

# GuideStar



October, 2011  
Volume 29, #10

## October 7, 7:00 p.m. All-Clubs Meeting

### To Infinity and Beyond

Dr. Scott Parazynski

Where: Houston Museum of Natural Science -  
Arnold Hall, 1 Hermann Circle Drive, Houston  
77002



Scott will give a personal account of his five missions into space, one in particular with John Glenn, and his post-astronaut adventure climbing Mount Everest in 2008.

**Note: There will be no HAS meeting at the University of Houston this month. The meeting described here is the annual All-Clubs meeting. For details, read the last page of this GuideStar.**

#### 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.

None this month — see All Clubs meeting announcement

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

**See last page for directions and more information.**



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

## 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  
 Secretary: Rene Gedaly ..... H:281-300-3559  
 Treasurer: Warren Murdoch ..... H:281-293-8164  
 Past President: Bill Leach ..... H:281-893-4057

### Additional Board Members

Bill Flanagan ..... H:713-699-8819  
 Bram Weisman ..... C:832-338-9499  
 John Missavage ..... C:281-795-4443  
 Greg Barolak ..... H:281-467-5780  
 Chris Mendell ..... H:281-291-9544

### Committee Chairpersons

Audit ..... Scott Mitchell ..... H:281-293-7818  
 Education ..... Richard Nugent ..... H:713-524-1993  
 Field Tr./Obsg ..... Siobhan Saragusa ..... H:713-376-5873  
 Novice ..... Justin McCollum ..... H:409-212-2795  
 Observatory ..... Vacant  
 Program ..... Brian Cudnik ..... H:832-912-1244  
 Publicity ..... John Missavage ..... C:281-795-4443  
 Telescope ..... John Haynes ..... H:802-363-8123  
 Welcoming ..... Katy Keene .....  
 ..... katykeene@comcast.net

### Ad-Hoc Committee Chairpersons

Texas Star Pty ..... Steve Goldberg ..... H:713-721-5077

### 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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## New Members

The Houston Astronomical Society welcomes the following new members: Howard & Sally Tinsman, Rob Sullivan, Martin Hajovsky, John Creegan, Amir Athari, Adam Atanas, Josh Connelly, John Schneider, Burke Nail, Jim Haley, Lawrence Myint, Todd Simmons, Melissa Kiesel, Arthur Rojas, Chris Gussett, Roberto Brunel

## 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)

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



# Report of the Nominating Committee

*By Gordon Houston, Nominating Committee Chair*

The 2012 candidates for officers, board members, and committee chairs are the following:

### Officers

President .....Gordon Houston  
 Vice Pres .....Bill Pellerin  
 Secretary .....Doug McCormick  
 Treasurer .....Warren Murdoch

one person for each position. This is a challenging responsibility and as sometimes happens, we have several people in dual roles. The elections are not limited to the candidate list and nominations from the floor may be made.

### Additional Board Members

Greg Barolak  
 Mike Edstrom  
 John Haynes  
 Mark Holdsworth  
 Mike Rao

### Committee Chairpersons

Audit.....Scott Mitchell  
 Education .....Debbie Moran  
 Field Tr./Obsg.....Siobhan Saragusa  
 .....Patricia Nadema  
 Novice .....Justin McCollum  
 Observatory.....Bob Rogers  
 Program.....Brian Cudnik  
 Publicity.....Mike Rao  
 Telescope .....John Haynes  
 Welcoming .....Katie Keene

### Past President

Ken Miller-(This position is not elected and is not determined by the nominating committee.)

This year, November 4th is the date of the HAS annual meeting, which is always the November meeting per the bylaws. The nominating committee's responsibility is to nominate at least

## Observations... of the editor

by Bill Pellerin, GuideStar Editor

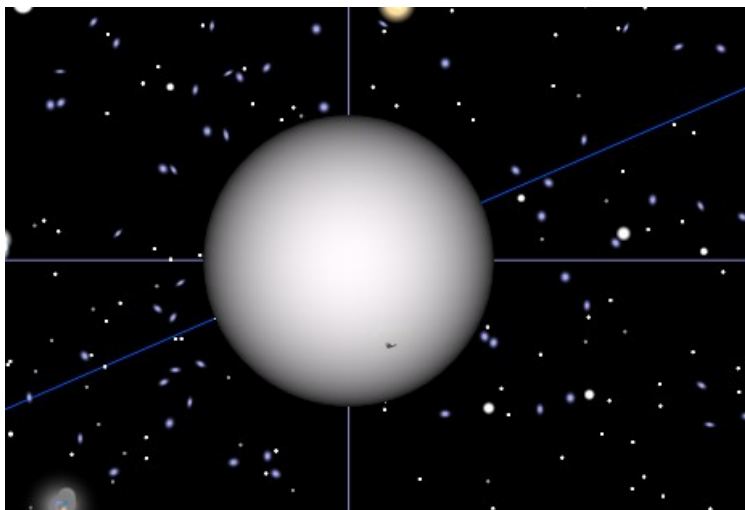
### Fall, Finally

Finally, fall (autumn) begins. In many ways it has been a dreadful summer. Hot, dry, dryer, driest. If you're a farmer or a rancher you're painfully aware of the situation, and if you're a homeowner you only need to look at your yard to see the effects of the summer.

August was a month in which only one day failed to exceed 100 degrees. Glad that's over!

So, we welcome fall — cooler, longer nights. The summer constellations are setting earlier and, if we stay up late enough we can see the winter constellations. By mid month Orion crosses the eastern horizon at about 11:00 p.m. Can winter be far behind?

Technically, the autumnal equinox, the first instant of fall, happens as the Sun crosses the equator on its way south for the winter. This happened on September 23 at 4:04 a.m. Houston time. Here's what it looks like:



The horizontal line is the equator, the blue line is the ecliptic, and the vertical line is 12:00 RA. It's good to know that everything is falling into place.

We all look forward to cooler, longer nights for observing. Cool fronts coming through town will clear out the air and cool down the temperatures. Can't wait.

### In This Issue

The report of our **nominating committee** is in this issue of the *GuideStar*. Committee leaders can always use help getting the work done that is needed to keep the Houston Astronomical Society viable. You can volunteer to help with many of the activities of the club, so contact any of the officers or committee leaders.

Also in this issue is a list from Alan Rossiter of the available **star parties for children and the general public**. Check this list, contact the coordinator, and plan to come out.

October 8 is **Astronomy Day at the George Observatory**. This is another great volunteer opportunity. Contact Cynthia Gustava (cynm31@att.net) if you can help with this event. Check it out at [astronomyday.net](http://astronomyday.net).

Any good observing in September? Let us hear about it.

*Until next time...*

*clear skies and new moons!*

*..Bill*

## Just Looking

### A GuideStar Interview by Clayton L. Jeter

## Bob Kepple and Glen Sanner



**A**s I shopped in the vendor buildings at TSP-2011 (there are two buildings now), I was happily introduced to Bob Kepple and Glen Sanner. Have you heard of them before? Sure you have. Their fantastic three volume set of astronomy books titled *The Night Sky Observer's Guide* is the rage in the astronomy



*Glen and Bob at Texas Star Party 2011  
author's recent photo*

community. If you haven't picked up a set, then you're in for a treat. These books are hot sellers. They contain a wealth of information about our

night sky. They are just what the amateur needed. Move over Mr. Burnham!

You're going to enjoy this tag-team interview. These are two swell guys. I'm more than happy to introduce you to this dynamic duo.... Here's Bob and Glen...

#### **George Robert Kepple bio...**

"Bob" is a lifelong avid amateur astronomer as well as an artist and a photographer. He became interested in astronomy in the 4th grade at age 10. Bob soon bought a 2.5-inch refractor in 1951 which he used for ten years. His next purchase was an 8-inch re-



lector, followed by a Cave 12.5 reflector. In the 1980s Coulter Optics offered a 17.5 Dobsonian telescope and he was one of the first to buy one. He now observes with a 22-inch Dobsonian truss tube reflector fitted with servo motors. By the time he was 15 he started doing drawings and oil

paintings. In high school he was the yearbook sports photographer. However, a tour of duty in the Army and earning a living held back all three hobbies until after he retired in 1996. Bob worked as a precision roll grinder and lathe operator for 37 years at Allegheny

-Ludlum Steel

Corp. Now that he is retired, Bob is very active in all three hobbies. Bob has co-authored, along with Glen Sanner, a three volume set of astronomy books titled *The Night Sky Observer's Guide*. Due to his artistic abilities the publisher accepted his page layout without any major revisions for all three volumes. The "Guide" shows people who have telescopes what to look for in the night sky describing objects such as double stars, star clusters, nebulae, and galaxies with a range of different size telescopes. In 2003, after living in Pennsylvania all his life, Bob and his wife moved to Arizona (Glen had moved there first in 1987). The clear, dark night skies of the southwest offered much more time for him to pursue his astronomy interests. It wasn't long until he joined the Huachuca Astronomy club and two local art clubs in southeastern Arizona where his paintings are on display in their galleries.

#### **The Glen Sanner bio...**

I am an avid amateur astronomer. In addition I enjoy nature photography and woodworking. I had an interest in astronomy in high school but did not pursue it until 1975 when I purchased my first telescope, a Celestron 5 inch SCT. At that time I began attending the meetings of our local astronomy group, the Kiskiminetas Astronomy Club. George Robert Kepple better known as "Bob," was a member and an officer of the club. Bob lived near my home and he invited me to observe with him at his backyard observatory utilizing his 12.5" Cave.

In the early 1980's "aperture fever," struck and I built an 18.5" Dobsonian. The home-built backyard domed observatory came next. This hobby was getting serious.

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With the advent of home computers and desktop publishing software, Bob and I decided that we could publish a bi-monthly astronomy observing magazine. We called it the *Observer's Guide*. We described, with the help of our readers, objects in the night sky which would interest amateur astronomers. We continued the magazine for six years. Then Perry Remaklus of Willmann-Bell publishing approached us to do a book loosely based on our previous work. With guidelines set up by our publisher it took us several years to co-author *The Night Sky Observer's Guide, Volumes 1 & 2*.

In 1997, after working for thirty years as a pharmacist in western Pennsylvania, I had an opportunity to make a job change. That change led me to southeastern Arizona. What a change in skies! My wife Deanna and I moved into our Santa Fe style home in 2000 and shortly thereafter the backyard observatory was finished. It now houses my original 5" scope, the 18.5" and a 12.5." I am an active member of the Huachuca Astronomy Club and I have a great interest in observing "faint fuzzies," pushing my scopes to their limits.

Since retiring in 2008 I have also actively pursued nature photography, specifically birds in flight. With the advent of DSLRs a whole new world of photography is possible. I have joined a local art association and display my work in their gallery. My long-time woodworking hobby allows me to mat and custom frame my own work. Woodworking provides another avenue of enjoyment when not observing the night sky. What a great time to be involved with so many wonderful hobbies!

#### ***The Glen Sanner and George Kepple interview...***

**Clayton:** Great to have you guys here for a long overdue interview. Your set of three observing guide books are just what the amateur astronomer needed. I bet it was real work for both of you... I see thousands of man-hours involved here. Are there any afterthoughts about what you might have changed in the text, layout, or photos?

**George:** Our first draft was the magazine series so when we re-worked it for the books we included all our new ideas, so there is nothing more that we would like to do.

**Glen:** Thinking back on our work on the Night Sky Observer's Guide we did the best we could at the time. We had virtually no internet help because the "net," was so new. Now the resources available are very numerous and that perhaps would have contributed some changes, but I think we would not change very much.

**Clayton:** You mentioned earlier that you owned a Cave 12.5" reflector. I bet that scope had awesome optics. Tell us a little about that instrument. Do you still own it?

**George:** The 12.5 Cave was a great telescope and I would have kept it longer had the "Dobsonian Revolution" not come

about. I sold it to buy the 22-inch.

**Clayton:** How are the sales of your books? Are they catching on?

**George:** Actually, the books are tapering off because by now most serious observer's have a copy. They really sold quite well the first two years.

**Glen:** I can assure you, Clayton, that they have caught on. We continue to sell the books to those who are just entering the hobby, and we also sell many to seasoned observers looking for new objects or wanting to find photographic targets.

**Clayton:** How often do you guys actually observe together?

**George:** We observe together quite often, one night I go up to Glen's observatory, the next night he comes down to mine.

**Glen:** We often observe together because we enjoy sharing the night time sky and one of us always has something different to contribute to our observing session. In addition we often have others viewing with us. I have found it more fun to be with friends rather than observing alone.

**Clayton:** Tell me about your home observatory. It sounds great.

**George:** My observatory is a 18x24 foot building with a roof that rolls off to the north. When it is open the roof is over my computer/warm-up room which keeps wind gusts from getting under it. The part that houses the telescopes is 18x18.

**Glen:** I have a 17' x 22' roll off roof observatory with a warm up room attached which also houses the computer area.

**Clayton:** How are we ever going to get our children more involved in astronomy?

**George:** That's a question Glen and I have talked about often. With all the interactive computer games, etc. you would think it is an impossible task. When we have public star parties, I get kids going "Oh, Wow," especially when I show them Saturn, or a globular cluster so I know they are impressed.

**Glen:** I think outreach is the only answer. Chil-

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dren are a lot more involved with activities today than they were a generation ago and it is our responsibility to promote astronomy any way we can. Inviting parents to bring their children to star parties or public events related to astronomy is good way to foster the hobby. Getting teachers involved and helping them with resources is also important.

**Clayton:** We all have a funny story to tell about observing under dark skies. Perhaps something that could go wrong... did go wrong! Have you got a tale to tell?

**George:** One night back in Pennsylvania Glen and I got trapped in my observatory by a Skunk that refused to go away.

**Glen:** We were observing in my backyard domed observatory in Pennsylvania for a couple of hours and we decided to step outside for a minute. We found that the most beautiful "aurora borealis," was taking place and that we had missed it for those couple of hours because of the dome.

**Clayton:** Do you have an amateur observing mentor?

**Glen:** I would say that George is my mentor. He was observing long before I got "the bug," and he is a wonderful teacher. I am trying to be a mentor to young people just getting into the hobby.

**George:** Once a person buys a telescope I like to show them how to use it and later encourage them to do some of the Astronomical League observing programs. The League gives you a pin and a certificate for observing a list (usually a hundred objects). This is a good way of becoming familiar with the sky. You can work toward a master observer's certificate by doing ten programs, five required programs and five of your own choosing. Through the years I have finished 22 programs and am working on two more.

**Clayton:** How many star parties do you attend per year? Which ones?

**George:** Not counting our local club star parties, I average four or five. I like the Texas Star Party and the Okie-Tex star party the best.

**Glen:** I usually attend TSP and the Okie-Tex star parties as well as Riverside if possible. In addition, I go to as many local star parties as I can.

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

**Glen:** I envision less visual astronomy. We are becoming more tech-savvy and that will lead to less visual "out under the stars" astronomy and more "armchair," astronomy. We now have amateurs running remotely controlled telescopes doing all sorts of astrophotography, astrometry, and spectroscopy. The new photographic astronomy surveys which

will continue to come "on-line" will lead to many other avenues which we cannot even imagine.

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

**George:** I certainly do. I always get asked what kind of a telescope to buy which will allow astrophotography. I advise them to get a telescope and learn to use it and get familiar with the sky first. If they keep insisting that they want to take astrophotos, I advise getting an SCT with a wedge or a German equatorial mount.

**Glen:** Learn the sky! I encourage those just getting into the hobby to get out under the stars and become familiar with the heavens above. Learn those constellations and then you can go "deep."

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

**Glen:** Sure, I can be reached at [lon-geyes1@msn.com](mailto:lon-geyes1@msn.com)

**George:** [astrocards@aol.com](mailto:astrocards@aol.com) and my web site is: [Astronomy-Mall.com/Astrocards](http://Astronomy-Mall.com/Astrocards).

**Clayton:** Thanks for both of you guys taking the time to share your interest and thoughts within our HAS newsletter, 'The Guide Star'. 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!

**Glen:** It has been a pleasure, Clayton. Please come and visit us in southeastern Arizona.

**George:** Thanks Clayton, it was nice meeting you at TSP. I'll reinforce Glen's invitation, if anyone is in our area of Arizona, let us know you will be in the area and stop by for some observing.

*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)*

## **All Clubs Meeting, October 7, 2011**

### **Featured speaker biography**

# **Dr. Scott Parazynski**

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Scott Parazynski received his Bachelor of Science degree in biology from Stanford University in 1983, continuing on to graduate with honors from Stanford Medical School in 1989. He served his medical internship at the Brigham and Women's Hospital of Harvard Medical School (1990) and had completed 22 months of a residency program in emergency medicine in Denver (CO) when he was selected to the Astronaut Corps.

As an undergraduate at Stanford University, Dr. Parazynski studied antigenic variation in African Sleeping Sickness and while in medical school, he was awarded a NASA Graduate Student Fellowship to conduct research at NASA-Ames Research Center on fluid shifts that occur during human space flight. Additionally, he has been involved in the design of several exercise devices that are being developed for long-duration space flight, and has conducted research on high-altitude acclimatization. Dr. Parazynski has numerous publications in the field of space physiology and has a particular expertise in human adaptation to stressful environments.

Selected as an astronaut in March of 1992, Dr. Parazynski completed one year of training and evaluation, and was qualified as a mission specialist. A veteran of five space flights, STS-66 (1994), STS-86 (1997), STS-95 (1998), STS-100 (2001) and STS-120 (2007), Dr. Parazynski has logged over 1,300

hours in space, including 47 hours of EVA during seven spacewalks, and traveled over 23 million miles. Dr. Parazynski retired from NASA in March of 2009 to start a new career with Wyle Labs in Houston and to pursue other entrepreneurial interests.

On a personal note, Dr. Parazynski has scaled major mountains in the Alaska Range, the Cascades, the Rockies, the Andes and the Himalayas. His summits include Cerro Aconcagua (22,841 feet above sea level) and 53 of Colorado's peaks over 14,000 feet in altitude. After failing to reach the summit of Mount Everest (29,035 feet) in 2008 due to a severe back injury, on May 20, 2009, he became the first astronaut to stand on top of the world.

***See the last page of the GuideStar for details on the All-Clubs meeting.***

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## **Kids Outreach & Star Parties, October - November 2011**

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### **Event: Fathers & Flashlights**

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

Date: Saturday, 10/1/2011

Time: 7:00 PM - 9:00 PM

Location: West University Little League Field (University Blvd @ Auden Street)

### **Event: Candlelighters – Camp for All**

Type: Event at camp for special needs kids. Numerous organized activities.

Date: Friday, 10/7/2011

Time: 6:30 PM - 9:30 PM

Location: Camp for All, 6301 Rehburg Road, Burton, TX 7783

### **Event: Robinson Star Party**

Type: Elementary School Star Party. We are the main attraction!

Date: Thursday, 11/10/2011

Time: 6:00 PM - 9:30 PM

Location: 12425 Woodforest Drive (East side of Houston, I-10 outside 610)

### **Event: Askew Elementary Science Night**

Type: Elementary School Science Night. Numerous organized activities.

Date: Thursday, 11/17/2011

Time: 6:00 PM - 9:30 PM

Location: 11200 Wood Lodge Drive (West side of Houston, Beltway @ I-10)

## Dark Clues to the Universe

By Dr. Marc Rayman

Urban astronomers are always wishing for darker skies. But that complaint is due to light from Earth. What about the light coming from the night sky itself? When you think about it, why is the sky dark at all?

Of course, space appears dark at night because that is when our side of Earth faces away from the Sun. But what about all those other suns? Our own Milky Way galaxy contains over 200 billion stars, and the entire universe probably contains over 100 billion galaxies. You might suppose that that many stars would light up the night like daytime!



*This Hubble Space Telescope image of Galaxy NGC 4414 was used to help calculate the expansion rate of the universe. The galaxy is about 60 million light-years away. Credit: NASA and The Hubble Heritage Team (STScI/AURA)*

Until the 20th century, astronomers didn't think it was even possible to count all the stars in the universe. They thought the universe was infinite and unchanging.

Besides being very hard to imagine, the trouble with an infinite universe is that no matter where you look in the night sky, you should see a star. Stars should overlap each other in the sky like tree trunks in the middle of a very thick forest. But, if this were the case, the

sky would be blazing with light. This problem greatly troubled astronomers and became known as "Olbers' Paradox" after the 19<sup>th</sup> century astronomer Heinrich Olbers who wrote about it, although he was not the first to raise this astronomical mystery.

To try to explain the paradox, some 19th century scientists thought that dust clouds between the stars must be absorbing a lot of the starlight so it wouldn't shine through to us. But later scientists realized that the dust itself would absorb so much energy from the starlight that eventually it would glow as hot and bright as the stars themselves.

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although the idea of a finite universe explains why Earth's sky is dark at night, other factors work to make it even darker.

The universe is expanding. As a result, the light that leaves a distant galaxy today will have much farther to travel to our eyes than the light

### NASA Space Place

that left it a million years ago or even one year ago. That means the amount of light energy reaching us from distant stars dwindles all the time. And the farther away the star, the less bright it will look to us.

Also, because space is expanding, the wavelengths of the light passing through it are expanding. Thus, the farther the light has traveled, the more red-shifted (and lower in energy) it becomes, perhaps red-shifting right out of the visible range. So, even darker skies prevail.

The universe, both finite in size and finite in age, is full of wonderful sights. See some bright, beautiful images of faraway galaxies against the blackness of space at the Space Place image galleries. Visit <http://spaceplace.nasa.gov/search/?q=gallery>.

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

# New Discoveries on Odd Stellar Explosions

By Kurtis Williams, <http://blog.professorastronomy.com/>

Over the last week and a half, there have been a couple of news releases about stellar explosions. In the first story, astronomers have spotted a puzzling blast of gamma ray and X-ray emission that could be a star being ripped apart by a massive black hole. In the other story, astronomers have made substantial progress in understanding the brightest supernovae ever observed.

First, the puzzling gamma rays. For decades, astronomers have seen sudden, short bursts of gamma rays coming from all over the sky. About ten years ago, after a lot of hard work (and a little luck) by many different researchers, most astronomers came to believe that many of these "gamma-ray bursts" are the birthing cry of new black holes formed at the centers of massive, exploding stars.

Several space missions have been studying these gamma-ray bursts, including the currently-operating Swift satellite. These satellites automatically detect the few-second long burst of gamma rays, locate where in the sky they are coming from, and send emails and instant messages to astronomers around the globe alerting them to the event. Especially interesting events can get rapid observations from large telescopes and major satellites such as the Chandra X-ray Observatory and the Hubble Space Telescope.

On March 28, the Swift satellite detected a burst of gamma rays in the direction of the constellation Draco. Since gamma-ray bursts are seen every few days, this burst started the normal response. Automated messages went out, a team analyzed the data and put out some standard preliminary analysis. But just 43 minutes later, Swift detected another burst at *exactly the same place*. This is very rare, though not unheard of - but it is rare enough that additional resources started swinging into action. Over the next few days, many additional bursts of both gamma rays and X-rays were seen coming from the same object.

Finally, data from the Chandra X-ray Observatory and the Hubble Space Telescope came in. The source of the gamma rays and X-rays lies very

close to the center of an otherwise normal-looking galaxy. In fact, as far as astronomers can tell, the source lies directly in the center of that galaxy.

This discovery, that the weird source lies at the center of a galaxy, casts suspicion

squarely on the type of object that lives in the center of most galaxies: a super-massive black hole. Now unlike what many people think, a black hole is not some sort of cosmic vacuum cleaner, sucking in everything around it. A black hole can only eat anything that wanders too close.

How close is too close? The diameter of a black hole can be found by multiplying its mass (in terms of the sun's mass) by 3.7 miles. So, if the sun were to collapse into a black hole, the black hole

would be 3.7 miles across. Typical black holes that form from dying stars are about 10 times the mass of the sun, and so are a few dozen miles in diameter. The black hole at the center of our Milky Way galaxy is about 4 million times the mass of the sun, and so it is about 15 million miles in diameter.

The really weird stuff that happens around black holes due to Einstein's general relativity (time slowing way down, space highly distorted, light being highly bent, and unfortunate space explorers being turned into spaghetti) only happens when you get closer than a few times this distance. So, if the sun were to be magically transformed into a black

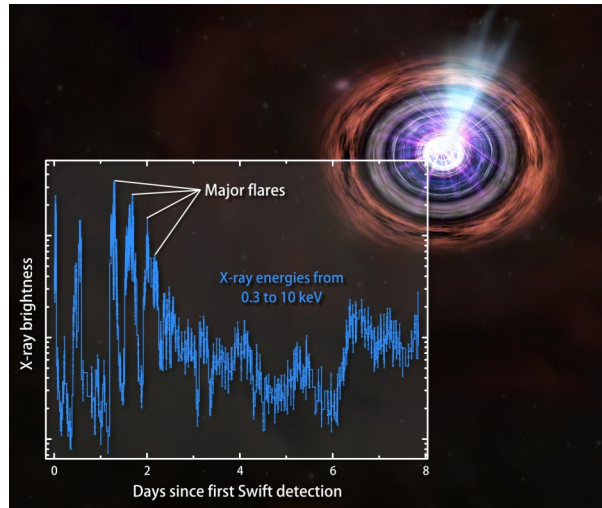


Image Credit: NASA/Swift/Penn State/J. Kennea

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hole, really weird things would only happen if you happened to get within a dozen miles or so of the black hole. The Earth, 93 million miles away, would be unharmed.

The black holes at the centers of galaxies are much larger, but compared to the distances between stars, they are still tiny. The black hole at the center of the Milky Way has many stars orbiting it, including one star that gets within 10 billion miles (about three times the average Sun-Pluto distance) every 16 years. That star passed by the black hole in 2002 with no ill effects.

Still, if a star were to somehow wander within a hundred million miles or so of a supermassive black hole in the center of a galaxy, it would get ripped to shreds. This shredding would release a lot of energy in the form of gamma rays and X-rays. A press release from NASA suggests that this is precisely what caused the multiple gamma ray bursts from the otherwise normal galaxy in Draco last week.

This explanation makes sense, but it's important to emphasize that it is just a hypothesis right now. More data continues to come in, and as news of the discovery spreads, more astronomers will begin to compare these data to simulations of what happens when a star is shredded by a black hole. Perhaps they will agree, and perhaps they won't. Time will tell.

This leads us to the second story, which was announced this week by McDonald Observatory. This story is based on a journal article that has been published in the *Astrophysical Journal*, one of the main astronomy journals, so the science has already passed significant vetting by peer reviewers. It doesn't mean the science is absolutely, positively right, but it does mean the science has met some substantial level of quality control.

About four years ago, astronomers announced the discovery of what was then the most energetic supernova ever detected. The initial discovery was made by Robert Quimby, then a graduate student at the University of Texas in Austin, and now a postdoctoral researcher at Caltech.

Many people initially speculated that this supernovae, and a few others like it, was a new kind of exploding star. Some models of really massive stars suggest that, as the star ages, it becomes unstable, manages to create large amounts of antimatter, and rips itself apart in the ensuing explosion, called a pair instability supernova.

However, new studies by Emmanouil "Manos" Chatzopoulos, a graduate student at the University of Texas at Austin, and his advisor, Dr. Craig Wheeler, seem to show that these very luminous explosions are *not* a pair instability supernova. The stars are, alas, not being torn asunder by the explosive mixture of matter and antimatter. Instead, the evidence suggests that these are normal supernova explosions, but

as the blast wave from the star travels outwards at high speeds, it rams into shells of matter thrown off by the star decades or centuries before the supernova. This violent collision releases tremendous amounts of energy in the form of visible light, and makes the supernova appear much more luminous than it otherwise would.

These shells of matter are known to exist around a type of star called a Luminous Blue Variable (LBV). These stars sometimes shed huge amounts of material into space via dramatic eruptions from the surface of the star. In our own Milky Way, the LBV Eta Carinae had just such an eruption back in the 1840s. The Hubble Space Telescope has taken amazing images of the material blown off the star during that eruption.

If Eta Carina were to explode as a supernova now (and it almost certainly will explode within the next million years), the blast wave from the supernova would smash into those large lobes of material, brightening in a very similar way to the very luminous supernovae Manos has been studying.

So, it looks as if Manos's work may have changed the explanation of these ultra-bright supernovae from some exciting and exotic antimatter-driven explosion mechanism to a slightly more mundane "giant outer space train wreck" explanation. But this is so often how science works, and how it should work: explanations for observed phenomena must be tested, re-tested, and then scrutinized some more. Only then can we be reasonably sure we understand what is happening in the depths of space.

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## Shallow Sky Object of the Month

# NGC 6210—Turtle Nebula

**Object:** NGC 6210

**Class:** Planetary Nebula

**Constellation:** Her

**Magnitude:** 8.8

**R.A.:** 16 h 44 m 30 s

**Dec:** 23 deg 48 min 02 sec

**Size/Spectral:** 20"

**Distance:** 4700 ly

**Optics needed:** 8" telescope (?) maybe smaller will do

### Why this object is interesting:

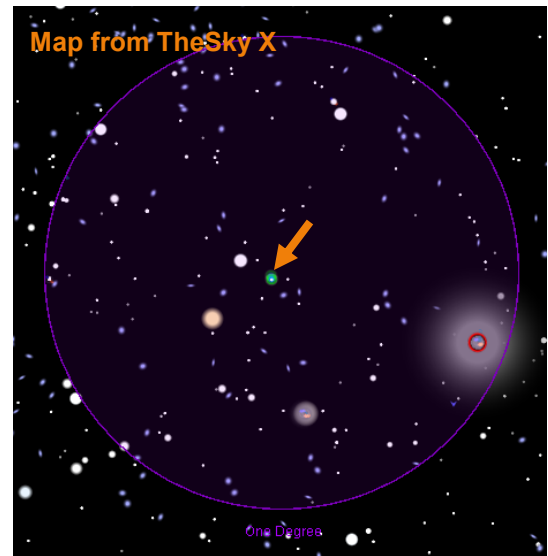
This summer I had the opportunity to see this object through the 107" telescope at the McDonald Observatory. It was very nice, of course, but this object isn't *that* dim. It will be relatively easy to see in amateur telescopes.

It is well placed for early evening viewing by the 22nd of October when the moon is out of the early evening sky. On that date, sunset is at 18:48 (6:48 p.m.) DST (yes, we're on Daylight Savings Time until November). You'll want to catch it early in your observing session that night because it sets at 11:08 p.m.

While it will look round to you, Hubble Space Telescope images show it to be a hodge-podge of material in a messy configuration surrounding the remnant of what was once a low mass (similar to the sun) star.

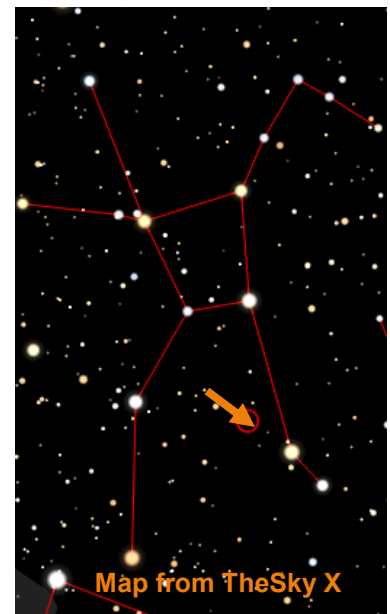
In the lifecycle of the universe stars are born and they die. They run out of fuel and can no longer sustain nuclear fusion. If the star has a low mass, it dies with a whimper rather than a scream. Its outer layers have been ejected as it nears the end of life and they're glowing because of the radiation from the remnant white dwarf star. A white dwarf star isn't fusing anything, so calling it a 'star' is incorrect.

Most importantly, stars are manufacturing facilities for chemical elements heavier than hydrogen or helium. Without these processes, the carbon and the oxygen (which combines with hydrogen to make water) that are parts of all of us would not exist. Our bodies are 65% oxygen and 18% carbon. We owe our existence to the stars that have come before us. Perhaps each planetary nebula you see now is the source of the elements required to make a new civilization on a not-yet-



established planet.

The planetary nebula phase is a short lived period in the life of a low-mass star. A planetary nebula shines for only a few 10's of thousands of years



# **Houston Astronomical Society**

P.O. Box 20332

Houston, TX 77225-0332

## **General Membership Meeting**

The Houston Astronomical Society holds its regular monthly General Membership Meeting on the first Friday of each month, unless rescheduled due to a holiday or a conflict with other events at the University of Houston.

## **Board of Directors Meeting**

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

## **GuideStar Information**

The H.A.S. *GuideStar* is published monthly by the Houston Astronomical Society. All opinions expressed herein are those of the contributor and not necessarily of Houston Astronomical Society. The monthly Meeting Notice is included herein. *GuideStar* is available on the HAS web site to all members of H.A.S., and to persons interested in the organization's activities. Contributions to *GuideStar* by members are encouraged. Electronic submission is helpful. Submit the article in text, MS-Word format via email [BillPellerin@sbcglobal.net](mailto: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

Email: [BillPellerin@sbcglobal.net](mailto:BillPellerin@sbcglobal.net)

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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, October 7 is the***

***All Clubs Meeting—Houston Museum of Natural Science  
Hermann Park***

Meeting is in Arnold Hall of the HMNS main building

Drive into parking garage – arm will be in “up” position for us that night, so parking fee is being comp’d by the museum.

Take the elevator to Level 1. When you get off the elevator, turn left. Turn right at the massive Amethyst Geode display and go up short flight of stairs and through glass doors.

You are now in the museum “store.” Walk straight ahead until you see the main entrance of the museum.

From here, there are two ways to get to Arnold Hall:

Elevator...before you reach the main museum entrance (you have not left the store yet), you will see a security guard station to your left. Security staff will be stationed there to assist you. To your right, will be two very tall purple geodes. The elevator is in between the two purple geodes. Take the elevator down to the lower level. Exit elevator to the right, walk down the hall and go left. Find the Gene Norman Channel 2 weather display and the “Earth Forum.” Directly ahead of you will be the registration and refreshment tables for the All-Clubs meeting.

Stairs... go all the way to the main entrance of the museum (through the gift shop) and turn right. Go past the “Will Call/Information” desk and enter to the Paleontology hall. Look to your left for the staircase down to the lower level. At the bottom of the stairs, look for the Gene Normal Channel 2 weather display and “Earth Forum” as above. Turn right and go straight to the Arnold Hall. Look for the registration and refreshment tables.

Surface parking is also available past the rotunda outside the main entrance.