

# GuideStar



August, 2010

Volume 28, #8

## At the August 6 meeting...

### Cassini: A Trip to The Lord of the Rings

*Aaron Clevenson, Ph.D.*

Launched in October, 1997 with a mission to



*Cassini spacecraft  
NASA image*

study the planet Saturn and its satellites, Cassini went into orbit around Saturn 6 years ago.

The whole mission of the spacecraft was supposed to be over by now, but it has been extended. It may continue to operate for another seven years or so.

The mission is now called the Cassini Equinox Mission because the latest extension of the use of the spacecraft kept it going during the Saturnian equinox (September, 2009). Current work is focused on resolving questions that came up early in the mission and developing a better understanding of Saturn's ring system.

#### Highlights:

Who I'm Following on Twitter	5
Society Update	6
John Kennedy—'Pocket Universe'	7
Special Volunteer Opportunity	10
Observatory Corner	11
The Sun is the Boss	12
The Summer Triangle—'A' Stars	13

#### 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.  
*Astronomical presentation of interest to new observers*

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  
 Secretary: Rene Gedaly ..... H:281-300-3559  
 Treasurer: Allen Grissom ..... C:281-617-9813  
 Past President: Bill Leach ..... H:281-893-4057

### Additional Board Members

Bill Flanagan ..... H:713-699-8819  
 Bram Weisman ..... C:832-338-9499  
 Jay Levy ..... H:281-557-4920  
 John Missavage ..... C:281-795-4443

### Committee Chairpersons

Audit ..... Tom Blocker ..... H:281-498-0341  
 Education ..... Richard Nugent ..... H:713-524-1993  
 Field Tr./Obsg ..... Mike Edstrom ..... H:281-347-7267  
 Novice ..... Justin McCollum ..... H:409-212-2795  
 Observatory ..... Bob Rogers ..... H:281-460-1573  
 Program ..... Brian Cudnik ..... H:832-912-1244  
 Publicity ..... John Missavage ..... C:281-795-4443  
 Telescope ..... Bram Weisman ..... H:281-398-9434  
 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.

## Table of Contents

3	.....August/September Calendar Web site
4	.....Observations of the Editor
5	.....Who I'm Following on Twitter
6	.....Society Update
7	.....John Kennedy - 'Pocket Universe'
10	.....Special Volunteer Opportunity
11	.....Observatory Corner
12	.....The Sun Can Still Remind Us Who's Boss
13	.....The Summer Triangle - 'A' Stars

## Special Interest Group Listing

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

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

## 2010 Star Party Dates

- 9/11 All Clubs with B-B-Que
- 10/9 All clubs annual picnic
- 12/4 HAS members only

## Other Meetings...

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

**Johnson Space Center Astronomical Society** meets in the the Lunar and Planetary Institute on the 2nd Friday of each month. Web site: [www.jscas.net](http://www.jscas.net)

**North Houston Astronomy Club** meets at 7:30 p.m. on the 4th Friday of each month in the Teaching Theatre of the Student Center at Kingwood College. Call 281-312-1650 or E-mail [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

### Astronomy on Twitter

There are plenty of things to 'follow' on Twitter. If you're not familiar with Twitter, think of it as a big room full of people you've selected to listen to. From time to time any of these persons can 'say' something, interesting or not, and you can hear it.

Setting up an account on Twitter is free, and, once done, you can join the conversation. You don't have to say *anything*. You can only listen to what others say. Go to [www.twitter.com](http://www.twitter.com) to sign up.

On the next page, I have listed the astronomy related 'Tweets' that I 'follow'. There are plenty more that will be of interest, I'm sure. This looks like a long list, and I was surprised when I wrote it down how long it is, but many of these don't 'tweet' very often, so you shouldn't worry about being overwhelmed. In any case, if you miss a 'tweet', so what?

There are other things to follow depending on what you want to hear about. Most news organizations have a Twitter presence. Beware! You could get to the point that you spend all your time on social networks.

### Objects I Saw for the First Time

I've been looking at the sky for a long time, but just when I think I know something about the layout of the sky and the objects in it, I'm surprised by the number of things I've missed. I was in the Texas Hill Country last Thursday night and didn't have access to a telescope, but I had my 10x30 binoculars and a sky map with me.

Aside: Have I recommended *The Observer's Sky Atlas*, by E. Karkoschka to you? It's a compact observing guide for naked eye, binocular and small telescope observing. It's now in the third edition (I have the second edition), and a nice book to carry with you when you're doing some casual stargazing.

Here are a couple of objects I saw Thursday for the first time. Both of these (especially the first one) require a good southern horizon.

#### **Corona Australis**

Just below (south of) the teapot in Sagittarius this little constellation reminds me of Corona Borealis, which should be no surprise. The names mean 'southern crown' and 'northern crown' respectively. There are only a few objects of interest in this constellation, NGC 6541 is a small globular cluster, and Gamma CrA is a challeng-

ing double star (1.6", mag 5 for both stars). The thing is, here is one of the 88 constellations that you may never have seen before.

#### **NGC 6231 — Bright Open Cluster (Sco)**

Check this one out. It is located near where the 'body' of Scorpius joins the tail (near Zeta Sco). It is easy to find and a fine sight in binoculars. It is listed at a magnitude 2.6, so you shouldn't have any trouble finding it.

### Minutes for the Board Meeting

Our secretary, Rene Gedaly, has submitted minutes from the last HAS board meeting. Thanks.

Read these minutes on page 6 of this issue of the *GuideStar*.

*Until next time...*

*clear skies and new moons!*

*..Bill*

## Who I'm Following on Twitter

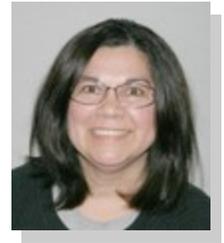
By Bill Pellerin, *GuideStar* editor

Twitter name	Real name	Notes
<a href="#">GuideStar_HAS</a>	Bill Pellerin	Editor of the <i>GuideStar</i> (me). HAS info
<a href="#">MeadeInstrument</a>	Meade Instruments	Maker of telescopes and accessories
<a href="#">Fcain</a>	Fraser Cain	Publisher of Universe Today and co-host of Astronomycast (podcast)
<a href="#">Neiltyson</a>	Neil deGrasse Tyson	Planetarium director; PBS science programs
<a href="#">Plutokiller</a>	Mike Brown	Prof. California institute of Technology. Planet finder
<a href="#">Universtoday</a>	Fraser Cain (must be?)	
<a href="#">Astronomycast</a>	Fraser Cain & Dr. Pamela Gay (astronomer)	Related to astronomycast podcast
<a href="#">Cosmos4u</a>	Daniel Fischer	From Germany—'all things astronomy'
<a href="#">Nasaspacelace</a>	NASA	Public outreach
<a href="#">Elakdawalla</a>	Emily Lakdawalla	Planetary Society blogger
<a href="#">Galaxyzoo</a>	Galaxyzoo	Galaxy Zoo uses citizen scientists (you) to classify galaxies
<a href="#">Simostronomy</a>	Mike Simonsen	Slacker Astronomy (podcast), variable star observer
<a href="#">BadAstronomer</a>	Phil Plait	Author, astronomer
<a href="#">Celestron</a>	Celestron Telescope	News about Celestron equipment
<a href="#">SkyandTelescope</a>	Sky and Telescope magazine	
<a href="#">NASA</a>	NASA	
<a href="#">NASA_Hubble</a>	NASA	Specific to the Hubble Space Telescope
<a href="#">SkyImageLab</a>		Provides links to images from observatories
<a href="#">AstronomyMag</a>	Astronomy Magazine	News from the magazine
<a href="#">SanAntonioAstro</a>	San Antonio Astronomy Club	
<a href="#">Professor_astro</a>	Unidentified astronomer at UT	
<a href="#">APOD</a>	Astronomy Picture of the Day	Link to the Astronomy Picture of the Day site
<a href="#">NASAKepler</a>	NASA	News about the Kepler mission to find extrasolar planets

# Society Update

## Minutes of the Houston Astronomical Society

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By Rene Gedaly, HAS Secretary

The theme of the 2nd quarter board meeting was communication, beginning with the decision to publish highlights of the HAS board and general membership meetings in the *GuideStar*. The general membership meeting for July was cancelled due to area-wide flooding, but more action items from the June 29, 2010 board meeting follow.

### Facebook

If we want to expand membership to include a new generation, we need to be where they are, and Facebook is where they live. Having a presence on social networking sites, however, does open the club to undesirable postings and privacy issues. To mitigate this, the board designated publicity director John Missavage to oversee a six-month trial so we can evaluate what Facebook can do for HAS and to determine how we should best use this medium.

### Streaming Video of HAS meetings

An instant success driven by Warren Murdoch and Siobhan Saragusa, streaming video of our novice and general membership meetings is here to stay. Some tweaking of the process was discussed. For example, videos would be posted following any necessary editing due to technical difficulties, or other issues, rather than being broadcast in real-time. We also need our speakers to grant permission to be video recorded and will put those measures in place immediately.

### HAS Banquet

Blame the economy: the banquets for the past two years have lost money that the society cannot afford. The board moved that we not hold a banquet this year.

### Bake Sale, Anyone?

Every club has a wish list of nice-to-have equipment, services, and events that are difficult to fund. The board has been noodling over painless ways to raise money that also enhance the value of membership in HAS. We are working on a few ideas along this line and welcome suggestions. Just contact any board member.

### Next board meeting 9/28/2010

The next board meeting is Tuesday, September 28, 2010 at the Houston Chronicle building in downtown Houston. Join us! Contact John Missavage or Ken Miller for info about where to park and how to get into the building.

## Just Looking

### A GuideStar Interview by Clayton L. Jeter

## John Kennedy—'Pocket Universe'



Let's face it; the "Smart Phone" is our new way of living. It's like a part of us...literally! We carry it on our person like it's another billfold or purse. If you're not familiar with the I-Phone and its many applications, then you're in for a treat. It does so much. It's a phone, camera, recorder, bubble level, time piece, computer, and the list goes on and on. Ten of thousands of different applications.

One of the newer apps that I have come across and truly love as an amateur astronomer is the "Pocket Universe" created by John Kennedy. To find your way around the night sky, simply open the program, hold the phone up at arm's length, and what you see on



your phone is what you see in the night sky. It looks exactly the same! But, the stars and objects are labeled making life a lot easier if

you're not sure which star is which. This is great for navigating around when observing. It's great for star hopping. You Dob users will love this handy program.

I've always wondered how these different programs are invented and conceived and the work that goes into their design. Now that I have you cornered for a few question, I'm going to dig a bit into your work. This should be fun...

#### **The John Kennedy Bio...**

I've always had a love of astronomy, and one of my favorite childhood memories is using my tiny TASCOS refractor telescope to see the moons of Jupiter when I was nine or ten. The shock of realizing what exactly it was I was seeing quickly turned to joy. That 'wow' moment is something that I've tried to share with my own kids, and in fact, anyone else I can convince to look through my telescope (I recently updated my malfunctioning NexStar5 to an 8" LX90).

My iPhone App "Pocket Universe" has been over ten years in the making. I first wrote it for the Windows CE handhelds when I lived in the UK, and this entailed learning Windows development, 3D graphics coding and reading every book by Jean Meeus and Peter Duffet-Smith. The first version took a year to write, but it also lead me to get a job at Microsoft where I helped out on the Visual Studio team, then Windows Mobile, and finally the Xbox division. In total I worked for Microsoft for ten years, based in Redmond Washington and it was great fun. During a six month break as I moved back from the US to the UK and Ireland, I spent my time learning Mac programming. When the iPhone was released, I was ready to begin porting and Pocket Universe appeared soon after. The iPhone is the most amazing platform available: Pocket Universe has been waiting for it. I recently added some Augmented Reality features - this would have been simply impossible only a few years ago.

To my huge surprise, the iPhone App has been a staggering success: so much so, that I've been able to quit working for Microsoft to focus on it full-time. I currently split time between the UK and US, as I've family in both countries. My Mac Book Air is essential with all my traveling.

The best part of my new job/hobby is getting emails from people who share my 'wow' moment and thank me for helping them discover the sky. What a rare privilege that is!

*(Continued on page 8)*

(Continued from page 7)

### **The John Kennedy interview...**

**Clayton:** It is so great to have you here with us for this informative interview. I really envy your work. Your product is everywhere now. Congratulations on your program.

Let's get to it...I'm sure there was a lot of work and sweat that went into the making of your "Pocket Universe". Can you tell us of what's on the horizon for this product? Are you thinking about a new product? New versions?

**John:** I'm working on the app all the time, adding new features. Now I can work on it full time, I have the luxury of reading and researching and listening to feedback from the people kind enough to buy it. I've a long list of features to implement, and one or two which I think are going to be very cool indeed. My focus has always been to answer the question "Hey, what's that?" and while I hope to push that a little bit, it's still the driving force behind it.

**Clayton:** Just how popular is your "Pocket Universe"? What is its purchase price?

**John:** Amazingly there will soon be 200,000 copies of Pocket Universe out there. I'm just staggered at the popularity. There are a lot of people keen to know more about the night sky. It costs \$2.99 from the Apple App Store.

**Clayton:** What sets your program apart from other astronomy programs?

**John:** I think it looks fun and not particularly intimidating, and makes use of some cool smart phone features (the compass, accelerometers and camera for example). I also keep updating a monthly "interesting things to look at" section, which prolongs interest. Truth be told, I'm still a complete newbie at Astronomy and Pocket Universe was written primarily to help me! I think if you are writing software for yourself, that can help ensure you are working on the right features. As my own knowledge increases, so Pocket Universe will develop in new ways.

**Clayton:** There are a dozen popular astronomy software programs on the market (The Sky, Starry Night, MegaStar, Sky Tools, etc?) Most even control a scope. Have you got a favorite that you like using on your laptop?

**John:** I love Stellarium on the Mac. It looks fantastic and "just works". I love its simplicity. It's a work of art. I've also used *The Sky* a lot, but as I'm now Mac-only my choice is a little more limited. Working with webcams is a little more challenging for

example, although I know folks using Windows who also have pain when updating to Vista or Windows 7. Things are never as easy as they should be when computers are involved, are they?

**Clayton:** You said you're back and forth between the U.K. and the U.S. Just exactly where is your home? Why all the traveling? Think you might be coming to Houston any time soon?

**John:** I'm delighted to say that my home is Earth. I believe that as human beings living in the 21st Century, the simple fact is that we all look up to the skies from the one planet, and that is more important than artificial constructions as primitive as nationalities. Yes, I'm hopelessly naive!

I'd love to visit Houston; I've heard great things about it.

**Clayton:** Tell us about observing years ago with your Tasco refractor. Describe your early "Wow's". Enlighten us with a typical observing session in recent times. How do they differ?

**John:** My early sessions consisted of using the Tasco, which must have been a 50mm refractor, to look at the Pleiades, the Moon and Jupiter, and to project sunspots. I saved up and found a 3 inch reflector in a local junk shop, and that meant I could see Saturn's rings for the first time, and some detail on Jupiter and Mars. When I joined Microsoft, I spent my first paycheck on a NexStar 5, which was a revelation: I didn't have to spend 95% of my evening just trying to find stuff. Finally, thanks to the success of Pocket Universe sales, I was able to get the LX. I'm now trying to be more "serious" about my observations, and doing some research into what I'm actually looking at.

**Clayton:** How do you like your 8" Meade LX-90 overall? Was your Celestron NexStar 5 a good scope?

**John:** The NexStar was great, but the LX feels like a "grown up" telescope.

(Continued on page 9)

(Continued from page 8)

**Clayton:** Are you a member of an astronomy club? Is amateur astronomy popular in the U.K.?

**John:** Astronomy has a long and proud tradition in the UK and Ireland. Unfortunately the weather is awful a lot of the time, but remember for the longest time the UK was the world leader in science of all kinds. There are many associations and clubs, but a distressing lack of Planetariums. On my last visit to London, I



*Moon Phase Calendar from Pocket Universe*

was dismayed to discover that the Planetarium I had visited as a boy was turned into a tawdry wax-works museum. I think it has moved to Greenwich, but it was still a disappointment. The UK also suffers from very rigid educational systems: when I went to University, it was not possible to take any classes in Astronomy (never mind the Arts) because I was studying computing. Such early specialization in higher learning is a mistake I fear.

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

**John:** This is probably sacrilegious to mention in a club newsletter, but for me, Astronomy is something very personal. I very much enjoy being alone outside, looking at the sky. Yes, sharing the view with my children is important, but most of the time I'm happiest when it's just me, a flask of tea, my 'scope and a clear sky. I think staring at a nebular or star cluster is just as close to meditation as I've experienced. There is something about a photon from the Andromeda Galaxy traveling across interstellar space for two million years before hitting your eye that provides a sense of perspective, don't you think?

**Clayton:** How do you envision amateur astronomy in the next 10 years, particularly with astro software?

**John:** I love gazing into the crystal ball!

For the beginning astronomer, Augmented Reality systems are

going to improve everything dramatically. Programs like Pocket Universe and the Celestron SkyScout give a hint as to what is to come. Imagine an almost invisible light-weight headset or active contact lenses, with which you'll be able to look at the sky above you and see everything labelled and explained. You'll be able to virtually magnify objects, pull up facts and figures, and even share the experience with your friends instantly over the internet.

For more advanced astronomers, the improvement in imaging software and hardware will make it possible to take ever more amazing astrophotographs.

I hope that by 2020 the major software and telescope developers will also have Mac versions available! Adding a little more Mac software philosophy might help us evolve to using software which doesn't all look and feel like it was designed for Windows 3.1 ;-)

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

**John:** Don't be put off by the fact you can't remember the constellations or find your way around the sky. It takes time to learn, and you simply don't have to know everything now with devices like goto telescopes and SkyScout. Simply enjoy looking! I think like learning anything new, you have to do it regularly. Once you've noticed how the sky changes over a few days or weeks, you'll get a feel for it, and naturally start to pick out the elements of Astronomy that really appeal to you - whether it's planets, or deep sky objects, or just enjoying the view.

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

**John:** Always happy to get mails at johntkennedy@gmail.com. I wish I could say I was an Astronomy expert, but I'm barely a newbie, so keep in mind if you are asking a question, you'll probably know more about it than me!

(Continued on page 10)

## Special Volunteer Opportunity—October 8

*..at the Camp for All, near Brenham*

The astronomy clubs in the Houston area are working together to provide outreach opportunities for our members. All of those opportunities represent a great time to introduce the public to the night sky.

We now have a new, and an outstanding opportunity. The Houston Candlelighters' mission is "to provide emotional, educational, and practical support to children with cancer and their families". On October 8, 2010 (a Friday), Houston area astronomers are invited to bring their telescopes and educational materials to the Camp for All to show the sky to these children, their parents, and the camp counselors. A request has already been submitted via the Night Sky Network and the Greater Houston Astronomical Coalition. One of the coordinators from the GHAC will be setting up the event.

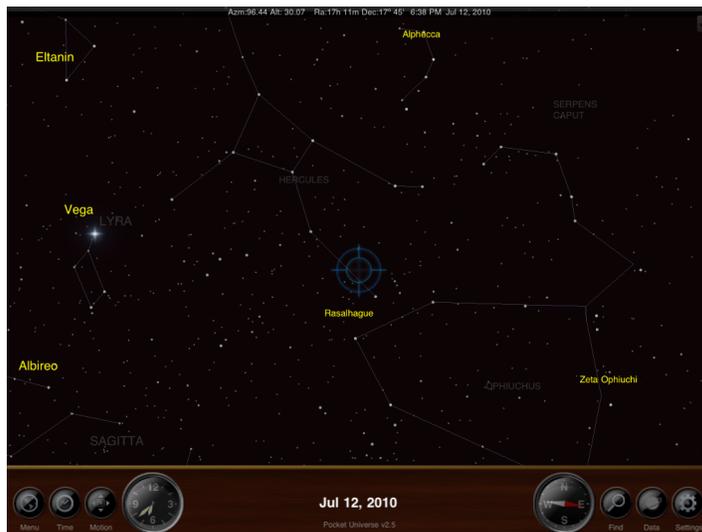
The date for this event is very close to the new moon, these are dark country skies, so there'll be a lot to see and to show the participants. When you get an email on the list server asking you to participate, please say 'yes'. It'll be a great experience for you and for the kids from MD Anderson Cancer Center and Texas Children's Hospital.

Check out the program at [www.candle.com](http://www.candle.com).

*(Continued from page 9)*

**Clayton:** Thanks John 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 and your "Pocket

*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)*



*Sky Map from Pocket Universe*

Universe". Please come visit our society when in the Houston area, we'd love to see you.

**Clear skies always!**

**John:** It's been a pleasure. Thanks very much for your interest! My ego has been suitably flattered.

# Observatory Corner

*By Bob Rogers, Observatory Chairman*



**Hello everyone.**

Well, I'm glad to report that we did indeed get the riding mower back and the grass is finally getting mowed. The total cost of the repair - \$1000. On another note concerning the site, this spring I discovered that we have 5 dead trees on the property. The first one is at the entrance to the field; 2 are in the picnic area. All 3 of these are next to power lines. The 4<sup>th</sup> one is next to the bathrooms and the 5<sup>th</sup> one is close to the tractor shed. I have gotten several quotes for removing the trees at around \$1300. Normally, a few of us on the Observatory Committee would get chain saws and take care of dead trees ourselves, but these trees are big, tall and near critical areas such as power lines and buildings. This is why I'm going for professional help on this.

Now, the reason that I mention all this is to let everyone know about some of the expenses that go into maintaining the site for everyone to enjoy. This is why at the August membership meeting I will be presenting a short PowerPoint presentation to the membership about the need to ask for donations. Since taking over the Observatory Committee in 2007, I have not asked for donations but have received donations from some members every year. More lately though, I have had site expenses that have depleted the Observatory bank account below the minimum amount that I need to maintain for emergencies such as well repair or septic system repair. If you can donate, I would appreciate it; all donations are tax deductible. I hope to see you at the August meeting with checkbook in hand. Remember that we are the only area club with an observing site away from city lights that everyone can use. It cost money every year to keep the site maintained for your use and pleasure.

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 rolls 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**

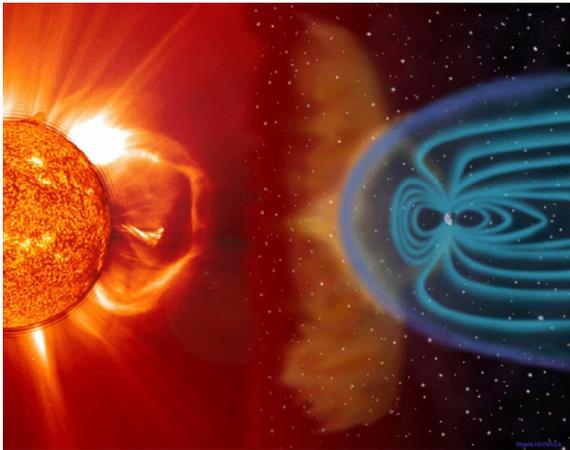
# The Sun Can Still Remind Us Who's Boss

By Dr. Tony Phillips

NASA Space Place

Grab your cell phone and take a good long look. It's indispensable, right? It tells time, surfs the web, keeps track of your appointments and, by the way, also makes phone calls. Modern people can hardly live without one.

One good solar flare could knock it all out.



*In spite of Earth's protective magnetosphere, solar storms can wreak havoc with Earth satellites and other expensive electronics on the ground.*

"In the 21st century, we're increasingly dependent on technology," points out Tom Bogdan, director of NOAA's Space Weather Prediction Center in Boulder, Colorado. "This makes solar activity an important part of our daily lives."

Indeed, bad space weather can knock out power systems, telecommunications, financial and emergency services—basically, anything that needs electronics to work. That's why NOAA is building a new fleet of "space weather stations," the GOES-R satellites.

"GOES-R will bring our existing fleet of weather satellites into the 21st century," says Bogdan. "They're designed to monitor not only Earth weather, but space weather as well."

NOAA's existing fleet of Geostationary Operational Environmental Satellites (GOES) already includes some space weather capabilities: solar ultraviolet and X-ray telescopes, a magnetometer and energetic particle sensors. GOES-R will improve upon these instruments and add important new sensors to the mix.

One of Bogdan's favorites is a particle detector named "MPS-Low," which specializes in sensing low-energy (30 eV – 30 keV) particles from the sun.

Who cares about *low-energy* particles? It turns out they can be as troublesome as their high-energy counterparts. Protons and other atomic nuclei accelerated to the highest energies by solar flares can penetrate a satellite's exterior surface, causing all kinds of problems when they reach internal electronics. Low-energy particles, particularly electrons, can't penetrate so deeply. Instead, they do their damage on the outside.

As Bogdan explains, "Low-energy particles can build up on the surfaces of spacecraft, creating a mist of charge. As voltages increase, sparks and arcs can zap electronics—or emit radio pulses that can be misinterpreted

by onboard computers as a command."

The Galaxy 15 communications satellite stopped working during a solar wind storm in April 2010, and many researchers believe low-energy particles are to blame. GOES-R will be able to monitor this population of particles and alert operators when it's time to shut down sensitive systems.

"This is something new GOES-R will do for us," says Bogdan.

The GOES-R magnetometer is also a step ahead. It will sample our planet's magnetic field four times faster than its predecessors, sensing vibrations that previous GOES satellites might have missed. Among other things, this will help forecasters anticipate the buildup of geomagnetic storms.

And then there are the pictures. GOES-R will beam back striking images of the sun at X-ray and extreme UV wavelengths. These are parts of the electromagnetic spectrum where solar flares and other eruptions make themselves known with bright flashes of high-energy radiation. GOES-R will pinpoint the flashes and identify their sources, allowing forecasters to quickly assess whether or not Earth is in the "line of fire."

They might also be able to answer the question, *Is my cell phone about to stop working?*

The first GOES-R satellite is scheduled for launch in 2015. Check [www.goes-r.gov](http://www.goes-r.gov) for updates. Space weather comes down to Earth in the clear and fun explanation for young people on SciJinks, <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.*

## Shallow Sky Object of the Month

# The Summer Triangle—'A' Stars

By Bill Pellerin, GuideStar Editor

**Object:** Deneb, Altair, and Vega

**Class:** Stars — all 'A' class

**Magnitude:** 1.25, .76, and .03

**R.A.:** 19 h, 30 m, 43 s

**Dec:** 27 deg, 57 m, 35 s

**Constellation:** Cygnus, Aquila, and Lyra

**Size/Spectral:** A

**Distance:** 1400 ly, 17 ly, 25 ly

**Separation:** n/a

**Optics needed:** Naked eye

### Why this object is interesting.

As we move through the colors of main sequence stars we've arrived at the 'A' stars which are generally talked about as 'white to blue-white'. It is happenstance that the three stars that make up the summer triangle are all 'A' class stars. While they may all be 'A' stars not all are exactly the same color. In particular —

Deneb—A2

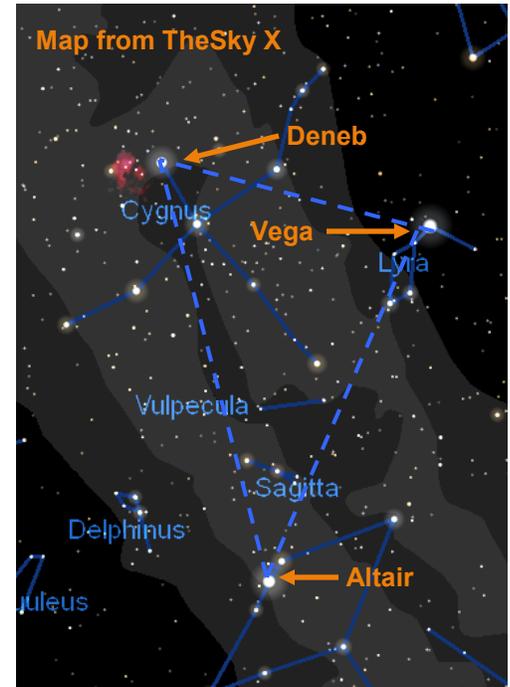
Altair—A7

Vega—A0

What does this mean? In order to give more precise color designations to stars astronomers added a number to the color designation (OBAFGKM). Within the 'A' class of stars the A0 stars are the hottest and the A9 stars are the coolest. So, there are, in practice, 70 different stellar temperatures that can be designated this way. Look at the three stars and see if you can detect any color

difference between, say, Vega and Altair. Altair should be ever so slightly redder than Vega.

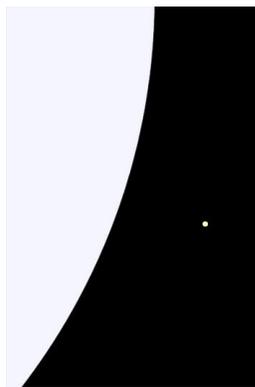
Vega happens to be very close to zero magnitude, so if you want to see what a magnitude 0 star looks like, look at Vega. It's also the brightest of the three stars that constitute the summer



triangle... at least to us. When you compare the distances to the three stars, though, a very different picture emerges. The absolute magnitude of Deneb, Altair, and Vega are  $-6.9$ ,  $2.21$ , and  $.58$  respectively. So, far and away, Deneb is the brightest star. (The absolute magnitude is the magnitude the star *would be* if were 10 parsecs [32.6 light years] from us.) Second place in the brightness race goes to Vega.

A little math tells you that Deneb is (intrinsically) 4400 times as bright as Altair.

The 'summer triangle' has been called an asterism — a collection of stars making up a figure in the sky, but not a constellation. Most asterisms (the Coathanger, for example) are collections of close (on the sky) stars, so it's a bit of a stretch to call the summer triangle an asterism (I think).



### Deneb vs Sun

From Wikimedia commons, public domain

# 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.

Editing & Production: Bill Pellerin,

713-880-8061; FAX: 713-880-8061;

Email: 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, August 6**

**7:00 Novice & Site Orientation**

**8:00 General Meeting**

## **University of Houston**

### **Directions to meeting:**

#### **From I-45 going south (from downtown)**

- exit at Cullen Boulevard
- turn right on Cullen
- turn 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.