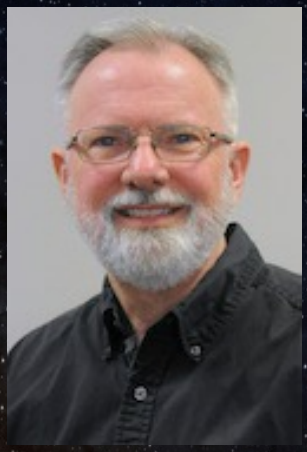
# The Prairie Astronomer

December 2014 Volume 55, Issue #12

December Program:

## The Start of TMT Construction



Our guest speaker for the December meeting will be Larry Stepp, Telescope Department Head of the Thirty Meter Telescope Project. Larry is a Lincoln native and a member of PAC.

The Newsletter of the Prairie Astronomy Club

**Next PAC Meeting:**
**TUESDAY December 30, 2014 7:30 PM**
**Mueller Planetarium**

# Program

Instead of the regular club meeting, we will have a private holiday gathering at Mueller Planetarium.

Our guest speaker will be Larry Stepp, Telescope Department Head of the Thirty Meter Telescope Project. Larry is a Lincoln native and a member of PAC.

"The Start of TMT Construction"

*The Thirty Meter Telescope international partnership has committed to the start of the construction phase of the project and work on Mauna Kea and in the partner countries is ramping up. This presentation will provide a brief introduction to TMT, describe current activities and highlight the multi-year path forward to completion and first light.*

# Observing Awards

Congratulations to Dan Delzell for completing the Caldwell Observing Program. Dan is the first PAC member to earn the Caldwell award. This is Dan's third observing award having already completed the Messier Program and the Globular Cluster Program. Congratulations again to Dan.

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, 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.

# Events

PAC Meeting
Tuesday December 30th, 2014, 6:30pm
Mueller Planetarium

PAC Meeting
Tuesday January 27th, 2015, 7:30pm
Hyde Observatory

PAC Meeting
Tuesday February 24th, 2015, 7:30pm
Hyde Observatory

Newsletter submission deadline January 15, 2014

# Club Officers

| | |
|---|---|
| **PRESIDENT** | **Jim Kvasnicka**<br>(402) 423-7390<br>jim.kvasnicka@yahoo.com |
| **VICE PRESIDENT** | **Brett Boller**<br>proboller86@yahoo.com |
| **2nd VP (Program Chair)** | **Dave Churilla**<br>dchurilla@neb.rr.com |
| **SECRETARY** | **Lee Taylor**<br>otaylor88@gmail.com |
| **TREASURER** | **John Reinert**<br>jk6@aol.com |
| Club Observing Chair | **Jim Kvasnicka**<br>jim.kvasnicka@yahoo.com |
| Outreach Coordinator | **Dan Delzell**<br>dan@delzell.net |
| Website and Newsletter Editor | **Mark Dahmke**<br>mark@dahmke.com |



Night Sky Network

# Club Membership Info

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 Dave Churilla. 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

# Internet

PAC: www.prairieastronomyclub.org
Night Sky Network: https://nightsky.jpl.nasa.gov/
CafePress (club apparel) www.cafepress.com

www.hydeobservatory.info
www.nebraskastarparty.org
www.OmahaAstro.com
Panhandleastronomyclub.com
www.universetoday.com/
www.planetary.org/home/
http://www.darksky.org/

# PAC Star Party Dates

Dates in bold are closest to the new moon

**2015 Star Party Dates**
Jan 16,**23**, Feb 13,**20**
Mar 13,**20**, Apr 10,**17**
May 8,**15**, Jun 12,**19**
Jul 10,**17**, NSP **Jul12-17**
Aug 7,**14**, Sep 4,**11**
Oct **9**,16, Nov 6,**13**
Dec 4,**11**

**Lunar Party Dates**
Mar 27, Apr 24, Jul 24, Aug 21 (Lunar party dates are tentative, sites to be determined.)

**PAC E-Mail:**
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

# Club Apparel

Order club apparel from cafepress.com:


# Address

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

# Club Meeting Minutes

Prairie Astronomy Club
Minutes for the Meeting of November 25, 2014

Call to order, welcome 7 visitors

Jim recognized our new members, Billy Allen and Beth Jenckes, whose image of Orion featured in the November Newsletter.

Review of new officers

President Jim Kvasnicka
VP: Brett Boller
secretary: Lee Taylor
Treas: John Reinert
PC: Dave Churilla
Obs chair: Jim
Outreach coordinator: Dan Delzell
Newsletter editor: Mark Dahmke

Upcoming events and activities

Hyde Memorial Observatory is open every Sat except on or near major holidays, such as this Saturday, after Thanksgiving.

The next meeting is a club gathering on Dec. 30 at Mueller Planetarium. This will be a private, members only group. We'll meet at 6:30 for a social hour with snacks, followed by Larry Stepp as our guest speaker.

Jim briefly discussed club membership benefits and activities, including:

Volunteering at Hyde, public outreach activities, such as those at Homestead National Monument, and club support of Mahoney State Park Star Parties.

Monthly meetings featuring speakers on astronomyt topics
membership in the Astronomical League
newsletter subscriptions and subscription to the AL publication, The Reflector.
Participation in Mahoney star parties, at Mahoney State Park

Brian Sivill noted that Mahoney star parties are now under the auspices of the Nebraska Star Party, as opposed to being a PAC or OAS activity.
Observing Report. Dec.
12, & 19th Star parties

Club business

2017 Eclipse: We've been contacted by some organizations who would like help with their presentations of the eclipse. North Platte and Lincoln County visitor's bureau, Matt Penn National Solar Obs. Fleet of 80mm 'scopes Oregon – South Carolina. Several members expressed
a preference to observe this once-in-a-lifetime event with friends and family as opposed to performing public presentations. We will share these with requests with the club membership, members should feel welcome to help, but as a club we would not, as yet, make any pledges to help with these events.

Tom Mill Observatory/ robotic control.

Brian talked about the tour he and Brett took of Tom Miller's observatory and presented several options for upgrading and operating Tom's facility as a club remotely controlled observatory. Brian expressed a desire to provide Tom with a final proposal early in 2015. There was a concern about having the membership being able to make comments, present ideas, etc. during any discussion of this.

Adjourn to program, How to Buy a Telescope.

# On-Site Construction Begins on the Thirty Meter Telescope in Hawaii

Construction is now underway for the next-generation Thirty Meter Telescope (TMT) will launch a multi-national $1.4 billion project near the summit of Mauna Kea, Hawaii.

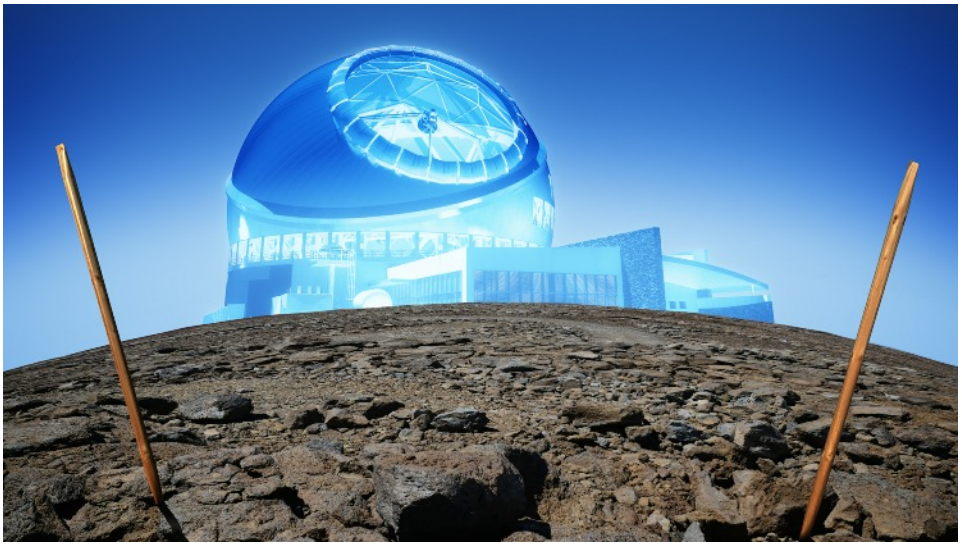
Next-Generation Discoveries from a Next-Generation Observatory
"This is an exciting moment as we begin construction of TMT. Its giant mirror, nearly 100 feet across, promises the highest definition views of planets orbiting nearby stars and the first stars and galaxies in the distant universe," said Edward Stone, Executive Director, TMT International Observatory.

The TMT International Observatory (TIO) is an international partnership with members comprised of the California Institute of Technology, the National Astronomical Observatories of the Chinese Academy of Sciences, the National Institutes of Natural Sciences in Japan, and the University of California. India recently received approval from the Union Cabinet of India to join the TMT project this fall, and Canada is aiming to join as a member in spring 2015.

Initial activities in Hawaii include site preparation and grading, and offsite work has begun in earnest as well. In China, partners are designing the telescope's fully articulated main science steering mirror system and developing the laser guide star system. Japan has produced over sixty special zero thermal-expansion glass mirror blanks for the main mirror and is designing the telescope structure in detail. Fabricating the mirror support system is ongoing in India. The adaptive optics facility is in final design and the enclosure is ready for construction in Canada. The mirror control system is in final design in California.

"With profound respect for the culture, environment, and values, and thanks to the people of Hawaii, we appreciate the opportunity to build this revolutionary facility for expanding our understanding of the universe," said TIO Board Chair Henry Yang. "This is a remarkable partnership among institutions in five nations, in cooperation with the University of Hawaii, to achieve a shared, visionary goal. We are grateful for the hard work and outstanding support of so many, including the Gordon and Betty Moore Foundation, over the past decade to reach this important and meaningful milestone."

"TMT has made a commitment to the people of Hawaii to work within a plan created by the Office of Mauna Kea Management for responsible development on Mauna Kea," said Sandra Dawson, TMT's Manager of Hawaii Community Affairs. "Respect for the community and Mauna Kea is the cornerstone of our continuing stewardship."



***TMT Groundbreaking***

*An artist concept of TMT for the groundbreaking*

# Texas Star Party

The great tradition of dark sky observing continues with the 37th Annual TEXAS STAR PARTY, May 10-17, 2015.

Staying on the Ranch in housing, RV, or camping? Staying off-site in other accommodations? Everyone needs to enter the TSP drawing, held in late January.

Submit a Registration/ Reservation Request Form to ENTER THE TSP DRAWING before January 21, 2015. This will provide you the highest possible chance of being selected as one of the 500 people who will be able to attend TSP this year.

Follow this link to get started: https://texasstarparty.org/get-started/

Get info on our new AstroLearn Workshop at https://texasstarparty.org/astrolearn/

Need funds to help pay for your trip to TSP? You can find out about getting paid while at TSP at: https://texasstarparty.org/paid-workers-needed/

Check out the latest news at: https://texasstarparty.org/news/

Questions? Visit our web site for the latest and complete details! https://texasstarparty.org/ or email TSPRooms@TexasStarParty.org

We look forward to seeing you next May!

Sincerely,
the volunteers for Texas Star Party

# A Chemical Signature of First-Generation Very-Massive Stars

[Adapted from an announcement from NAOJ] - A team of astronomers from the National Astronomical Observatory of Japan (NAOJ), the Konan University and the University of Hyogo in Japan, the University of Notre Dame, and New Mexico State University has used the 8.2 m Subaru Telescope to discover a distant low-mass star, dubbed SDSS J0018-0939. This special star exhibits the peculiar chemical abundance ratios associated with the process of creating new atomic nuclei (nucleosynthesis) in a first-generation very-massive star. Until now, no observational evidence has supported numerical simulations of the existence of very-massive stars among the first generation of stars formed after the Big Bang.

These first-generation stars are objects formed in the early Universe (within a few hundred million years after the Big Bang) from gas clouds containing only hydrogen and helium. First-generation stars are the probable precursors of the formation of the Universe's structure and chemical enrichment; large stellar systems, e.g., galaxies, formed later.

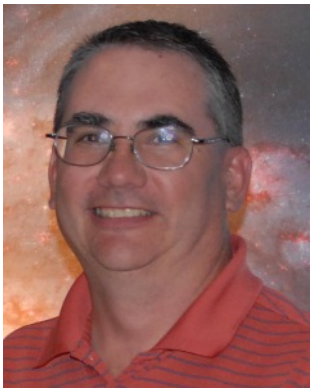
Further research to find early generations of low-mass metal-poor stars is necessary to estimate the proportion of very-massive stars among the first stars. If very-massive stars are relatively common, next-generation large telescopes such as Thirty Meter Telescope (TMT) and the James Webb Space Telescope (JWST) will have the potential to directly detect groups of such first stars in studies of the most distant galaxies.

Dr. Wako Aoki, TMT-Japan Communications Scientist, was lead author on the paper describing these findings titled "A chemical signature of first-generation very-massive stars," published in the journal Science on August 22, 2014.

For more information, please see: http://www.naoj.org/Pressrelease/2014/08/21/index.html.

# January Observing: What to View

*Jim Kvasnicka*



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

## Planets

**Venus/Mercury:** Very near each other the first part of January at dusk. Look for Mercury to the lower right of bright Venus.

**Mars:** At magnitude 1.2. Look 20° to the upper left of Venus and Mercury.

**Neptune:** On January 19th Neptune is just ¼° to the upper right of Mars.

**Uranus:** In Pisces at magnitude 5.7.

**Jupiter:** In Leo rising around 8 pm to start January and a half hour after sunset to end the month. Jupiter brightens to magnitude -2.6 with a disk 45.3" wide.

**Saturn:** Starts the month rising around 4 am and by 2:30 am to end the month.

## Messier List

**M33:** The Triangulum Galaxy.

**M34:** Open cluster in Perseus.

**M52**: Open cluster in Cassiopeia.

**M74:** Galaxy in Pisces.

**M76:** The Little Dumbbell in Perseus.

**M77:** Galaxy in Cetus.

**M103:** Open cluster in Cassiopeia.

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

**Next Month:** M1, M35, M36, M37, M38, M42, M43, M45, M78, M79

## NGC and other Deep Sky Objects

**NGC 2360:** Open cluster on Canis Major.

**NGC 2362:** The Tau Canis Majoris Cluster.

**NGC 2392:** The Eskimo Nebula in Gemini.

**NGC 2403:** Galaxy in Camelopardalis.

**NGC 2423:** Open cluster in Puppis.

**NGC 2440:** Planetary nebula in Puppis.

## Double Star Program List

**Beta Orionis:** Rigel, bright white and dim blue stars.

**Delta Orionis:** Mintaka, bright white and pale blue pair.

**Struve 747:** Equal pair of white stars.

**Lambda Orionis:** Pair of white stars.

**Theta 1 Orionis:** The Trapezium.

**Iota Orionis:** Bright white and blue stars.

**Theta 2 Orionis:** Three white stars.

**Sigma Orionis:** White primary with three pale blue stars.

**Zeta Orionis:** Alnitak, white primary with two white secondary stars.

## Challenge Object

**NGC 2438:** Planetary nebula in Puppis, a foreground object in open cluster M46.

# NGC Objects

*Jim Kvasnicka*

## The Eskimo Nebula - NGC 2392

NGC 2392 is a 9.1 magnitude planetary nebula in Gemini. It was discovered by William Herschel in 1787. NGC 2392 is 3,000 light years away and has an apparent size of 0.7 arc minutes.

The Eskimo Nebula gets its name because it resembles a face surrounded by a fur parka. The planetary nebula formed some 10,000 years ago when the star ejected its atmosphere. It the seeing conditions are good use high magnification to observe the Eskimo Nebula. The blue planetary is a great object to view in a 10 inch or larger telescope. The +10.5 magnitude central star is visible.

NGC 2392 is part of the Herschel 400 list and Caldwell Object 39.

# Galactic Gathering Gives Sparkling Light Display

At this time of year, holiday parties often include festive lights. When galaxies get together, they also may be surrounded by a spectacular light show. That's the case with NGC 2207 and IC 2163, which are located about 130 million light-years from Earth, in the constellation of Canis Major.

This pair of spiral galaxies has been caught in a grazing encounter. NGC 2207 and IC 2163 have hosted three supernova explosions in the past 15 years and have produced one of the most bountiful collections of super-bright X-ray lights known. These special objects -- known as "ultraluminous X-ray sources" (ULXs) -- have been found using data from NASA's Chandra X-Ray Observatory.

This composite image of NGC 2207 and IC 2163 contains Chandra data in pink, optical-light data from NASA's Hubble Space Telescope visible-light data in blue, white, orange and brown, and infrared data from NASA's Spitzer Space Telescope in red.

More information about the image is online at:

http://chandra.harvard.edu/photo/2014/ngc2207

*That's the case with NGC 2207 and IC 2163, which are located about 130 million light-years from Earth, in the constellation of Canis Major. Image credit: NASA/CXC/SAO/STScI/JPL-Caltech*