



# The Prairie Astronomer

March, 2013

Volume 54, Issue #3

The Official Newsletter of the Prairie Astronomy Club

## March Program

## Professor Jack Gable - Creighton University

### Black Holes and Quasars

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  - What to View in March
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- The James Webb telescope gets its wings
- A look at Comet PANNSTARS

NGC 3521 is a very disturbed flocculent spiral galaxy in Leo about 35 million light-years distant. NGC 3521 is embedded in gigantic bubble-like shells. The shells are likely tidal debris, streams of stars torn from satellite galaxies that have undergone mergers with NGC 3521 in the distant past.

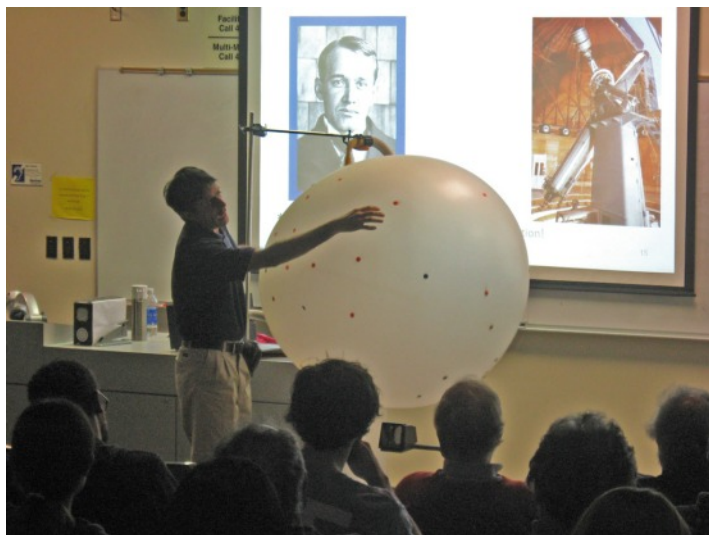
*Image Credit: PAC Member Rick Johnson*

## Featured Photo



# Dr. Bharat Ratra - Kansas State University Cosmologist

On Saturday March 2nd, PAC helped sponsor a talk at Morrill Hall by Dr. Bharat Ratra. He gave a fascinating talk on dark matter and dark energy and how it fits within the universe. All photos are courtesy of Jack Dunn.



## Club Events

## ON THE NET

Newsletter submission deadline April 15, 2013

PAC Meeting

Tuesday March 26th, 2013 @Hyde Observatory  
Prof. Jack Gable of Creighton University

Astronomy Day

April 20, 2013

PAC Meeting

Tuesday April 30th, 2013 @Hyde Observatory  
TBA

**PAC:**

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

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

**NSP:**

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

**NSP E-Mail:**

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

**OAS**

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

**Hyde Observatory**

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

**2013 PAC Star Party Dates - Dates in bold are closest to the new moon**

January	Jan 4th	<b>Jan 11th</b>
February	Feb 1st	<b>Feb 8th</b>
March	Mar 1st	<b>Mar 8th</b>
April	Apr 5th	<b>Apr 12th</b>
May	May 3rd	<b>May 10th</b>
June	May 31st	<b>Jun 7th</b>
July	Jun 28th	<b>Jul 5th</b>
<b>NSP</b>	<b>Aug 4-9</b>	
August	Aug 2nd	<b>Aug 9th</b>
September	Aug 30th	<b>Sep 6th</b>
October	Sep 27th	<b>Oct 4th</b>
November	Oct 25th	<b>Nov 1st</b>
December	Nov 29th	<b>Dec 6 and 27th</b>

**Lunar Party Dates:**

Apr 19th  
May 17th

Aug 16th  
Sep 13th  
Oct 11th

**Panhandle Astronomy Club**

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

**PAC-LIST:** You may subscribe to the PAC listserv by sending an e-mail message to: [imailsrv@prairieastronomyclub.org](mailto:imailsrv@prairieastronomyclub.org). In the body of the message, write "Subscribe PAC-List your-email-address@your-domain.com"

For example:

Subscribe pac-list me@myISP.com

To post messages to the list, send to the address

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

PAC can also be found on Twitter and Facebook.

Buy club apparel through the club website. Shirts, hats, mugs, mouse pads and more.



### **Internet Links of Interest**

<http://www.universetoday.com/>

<http://www.thespacereview.com>

<http://www.thespacereview.com/article/1945/1>

<http://space.flatoday.net/>

<http://www.spaceportamerica.com/>

<http://www.planetary.org/home/>

<http://www.nasaspaceflight.com/>

<http://www.spacex.com>

## March Observing: What to View--Jim Kvasnicka

### Planets

**Jupiter:** Fades in brightness from magnitude -2.1 to -2.0. By the end of April Jupiter will be setting by 11 pm.

**Saturn:** Saturn reaches opposition on April 28<sup>th</sup>. It will increase in brightness to a magnitude 0.1 with its rings tilted 18°. The ring system measures 43" x 13".

**Venus/Mercury/Mars/Uranus/Neptune:** All are not visible this month.

### Comets

**PanSTARRS (C/2011 L4):** The comet will be moving to the north. How bright?

### Meteor Showers

**Lyrids:** Peaks the early morning of April 22<sup>nd</sup>. The Lyrids are not very predictable.

### Messier List

**M40:** A close pair of stars in Ursa Major.

**M65/M66:** Part of the Leo Triplet Group.

**M95/M96:** Both galaxies in Leo fit in the same FOV.

**M97:** The Owl Nebula in Ursa Major.

**M105:** A small galaxy in Leo.

**M106:** Oval galaxy in Canes Venatici.

**M108/M109:** Galaxies in Ursa Major.

**Last Month:** M41, M44, M46, M47, M48, M50, M67, M81, M82, M93

**Next Month:** M49, M51, M61, M63, M64, M85, M94, M101, M102, M104

### NGC and Other Deep Sky Objects

**NGC 2903:** Bright galaxy in Leo.

**NGC 3079:** Elongated galaxy in Ursa Major.

**NGC 3384:** Elongated galaxy in Leo.

**NGC 3628:** Part of the Leo Triplet Group with M65 and M66.

### Double Star Program List

**Alpha Leonis:** Regulus, white and yellow pair.

**Gamma Leonis:** Algieba, pair of yellow stars.

**54 Leonis:** Yellow primary with a greenish colored secondary.

**Alpha Canum Venaticorum:** Cor Caroli, blue-white and greenish pair.

**Zeta Ursa Majoris:** Mizar, pair of white stars.

**Gamma Virginis:** Porrima, close pair of yellow stars.

**24 Comae Berenices:** Yellow primary with a pale-blue secondary.

**Delta Corvi:** White and rose colored stars. .

## Basic Astronomy

How many of you know how big your field of view is when looking through your telescope? How many of you know how to calculate the field of view?

Field of view is another term we use in astronomy and not understood by everyone.

**Actual Field of View:** The angular width of the patch of sky you are looking at through the telescope.

The eyepiece we use in our telescope determines both the magnification and the actual field of view we see through our telescope. Each eyepiece has a focal length and an apparent field of view.

**Apparent Field of View:** The width in degrees of the field as seen through just the eyepiece. This can vary from 30° to over 100°.

**Magnification** = Telescope Focal Length / Eyepiece Focal Length

**Actual Field of View** = Apparent Field of View / Magnification

Once you determine the magnification for an eyepiece in your telescope you can then determine the FOV for that eyepiece.

I have a 10 inch Orion XT Dobsonian telescope with a focal length of 1200mm. One of the eyepieces I use quite often is a Stratus 17mm with an apparent field of view of 68°. What is the FOV when I use the Stratus 17mm in my telescope?

**Magnification:**  $1200 / 17 = 70.5x$

**Actual Field of View:**  $68 / 70.5 = 0.96^\circ$  or 57.6 arc minutes (0.96 x 60)

The 17mm Stratus gives me a FOV just under one degree. So how does knowing the FOV help me? Knowing the FOV for my different eyepieces helps me determine which eyepiece to use when observing certain objects. If I want to look at M44, The Beehive Cluster, I know I need an eyepiece that gives me a large FOV. The Beehive has a listed size of 95'. My 17mm Stratus has a FOV of 57.6'. If I used that eyepiece I would not be able to fit the whole Beehive in the FOV.

Knowing the FOV also helps me when I'm looking for new objects. I'm currently working on the Herschel 400 Program. There are a number of small galaxies to observe for the program. Before I go out observing I put together a list of objects and what their apparent size is in a 10 inch telescope. If NGC 1055 in Cetus has a listed size of 4'x1' I then know what it will look like in my FOV. If my FOV is 57.6' then NGC 1055 will be a small streak that doesn't take up much room in the FOV. Knowing the FOV will allow you to estimate the size of an object. Some observing programs ask that you estimate the size of the objects you observe.

If you have any questions on FOV I would be glad to answer them.

## 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.**

**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 telescope contact **Ben Rush**. If you keep a scope for more than a week, please check in with Ben 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**

# NASA's Webb Telescope Gets Its Wings

- Sciencedaily.com

A massive backplane that will hold the primary mirror of NASA's James Webb Space Telescope nearly motionless while it peers into space is another step closer to completion with the recent assembly of the support structure's wings.

The wings enable the mirror, made of 18 pieces of beryllium, to fold up and fit inside a 16.4-foot (5-meter) fairing on a rocket, and then unfold to 21 feet in diameter after the telescope is delivered to space. All that is left to build is the support fixture that will house an integrated science instrument module, and technicians will connect the wings and the backplane's center section to the rest of the observatory. The center section was completed in April 2012.

"This is another milestone that helps move Webb closer to its launch date in 2018," said Geoff Yoder, NASA's James Webb Space Telescope program director, NASA Headquarters, Washington.

Designed, built and set to be tested by ATK at its facilities in Magna, Utah, the wing assemblies are extremely complex, with 900 separate parts made of lightweight graphite composite materials using advanced fabrication techniques. ATK assembled the wing assemblies like a puzzle with absolute precision. ATK and teammate Northrop Grumman of Redondo Beach, Calif., completed the fabrication.

"We will measure the accuracy down to nanometers -- it will be an incredible engineering and manufacturing challenge," said Bob Hellekson, ATK's Webb Telescope program manager. "With all the new technologies that have been developed during this program, the Webb telescope has helped advance a whole new generation of highly skilled ATK engineers, scientists and craftsmen while helping the team create a revolutionary telescope."

When fully assembled, the primary mirror backplane support structure will measure about 24 feet by 21 feet and weigh more than 2,000 pounds. The backplane must be very stable, both structurally and thermally, so it does not introduce changes in the primary mirror shape, and holds the instruments in a precise position with respect to the telescope. While the telescope is operating at a range of extremely cold temperatures, from minus 406 to minus 360 degrees Fahrenheit, the backplane must not vary more than 38 nanometers (about one one-thousandth the diameter of a human hair). The thermal stability requirements for the backplane are unprecedented.

"Our ATK teammates demonstrated the thermal stability on test articles before building the wing assemblies with the same design, analysis, and manufacturing techniques. One of the test articles ATK built and tested is actually larger than a wing," said Charlie Atkinson, deputy Webb Optical Telescope Element manager for Northrop Grumman in Redondo Beach, Calif. "The mirrors are attached to the wings, as well as the rest of the backplane support structure, so the alignment is critical. If the wings distort, then the mirror distorts, and the images formed by the telescope would be distorted."



The James Webb Space Telescope is the successor to NASA's Hubble Space Telescope. It will be the most powerful space telescope ever built and observe the most distant objects in the universe, provide images of the first galaxies formed and see unexplored planets around distant stars. The Webb telescope is a joint project of NASA, the European Space Agency and the Canadian Space Agency.

Technicians complete the primary mirror backplane support structure wing assemblies for NASA's James Webb Space Telescope at ATK's Space Components facility in Magna, Utah. ATK recently completed the fabrication of the primary mirror backplane support structure wing assemblies for prime contractor Northrop Grumman on the Webb telescope. (Credit: Northrop Grumman/ATK)

Technicians complete the primary mirror backplane support structure wing assemblies for NASA's James Webb Space Telescope at ATK's Space Components facility in Magna, Utah. ATK recently completed the fabrication of the primary mirror backplane support structure wing assemblies for prime contractor Northrop Grumman on the Webb telescope. (Credit: Northrop Grumman/ATK)

## Challenge Observing Objects for March/April

Each month I will have two objects, one for the more seasoned observer and one for the beginning observer. Each object I hope will challenge you just a little bit. I will provide you with a little bit of information about the object. It is your job to find it and if you would write a little report or draw what you see. The first person to report back on each object will have their report published in the next issue of the newsletter. Happy Hunting!

### Advanced Object

#### NGC 2371/2372

This faint planetary nebula is located in Gemini. When it was discovered in 1785 it was thought to be two separate objects. It is better known as the Gemini Nebula because of the two brighter lobes of the nebula. It has an apparent magnitude of 11.2 and is 55 arc seconds in size. It is best seen with a OIII filter. It lies approximately 4,400 light years from Earth.



*Image Credit: Brad Snowder*

### Beginner Object

#### NGC 3242

This planetary nebula is also called The Ghost of Jupiter is located in Hydra. It has a blue-green color. It is 2,900 light years from Earth. It's apparent magnitude is 7.3 and is 40 x 35 arc seconds in size.



*Image Credit: Klaus Hobmann*

## Comet PANNSTARS from the Club's point of view



*Mark Dahmke*



*Brett Boller*





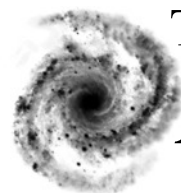
*Brett Boller*



*Jason Noelle*



*Jason Noelle*



# THE *Prairie* *Astronomy* *Club*

Amateur Astronomy --  
A Hobby as Big as the Universe

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: **Jason Noelle at [jason.noelle@gmail.com](mailto:jason.noelle@gmail.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.

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Club Observing Chair:	<b>Jim Kvasnicka</b> <a href="mailto:jim.kvasnicka@yahoo.com">jim.kvasnicka@yahoo.com</a>
Outreach Coordinator:	
Website Editor:	<b>Ben Rush</b>
Publicity:	<b>Jack Dunn</b> <a href="mailto:Jdunn@spacelaser.com">Jdunn@spacelaser.com</a>

FIRST CLASS MAIL

**Next PAC Meeting**  
**Tuesday**  
**April 30 , 2012**  
**7:30 PM**  
**Hyde Observatory**