

At the March 5 meeting...

Building a Personal Observatory—Twice

Bill Pellerin—GuideStar Editor

A personal observatory can make your observing activities much easier. Open the observatory, and you're ready to go.

- What do you need to think about as you consider building an observatory?
- What are the advantages of different designs?
- How much will this cost?
- Lessons learned



Highlights:

Emily Lakdawalla-Planetary Society	5
Vesta—from the GRAS Telescope	8
Observatory Corner	9
Lights on Cosmic Darkness	11
Ghost of Jupiter	12

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.
TBA

General meeting: 8:00 p.m

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

The Houston Astronomical Society

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

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Special Interest Groups & Help Committees

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

Advisors

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

Membership Application: Send funds to address shown on 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	March/April Calendar
	Web site
	Welcome New Members
4	Observations of the Editor
5	Emily Lakdawalla-Planetary Society
8	Vesta—from the GRAS Telescope
9	Observatory Corner
11	Flipping the Lights on Cosmic Darkness
12	The Ghost of Jupiter

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

- 3/13 All clubs with B-B-Que
- 4/17 All Clubs with B-B-Que
- 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

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

March/April Calendar



Date	Time	Event
March		
5	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
7	9:43 a.m.	Moon at last quarter
13		Prime Night, All Clubs Star Party Columbus Observing Site
14	2:00 a.m.	Daylight Savings Time begins Move clocks forward one hour
15	4:02 p.m.	New Moon
20	12:33 p.m.	Spring or vernal equinox
22	7:00 p.m.	Saturn at opposition
23	5:59 a.m.	Moon at first quarter
30	9:25 p.m.	Full Moon
April		
2	7:00 p.m.	HAS Novice Meeting, U of H
	8:00 p.m.	HAS General Meeting, U of H
4		Easter
6	4:37 a.m.	Moon at last quarter
8	6:00 p.m.	Mercury at greatest elongation east
10		Prime Night, Columbus Site
14	7:30 a.m.	New Moon
17		All Clubs Star Party Columbus Observing Site
21	1:19 p.m.	Moon at first quarter
22		Lyrid meteors peak
28	7:18 a.m.	Full Moon

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

★ ★ ★ ★

GuideStar deadline

for the April

★ issue

★ is March 15

★ ★

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

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

Welcome Visitors & New Members

Welcome to new members

Jim Hitchcock
Travis Crouse
Delicia Crouse
Jimmy Newland

Observations... of the editor

by Bill Pellerin, *GuideStar Editor*

.....

About fonts and PDFs

One of the comments I got last month was that the information in the left column of page 2 was not readable if the page is printed because the font was too small. I printed the page and I agree that it was too small, so it's a bit bigger this time.

That said, and at the risk of providing too much information, I want to let you know a little bit about how the fonts and the PDFs work. The PDF is the 'portable document format' that Adobe created. All *GuideStar* issues are posted to the HAS web site in PDF format and require the free Adobe reader to view.

There's a lot to say about fonts and the PDF format.... and I spent a bit of time trying to develop an understanding of it.

When the editing is completed for the *GuideStar* I export the document in PDF format. The *GuideStar* is now created with Microsoft Publisher; it was previously created with Adobe InDesign.

When the document is exported I have to specify various PDF document parameters. The ones that affect the file size are image quality and font embedding. Better image quality and embedded fonts means a bigger file.

Since I want you to see the document as I created it, and with good image quality I specify higher image quality and that the fonts are embedded with the document.

'Embedded' means that they're carried along with the PDF so that whoever sees the PDF sees it in the same font that was used when it was created. An embedded font is temporarily installed on the viewer's PC (if it doesn't already exist) when the document is opened and is deleted when the document is closed.

The problem is that not all fonts are licensed in such a way that they can be embedded. I got a list of the fonts provided with the MS-Publisher product, all of which allow embedding. Because I wanted the *GuideStar* to look the same way to anyone who opens the file I only used fonts that allow embedding (or, at least, that is my intent). If a font cannot be embedded (due to licensing restrictions), the PDF creator software is supposed to con-

vert that font to a graphic image. So, all the fonts should look the same to all viewers of the document -- either because the font is already on your computer or because it is embedded or because the font is converted to a graphic.

The primary font for the *GuideStar* is now Calibri, which is a sans-serif font with a more modern look than Arial. The primary font for previous editions of the *GuideStar* was Century Schoolbook, which can also be embedded. I thought a change might update the look of the publication a bit. Century Schoolbook is more like a Times New Roman and more traditional.

A low-res version of the document does not embed the fonts, so the assumption of the PDF reader is that the font used in the original publication is available on the viewer's PC. If it's not, the PDF reader substitutes similar a font that is available on the viewer's PC. So... one of the 'costs' of a low-res version is that the viewer may not see exactly what the document creator intended.

I've decided to stop producing the low resolution version. We're in an Internet environment in which most folks have relatively high speed Internet access and can get the larger file without waiting too long.

The problem for me is that I DO have all the fonts that are in the publication on my PC so any font substitution problems are invisible to me. If you see any irregularities in the high-res version (font mismatches, etc.) let me know where they are and I'll try to sort them out.

I fiddle a bit with font sizes to make things fit. If I have an article that almost fits on a page, but not quite, I might drop the font size slightly to get it all onto the one page. Often, I'll write a short item for the *GuideStar* to take up an empty 1/2 page -- the item of iPhone apps in the February issue was written quickly at the end to solve the empty-half-page

(Continued on page 10)

Just Looking

A GuideStar Interview by Clayton L. Jeter

Emily Lakdawalla-Planetary Society



I recently finished a wonderful article in the January 2010 issue of *Sky and Telescope* written by Emily Lakdawalla of Los Angeles. The article is entitled: "Spacecraft Imaging for Amateurs... An international Community of Space". In this fascinating article, Emily describes the ability for amateurs to be able to research old and even current data/photos that were sent to earth from unmanned interplanetary missions. This is real science



that you and I can do from our own desktop at home! Can we really discover? You bet. Recently, this past August, Ted Stryk (a professional philosopher and amateur planetary scientist) examined old photos from the Voyager 2 mission. The find: a moon circling Neptune, Despina.

We as tax payers... paying for these space missions, can now have the use of this stored data that in the past

was a big no-no to obtain. This new way to discover was news to me until I read Emily's fine article. But wait, there's more to learn here. Let's listen to Emily chat about how we might too be involved in this science. Meet Emily Lakdawalla...

The Emily Lakdawalla bio...

Emily Lakdawalla, Science and Technology Coordinator for The Planetary Society, received a Bachelor's degree in geology from Amherst College and then taught science to fifth- and sixth-grade children in Chicago. A class project simulating a space mission made her wonder whether she could study geology on other planets. So she went to Brown University to do just that, where she studied the geologic history of Venus and Mars using images and data from orbiting spacecraft, and received a Master's degree for her trouble. Emily came to The Planetary Society in 2001 to work on the Society's public involvement projects. Among other things, she has trained and coached the Student Astronauts who worked on the Mars Exploration Rover mission; tested out a prototype Mars Airplane at the Houghton Mars Project on Devon Island; and developed and built new LEGO rovers for the Mars Station project. She is the author of The Planetary Society Blog at <http://planetary.org/blog> and Tweets at <http://twitter.com/elakdawalla>. She frequently reports about space mission and planetary science news on planetary.org, develops informational sections of the website such as Exploring Mars and the Cassini-Huygens site, and is an occasional contributor to the Society's bimonthly magazine, The Planetary Report. She lives in Los Angeles with her economist husband and two daughters, ages 3.5 and 9 months.

The Emily Lakdawalla interview...

Clayton: It is fantastic Emily that you're here for this informative interview with us. Thanks for taking the time-out to stop what you're doing and answer a few questions about astronomy.

How did you first team up with *Sky and Telescope* for your superb article?

Emily: It was actually my second article for them. The first was last June, when their editor asked me to write about Cassini's observations of Saturn's icy moons. He asked me if I had any other topics I'd be interested in writing about; I'd presented about amateur imaging at a couple of conferences (including Dot Astronomy in 2008), and the editor was interested. Here's my video presentation to that conference:

<http://dotastronomy.com/archive/pasengers-on-voyages-of-exploration/>

Clayton: You're saying that as amateur astronomers we can do real science with these old photos/data from space missions? How do we start? Is this all too complicated for the average 'Joe'?

Emily: I doubt "average Joes" are reading this newsletter! Anyone with the interest and the kinds of basic photo skills you get from manipulating the snapshots you take with your own digital camera can play with space images. The

(Continued on page 6)

(Continued from page 5)

best place to start is just by browsing the raw image catalogs from the rovers, Cassini, and Mars Express' engineering camera, which you can find at

<http://marsrovers.jpl.nasa.gov/gallery/all/>

and

<http://saturn.jpl.nasa.gov/photos/raw/>

and

<http://webservices.esa.int/blog/blog/6>

These are all raw images in near real time from the spacecraft. There are also archives of calibrated data from current and past missions, which are a bit more difficult to access, but still totally accessible to the persistent. The Rings Node and Imaging Node of the Planetary Data System are good places to start with this stuff: <http://pds-rings.seti.org/> and <http://pds-imaging.jpl.nasa.gov/>

Clayton: What tools do we need for a scientific find? Only a PC?

Emily: I wouldn't emphasize scientific finds. To use an amateur astronomy analogy, I think most people can't expect to discover a new comet or asteroid, but they can have a lot of fun following up on the recent (or not so recent!) finds of others. With just a web browser on your PC or even your phone, you can follow the day-by-day activities of the rovers, Cassini, and Mars Express through the pictures they take and return to Earth every day. Every image is posted to the web within usually less than 24 hours of the time that the spacecraft takes it. As I write this, Cassini's recently done a Titan flyby and done lots of observations of a tiny, distant moon called Erriapus for orbit determination; Spirit's settling in to her winter position, and you can see her last moves on her Hazcam photos; Opportunity is exploring a small crater named Concepcion, and studying the cool, blocky rocks that surround it; and Mars Express is getting some lovely high-phase shots of Mars.

Clayton: After reading your article, I noted that we can use the recent incoming data from the Mars rovers too. Just how "new" is that data? Does the JPL research it all first?

Emily: Like I said, it's brand new, usually posted within 24 hours of when the rovers captured it. Depending on what time of day it is that the rovers send their data back (which is in the rovers' afternoon, usually, but since Mars' day is longer than Earth's, that time drifts around the clock), random denizens of the Internet sometimes see the images before the science or engineering teams do.

Clayton: Emily, do you explore this information yourself for a future historic find?

Emily: It's not really about discovering things that people haven't observed before. It's about following along with the exploration adventure in real time. Especially with the rovers, the mission teams use these images to plan the next day of operations. When we look at these images, we get a chance to look over their shoulders and go along for the ride. I also like to go back into mission archives for views of worlds that haven't previously seen publication. It's like a museum -- only a tiny fraction of the data returned by spacecraft is ever "put on display" by being cleaned up and press-released; more than 95% of it is just sitting on hard drives, probably having been seen by a handful of scientists and engineers and nobody else.

Clayton: How did you first become interested in astronomy? Were you a youngster when you first had that 'spark' of interest or did it all come later in life?

Emily: I'd always been interested in science -- astronomy but also geology, paleontology, and biology. I was "babysat" by Carl Sagan, David Attenborough, Philip Morrison, and all the other grand masters of public television programming as a kid in the '70s and '80s. But I liked the visual arts too. I enjoyed geology best in college, because it got me outdoors, and because of its storytelling and creative aspects -- with geology you're always trying to compose stories about geologic history based upon only very fragmentary data. Planetary geology is the same, except it's conducted in space, with robots serving as your feet and eyes. It's fun.

Clayton: Do you happen to own a personal telescope? Are you interested in only planets? Which is your favorite?

(Continued on page 7)

(Continued from page 6)

Emily: I do not own a telescope, I'm afraid. I'm very much not a night person and I have poor vision. So I prefer to explore space through the eyes of robots. As a geologist, I'm most interested in worlds with solid surfaces that I could imagine exploring on foot -- so that's the terrestrial planets, the moons, asteroids, and assorted other small bodies in the solar system. I can't really pick a favorite. But I have to say that the one that boggles my mind every time I look at pictures of it is Itokawa, the tiny asteroid visited by Hayabusa. Just as the most common multicellular life on Earth is insects, tiny multilegged creepy crawly things, most of the things in the solar system look, up close, more like Itokawa than they do like Mars or even Mimas. And Itokawa just looks so bizarre.

Clayton: Excluding your recent article in *Sky and Telescope*, how do you enlighten folks about the availability of all this information at the JPL and how they can use it for their own discoveries?

Emily: Primarily there's my blog at planetary.org/blog. It's not just JPL! JPL is just one NASA center. There's many other space agencies, including ESA and JAXA and ISRO, and they're all conducting space missions. I try to collect it all in one place in the blog, and not be too NASA- or U.S.-centric.

Clayton: How do you envision amateur planetary discoveries in the next 10-25 years? Will we see more of these types of finds? I'm thinking the younger generation just might really enjoy this type of astro fun. Your thoughts?

Emily: The change I hope to see is that I hope to see space agencies embrace the work of these fans, and actually use the work of the fans in promotion of the activities of their spacecraft. I already see scientists taking advantage of the fantastic work done by amateurs in producing really gorgeous pictures out of sometimes gnarly spacecraft data; I'd like to see space agencies doing the same, which would involve the public more directly in the missions they pay for. Also, I think there's a lot of untapped potential in citizen science programs like Clickworkers, Stardust@home, and Galaxy Zoo -- I'd like to see more programs like those.

Clayton: Do you have any helpful advice to pass on to amateurs that are starting the hunt with this available data from unmanned interplanetary missions?

Emily: Start with these tutorials that I put together:
<http://planetary.org/explore/topics/imaging/tutorials.html>

To see what other amateurs are doing, read the posts on the online forum unmannedspaceflight.com

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

Emily: Sure, blog@planetary.org, or Tweet [@elakdawalla](https://twitter.com/elakdawalla). I also spend lots of time reading and responding to people at unmannedspaceflight.com

Clayton: Thanks Emily 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. Thanks too for providing us with a new avenue to perform real science...from our own home. Please come visit our society when in the Houston area, we'd love to see you.

Clear skies always!

Emily: Thanks, I'm honored for the invitation! Since you're in Houston, y'all really ought to look into attending a day or two of the Lunar and Planetary Science Conference, which takes place each March. It used to be held at LPI near JSC, but the conference (now in its 41st year) has grown so big that it's outgrown that venue and is now held at The Woodlands Waterway Marriott, on the north side of the city. More information here:
<http://www.lpi.usra.edu/meetings/lpsc2010/>
I'll be attending the first three days.

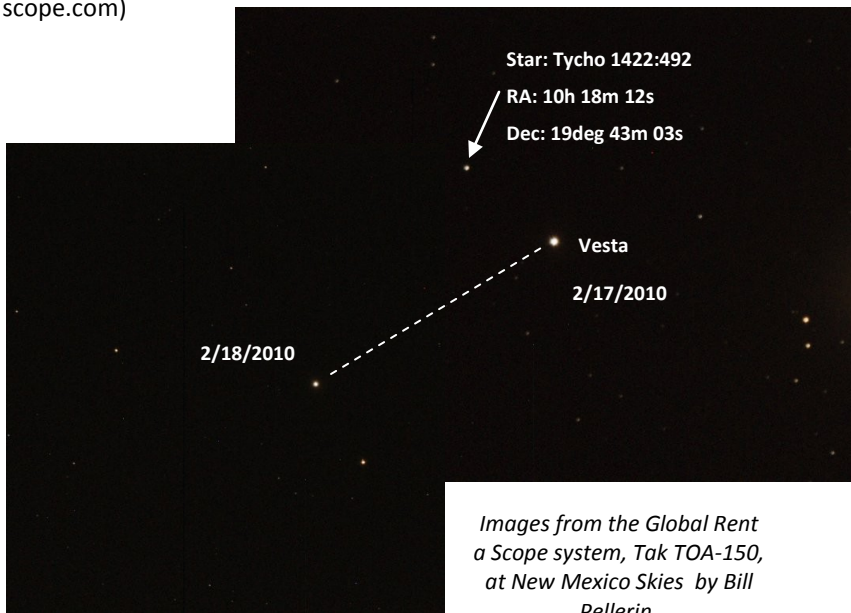
Editor's Note: HAS members can sign up for the LPI Science Conference as Students. This information was provided to me by Linda Tanner (LPI) in response to an inquiry.

Vesta—from the GRAS Telescope

By: Bill Pellerin, GuideStar Editor

I mentioned recently that I thought remote astronomy was going to be the next wave in amateur astronomy. (Maybe it'll just be one of the next waves — another being data mining from other data such as the Sloan Digital Sky Survey.) There was an article recently in the March, 2010 issue of *Sky and Telescope* magazine about this called "Observatories on the Web".

Anyway, feeling a bit photon deprived, I signed up for a free trial run of the Global Rent a Scope system. (www.global-rent-a-scope.com)



Here are two images from the GRAS (Global Rent a Scope) system that I took last week. These are aligned in such a way as to show the position of Vesta on two consecutive nights at about 10:00 p.m. local time. The object of this exercise was to have fun and see if I could get this data. It was easy, actually. I plotted the expected positions of Vesta using TheSky software, and directed the telescope to slew to those RA and Dec coordinates. The first image (on the right) is a 30 second exposure, and the one on the left is a 15 second exposure — Vesta did not get dimmer on the second night. The labels and the dotted line were added for the purposes of this article.

Using my chart from TheSky, I aligned these images to show the change in position of Vesta over that 24 hour period. I wasn't trying to get scientifically useful data, so I didn't attempt to measure positions. The motions of Vesta are sufficiently well known that my results aren't important.

The next thing I want to try is photometry. For that, I had to sign up as a paying member of GRAS.

I reviewed the system's photometric capability and it looks like it's going to be easy to use. I've been doing photometry with my own equipment for a while, and the process is similar. The GRAS system takes the drudgery out of the process.

I hope you find this interesting. I do.

I cannot tell you now how deep I'll get into this, but I'll let you know what happens as I attempt to do photometry of variable stars.

By the way, I have no financial interest in the GRAS system, Software Bisque (creator of TheSky software), or any of the components of the system.

There are other Web-based systems to check out, including Slooh, Light Buckets, and the Cherry Mountain Observatory. All these are reviewed in the *S&T* article.

Observatory Corner

By Bob Rogers, Observatory Chairman



Hello everyone.

I need to remind everyone to fill 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

Remember: Fill out the log reports when you use the HAS Observing site. This document is needed to provide the land owner with proof that the site is being used by HAS members.

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 show that the Observing site is being used. Your help on this is very much appreciated.

I will have my Boy Scouts coming out to the site on the weekend of February 26 – 28th. We plan to get the pot holes filled in on all the roads along with the ruts in the field from vehicles that have gotten stuck out there. Thanks to Ed Fraini on getting a load of sand delivered for filling in the ruts and getting sand spread around the pads. With all the rain that we have had recently, I need to remind everyone to be very careful about driving off road at the site. Don't stray off the roads until you are on the field and then only go directly to the pad you are planning to use for observing. Also, do not park on the field area between the Picnic area and the Observatory due to the very soft ground.

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

(Continued from page 4)

problem.

Thanks again for your comments. I really do welcome all feedback. It's nice to hear that people read the *GuideStar* and are interested in it.

Texas Star Party

Are you signed up for the 2010 Texas Star Party? It's only a couple of months away and if you're going you can start planning your trip now. If you haven't signed up yet, go to www.texasstarparty.org for information.

Until next time...

clear skies and new moons!

..Bill

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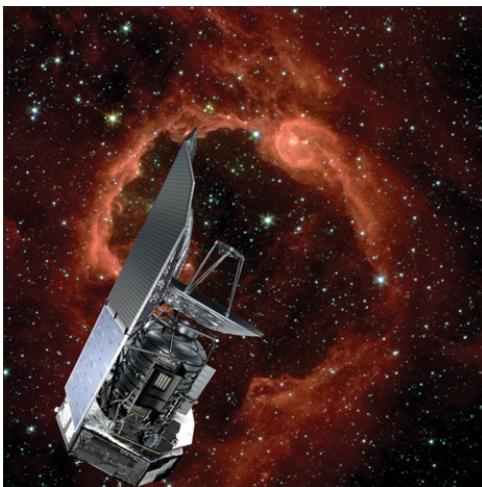
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Flipping the Lights on Cosmic Darkness

Exploring the universe is a bit like groping around a dark room. Aside from the occasional pinprick of starlight, most objects lurk in pitch darkness. But with the recent launch of the largest-ever infrared space telescope, it's like someone walked into the room and flipped on the lights.

Suddenly, those dark spaces between stars don't appear quite so empty. Reflected in the Herschel Space Observatory's 3.5-meter primary mirror, astronomers can now see colder, darker celestial objects than ever before—from the faint outer arms of distant galaxies to the stealthy "dark asteroids" of our own solar system.

Many celestial objects are too cold to emit visible light,



The Herschel Space Observatory has 3.5-meter primary mirror, allowing astronomers to see colder, darker celestial objects than ever before.

but they do shine at much longer infrared wavelengths. And Herschel can observe much longer infrared wavelengths than any space telescope before (up to 672 microns). Herschel also has 16 times the collecting area, and hence 16 times better resolution, than previous infrared space telescopes. That lets it resolve details with unprecedented clarity. Together, these abilities open a new window onto the universe.

"The sky looks much more crowded when you look in infrared wavelengths," says George Helou, director of the NASA Herschel Science Center at Caltech. "We can't observe the infrared universe from the ground because our atmosphere blocks infrared light, and emits infrared itself. Once you get above the atmosphere, all of this goes away and suddenly you can look without obstruction."

NASA Space Place

Herschel launched in May from the Guiana Space Centre in French Guiana aboard a European Space Agency Ariane 5 rocket. Since then, it has expanded the number of distant galaxies observed at far infrared wavelengths from a few hundred to more than 28,000. And with the instrument testing and system check-out phases finally completed, the discoveries are only now beginning.

Beyond simply imaging these dark objects, Herschel can identify the presence of chemicals such as carbon monoxide and water based on their spectral fingerprints. "We will be able to decipher the chemistry of what's going on during the beginnings of star formation, in the discs of dust and gas that form planets, and in the lingering aftermath of stellar explosions," Helou says.

And those are just the expected things. Who knows what *unexpected* discoveries may come from "flipping on the lights?" Helou says "we can't wait to find out."

Herschel is a European Space Agency mission, with science instruments provided by a consortium of European-led institutes and with important participation by NASA. See the ESA Herschel site at

sci.esa.int/science-e/www/area/index.cfm?fareaid=16

Also, see the NASA sites at

herschel.jpl.nasa.gov

www.herschel.caltech.edu

www.nasa.gov/mission_pages/herschel

Kids can learn about infrared light by browsing through the Infrared Photo Album at The Space Place,

spaceplace.nasa.gov/en/kids/sirtf1/sirtf_action.shtml

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

Ghost of Jupiter

By Bill Pellerin, GuideStar Editor

Object: Ghost of Jupiter, NGC3242, Caldwell 59

Class: Planetary Nebula

Magnitude: 8

R.A.: 10 h, 24 m, 46 s

Dec: -18 degrees, 38 minutes, 31sec

Constellation: Hydra

Size/Spectral: 15"

Distance: 1400 ly

Optics needed: Telescope (OIII filter helps)

Why this object is interesting.

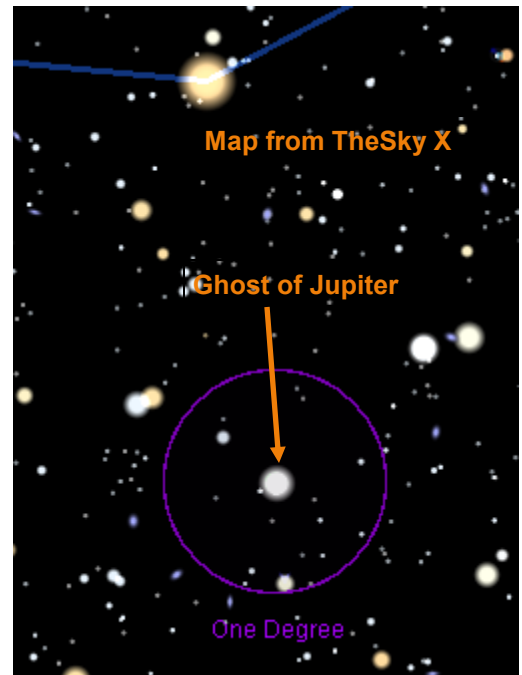
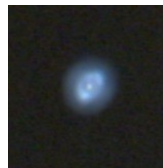
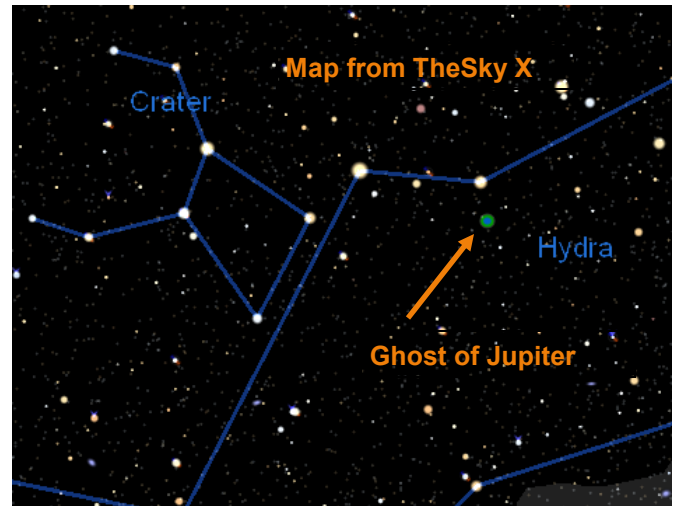
Stars are in mid-life when they're fusing hydrogen to helium (our Sun is doing this), and in late life when they are fusing helium to carbon and oxygen. For many stars, (smaller than 8 solar masses), the end of life is characterized by a carbon and oxygen core and a shell of ejected material forming what we call a planetary nebula. The ejected material is excited by the ultraviolet radiation from the now exposed star core and the material glows. Much of the glow from the material comes from doubly ionized oxygen. Because of this, an OIII filter is useful for picking out small planetary nebulae from a busy star field. When viewed through an OIII filter, the stars in the field will get dimmer, and the planetary will remain bright.

To be able to see a planetary nebula you have to be alive at the right time. This is because the lifetime of a planetary nebula is very short, on the order of a few tens-of-thousand years. The other consequence of this information is that every planetary nebula that we now see in the sky can't be over, say, 60,000 years old. So, for a Sun-like star which becomes a planetary nebula, its duration as a planetary will only be .0003% of its stellar (main sequence) lifetime. The Sun, by the way, will become a planetary at the end of its life, in about 5 billion years. There are a few thousand planetary nebulae in the Milky Way galaxy.

The central remnant of the star has very little fuel to 'burn' so its lifetime is going to be very short. Once the central star stops providing the ultraviolet radiation that lights up the planetary, it's over. The planetary dims and goes out, never to be seen again.

A few interesting facts —

- Planetary nebula have nothing to do with planets, of course, but to early observers who didn't know what they were they *looked* like planets, because they clearly *weren't* point sources, so they called them 'planetary' nebula.



- This planetary was found by William Herschel in February of 1785
- The NGC3242 designation in Dryer's New General Catalog was applied in 1888

Houston Astronomical Society

P.O. Box 20332
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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, March 5

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.