

# GuideStar



April, 2011  
Volume 29, #4

## At the April 1 meeting...

### Eyepieces

**Darrin Lewer**

Along the optical path to our eyeball, the last piece of glass in a telescope is contained in the eyepiece.



There are expensive ones, and inexpensive ones. Some with 40 degree fields and others with over 100 degree fields.

What does all this mean to you, the observer? Are the high-end eyepieces *really* worth the money? Where's the "sweet spot" between good performance and high cost?

How do you choose a good set of eyepieces for your telescope? How about the maximum and the minimum magnification? Should I put most of my money into a few high end eyepieces or should I get a set of eyepieces that cover a range of magnifications?

Learn about this subject from Darrin Lewer at the April 1 (no foolin') meeting.



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

#### Highlights:

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#### HAS Web Page:

<http://www.AstronomyHouston.org>

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

#### Schedule of meeting activities:

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

Novice meeting: ..... 7:00 p.m.

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

See last page for directions and more information.

## The Houston Astronomical Society

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

### Officers & Past President

President: Ken Miller ..... C:713-826-1049  
 Vice Pres: Gordon Houston ..... C:713-906-9101  
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### 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  
 Honorary..... N/C

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

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

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## Special Interest Group Listing

Any member who wants specific information on a SIG listed below may call the listed individual. Anyone who wants to offer to coach another member on his or her special interest is invited to have a listing in this section.

Advanced ..... Bill Leach ..... 281-893-4057

## 2011 Star Party Dates

- Pending

## 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](http://www.jscas.net)

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

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



## Observations... of the editor

by Bill Pellerin, *GuideStar Editor*

### Observing with a Purpose!!

I expect that too many telescopes are languishing in closets because the owner "ran out" of things to see. The truth is, of course, that you'll never run out of things to see in the night sky no matter how long you observe.

And don't think that observing has to become more difficult for you to continue to enjoy the night sky for the rest of your life. It doesn't.

What is important is that you have a goal to your observing program. Perhaps your goal is to become an Astronomical League 'Master Observer' by completing 10 of the league programs, a worthy endeavor. Learn what you need to know at [www.astroleague.org](http://www.astroleague.org).

Or, maybe you want to contribute to science. You can do that as well. The American Association of Variable Star Observers is standing by for your submissions of star magnitude estimates. It's easy to get started; binoculars will do the job.

Planets and other solar system bodies are great targets, too, and many of those can be seen from your home in the city. The Astronomical League has an observing program for the moon, an object you can't miss.

Other organizations are interested in occultations and grazes. Check out the Association of Lunar and Planetary Observers (ALPO) at [alpo-astronomy.org](http://alpo-astronomy.org).

How about doing some outreach? The George Observatory always needs volunteers to help with their public observing nights. Get on their email list and you'll get more invitations to participate than you can handle. There are other share-the-sky opportunities through the Night Sky Network. ([nightsky.nasa.jpl.gov](http://nightsky.nasa.jpl.gov)). Once you login look for the 'Greater Houston Astronomical Coalition' and get involved.

### Articles for the GuideStar!!

I'm always looking for content for the *GuideStar*. How about it? It's easy to write something. Really. What have you been doing recently? Have you happened on a way to do something that would be of value to other members of the Houston Astronomical Society? How about equipment reviews? We don't have a regular article reviewing current equipment or even something that has been around a while, but is new to you. It'd be great to have a monthly article on equipment, tools, and techniques. Think about it. Submit

your articles to me at [billpellerin@sbcglobal.net](mailto:billpellerin@sbcglobal.net). I'm the *editor* so I'll help with editing your work.

### The Texas Star Party is coming.

The Texas Star Party is coming up at the end of May. While the motel rooms have been assigned, you may be able to find accommodation in Fort Davis (or nearby), and there may yet be 'bunk house' space available at the Prude Ranch. Get on the list!!

I've been called a couple of weeks before the TSP with the news that there's a room available if I want it. (Of course, I do.) Don't think it's too late. I hope to see you there.

***Until next time...***

***clear skies and new moons!***

*..Bill*

## Just Looking

### A GuideStar Interview by Clayton L. Jeter

## Phil Harrington - Author, Observer



By now, I bet you have heard the name Phil Harrington. Chances are if you have picked up an issue of Astronomy magazine in the past 20 years, you have read an article by Phil, whether it was about binocular observing or an equipment review. Or you may know him from any of the nine books he has written, including *Star Ware*, *Star Watch*, *Touring the Universe through Binoculars*, or his latest, *Cosmic Challenge*\*

As you read his bio below, you'll see this amateur has a great love



for his hobby. He's extremely busy observing, writing, teaching, and raising a family. This guy is full of energy. Let's enjoy what Phil has to say and maybe we can learn a bit. Here's Phil...

#### The Phil Harrington bio...

A lifelong amateur astronomer, Phil Harrington was bitten by the "astronomical bug" when he was assigned to watch the

total lunar eclipse of April 1968 as a homework assignment. Since then, Phil has spent countless hours touring the universe through telescopes and binoculars. He is a former staff member of New York City's Hayden Planetarium and instructor at the Vanderbilt Planetarium in Centerport, New York.

Phil is an adjunct professor at Dowling College, Oakdale, NY, and Suffolk County Community College, Selden, New York, where he teaches courses in stellar and planetary astronomy. He is a founding member of the Westport (CT) Astronomical Society and is also

one of the coordinators of the annual Astronomer's Conjunction, held every summer in Northfield, MA.

He is perhaps best known to amateur astronomers for his nine books:

*Astronomy for All Ages* (Globe Pequot Press, 1994; second edition 2000)

*Cosmic Challenge* (Cambridge University Press, 2010)

*The Deep Sky: An Introduction* (Sky Publishing, 1998)

*Eclipse!* (John Wiley and Sons, Inc., 1997)

*The Illustrated Timeline of the Universe* (Sterling Publishing, 2006)

*The Space Shuttle: A Photographic History* (Browntrout Publishers, 2003)

*Star Ware* (John Wiley and Sons, Inc.,

*Star Watch* (John Wiley and Sons, Inc., 2003)

*Touring the Universe Through Binoculars* (John Wiley and Sons, Inc., 1990)

Phil is also a contributing editor for *Astronomy* magazine, where he frequently reviews telescopes, binoculars, and other astronomical equipment, as well as authors observing features. Phil wrote the magazine's monthly "Binocular Universe" column from 2005 until May 2009, when the column migrated to Cloudynights.com, where it can be found today. Every month, readers from around the world learn why Phil always says that "two eyes are better than one." In addition, Phil has written for *Deep Sky*, *Sky & Telescope*, and several other astronomical maga-

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\*For a review of the book *Cosmic Challenge* by editor Bill Pellerin, go to [www.astroleague.org](http://www.astroleague.org).

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zines.

Academically, Phil has undergraduate degrees in science education from Wagner College (Staten Island, NY) and mechanical engineering from New York Institute of Technology (Old Westbury, NY), as well as a Master's degree in environmental engineering from New York Institute of Technology.

A native of Rowayton, Connecticut, Phil has been happily married to his Wagner College sweetheart, Wendy, since 1980. They now live on Long Island's north shore with their daughter Helen. Phil is also an avid bicyclist and authored, with Wendy, Short Bike Rides in and Around New York City.

### The Phil Harrington interview...

**Clayton:** It's so great Phil to have an interview with you here at the *GuideStar*. I love reading your articles in *Astronomy* magazine...great work.

Let's get started...

You mentioned that you caught the astronomy bug back in 1968 while observing a lunar eclipse. Can you tell us about that evening? Did you take notes, etc?

**Phil:** April 12, 1968, dawned like most other days. It was a Friday, and I was looking forward to the weekend. I wanted to relax after what had been, at least through the eyes of a twelve-year-old, another trying week of school and homework. All this was about to change as I entered my 6th-grade science class that day. Against his usual policy, my teacher, Mr. Clark, had a weekend homework assignment written on the blackboard. That night, he told us, there was going to be a total eclipse of the Moon. He wanted us all to watch it from our homes and write down our observations to hand in as a report on Monday. And just my luck, it was clear!

I would have preferred to stay inside and watch TV, but instead, I set up a card table and lawn chair, and brought out a pair of small binoculars. The eclipse began right on time, just as Mr. Clark had promised. Slowly, over the next several hours, the Earth's shadow silently devoured the Moon, turning it a deep-orange color around the middle of the eclipse. I don't remember the exact moment, but sometime during that eclipse, something clicked. I became so engrossed with the eclipse that I watched it in an almost hypnotic trance. That was it; I was hooked on the sky.

**Clayton:** Did you think that you'd become this involved in astronomy back in '68? Where did all this passion come from?

**Phil:** Good question. Shortly after I joined my first astronomy club, the Fairfield County Junior Astronomical Society in Stamford, CT, in early 1969, the club officers all moved on to college. That left us "kids" (mostly 12-14-year-olds) to run the club. It was pretty much trial-by-fire, but we did a pretty good job over

the next few years. We revived the club newsletter; held public star parties at the Stamford (CT) Observatory, where we met; and took trips to local planetaria and meetings. That level of involvement at such a young age undoubtedly left its mark.

**Clayton:** You seem to be a telescope-nut like me. Do you have a favorite scope? How about a favorite design?

**Phil:** Not surprisingly, since I'm an avid deep-sky observer, I've always preferred Newtonian reflectors. Aperture wins...size does matter. Of the seven scopes I own, my favorite scope is my 18-inch f/4.5 Newtonian housed in my backyard Star Watcher Observatory. Readers can see a photo blog of its construction on my web site, while complete plans are in the 4th edition of my book *Star Ware*.

**Clayton:** Are you a visual observer only? Tell us about a typical observing session for yourself.

**Phil:** Primarily, yes. The deep sky quickly became my main interest after I caught the bug, thanks in part to Walter Scott Houston's writings in *Sky & Telescope* magazine. But beyond that, *Sky & Telescope* also ran a series in the late '60s/early '70s called "A Messier Album" by John Mallas and Evered Kreimer. Mallas used a 4-inch refractor for his visual observations, while Kreimer had a HUGE (in my eyes back then) 12.5-inch reflector for photography. Together, each month they would profile 2-3 of the Messier objects. Those columns, which were later combined into the book of the same name, really fueled my interest in deep-sky observing.

I believe in "go big or go home." That was my mantra as I researched targets for my book *Cosmic Challenge*. Rather than constantly reobserve the same objects over and over, I wanted to see new, usually difficult objects -- stuff that's off the beaten path. Even though I completed observations for the book two years ago, that's still my main interest. Who knows, maybe this will lead to a volume 2 one day.

**Clayton:** Where is most of your observing performed?

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**Phil:** Mostly from my backyard observatory. I'm very fortunate to have a wide-open yard, which affords a good view in all directions. Admittedly, light pollution can be pretty brutal on eastern Long Island (best I can hope for is 5th magnitude naked eye), but even though there are far darker sites less than an hour's drive away, there is no denying that convenience usually wins.

**Clayton:** Do you think public outreach is working? Do you participate in public events?

**Phil:** Let me expand 'public' to include 'educational.' I have been an astronomy educator at various institutions for the past 30 years. Today, I teach undergraduate astronomy courses at Dowling College and Suffolk County Community College, both here on suburban Long Island. In those years, I hope that I have had a positive influence on some of my students. I have helped several purchase telescopes over the years because of an interest developed in one of my classes. I also know of a few who have even changed their college majors to astronomy or a related field. There is nothing more rewarding to a teacher than knowing they have had a positive influence on a student!

**Clayton:** How did you get hooked up with *Astronomy* magazine??

**Phil:** My first article in *Astronomy* appeared in the June 1988 issue. It was called Seeing Double. As you can probably guess, it discussed double stars. That was 130 articles ago. But my writing career started long before that first piece in *Astronomy*.

I often call the 1970s the "decade of the magazine." *Astronomy* was born in 1973, but so were many other magazines that are now long forgotten. There was *Modern Astronomy*, *Celestial Observer*, and *Observer's Sky*, among others. *Observer's Sky* was a little one-man operation out of Iowa. I subscribed after seeing an ad in *Sky & Telescope*, and shortly contacted the editor/publisher to inquire about doing a deep-sky column for the bimonthly magazine, ala *Deep-Sky Wonders*. He agreed, and so I began. The magazine folded after a few years, but in that time, I discovered that I enjoyed sharing my passion with others through writing.

Toward the end of the decade, another magazine popped onto the scene, *Deep Sky Monthly*, edited by a high school kid in Ohio named David Eicher. Again, I subscribed and shortly after, inquired about submitting articles. He too agreed and so it began. DSM was subsequently bought by AstroMedia, *Astronomy* magazine's publisher at the time, in 1983. Shortly after it evolved into the quarterly magazine *Deep Sky*, I began a column called Challenge Objects, which ran in every issue until the magazine ceased in 1991. That column planted the seed that eventually became my latest book, *Cosmic Challenge*, which was published last November by Cambridge University Press.

**Clayton:** Do you have an astronomy mentor?

**Phil:** I have several. The first is George Clark, my 6th-grade science teacher in Norwalk, CT, who assigned us to watch that lunar

eclipse. I'm sure he had no idea what he had done that night!

The second is Russ Harding, former director of the Robert B. Oliver Planetarium for the Norwalk school system. He let this high schooler putter around the planetarium nearly every day after school, very likely getting in the way and causing more trouble than help. But I loved it.

Another influential teacher in my life was Fred Bump from the neighboring Westport, CT, schools. Fred was the power behind resurrecting Rolnick Observatory and the Westport Astronomical Society, where I was an active member "back in the day."

Finally, there was Charles Scovil, curator of Stamford Observatory in Stamford, CT. While some kids hung out at the local pool hall, mall, or elsewhere, my Friday night hangout was the observatory. That's where the FCJAS met, and where we began experimenting with astrophotography, film processing, and telescope making.

**Clayton:** Have you a favorite star party that you attend regularly? Are there others?

**Phil:** I am fortunate to have been invited to speak at many conventions and star parties across the country. But my favorite is unquestionably Stellafane in Springfield, VT. My parents first brought me there in 1969 and, save for three isolated years, I have been there every year since. It's now a big family reunion for me, since I get to see so many friends who are otherwise far away. And there is nothing like a clear Vermont summer sky on top of Breezy Hill. When a bolide flashes overhead and you hear the collective "ooo" and "ahhh" from more than a thousand fellow Stellafaners, well, that for me is astronomy.

I am also one of the coordinators of the Astronomers Conjunction that is held every summer in Northfield, MA. 2011 will be our 29th year. Far smaller than Stellafane, the Conjunction features several talks and solar observing during the day, followed by a keynote after dinner, and dark-sky observing. Anyone interested in learning more can visit our web site at <http://www.philharrington.net/astroconjunction>

There are many other conventions, as well,

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but to single out one over the rest would be unfair. I have enjoyed every one.

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

**Phil:** I see both good and bad times ahead. Good in that we have such a remarkable variety of equipment from which to choose today. It's absolutely amazing. My first good scope was the Criterion RV-8 Dynascope, an 8-inch reflector that I got for Christmas 1971. That was considered reasonably large back then. Now, look what we have setting up at star parties. My 18-inch is a pipsqueak, barely noticeable in the shadows of all the monstrous 20-30 inch+ scopes. Add to these all of the amazing eyepieces, digital imagers, and computerized everything sold today, and it's easy to see why we are in a golden age of amateur astronomy.

At the same time, when I go to conventions, I see a graying population. When I would go to Stellafane in the 1970s, we would have a whole contingent of "junior astronomers" milling about. Today, I see very few teenagers attending who are there under duress from their parents. That's troubling.

I believe a large part of why so many of us fell into amateur astronomy in the 1960s and 1970s was because of NASA. We had the Apollo program, but also the promise of going back to the moon to stay, and then on to Mars. Those visions were cemented by Hollywood, with such releases at 2001: A Space Odyssey and Star Trek, among others. All that seemed to be within reach. Space was exciting!

It still is, but the message today seems to be missing the mark. We need to improve the science curriculum in schools from the earliest grades through high school. Very few of my students, many of whom are earth science majors, have ever had an astronomy class beyond some brief exposure in elementary school. Where is the next generation of amateur astronomers, if we don't expose them -- and excite them -- about astronomy? With NASA's manned program in a shambles, and no real goal for future exploration, society's interest with space exploration is fading. But every kid is inherently fascinated by space. We need to rejuvenate the excitement in school, whether it's assigning everyone to look at a lunar eclipse or some other activity.

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

**Phil:** My best single advice would be to join and become involved in an astronomy club. That was of immeasurable help to me way back when. New members should become involved in the club, too, not just sit back and watch the old hands run the show. Learn from the veterans, both from their successes and from their mistakes. We all have them.

And by all means, a club should reach out to all newcomers. The new kid today may be president tomorrow. That's the position I found myself in after belonging to the FCJAS for just 5 months! It was rather overwhelming -- but I loved it.

I would also encourage clubs to resurrect a junior section. Back in the 1960s and 70s, nearly every "adult" club also had a junior club

aimed at junior and senior high schoolers. Normally, one of the adult members would act as a mentor, but only to the extent needed. The kids would run the show on their own for the most part. That's how we did it "back in the day," even to the point of running off our own newsletter on a hand-cranked mimeograph machine. Remember those?

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

**Phil:** Sure. [phil@philharrington.net](mailto:phil@philharrington.net)

**Clayton:** Thanks Phil 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.

Clear skies always!

**Phil:** Thanks, Clayton. I'm just an airline ticket away!

*Clayton L. Jeter is an avid SCT visual observer and a long time member of the Houston Astronomical Society. Contact him at: [stonebloke@gmail.com](mailto:stonebloke@gmail.com)*

# Observatory Corner

By Bob Rogers, Observatory Chairman

Hello everyone.

On the weekend of February 18 – 20, we had Pack 299 from Industry and Troop 404 from Pearland come out to the site and camp for the weekend. Troop 404 was busy moving a lot of Cinder blocks from the



Picnic area to make the summer mowing easier so we don't tear up the mower because of hidden blocks in the grass.

Pack 299 was busy clearing out the overgrown brush from the entrance road. I was



able to show Pack 299 Jupiter before it went down behind the Observatory wall using the C-14. By the time they got back to the Observatory from eating dinner, the clouds had moved in. I took everyone inside the Observatory and explained the 3 types of telescopes

that we have and did a lot of talking about Astronomy. Once again, I was amazed by some of the questions that these young minds asked and amazed that I could answer almost all of them too. Everyone had a great time and they want to come back out next year and they are certainly welcome to.



I hope this article will be in the *GuideStar* before the April 2<sup>nd</sup> weekend. There are 3 events going on at the site on the weekend of April 2<sup>nd</sup>. The first is the gate code will be changed to the site. To get the new code, you need to have your 2011 dues paid and have taken the Site Orientation class since joining.

Second is work on the fence line replacement. The plan is to remove all the barbed wire, staples and T-poles from the fence line between the 2 gates. Once removed, this will clear the way for Colorado County to come out and bulldoze the fence line down. Any and all help would be appreciated as we are on a time schedule with the county.

Third is the HAS All Clubs Star Party that evening at the site. Our field Trip and Observing Chairman has assured me that food will be served for this Star Party. There will be a \$5.00 a plate charge for the food. So if you can make a day of it, come out and help with the fence, then eat dinner and have fun at the Star Party.

A reminder that we are taking donations to help with some of the cost of the fence replacement. If you can donate, it would be appreciated and all donations are Tax deductible.

Donations can be made to:

HAS  
PO Box 20332  
Houston, TX 77225-0332

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## ***Kids Outreach & Star Parties, April/May 2011***

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**Tents in Town:** Urban camp for elementary kids

**Date:** Saturday, 4/2/2011

**Time:** 6:00 PM - 9:00 PM

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

**Event:** Ridgeway Elementary School Science Night

**Date:** Tuesday, 4/12/2011

**Time:** 6:00 PM - 9:00 PM

**Location:** 6015 West Ridgeway Drive, Houston, TX 77053 (Southwest Houston)

**Event:** Houston Arboretum Star party

**Date:** Saturday, 5/14/2011

**Time:** 7:00 PM - 10:00 PM

**Location:** 4501 Woodway Drive, Houston, TX 77016

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Dear Houston Astronomical Society,

Thank you so much for your generous donation of time to Fathers and Flashlights 2010. It is because of supporters like you that this event continues to be so successful. A key measure of that success was the record turnout of 273 dads and 489 children who participated this year.

Thank you again for your contribution to this premier community-wide event. We hope that we can count on your support for Fathers and Flashlights 2011.

All the best,

*Courtney Archer*

## Stars Caught in Fiery Merger

By Ray Villard, *Discovery Space*

In 2002, astronomers witnessed one of the strangest celestial events ever. A star on the outskirts of our Milky Way briefly grew one million times brighter, outshining almost all other stars in our galaxy. It didn't explode as a supernova, but just sort of hiccuped a brilliant burst of light.



The star, called V838 Monocerotis, expanded to an enormous size, cooled and reddened (left). Since then razor-sharp Hubble Space Tele-

scope pictures have caught the eerie "light echo" around the star as the glow from the flash rebounds off of interstellar dust. This phenomenon gives the illusion that material is streaming off the star as velocities faster than the speed of light.

Astronomers remain at a loss to satisfactorily explain the outburst, but there has been lots of speculation. Did the star ignite helium at the core, swallow a planet, or swallow a companion star?

In September 2008, another strange stellar burst was seen deep in the heart of the Milky Way, 10,000 light-years away in the opposite direction of V838 Mon.

Called V1309 Scorpii, it too would have joined the "stellar weirdo" list if not for a fortuitous observation that caught the pre-disaster activity -- like a shopping mall security camera recording a crime from start to finish.

Our galactic surveillance camera is the nearly two decade-long Optical Gravitational Lensing Experiment (OGLE), that looks for small changes in the brightness of tens of millions of stars in the direction of the galactic center.

A major goal of the project is to capture gravitational microlensing events where an unseen body passes between a background star and Earth. This causes the background star to momentarily brighten as the gravitational field of the foreground object amplifies the starlight like a magnifying glass. Light changes can also be caused by intrinsically variable stars, and planets passing in front of stars.

From 2001 to 2008 the OGLE survey made over 1,300 observations of the orange dwarf star before it blew its top in 2008. The star just happened to be in the field of view.

The survey shows that the star oscillated in brightness for years before the brilliant flash. Mysteriously the oscillation period was first measured at 1.4 days but grew shorter leading up to the 2008 blowout.

It's unlikely the variability could have been caused by star spots coming and going. A 1.4-day period would not remain so stable for so long. Like sunspots, starspots should change in size and migrate. It's also unlikely the star was pulsating because the oscillation rate got shorter over a several year period.

The best explanation is that actually two stars were seen orbiting edge-on to our line of sight. The amount of light from the system would momentarily drop every time one star passed behind the other. If the stars were spiraling together the orbital period would shorten, as observed.

The fast orbit meant that double star system was an unusual "contact binary" where a pair of stars are so close together they are nearly touching each other and share a common coronal envelope -- like a pair of waltzing skaters whirling around each other rapidly. Friction between the two stars would put drag on the system, and rob orbital momentum, causing the stars to get closer to each other.



When the stars merged all hell broke loose. The momentum from the orbit was converted to heat, causing the new merged star to skyrocket in temperature. The star also suddenly grew 10,000 times brighter.

### **Wide Angle: Massive Cosmic Explosions**

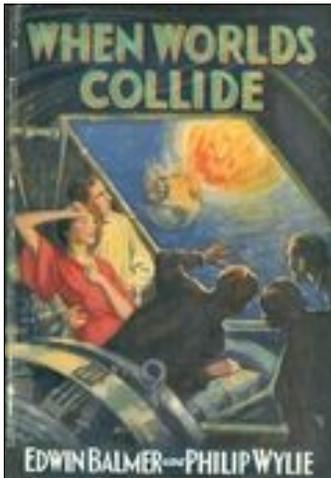
Imagine for a moment that the contact

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binary had an inhabited planet with an advanced civilization. Its astronomers would have noted the shortening orbital period between the binary duo.

This would presage a true apocalypse for the civilization. Astronomers would realize that the inevitable merger would incinerate the surface of their planet, perhaps boil away its oceans, and strip away the atmosphere. They would have a real doomsday clock the counted down each shrinkage of the binary's orbital period.



### **Analysis: Why Does a Star Explode?**

A space ark with a small population of refugees might be dispatched to find shelter on a moon of one of the system's gas giant outer planets. That is, assuming the merged star did swell up big enough to devour the entire system, as V838 Mon has done.

At the right distance, they would be in a newly expanded habitable zone around the swelled-up star.

The civilization's political and social upheaval would be unimaginably severe because only a fraction of the global population of planet could be saved. Independent nations would embark on a technological "survival-race" to see how many citizens could be launched off the planet. The 1933 science fiction novel "When Worlds Collide," presents just such a scenario.

Those left on the doomed planet might gamble to set up survival habitats in deep underground caverns with air, water and food processing capabilities.

To read more from Ray Villard, go to the *Discovery News* web site:

<http://news.discovery.com/contributors/ray-villard/>

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Thanks

(Continued from page 9)

In the note section, please put – "Observatory donation"

Remember that we are the only club that has an observing site that everyone can go to observe away from city lights. It cost money every year to keep the site maintained for your use and pleasure. So far we have around \$450.00 donated and I thank those who have donated towards our goal.

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

If you have a Randalls card, and have not done so, please have it coded for the Houston Astronomical Society. Our number is #6618. The Society gets 1% of the gross sales that members spend at Randalls. Randalls totals up the amount spent each quarter and will send us a check if the amount goes over \$2,500.00, otherwise the total roles over to the next quarter or zeros out at the end of the calendar year. So please link your Randalls card to the Houston Astronomical Society so that the society can benefit from this Randalls program. Our number is #6618. This is very easy to do, just go to the Courtesy Booth and tell the person there what you want to do.

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

Thanks,

*Bob Rogers*

Observatory Chairman  
281-460-1573  
[siteworkerbob@hotmail.com](mailto:siteworkerbob@hotmail.com)

## GOES-R, Zombie Fighter

by Dr. Tony Phillips

On April 5, 2010, something eerie happened to the Galaxy 15 telecommunications satellite: It turned into a zombie.

The day began as usual, with industry-owned Galaxy 15 relaying TV signals to millions of viewers in North America, when suddenly the geosynchronous satellite stopped taking commands from Earth. It was brain dead! Like any good zombie, however, its body continued to function. Within days, Galaxy 15 began to meander among other satellites in geosynchronous orbit, transmitting its own signal on top of the others'. Satellite operators scrambled to deal with the



*The Galaxy 15 communication satellite was "brainless" for several months in 2010 after being exposed to a geomagnetic storm. The new GOES-R satellite will warn of such dangers.*

Janet Green of NOAA's Space Weather Prediction Center recently led a study of the Galaxy 15 anomaly, and here are their conclusions:

On April 3<sup>rd</sup>, a relatively minor solar flare launched a cloud of plasma toward Earth. Galaxy 15 had experienced many such events before, but this time there was a difference.

"Galaxy 15 was just emerging from the shadow of Earth when the cloud arrived and triggered a geomagnetic storm," explains Denig. Suddenly exposed to sunlight and the ongoing storm, "the spacecraft began to heat up and charge [up]."

Electrons swirling around Galaxy 15 stuck to and penetrated the spacecraft's surface. As more and more charged particles accumulated, voltages began to rise, and—zap!—an electrostatic discharge occurred. A zombie was born.

"At least, this is what we suspect happened based on data collected by GOES satellites in the vicinity," he says. "We'll be able to diagnose

interference, all the while wondering *what happened?*

In horror movies, zombies are usually produced by viruses.

"In this case, the culprit was probably the sun," says Bill Denig of the National Geophysical Data Center in Boulder, Colorado. He and colleague

### NASA Space Place

events like this much better, however, after GOES-R is launched by NASA in 2015."

GOES-R is NOAA's next-generation Geostationary Operational Environmental Satellite. One of the instruments it will carry, a low-energy electron counter, is crucial to "zombie fighting." Low energy-electrons are the ones most likely to stick to a spacecraft's surface and cause brain-frying discharges. By monitoring these particles in Earth orbit, GOES-R will provide better post-mortems for future zombie outbreaks. This could help satellite designers figure out how to build spacecraft less susceptible to discharges. Also, GOES-R will be able to issue alerts when dangerous electrons appear. Satellite operators could then take protective action—for example, putting their birds in "safe mode"—to keep the zombie population at bay.

Meanwhile, Galaxy 15 is a zombie no more. In late December 2010, after 9 months of terrorizing nearby spacecraft, the comsat was re-booted, and began responding to commands from Earth again.

All's well that ends well? True zombie fighters know better than to relax. Says Denig, "we're looking forward to GOES-R."

You and the kids in your life can learn about space weather at <http://scijinks.gov/space-weather-and-us>.

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

# Building an Astronomer's Stool

*Complete with Sketch Desk and Red Lighting*

*By Jim Wessell*

*Part 2 of 7*

Continuing on with the construction of an Astronomer's chair... (the first part of this article is in the March, 2011 *GuideStar*.)

## *Measurements? Who needs stinkin' measurements?*

Ideally, a well designed astronomer's stool (or chair) would allow the observer to comfortably view through the telescope when the target object is near the horizon, or approaching zenith. Obviously, the type of telescope you use and the height of the supporting tripod or pier also play a large role. The determination of the total height of the combination of my upper body and the stool to view through the eyepiece was perhaps the most challenging facet of the entire project. John and I spent a considerable amount of time sketching diagrams, taking measurements, comparing back to Rod Nabholz's original design, and sometimes just plain guessing. Part of my problem lies in the fact that I don't own the tripod that I am targeting for an eventual purchase down the road – a computerized Celestron CGEM. Surprisingly enough, there is no mention of that tripod's height (legs NOT extended) anywhere on Celestron's website, or anywhere else that I could find. So with that caveat in mind, we took a measurement of John's Celestron CPC tripod and used that as a rough guesstimate (30"). We thought this would be a reasonable estimate since I doubt I would ever extend my tripod's legs out fully for observing. We then tacked on 10 inches for an approximation of the height of the mount.

Since my telescope is a Newtonian, I have to account for a rather wide difference in eyepiece height between a near horizontal view and one near zenith. To arrive at a semi-accurate measurement of this additional height, we balanced out the telescope and found a center of gravity, and then found the distance from the center of gravity through a vertical through the center of an eyepiece. This would account for the scope's portion of total height while viewing at zenith. Now we made the 'personal' measurement that is pretty much unique to each astronomer – your upper body length. This is taken by sitting in a chair and assuming a comfortable (or your typical) posture and measuring from where your posterior rests on the seat to the center of your eye level. All of us can slouch, and similarly, we can sit very erect, so there is some variability possible (for me, it's a little over 4 inches without much strain) to help account for less than a perfect height when viewing. The sketch to the right gives an idea of our two measuring schemes.

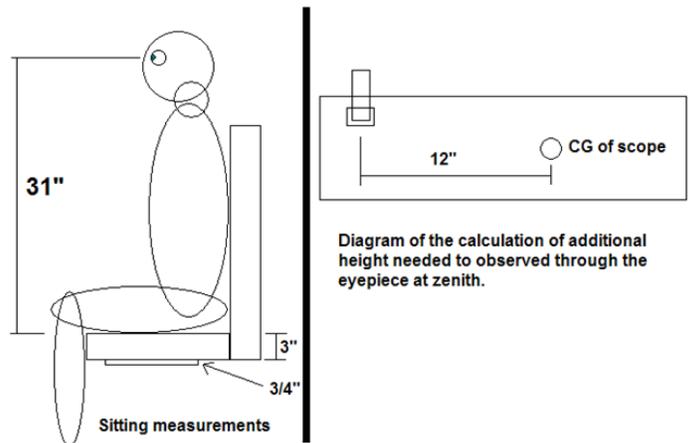


Diagram of the calculation of additional height needed to observed through the eyepiece at zenith.

## *He who builds his own pedestal had better use strong materials*

To partially offset the total needed height, the minimum size of the stool's 'pedestal' needed to be increased over that of Rob's original design. Back calculating out the other measurements, John and I found that the minimum height to the top of the seat (integrated – seat cushion, support piece of wood, two floor flanges, and the pedestal of the stool) needed to be about 25 inches (as it turned out, we ended up at 26" at the highest spot with the seat cushion uncompressed). This is only half of the final design measurement. Owing to the fact that the pipe is the only adjustable height feature of the stool, it has to also be sized to accommodate viewing near zenith. This complicated things, but just a little. The previously determined total height to view through the eyepiece at zenith MINUS my upper body height and all the fixed height items provided a maximum length needed for the pipe. Obviously, the length of the pipe is the easiest thing to change to allow for a larger future combination tripod,

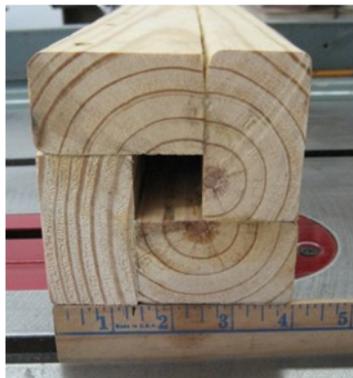
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mount and telescope, but it also changes the minimum viewing height and the overall stability of the stool when it is extended to full height. The stability of the stool will be addressed later, but realize here that how snugly the support pipe rides in the pedestal is ultimately the prime preventer of slop or play in seat movement, both of which you want to avoid. The neck of the pedestal needs to be a minimum of 6 inches long. This neck length certainly factors in for the final needed length of the pipe, and equally important the final length of the pedestal. John and I decided that for my needs the pedestal needed to be 19 inches tall, with the internal pipe being a total of 19 ¾" inches including the threaded end. The near difference of the height of the pedestal and the pipe is completely offset by the threads seating into the pipe flange, and the two pipe flanges proper. A side view of the partially assembled pedestal column is shown below:



Two points of construction of the stool are critical. One is the seat attachment, which I will cover later, and the other is the creation of the pedestal column. In the simplest description, the pedestal column is 4 pieces of wood that are joined together to form a sleeve around the pipe that supports the chair. In the final design, this sleeve has extensions sticking off to the sides to create a larger footprint and holes drilled through it for pin placement that regulates the height of the bottom of the pipe. The pedestal needs to be the strongest portion of the stool. After a few checks to confirm no noticeable pipe bend over its length and uniform outer pipe diameter, we used Rob's layout as a template for our design. As shown in the picture (left), each individual piece of wood provided a place for the pipe to rest



against and two surface areas for the next pieces of wood to attach. I can't convey strongly enough how important it is to make absolutely sure that the four pieces of wood making the pedestal form a tight collar around the pipe. This was truly a two person job and the use of locking clamps helped to facilitate this particular step. When the four pieces of wood are held together, and the unit is placed on end on a

level surface, you actually want it tight enough that it is snug and difficult (but not impossible) to slide the pipe up and down inside the pedestal. You will also get a first indication of the amount of terminal (seat end) play or movement if you slide the pipe to the normal maximally extended spot. This is the time to get it right. John and I micro ripped the boards lengthwise time and time again until we were sure we had the correct fit.



After assuring we were content with the pedestal column's interlocking fit with the integrated pipe, all edges of the

wood were gently sanded. The column was then assembled with the pipe in place. Pilot holes were drilled for all screws a drill size diameter under the root diameter of the 3" wood screws. For our efforts, the Y-axis was extremely snug, and we found that the X-axis has play in it less than the width of a quarter. After we attached the 1" floor pipe flange to the top of the pedestal column (see picture above), even more of the lateral play was removed. All in all we were very happy with the result and the fully assembled stool does not have an uncomfortable amount of 'looseness' to it when extended to the maximum height.

**Next Month: I will cover the seat attachment site on the underside of the chair and the construction of the armrests.**

## Shallow Sky Object of the Month

# Regulus—the Little King

By Bill Pellerin, GuideStar Editor

**Object:** Regulus

**Class:** Star

**Constellation:** Leo

**Magnitude:** 1.35

**R.A.:** 10 h 8 m 22 s

**Dec:** 11 deg 58 min 02 sec

**Size/Spectral:** B (blue/white)

**Distance:** 77.5 ly

**Optics needed:** Unaided eye for primary star, small telescope for secondary star.

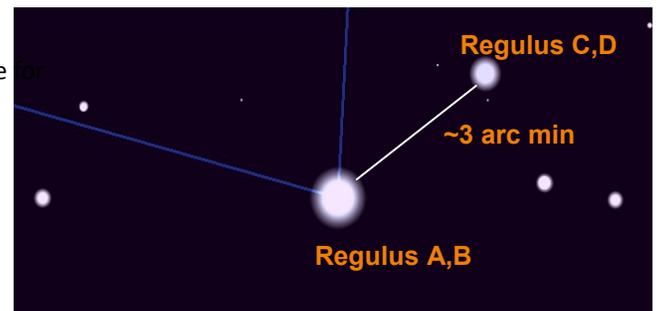
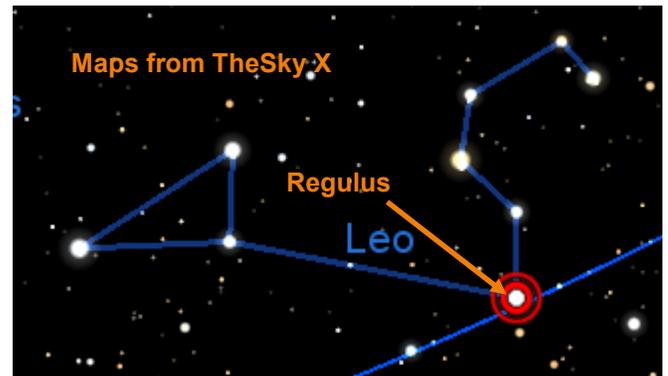
### Why this object is interesting:

The name Regulus is from word that mean Little King in Latin, but many cultures thought of this star as a king, including the the Babylonians. Regulus is often called the heart of the Lion .

Regulus is Alpha Leonis, the brightest star in the constellation Leo. Leo is one of the few constellations that actually looks like what it's supposed to represent, a Lion in repose. There are several interesting objects in Leo including the very nice double star Gamma Leo. Some very nice galaxies are in Leo as well.

Regulus consists of four stars arranged in two pairs. You can only see the two widely separated sets (of two each) though, and this pair is easy with a separation of 177", almost 3 arc minutes. The position angle is 307 degrees (meaning that the secondary star is northwest of the primary). The primary shines at magnitude 1.35, and the secondary is much dimmer at 7.6 magnitude. The primary star is a 'B' star (blue-white) and the secondary star is a 'K' star (orange), so the appearance in the eyepiece is quite nice. The dimmer companion is about 100 times the distance from Regulus as Pluto is from the Sun.

Regulus lies almost exactly on the ecliptic. I measure it to be about 27' (arc minutes) away from the ecliptic. The fact that it is close to the ecliptic means that the Moon or a planet can occult Regulus from time to time. The next occultation by Venus will be in 2044, so it will be a long wait for that one. The last occultation by the Moon was in 2007. The ecliptic is the line in the sky associated with the path of the Earth around the Sun. While other



Regulus, Close Up

planets in the solar system are always near the ecliptic, they're not always on the ecliptic. If the planets were always on the ecliptic they would only occult stars that reside there.

Regulus has a very fast rotational period of about 15.9 hours, which is quite fast for a 3.5 solar mass star. The Sun rotates in about 24.5 days. The fast rotation of Regulus makes it bulge significantly at the equator, so if we were able to see the star close it would be more noticeably oval.

If you accept the definition that a 1st magnitude star is one brighter than 1.5, then Regulus barely qualifies to be in the 'first magnitude' club.

# Houston Astronomical Society

P.O. Box 20332

Houston, TX 77225-0332

## General Membership Meeting

The Houston Astronomical Society holds its regular monthly General Membership Meeting on the first Friday of each month, unless rescheduled due to a holiday. 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.

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.

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

The benefits of membership are:

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

***You're invited to attend our next meeting.***

***You'll have a great time.***

## ***Houston Astronomical Society***

**Meeting on Friday, April 1**

**7:00 Novice Meeting**

**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 right into the parking lot (by the stadium)
- Science and Research is across the street (2nd building back)

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

- exit at Cullen Boulevard
- turn left on Cullen
- turn right into the parking lot (by the stadium)
- Science and Research is across the street (2nd building back)

### **Parking:**

There is Free Parking, **BUT DO NOT PARK IN ANY RESERVED PARKING SPACES AT ANY TIME.**  
U of H parking enforcement will ticket your vehicle.