

# The Prairie Astronomer

The Official Newsletter of the Prairie Astronomy Club



## IN THIS ISSUE:

PAC Goals for 2014

Ancient Light

What to View in November

NGC Objects

Powell Observatory

Gravity: The Movie

International Observe the Moon Night

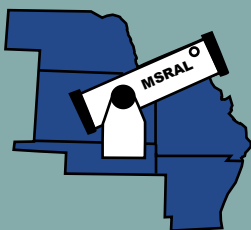
Wet Asteroid

## October Program

Michael Sibbersen will speak at the October meeting. The topic will be the Strategic Air and Space Museum mobile observatory and their plans for a robotic observatory working in conjunction with Jack Gable and Creighton University.

## Featured Photo

By Rick Johnson. NGC 2336 is a beautiful barred spiral 10 degrees from the north celestial pole in Camelopardalis about 100 million light-years from us.



## Night Sky Network



The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc. Membership expiration date is listed on the mailing label. Membership dues are: **Regular \$30/yr, Family \$35/yr.** Address all new memberships and renewals to: **The Prairie Astronomy Club, Inc., PO Box 5585, Lincoln, NE 68505-0585.** For other club information, please contact one of the club officers listed to the right. Newsletter comments and articles should be submitted to: **Mark Dahmke, P. O. Box 5585, Lincoln, NE 68505** or [mark@dahmke.com](mailto:mark@dahmke.com), no less than ten days prior to the club meeting. The Prairie Astronomy Club meets the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, NE.

## Meeting Minutes

PAC Meeting Minutes for September 24, 2013

Jason called meeting to order at 7:30.

Introduced program which was Mark Dahmke talking about a telescope mount and enclosure he built at his house and Jack Dunn would speak about Powell Observatory in Louisburg, Kansas.

Next meeting October 29 and includes election of club officers. No topic chosen. Jack Dunn made suggestions of a couple of possibilities for Xmas. Jack will send a notice by Night Sky Network as the December date is not the most convenient.

Bob was absent for Treasurer's Report so none was provided. Jason assured that the finances were in order.

Recent outreach events were discussed. Two upcoming October 5 Cub Scouts in Walton and October 26 Howling Homestead in Beatrice. Details will be sent by Night Sky Network. Volunteers are needed.

Observing report was presented by Jim

Kvasnicka. Star parties are Sept 27 and Oct 4 at the farm, and a Lunar party at Jim's October 11.

Jason reviewed roles of officers and pointed positions. Also will be presented in newsletter.

Nominations for officers included:

- President: Jack Dunn
- VP 1: Brett Boller
- VP 2: Zach Thompson
- Secretary: Dale Bazan
- Treasurer: Bob Kacvinsky

Nominations remain open until the election and can be made on the floor at October meeting.

Issues were noted with some not receiving The Reflector. Mark Dahmke suggested names should be forwarded to Astronomical League when memberships are received, not annually if that is the Practice.

Jason adjourned meeting at 8:00.

## Treasurer's Report for October

Checking	1443.43
Savings	7394.81
CDs	<u>29,942.15</u>
Total	<u>38,780.39</u>

Present membership: 68 with 21 members with unpaid dues

Single Membership: \$30  
Family Membership: \$35  
Student Membership: \$10

## ANNUAL MEMBERSHIP

REGULAR MEMBER - \$30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - \$35.00 per year. Same as regular member except gets 2 votes at club meetings.

STUDENT MEMBER - \$10.00 per year with volunteer requirement.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

## Club Telescopes

To check out one of the club telescopes, contact Cassie Etmund. If you keep a scope for more than a week, please check in once a week, to verify the location of the telescope and how long you plan to use it. The checkout time limit will be two weeks, but can be extended if no one else has requested use of a club scope.

100mm Orion refractor:  
Available

10 inch Meade Dobsonian:  
Available

13 inch Truss Dobsonian:  
Available

## PAC Star Party Dates

Dates in bold are closest to the new moon

Oct 25, **Nov 1**, Nov 29, **Dec 6 & 27**

### 2014 Star Party Dates

January 24, **31**  
February 21, **28**  
March 21, **28**, April 25  
**May 2, 23, 30**, June 20, **27**  
July 18, **25**  
NSP: July 27-Aug 1  
August **22, 29**, Sept 19, **26**  
Oct 17, **24**, Nov 14, **21**  
Dec 12, **19**

### Lunar Party Dates

May 9, June 6, Sept 5, Oct 3  
\* Lunar party dates are tentative, sites to be determined.

### PAC E-Mail:

[info@prairieastronomyclub.org](mailto:info@prairieastronomyclub.org)

### PAC-LIST:

To subscribe send a request to PAC. To post messages to the list, send to the address:

[pac-list@prairieastronomyclub.org](mailto:pac-list@prairieastronomyclub.org)

## Links

PAC: [www.prairieastronomyclub.org](http://www.prairieastronomyclub.org)

Night Sky Network: <https://nightsky.jpl.nasa.gov/>

CafePress (club apparel) [www.cafepress.com](http://www.cafepress.com)

[www.hydeobservatory.info](http://www.hydeobservatory.info)

[www.nebraskastarparty.org](http://www.nebraskastarparty.org)

[www.OmahaAstro.com](http://www.OmahaAstro.com)

[Panhandleastronomyclub.com](http://Panhandleastronomyclub.com)

[www.universetoday.com/](http://www.universetoday.com/)

[www.planetary.org/home/](http://www.planetary.org/home/)

<http://www.darksky.org/>

NGC4603 Credit: NASA

# Events

## PAC Meeting

PAC Meeting  
Tuesday Oct 29th, 2013  
@Hyde Observatory  
(Election)

PAC Meeting  
Tuesday Nov 26th, 2013  
@Hyde Observatory

December meeting date  
to be determined

Tuesday Jan 28th, 2014  
@Hyde Observatory

Newsletter submission deadline  
November 16, 2013



## Goals for PAC for 2014—Jack Dunn

---

Since it looks like I may be taking on the job of PAC President, I've written up some goals to accomplish for the year.

1. Reestablish the idea of a joint dinner with the Omaha Astronomical Society.  
– I've spoken recently with Bill Bond the OAS president and we have some ideas to try having such an event in February or more likely March.
2. We need to recruit more younger members. Some suggestions include:  
I am suggesting we have a special night at Hyde for science teachers sponsored by PAC.. We can try to work on this with the LPS Science Supervisor. Likewise I am arranging to get to speak to UNL's Astronomy 103 classes to promote PAC.
3. I don't plan on taking on all the duties alone. We will build a strong board to do all the work. Brett wants to work on the library and Cassie will take over Outreach Coordinator. We will continue to integrate PAC's website and social media presences.
4. PAC can investigate options regarding observing sites and possibly robotic observatories.
5. Produce a public-service announcement video for PAC to play on Time-Warner Cable and hopefully commercial stations.
6. Possibly organize a group trip to the Cosmosphere.

## Long-Sought Pattern of Ancient Light Detected—JPL

---

The journey of light from the very early universe to modern telescopes is long and winding. The ancient light traveled billions of years to reach us, and along the way, its path was distorted by the pull of matter, leading to a twisted light pattern.

This twisted pattern of light, called B-modes, has at last been detected. The discovery, which will lead to better maps of matter across our universe, was made using the National Science Foundation's South Pole Telescope, with help from the Herschel space observatory.

Scientists have long predicted two types of B-modes: the ones that were recently found were generated a few billion years into our universe's existence (it is presently 13.8 billion years old). The others, called primordial, are theorized to have been produced when the universe was a newborn baby, fractions of a second after its birth in the Big Bang.

"This latest discovery is a good checkpoint on our way to the measurement of primordial B-modes," said Duncan Hanson of McGill University in Montreal, Canada, lead author of the new report published Sept. 30 in the online edition of Physical Review Letters.

The elusive primordial B-modes may be imprinted with clues about how our universe was born. Scientists are currently combing through data from the Planck mission in search of them. Both Herschel and Planck are European Space Agency missions, with important NASA contributions.

The oldest light we see around us today, called the cosmic microwave background, harkens back to a time just hundreds of millions of years after the universe was created. Planck recently produced the best-ever full-sky map of this light, revealing new details about of our cosmos' age, contents and origins. A fraction of this ancient light is polarized, a process that causes light waves to vibrate in the same plane. The same phenomenon occurs when sunlight reflects off lakes, or particles in our atmosphere. On Earth, special sunglasses can isolate this polarized light, reducing glare.

Read the European Space Agency feature about this work at [http://www.esa.int/Our\\_Activities/Space\\_Science/Herschel/Herschel\\_helps\\_find\\_elusive\\_signals\\_from\\_the\\_early\\_Universe](http://www.esa.int/Our_Activities/Space_Science/Herschel/Herschel_helps_find_elusive_signals_from_the_early_Universe).



## Gravity - The Movie—Jack Dunn

---

By now most of you have probably seen the movie “Gravity.” I’m going to be careful here for those who have not in that I’m not going to say anything I think is a major spoiler. It is an intense drama and I don’t want to give away what happens. However, there are several points I think should be made. You probably know that immediately after the movie hit the theaters there were plenty of comments about its scientific accuracy – or problems with accuracy. There have been good commentaries already written by Neil Tyson

<http://blogs.wsj.com/speakeasy/2013/10/16/neil-degrasse-tyson-reboots-cosmos-and-reexamines-gravity/>

and Phil Platt

[http://www.slate.com/blogs/bad\\_astronomy/2013/10/04/ba\\_movie\\_review\\_gravity.html](http://www.slate.com/blogs/bad_astronomy/2013/10/04/ba_movie_review_gravity.html)

that explain the physics of the story. Even our own Nebraska astronaut Clay Anderson was hounded until he wrote something about the movie:

The “Gravity” of the Situation – posted on Facebook by Clayton C. Anderson

*“I give up! After several days of indecision, I have decided to put down in writing my thoughts on the new hit movie “Gravity,” starring Sandra Bullock and George Clooney. Too many questions have come my way asking my thoughts on this new blockbuster show. I simply couldn’t take it anymore. It doesn’t matter that the questions came from my relatives (a niece), one of our dogs, two Omaha radio stations and a former basketball referee... they were questions nonetheless and they were seeking MY expertise!*

*I realize that CNN or NBC or People Magazine or Dr. Phil didn’t contact me for my expertise, but when you are the only astronaut from Nebraska, you have to take it when you can get it! If you don’t like what I have to say, then you can just “google” astronauts Mike Massimino, Marsha Ivins, Tom Jones, Leroy Chiao, Sandy Magnus, Chris Hadfield or astro-physicist Neil DeGrasse Tyson. These google searches will lead you to all of their articles, interviews and musings about this new cinematic achievement.*



*First and foremost; I enjoyed the movie. I didn’t love it, I simply enjoyed it. And honestly, Sandra Bullock is very pleasant to look at when she is not in her spacesuit. Clooney, on the other hand, doesn’t do it for me – even when he’s chasing Dapper Dan hair cream in “Brother Where Art Thou?” (an astronaut office favorite) The local newspaper in Houston, the Chronicle, gave it 5 stars. I cannot agree with that assessment, but then I’m not a professional movie critic. Sandra Bullock in spanks, however, is worth about 3.5 stars.*

*The movie gets a lot of things right. Most important are its renditions of space and the planet Earth. This is expected as apparently they used a considerable number of NASA provided video images, taken in the last couple of years from the International Space Station. The interior views of the station’s modules, the Shuttle “Explorer,” and the Soyuz Space Capsule are also reasonably well done. While not perfect in every detail (an expectation of many in the space profession), they give a very accurate account to what I personally experienced during my 167 days in outer space. Of particular pleasure for me was a scene when Bullock, having entered the ISS, floats throughout its interior – excellent work by the movie folks!*

*I don’t choose to tackle the physics of the movie or the things that they don’t get quite right; another item for your aforementioned google search.*

*I encourage all of you to see the movie for yourself. Fork over the extra bucks and see it in 3D*

## Gravity, continued

---

*(you'll look really cool in those glasses!) as that will enhance your experience. But taking a cue from one of my colleagues who has been all over the news recently with regard to the film, use it as inspiration. View it in the manner for which it was intended; as entertainment. Take in the wonder and beauty that the filmmakers so expertly present – the wonder and beauty that only a few of us have been fortunate enough to see for real."*

---

Then tell everyone that you "... understand the "Gravity" of the situation!

Most of us who are in amateur astronomy are also fans of the space program – and also most of us are fans of the genre of science fiction. That may be as simple as the old original Star Trek (which although it had some great science fiction writers doing scripts certainly played fast and loose sometimes with science) to much more recent films and tv. I think sometimes to urge to be happy that any science makes it to the screen can cause people to go overboard in their praise of artistic endeavors (note I'm not talking documentaries here). And of course we know that a lot of film critics certainly don't know their science. So statements that "Gravity" is the most accurate portrayal of space ever can be taken as a bit of hyperbole.

What I would say is to follow a bit of what Clay said. It's only a movie. It is art, not a documentary. You have to separate the sense of art from the idea of the science. The director and producers made certain choices about the direction of the script and visuals. They made it more dramatic. As film, it's a good achievement. In making it more dramatic, they sometimes ignore Newton. That doesn't make it bad as film. If you are inspired by this view of space, that's great. Just don't assume everyone will have your reaction. Some might even be turned off by it. They might think space is way too dangerous and we shouldn't go there. Just pointing out the different types of reactions which might be in the public. As someone who deals with the public all the time, and will now have to explain to them that no, the shuttles aren't still flying, I'll have a different set of problems.(g) I'd say go and enjoy the film. For me, the most accurate still would be "Apollo 13" for it's actual filming of sequences in micro-gravity (they flew sets in the "Vomet Komet") or of course "2001." Some guy named Neil Armstrong said it had the best depiction of space he had ever seen. Of course he didn't get to see "Gravity" but I think he was correct in a lot of ways.

## Astronomical Society of Kansas City's Powell Observatory—Jack Dunn

---

In September I was part of the Western Alliance of Planetariums Conference held at Gottlieb Planetarium and Science City in Kansas City. As part of the meeting I did receive an interesting surprise. Nebraska Astronaut Clay Anderson was our banquet speaker. At the banquet he presented me with a plaque featuring a mission patch from his Expedition 15 group to the International Space Station. The patch flew in space back in 2007. On the plaque is a certificate showing the hours in space, orbits, etc. and also has a card signed by all of the astronauts and cosmonauts who flew in space with him. So it was quite a start to the week in Kansas City. I have worked with the ASKC over the last few years in the renovation of Gottlieb Planetarium. ASKC members Rick Henderson, Bentley Ouseley and Joe Wright volunteered at

Gottlieb and they took the information I had given them to build a projection system for fulldome in the Gottlieb. It's still running today and was used during the conference. But in working with the ASKC, I had several chances to visit their public observatory – Powell Observatory located 25 miles south of Kansas City in Louisburg, Kansas. Since I gave a talk at the October PAC meeting about Powell, I thought I would share some of the images I used and explain a bit more about their plans for the future.

Here in Lincoln, Hyde Observatory opened in 1977 and we in PAC have been its major source of volunteers for all those years. At Powell, they have a similar situation as it is operated by volunteers from ASKC. Moreover, the 30 inch Ruisinger telescope was actually built by

## Astronomical Society of Kansas City's Powell Observatory, Continued

---

members of ASKC. The fellow who did the major work was a mail carrier. This beast was constructed from scrap metal. It certainly is stable. Since they built it, the same people can take it apart and facilitate moving it. Plans are for this to happen as part of a five year plan ASKC has adopted for a new location and a larger observatory complex. During the WAC Conference, we did get one night to visit and observe at Powell. The skies cleared and we had views of Uranus and numerous M objects. The scope was designed for optical viewing, so unlike some other large scopes designed for research, it is very much a good scope for the public. However, because of its size, much of the time one has to climb a ladder to use it. That makes it difficult for anyone with disabilities to use it. Their plans for the future include a video system. In the case of Hyde, our light-polluted skies would make such a large aperture a waste. Yet, what Hyde has is the proximity to our population. For us to serve our community, we are in the correct place for those that want to view the Moon and planets.

Powell has a 16 inch Dobsonian and a 12.5 inch Dob in a roll-off roof structure, and another dome with a 12 inch SCT equipped with a CCD camera. The latter has been used by ASKC members studying asteroids. At Hyde,

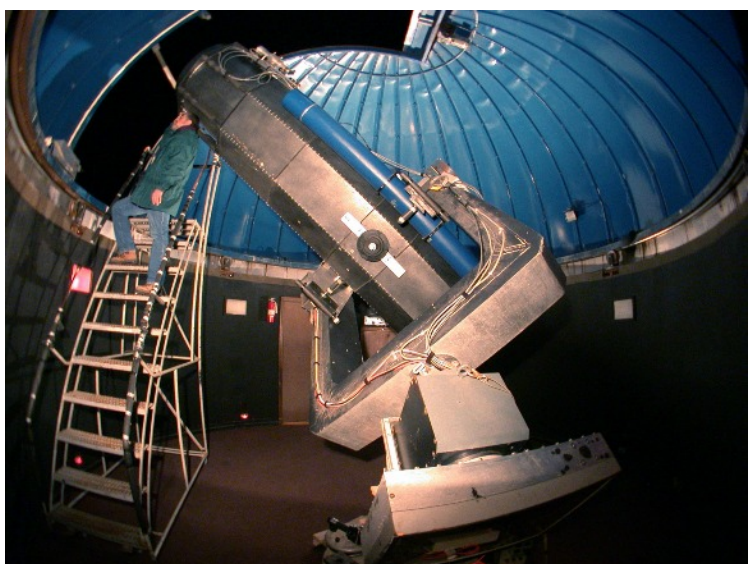
our newer scopes are computer controlled and the C-14 is not. We continue to think it is good to have one scope that can be operated completely manually.

At the present time, there are no plans to do a major expansion at Hyde, simply as it would necessitate a major fund-raising effort. ASKC is committed to doing that with Powell and their plan even includes a 40 foot diameter planetarium.

Here are their goals:

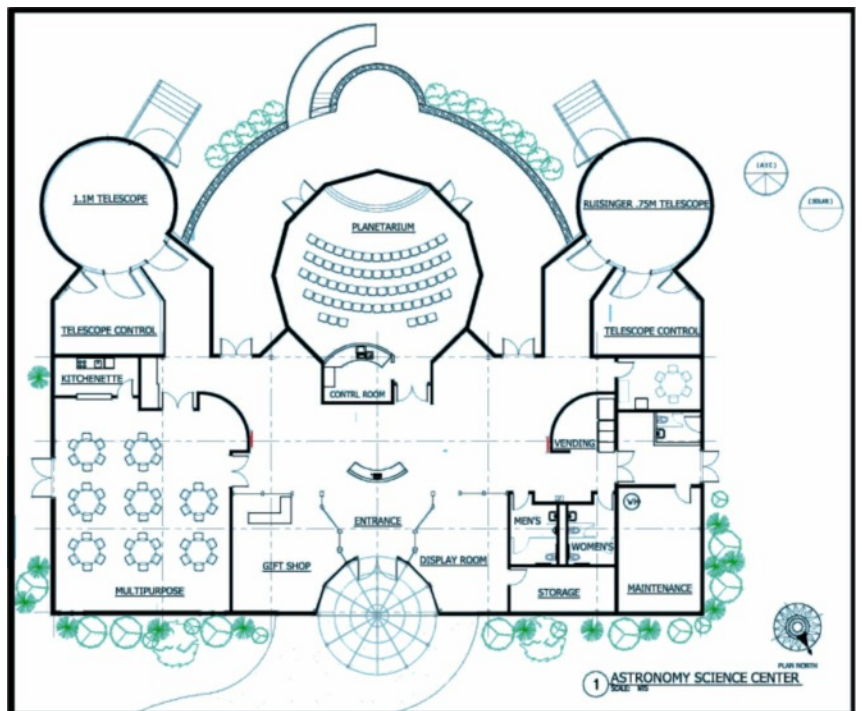
- New telescope and binocular areas
- Add permanent solar observatory
- Improve member observing and imaging capabilities
- Larger and improved meeting facilities
- Add Outdoor amphitheater
- Add Planetarium
- Upgrade observatory

The ASKC is a large club with over 180 members in a vibrant city. But I believe we can be proud of what we've done with Hyde over its almost 40 years of operation. If you are going to be in the Kansas City area from April through October, you might stop down to Lewisburg on a Saturday night and visit their facility.





# Astronomical Society of Kansas City's Powell Observatory, Continued





## Wet Asteroid's Remains Found In Old Star That Could Have Hosted Habitable Planets

*Universe Today*—Remains of a water-filled asteroid are circling a dying white dwarf star, right now, about 150 light-years from us. The new find is the first demonstration of water and a rocky surface in a spot beyond the solar system, researchers say.



*Artist's impression of a rocky and water-rich asteroid being torn apart by the strong gravity of the white dwarf star GD 61. Credit: Mark A. Garlick, space-art.co.uk, University of Warwick and University of Cambridge*

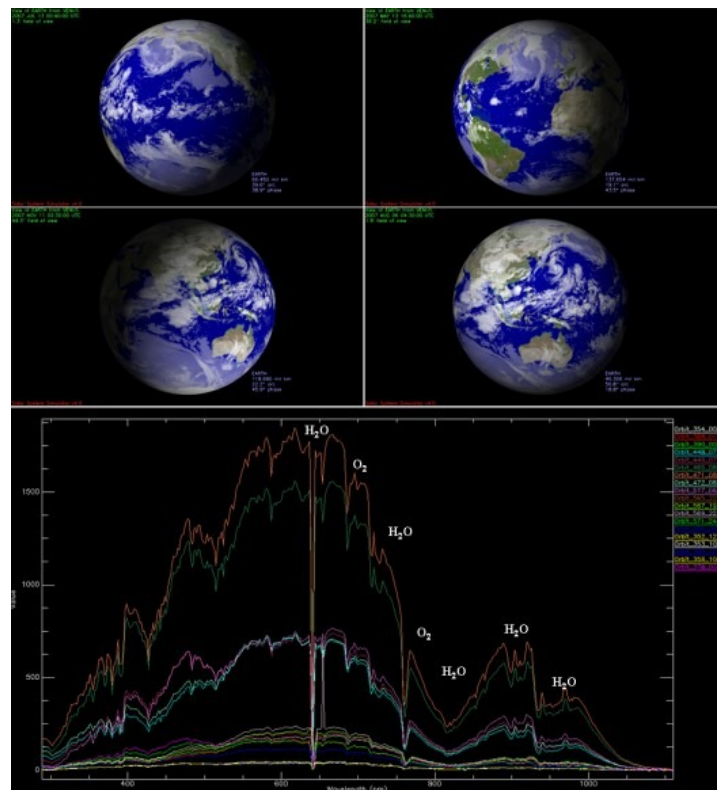
The discovery is exciting to the astronomical team because, according to them, it's likely that water on Earth came from asteroids, comets and other small bodies in the solar system. Finding a watery rocky body demonstrates that this theory has legs, they said. (There are, however, multiple explanations for water on Earth.)

“The finding of water in a large asteroid means the building blocks of habitable planets existed – and maybe still exist – in the GD 61 system, and likely also around substantial number of similar parent stars,” stated lead author Jay Farihi, from Cambridge’s Institute of Astronomy.

“These water-rich building blocks, and the terrestrial planets they build, may in fact be common – a system cannot create things as big as asteroids and avoid building planets, and GD 61 had the ingredients to deliver lots of water to their surfaces. Our results demonstrate that there was definitely potential for habitable planets in this exoplanetary system.”

More intriguing, however, is researchers found this evidence in a star system that is near the end of its life. So the team is framing this as a “look into our future”, when the Sun evolves into a white dwarf .

The water likely came from a “minor planet” that was at least 56 miles (90 kilometers) in diameter. Its debris was pulled into the atmosphere of the star, which was then examined by spectroscopy. This study revealed the ingredients of rocks inside the star, including magnesium, silicon and iron. Researchers then compared these elements to how abundant oxygen was, and found that there was in fact more oxygen than expected.



*Earth's oxygen and water as detected by Venus Express (ESA)*

“This oxygen excess can be carried by either water or carbon, and in this star there is virtually no carbon – indicating there must have been substantial water,” stated co-author Boris Gänsicke, from the University of Warwick.

“This also rules out comets, which are rich in both water and carbon compounds, so we knew we were looking at a rocky asteroid with substantial water content – perhaps in the form of subsurface

## Wet Asteroid, continued.

ice – like the asteroids we know in our solar system such as Ceres.”

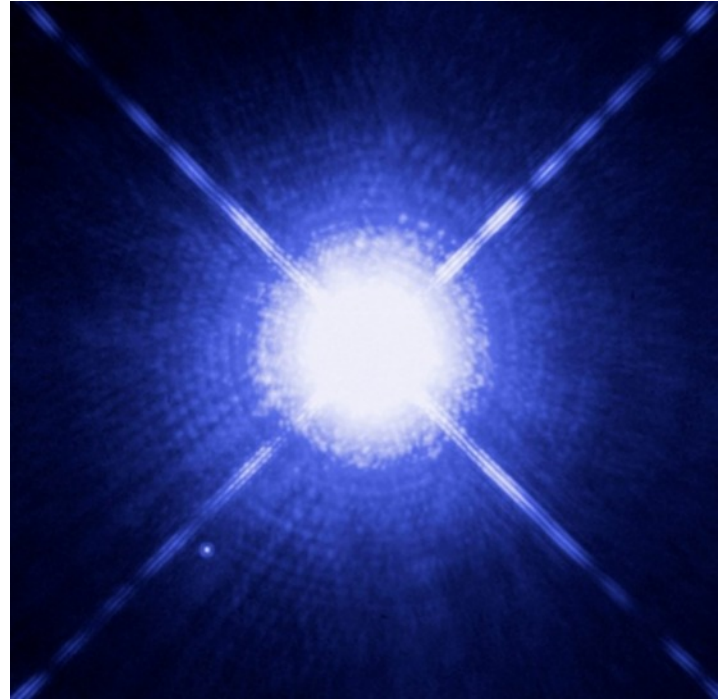
The measurements were obtained in ultraviolet with the Hubble Space Telescope’s cosmic origins spectrograph. What’s more, the researchers suspect there are giant exoplanets in the area because it would take a huge push to move this object from the asteroid belt — a push that most likely came from big planet.

“This supports the idea that the star originally had a full complement of terrestrial planets, and probably gas giant planets, orbiting it – a complex system similar to our own,” Farihi added.

Author: Elizabeth Howell, reprinted from Universe Today.

Read more:

<http://www.universetoday.com/105560/wet-asteroids-remains-found-in-old-star-that-could-have-hosted-habitable-planets/#ixzz2htmHpXRw>



*White Dwarf Star*

## International Observe the Moon Night—Cassie Etmund



The International Observe the Moon Night event that was held at SAC Museum. I really enjoyed going up to SAC that evening. We had about 60 people come out for the moon/star party. Got lots of kids that have never looked through a telescope before. There were 2 other members from OAS there, and I was the only one from PAC.



## November Observing—Jim Kvasnicka

---

This is a partial list of objects visible for the upcoming month.

### Planets

**Venus:** Increases in brightness from -4.5 to an amazing -4.7 in November.

**Mercury:** In the dawn sky it increases in brightness from 0.8 to -0.7.

**Saturn:** In conjunction with the Sun and does not become visible in the dawn sky until the last week of November.

**Jupiter:** In Gemini, rises around 10 pm daylight savings time to start the month and around 7 pm standard time to end the month. It shines at magnitude -2.6.

**Mars:** Rises around 2:30 am DST to start the month and by 1:00 am standard at the end.

**Uranus/Neptune:** In Pisces and Aquarius.

### Comets

**C/2012 S1 ISON:** Travels from Leo across Virgo and Libra into Scorpius this month. It will get brighter and lower each day. See November S&T page 50 for finder charts.

### Messier List

**M27:** The Dumbbell Nebula in Vulpecula.

**M30:** Class V globular cluster in Capricornus.

**M56:** Class X globular cluster in Lyra.

**M57:** The Ring Nebula in Lyra.

**M71:** Class XII globular cluster in Sagitta.

**M72:** Class IX globular cluster in Aquarius.

**M73:** Y shaped asterism in Aquarius.

**Last Month:** M11, M16, M17, M18, M24, M25, M26, M55, M75

**Next Month:** M2, M15, M29, M31, M32, M39, M110

### NGC and Other Deep Sky Objects

**NGC 225:** Caroline's Cluster in Cassiopeia.

**NGC 253:** The Silver Coin Galaxy in Sculptor.

**NGC 288:** Class X globular cluster in Sculptor.

**NGC 457:** The E.T. Cluster in Cassiopeia.

**NGC 7662:** The Blue Snowball in Andromeda.

### Double Star Program List

**Iota Trianguli:** Yellow primary with a pale blue secondary.

**Gamma Arietis:** Two equal white stars.

**Lambda Arietis:** Yellow and pale blue pair.

**65 Piscium:** Equal yellow stars.

**Psi 1 Piscium:** Equal bluish white stars.

**Zeta Piscium:** White primary with a yellow secondary.

**Alpha Piscium:** Close pair of white stars.

**Gamma Andromedae:** Almach, gold and greenish blue stars.

### Challenge Object

**NGC 7635:** The Bubble Nebula in Cassiopeia. Extremely faint, use averted vision.

---

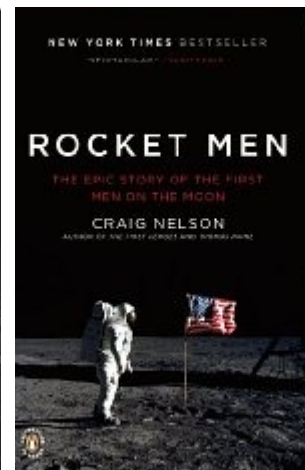
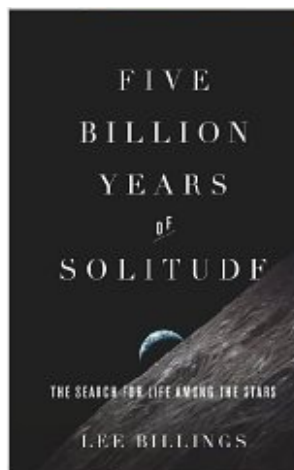
## Mark's Book Recommendations

Five Billion Years of Solitude: The Search for Life Among the Stars

ISBN 1617230065

Rocket Men: The Epic Story of the First Men on the Moon

ISBN 0143117165





## NGC Objects—Jim Kvasnicka

---

### The Silver Coin Galaxy NGC 253

NGC 253 was discovered in 1783 by Caroline Herschel, the sister of William Herschel who added it to his list of objects. It is located in the constellation Sculptor and is the brightest member of the Sculptor Galaxy Group some 10 million light years distant.

NGC 253 is a spiral galaxy with a true size of at least 70,000 light years, comparable to our Milky Way Galaxy. NGC 253 is known as the Silver Coin Galaxy or the Sculptor Galaxy.

The Silver Coin galaxy is a large galaxy with an apparent size of 25' x 7'. It is one of the brightest galaxies in the sky and is visible through binoculars.



NGC 253. Photo credit: T.A. Rector/University of Alaska Anchorage, T. Abbott and NOAO/AURA/NSF.



**Amateur Astronomy —  
A Hobby as Big as the  
Universe**

**PRESIDENT**      **Jason Noelle**  
402-730-8317  
jason.noelle@gmail.com

**VICE  
PRESIDENT**      Vacant

**2nd VP  
(Program Chair)**      **Jack Dunn**  
jdunn@spacelaser.com

**SECRETARY**      **Dale Bazan**  
dale.bazan@gmail.com

**TREASURER**      **Bob Kacvinsky**  
bob.kacvinsky@syngenta.com  
402-423-4967

Club Observing Chair **Jim Kvasnicka**  
(402) 423-7390  
jim.kvasnicka@yahoo.com

Website Editor:      **Mark Dahmke**

Newsletter Editor:      **Mark Dahmke**

Publicity      **Jack Dunn**  
Jdunn@spacelaser.com

The Prairie Astronomer  
c/o The Prairie Astronomy Club, Inc.  
P.O. Box 5585  
Lincoln, NE 68505-0585

**FIRST CLASS MAIL**

**Next PAC Meeting  
TUESDAY  
October 29, 2013  
7:30 PM  
Hyde Observatory**