPixel camera was a BIG camera.

Continued ...

Just Looking... from previous page

Clayton: Are any of your family or neighbors interested in your hobby? Do they observe too?

Bill: No. My wife, Lori, will come out for a quick look through the telescope, but it's not her thing. One year, I got up very early on a Sunday morning to watch for Leonid meteors, with the instruction that I was to wake her up if the shower was good. It was a good one, and after she got up and out, we counted over 200 meteors in just over an hour.

Clayton: How did you become interested in SETI? Not to confuse, but do you think we may have already been visited here on Earth?

Bill: Like you, I was excited about Carl Sagan's work, and he speculated about SETI quite a bit. The SETI program combined radio (an old interest of mine) and astronomy (a newer interest of mine) in an interesting way.

No, I doubt we've been visited. It's just too difficult a journey to make. Given enough time, humans may visit (or even populate) other solar systems, but the logistics are daunting. As Carl Sagan used to say, "extraordinary claims require extraordinary proof".

Clayton: What are your long range plans with astronomy? When will you be retiring?

Bill: Long range? How about medium-range? Now that the new observatory building is operational, I'm going to work on improving my technique in photometry. An equatorial mount will allow me to do longer exposures (better signal to noise ratio) and measure dimmer stars. The brighter stars can be measured visually, but visual observations don't work well for very dim stars. There is a hole in the data at the dim magnitudes.

There are plenty of stars for which there is little to no data, and the AAVSO is encouraging observers with imagers to go after those stars. I'd like to do that.

I can also improve my process by calibrating the equipment better. The ultimate measurements are taken with multiple filters. This data has to be analyzed with complex formulae to get the good result. So, it's more time consuming to get the data and more difficult to analyze the data once you have it.

The retirement question has everything to do with investments which have not done so well lately, and access to health insurance prior to age 65. I haven't figured out how to solve those problems.

Clayton: I know you're an avid (rabid is a better word here) TSP patron. How many have you attended? Do you attend other star parties around the country?

Bill: I have not attended other star parties. The first TSP I attended was something over 12 years ago. We went with my observing friend Jeff Miller and stayed at the Indian Lodge.

I'd like to go to NEAF one time (North-East Astronomy Forum). It's a vendor event, but it seems like fun. New toys and no late nights!

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

Bill: Trends... There are more and more RC telescopes coming on the market, at reasonable prices, so we're going to see movement to those instruments. Two big trends driven by technology will be automation and imaging. Already, we're seeing a lot of telescope automation, but we'll see more. Remote observing will become a bigger deal as time goes on. And, imagers have become better and cheaper. This will continue until the eyes of amateurs focused on computer screens rather than looking through eyepieces. This has already happened, of course, in the professional community.

Despite the efforts of the International Dark Sky Association, light pollution will continue to get worse. Remote observing may be the only way we can get to dark skies on a regular basis.

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

Bill: Here's my contrarian advice. Newcomers should get a small telescope right away (the conventional wisdom is that they should get binoculars). There's nothing that 'wows' a newcomer more than a view of Saturn and its rings, or a view of the craters on the Moon, or a view of Jupiter and its moons. Seeing M13 through binoculars just doesn't have the same effect (primarily because a newcomer doesn't understand what he or she is looking at).

Clayton: Is there an email address that you have that another HAS member could contact you for an additional question or two?

Bill: Sure. Email me at billpellerin@sbcglobal.net

Continued ...

The 2010 Astronomical Calendar: *specially priced for League members*

Just Looking... from previous page

The Astronomical League is pleased to announce a special offer for our members from the Universal Workshop, the producers of Guy Ottewell's popular Astronomical Calendar. They are making the 2010 edition of the Calendar available at a discounted price.

There are plenty of good reasons why it has been published for over thirty years. The 2010 edition will not disappoint! Packed throughout the Astronomical Calendar's 84 pages are monthly sky charts; daily celestial highlights; charts, tables, and explanations of planetary movements; eclipse times and paths; and lunar occultation specifics. There are extensive descriptions of the year's meteor showers and periodic comets, as well. This calendar tells, in clear language, what events occur and when they happen.

League members can order this incredible compilation of the year's celestial events for \$19.95, shipping included. (It is normally priced at \$24.95 with another \$7 added for shipping.) Volume discounts (a minimum of 15 copies) for clubs are available. The League's special low price of \$19.95 expires on December 31, 2009. Universalworkshop.com accepts Mastercard, Visa, Discover, American Express and PayPal.

Clayton: Thanks Bill for taking the time to share your interest and thoughts with us here at [you](#) monthly HAS newsletter, the *GuideStar*. We wish you luck with all of your astronomy interests. Again, thanks for such a superb job here at the newsletter. Thanks for being a friend too. Clear skies, always.

Bill: Thanks Clayton. I appreciate very much your effort to produce these interviews each month. These are a great addition to the *GuideStar*. I'm impressed with the set of people you've been able to interview; maybe [you](#) should do a book!

Remember --

All HAS memberships are due for renewal in January. It's time to pay your 2010 dues!! Our membership year corresponds to the calendar year.

If you've missed a dues payment in the past, there's no extra cost for late payment, and the organization appreciates your support.

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

The Sun's Sneaky Variability

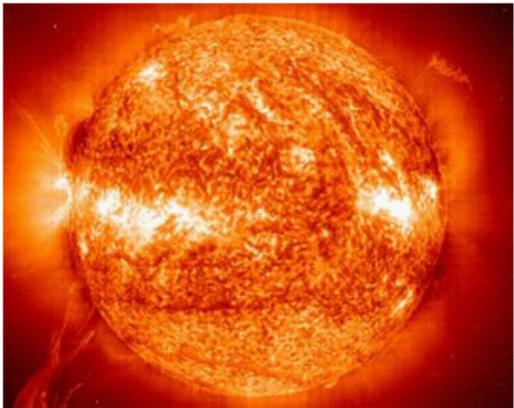
by Dr. Tony Phillips
Credit: Science@NASA

Every 11 years, the sun undergoes a furious upheaval. Dark sunspots burst forth from beneath the sun's surface. Explosions as powerful as a billion atomic bombs spark intense flares of high-energy radiation. Clouds of gas big enough to swallow planets break away from the sun and billow into space. It's a flamboyant display of stellar power.

So why can't we see any of it?

Almost none of the drama of Solar Maximum is visible to the human eye. Look at the sun in the noontime sky and—ho-hum—it's the same old bland ball of bright light.

"The problem is, human eyes are tuned to the wrong wavelength," explains Tom Woods, a solar physicist at the University of Colorado in Boulder. "If you want to get a good look at solar activity, you need to look in the EUV."



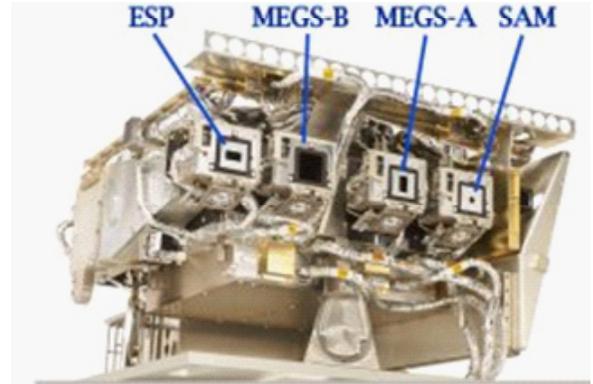
The active sun photographed at EUV wavelengths by the Solar and Heliospheric Observatory in the year 2000.

EUV is short for "extreme ultraviolet," a high-energy form of ultraviolet radiation with wavelengths between 1 and 120 nanometers. EUV photons are much more energetic and dangerous than the ordinary UV rays that cause sunburns. Fortunately for humans, Earth's atmosphere blocks solar EUV; otherwise a day at the beach could be fatal.

When the sun is active, intense solar EUV emissions can rise and fall by factors of thousands in just a matter of minutes. These surges heat Earth's upper atmosphere, puffing it up and increasing the drag on satellites. EUV photons also break apart atoms and molecules, creating a layer of ions in the upper atmosphere that can severely disturb radio signals.

To monitor these energetic photons, NASA is going to launch a sensor named "EVE," short for EUV Variability Experiment, onboard the Solar Dynamics Observatory as early as this winter.

"EVE gives us the highest time resolution (10 sec) and the highest spectral resolution (< 0.1 nm) that we've ever had for measuring the sun, and we'll have it 24/7," says Woods, the lead scientist for EVE. "This is a huge improvement over past missions."



The Extreme Ultraviolet Variability Experiment (EVE) with its primary sensors labeled

Although EVE is designed to study solar activity, its first order of business is to study solar inactivity. SDO is going to launch during the deepest solar minimum in almost 100 years. Sunspots, flares and CMEs are at low ebb. That's okay with Woods. He considers solar minimum just as interesting as solar maximum.

"Solar minimum is a quiet time when we can establish a baseline for evaluating long-term trends," he explains. "All stars are variable at some level, and the sun is no exception. We want to compare the sun's brightness now to its brightness during previous minima and ask ourselves, is the sun getting brighter or dimmer?"

Lately, the answer seems to be dimmer. Measurements by a variety of spacecraft indicate a 12-year lessening of the sun's "irradiance" by about 0.02% at visible wavelengths and 6% at EUV wavelengths. These results, which compare the solar minimum of 2008-09 to the previous minimum of 1996, are still very preliminary. EVE will improve confidence in the trend by pinning down the EUV spectrum with unprecedented accuracy.

Continued on page 15 ...

Staring at Lightning

There's something mesmerizing about watching a thunderstorm. You stare at the dark, dramatic clouds waiting for split-second bursts of brilliant light — intricate bolts of lightning spidering across the sky. Look away at the wrong time and (FLASH!) you miss it.

Lightning is much more than just a beautiful spectacle, though. It's a window into the heart of the storm, and it could even provide clues about climate change.earth_lightningThe

Strong vertical motions within a storm cloud help generate the electricity that powers lightning. These updrafts are caused when warm, moist air rises. Because warmth and lightning are inextricably connected, tracking long-term changes in lightning frequency could reveal the progress of climate change.



The Geostationary Lightning Mapper (GLM) on the next generation of GOES satellites will detect the very rapid and transient bursts of light produced by lightning at near-infrared wavelengths. This image was taken from the International Space Station and shows the Aurora Australis and lightning.

It's one of many reasons why scientists want to keep an unwavering eye on lightning. The best way to do that? With a satellite 35,800 km overhead.

At that altitude, satellites orbit at just the right speed to remain over one spot on the Earth's surface while the planet rotates around its axis — a "geostationary" orbit. NASA and NOAA scientists are working on an advanced lightning sensor called the Geostationary Lightning Mapper (GLM) that will fly onboard the next generation geostationary operational environmental satellite, called GOES-R, slated to launch around 2015.

"GLM will give us a constant, eye-in-the-sky view of lightning over a wide portion of the Earth," says Steven Goodman, NOAA chief

scientist for GOES-R at NASA's Goddard Space Flight Center. Once GLM sensors are flying on GOES-R and its sister GOES-S, that view will extend 18,000 km from New Zealand, east across the Pacific Ocean, across the Americas, and to Africa's western coast.



With this hemisphere-scale view, scientists will gather an unprecedented amount of data on how lightning varies from place to place, year to year, and even decade to decade. Existing lightning sensors are either on the ground — which limits their geographic range — or on satellites that orbit much closer to Earth. These satellites circle the Earth every 90 minutes or so, quickly passing over any one area, which can leave some awkward gaps in the data.

Goodman explains: "Low-Earth orbit satellites observe a location such as Florida for only a minute at a time. Many of these storms occur in the late afternoon, and if the satellite's not overhead at that time, you're going to miss it."

GLM, on the other hand, won't miss a thing. Indeed, in just two weeks of observations, GLM is expected gather more data than NASA's two low-Earth orbiting research sensors did in 10+ years.

The new data will have many uses beyond understanding climate change. For example, wherever lightning flashes are abundant, scientists can warn aircraft pilots of strong turbulence. The data may also offer new insights into the evolution of storms and prompt improvements in severe weather forecasting.

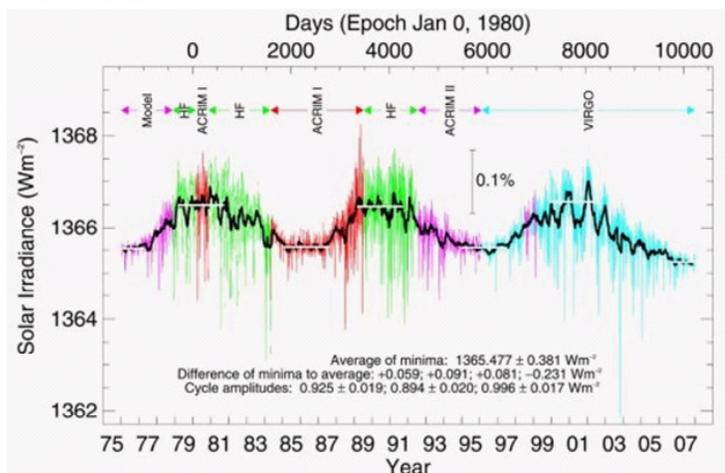
Staring at (FLASH!) Did you miss another one? The time has come for GLM.

Want to know how to build a weather satellite? Check the "how to" booklet at scijinks.gov/weather/technology/build_satellite.

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

The Sun's Sneaky Variability

...from page 13



Space-age measurements of the total solar irradiance or "TSI". TSI is the sun's brightness summed across all the wavelengths of the electromagnetic spectrum—visible light and EUV included. TSI goes up and down with the 11 year solar cycle.

Credit: C. Fröhlich.

The sun's intrinsic variability and its potential for future changes are not fully understood—hence the need for EVE. "The EUV portion of the sun's spectrum is what changes most during a solar cycle," says Woods, "and that is the part of the spectrum we will be observing."

Woods gazes out his office window at the Colorado sun. It looks the same as usual. EVE, he knows, will have a different story to tell.

ADVANTAGE Telescope Repair

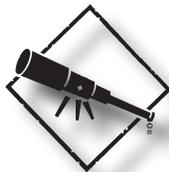
- Now offer "bargain" refurbished telescopes
- Complete telescope repair and upgrades
- Customized paint : OTA's, mounts, etc
- Local Pick-up or FedEx Ground
- Mirror recoating and refiguring by "Optic Wave Laboratories"



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Observatory Corner

By Bob Rogers, Observatory Chairman



Hello everyone.

The last HAS All Clubs Star Party was held on October 17th with around 30 to 40 members and guest attending. Besides HAS members, I saw members from FBAC and NHAC, and also some students from the Lonestar College astronomy club. Mike



Buster Wilson sets up for a night of observing

Edstrom, Greg Barolak and Dana Lindstrom put on the picnic with hamburgers, hot dogs and potato salad and brownies being served. There were a lot of telescopes set up on the observing field and clear skies to go along with the viewing. People were able to see a few items such as Jupiter and M13 and a few other

will send us a check if the amount goes over \$2,500.00, otherwise the total roles over to the next quarter or zeros out at the end of the calendar year. So please link your Randalls card to the Houston Astronomical Society so that the society can benefit from this Randalls program. Our number is #6618. This is very easy to do, just go to the Courtesy Booth and tell the person there what you want to do.

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

Thanks,

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

items before the clouds moved in. I would like to thank Ed Fraini, Dale Morningstar and Lee and Ginger Gibson for coming out Saturday morning to do the mowing and weed eating and getting the Observing site in shape.

Remember that the November 6th HAS is our business meeting. I will give a short talk about plans for 2010 at the observing site. If you have any ideas that you would like to see happen at the site along with next years All Clubs Star Parties observing programs, please let us know at the next meeting.

If you have a Randalls card, and have not done so, please have it coded for the Houston Astronomical Society. Our number is #6618. The Society gets 1 percent of the gross sales that members spend at Randalls. Randalls totals up the amount spent each quarter and



VY CMa - The Largest Star

by Bill Pellerin, GuideStar Editor

Object: VY CMa (Canis Major)
Class: Star
Magnitude: 6.5
R.A.: 7 h, 22 m, 58 s
Dec: -25 degrees, 46 minutes, 03 sec
Distance: 4900 ly
Constellation: Canis Major
Size/Spectral: M5 (very red)
Optics needed: Small telescope

Why this object is interesting.

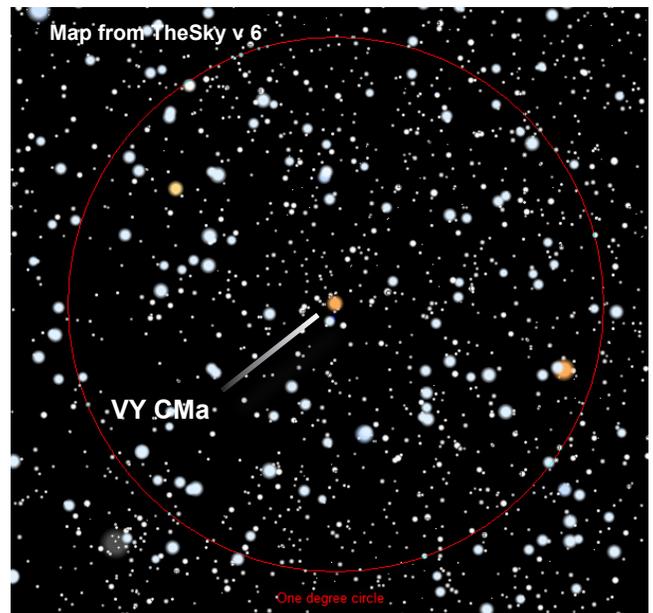
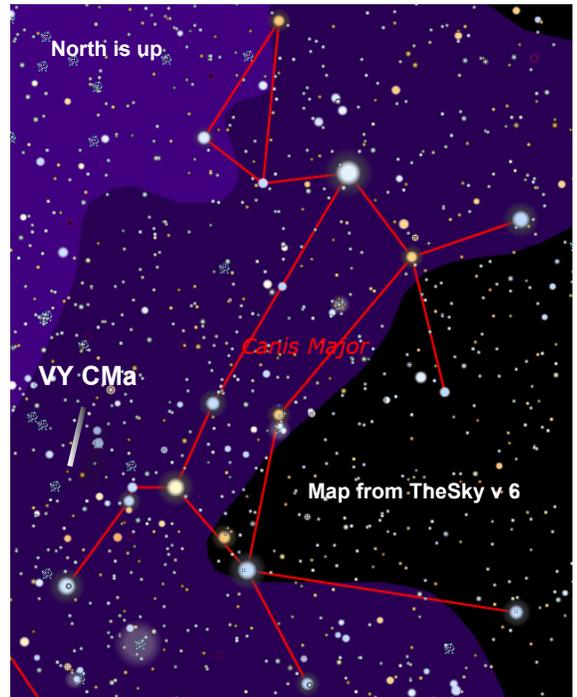
This late life star is the largest star known to exist. How large? It makes the Sun look like a pipsqueak. The diameter of VY CMa is about 2000 times the diameter of the Sun. Since the Sun's diameter is 109 times the diameter of the Earth, VY CMa's diameter is 218,000 times as large as Earth's diameter.

If the Sun were replaced by this star, the edge of the star would almost reach Saturn! Of course the Earth would be inside the star, and thus, toast. The illustration below shows the relative size of this star and of our Sun. VY CMa's diameter is 1.3 times the diameter of the famous star Betelgeuse.

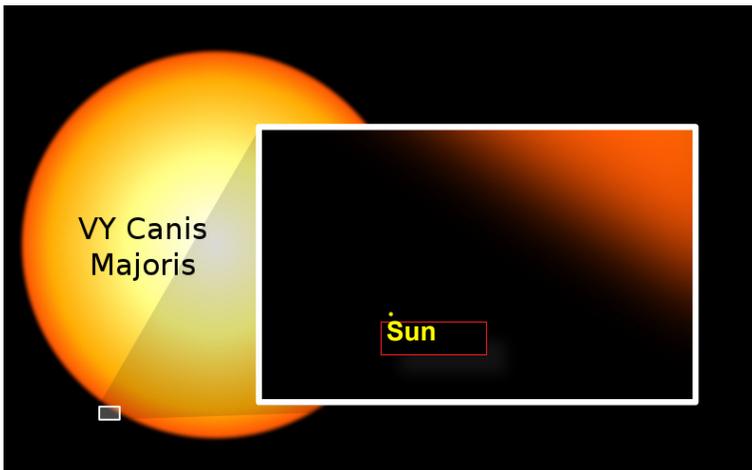
This star is a very old and very red hypergiant star living out the remainder of its life at the upper right of the HR diagram. The map at the right shows the star in color as very red and it should appear so in the eyepiece. When looking for the star, be aware of the high density of stars in this region and take your time.

If you are a bit savvy about variable stars you will see that the name of this star identifies it as a variable. This star varies from 7.4 to 9.6 over a period of 2200 days or so. (An article on Wikipedia puts the period at 17,200 years, but a visit to AAVSO.org

Continued on page 8 ...



Location of VY CM. The circle is one degree on the sky. North is up.



General Membership Meeting

The Houston Astronomical Society holds its regular monthly General Membership Meeting on the first Friday of each month, unless rescheduled due to a holiday. Meetings are in Room 117 of the Science and Research Building at the University of Houston. A Novice Presentation begins at 7:00 p.m.. The short business meeting and featured speaker are scheduled at 8:00 p.m. Also typically included are Committee Reports, Special Interest Group Reports, current activity announcements, hardware reviews, an astrophotography slide show by members and other items of interest. Parking is NOW across from Entrance 14, by the stadium.

Board of Directors Meeting

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

GuideStar Information

The H.A.S. *GuideStar* is published monthly by the Houston Astronomical Society. All opinions expressed herein are those of the contributor and not necessarily of Houston Astronomical Society. The monthly Meeting Notice is included herein. *GuideStar* is available on the HAS web site to all members of H.A.S., and to persons interested in the organization's activities. Contributions to *GuideStar* by members are encouraged. Electronic submission is helpful. Submit the article in text, MS-Word format via email BillPellerin@sbcglobal.net. Copy must be received by the 15th of the month for inclusion in the issue to be available near the end of the same month. Or, bring copy to the General Membership Meeting and give it to the Editor, or phone to make special arrangements.

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

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

Houston Astronomical Society

Meeting on Friday, November 6

7:00 Novice & Site Orientation

8:00 General Meeting

University of Houston

Directions to meeting:

from I-45 going south (from downtown)

- exit at Cullen Boulevard
- turn right on Cullen
- turn left into UH entrance 14
- Science and Research is on the left

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

- exit at Cullen Boulevard
- turn left on Cullen to UH entrance 14

Parking:

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

U of H parking enforcement will ticket your vehicle.

Houston Astronomical Society

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



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

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

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