



The Prairie Astronomer

February, 2011

Volume 52, Issue #2

The Official Newsletter of the Prairie Astronomy Club

February Program

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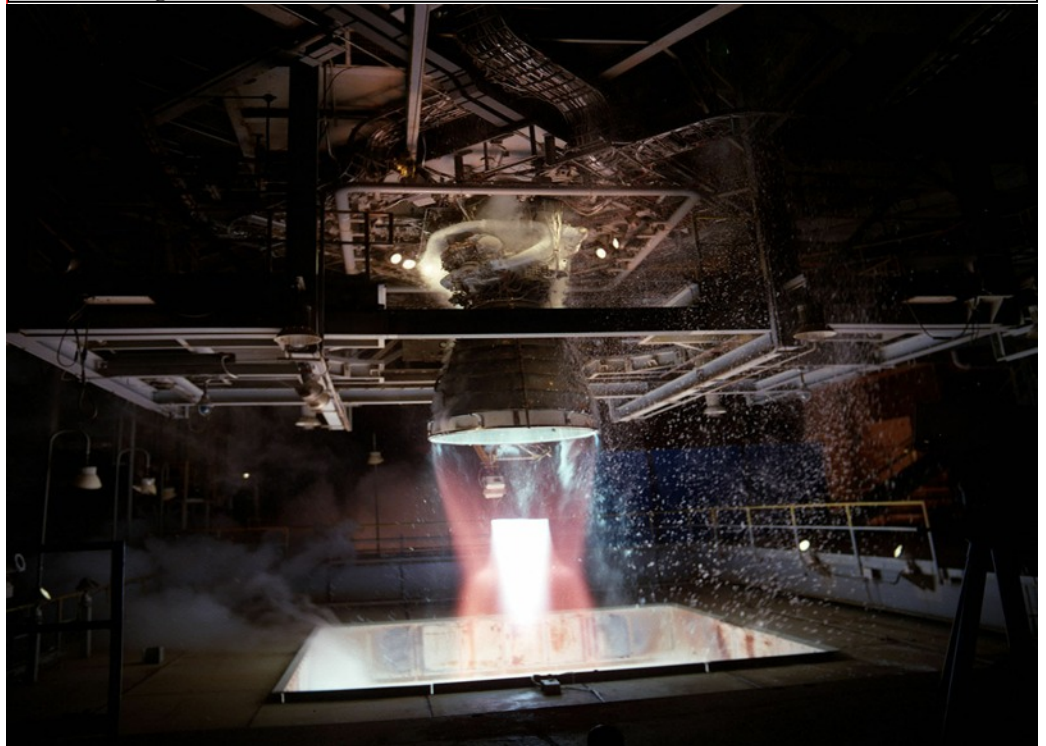
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Working on the Space Shuttle Engines

PAC member John Reinert will provide an overview of his experiences working with Space Shuttle Main Engines in Southern California twenty years ago. At that time it was thought that advanced instrumentation might play a leading role in reducing engine recycle times and promoting the general Health and Condition Monitoring of liquid rocket engine propulsion systems. Technologies included: Plume Spectrometry, Non-intrusive Speed Sensing, Bearing Wear Analysis, Robotic Welding, Particle Impact Noise Detection, among others

The photo is a Technology Test Bed Engine test (Space Shuttle Main Engine with added instrumentation) conducted at Marshall Space Flight Center, Huntsville, Alabama, December 12th, 1993. While in California, PAC member John W. Reinert listened to the control center talk via telephone link while this test was conducted. A Non-intrusive Speed Sensor was one of many instruments tested that day. John and his engineering team had delivered the speed sensor hardware shortly before the test. The sensor was designed to measure High Pressure Oxygen Turbopump (HTOTP) shaft speed ~28,000 RPM in a way that didn't adversely affect fluid flow (Liquid Oxygen, LOX) near the shaft. John will discuss this technology and his other experiences working on Space Shuttle Engines at our next meeting.

Featured Photo



Meeting Minutes - Brett Boller

January 25th, 2010 PAC Meeting

Announcements:

Dan Delzell called the meeting to order.

The next PAC star parties will be on Jan. 28th and Feb. 4th.

The next PAC meeting will be Tuesday February 22th, 7:30 PM at Hyde.

Upcoming Programs will be

Feb. – John Reinert – His workings on the Space shuttle main engines.

March – Jim Kvasnicka – How to sketch your observations.

Outreach upcoming events

Beginning Astronomy Class – April 7th & 8th.

Astronomy Day May 7th.

Hyde Saturday nights.

Volunteer at Hyde

We are looking for Volunteers .

Observing Report

Star parties.

Dec 31st 0 attendees.

Jan. 7th 0 attendees.

Evening planets in February include Jupiter and Uranus.

Night Planets in February include Saturn.

Morning Planets in February include Venus and Mercury

A new white storm has formed on Saturn.

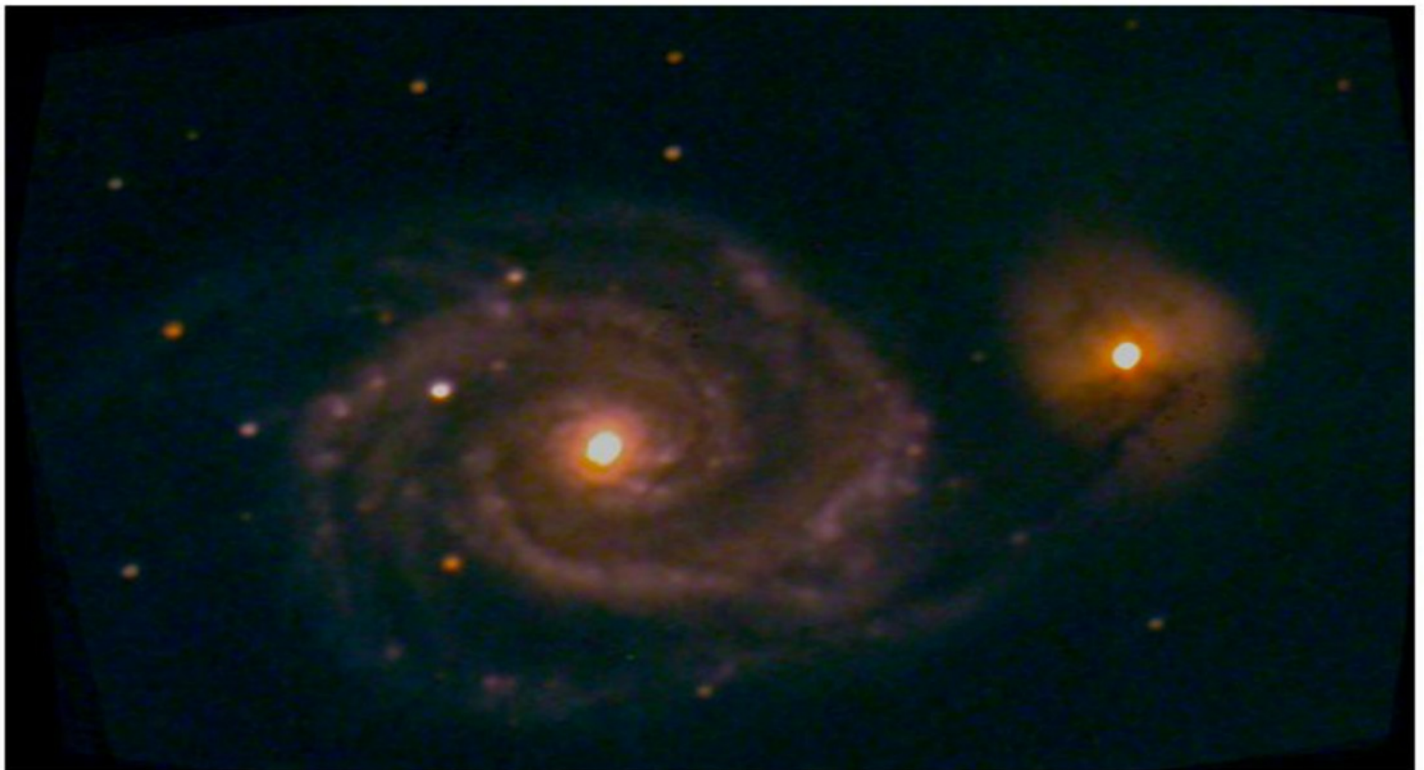
Canus Major was the topic constellation.

Financial audit was concluded by

Bob Levitt

David Kinchlow

Jim Kvasnicka



Whirlpool Galaxy in Canes Venatici (M51, NGC5195)
Celestron CPC 1100 - Meade DSI Pro II @prime * .5 - 47 subs @ 1min.
January 29, 2011 - Brett Boller

Club Events

ON THE NET

Newsletter submission deadline, March 15, 2011

PAC Club Meeting:

Tuesday, February 22, 2011 7:30pm @ Hyde Obsv.

Program: Speaker John Reinert, club member and engineer who was part of the Shuttle engine design team. PAC member John W. Reinert will provide an overview of his experiences working with Space Shuttle Main Engines in Southern California in the late 80's and early 90's.

PAC Club Meeting:

Tuesday, March 29, 2011 7:30pm @ Hyde Obsv.

Program: How to Sketch Your Observations by Jim Kvasnicka.

PAC Club Meeting:

Tuesday April 26, 2011 7:30pm @ Hyde Obsv.

Program: The Dummy's Guide to Filters by Dave Knisely

PAC:

www.prairieastronomyclub.org

PAC E-Mail:

info@prairieastronomyclub.org

NSP:

www.nebraskastarparty.org

NSP E-Mail:

info@nebraskastarparty.org

OAS

www.OmahaAstro.com

Hyde Observatory

www.hydeobservatory.info

Panhandle Astronomy Club

Panhandleastronomyclub.com

2011 PAC Star Party Dates

February	Feb 25th	Mar 4th	
March	Mar 25th	Apr 1st	
April	Apr 22nd	Apr 29th	May 6th
May	May 27th	Jun 3rd	
June	Jun 24th	Jul 1st	
July	Jul 22nd	Jul 29th	
August	Aug 26th	Sep 2nd	
September	Sep 23rd	Sep 30th	
October	Oct 21st	Oct 28th	
November	Nov 18th	Nov 25th	
December	Dec 16th	Dec 23rd	

Lunar Party Dates:

Mar 11th
Apr 8th
May 13th
Jun 10th
Jul 8th
Aug 5th
Oct 7th
Nov 4th

Dates in **BOLD** are closest to the New Moon. Lunar Party dates are possible dates and not official.

Volunteer Activities

Hyde Observatory on Saturday nights

PAC Beginners Field Class: April 7 and 8

New Club Member's Instructional Class: To be determined.

Please see the website or email a club member for more information and as always additional volunteer events will occur when they are scheduled.

PAC-LIST: You may subscribe to the PAC listserv by sending an e-mail message to: mailsrv@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

PAC can also be found on Twitter and Facebook.

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



March Observing: What to View--Jim Kvasnicka

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

Planets

Venus: Rises about 1³/₄ hours before sunrise. Venus fades in magnitude to -3.9.

Neptune: On March 27th Neptune is 1/2° west of Venus. Venus is 60,000 times brighter.

Saturn: Rises in Virgo around two hours after sunset to start March and by sunset to end March.

Mars and Uranus: Both are lost in the glow of the Sun.

Jupiter: Sets two hours after the Sun to start March. By the end of the month it is lost in the glow of the Sun.

Mercury: Becomes visible to the lower right of Jupiter the 2nd week of March.

March Messier List

M41: Open cluster in Canis Major.

M44: The Beehive Cluster in Cancer.

M46/M47: Open clusters in Puppis.

M48: Open cluster in Hydra.

M50: Open cluster in Monoceros.

M67: Open cluster in Cancer.

M81/M82: Galaxy pair in Ursa Major.

M93: Open cluster in Puppis.

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

Next Month: M40, M65, M66, M95, M96, M105, M106, M108, M109

NGC and Other Deep Sky Objects

NGC 2440: Planetary nebula in Puppis with an oval disk.

NGC 2451: Open cluster in Puppis.

NGC 2477: Open cluster in Puppis.

NGC 2610: Faint planetary nebula in Hydra.

NGC 3242: The Ghost of Jupiter in Hydra.

Double Star Club List

Epsilon Canis Majoris: Bright white and bluish white stars.

Delta Geminorum: Wassat, yellow and pale red pair.

Alpha Geminorum: Castor, white and yellow stars.

12 Lyncis: Close yellow white stars.

19 Lyncis: Pair of white stars.

38 Lyncis: White primary with a yellow secondary.

Zeta Cancri: Yellow and pale yellow pair.

Iota Cancri: Yellow primary with a pale blue secondary.

Challenge Object

NGC 2438: A planetary nebula in Puppis. It is a foreground object in the rich open cluster M46. Use 100x or higher to make out the planetary nebula.

Focus On Constellations - Jim Kvasnicka

Puppis

Puppis, the Ship's Stern, was once part of the ancient Greek constellation Argo Navis, the Ship. Due to its size it was divided in the 1750's into Puppis, the Ship's Stern; Pyxis, the Compass; Vela, the Sails; and Carina, the Keel. Puppis alone still covers 673 square degrees. Puppis is east and southeast of Canis Major and it contains an exceptionally star-rich portion of the Milky Way. Because of this Puppis is rich in open clusters including three Messier objects in M46, M47, and M93. The open clusters in Puppis vary a great deal. Several are large and loose, some are large and rich and a number are faint and require a medium to large telescope to be seen. Puppis is best seen in the month of March.

Mythology and History

In Greek mythology the ship Argo was the vessel commanded by Jason and his fifty Argonauts in search of the Golden Fleece. When they returned with the Fleece, Althena commemorated the event by placing the ship Argo in the heavens.

Objects Magnitude 12.0 and Brighter

Galaxies: NGC2310, NGC2427, NGC2525, NGC2559, NGC2566, NGC2578, IC2311

Open Clusters: M46, M47, M93, NGC2396, NGC2414, NGC2421, NGC2478, NGC2423, NGC2439, NGC2432, NGC2453, NGC2455, NGC2477, NGC2479, NGC2482, NGC2483, NGC2489, NGC2527, NGC2520, NGC2533, NGC2539, NGC2546, NGC2567, NGC2571, NGC2580, NGC2587, NGC2509, Cr147, Cr146, Cr155, Cr168, Cr185, Cr187, Ru32, Ru34, Ru36, Ru44, Ru47, Ru49, Ru55, Ru59, Czernik29, Bochum4, Bochum5, Haffner15, Pismis1

Globular Clusters: NGC2298

Planetary Nebulae: NGC2438, NGC2440, NGC2452

Bright Nebulae:

SNREM:

Dark Nebulae:

Named Stars: Naos (Zeta), Azmidiske (Xi)

Number of Objects in Various Observing Clubs

Messier Club: 3 objects

Double Star Club: 1 object

Herschel 400 Club: 13 objects

Globular Cluster Club: 1 object

Open Cluster Club: 6 objects

Planetary Nebula Club: 3 object

Urban Club: 1 object

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 **Jason Noelle**. If you keep a scope for more than a week, please check in with Jason 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

Program Chair Minute - Dave Churilla

First of all, I want to thank all the club members who helped out at the last meeting for the “Learn to Use Your Telescope” Program. We had 5 families that came out and who got a LOT of great hands on help with their scopes. I believe we had 11 guests and there were 23 club members there. Your help means a lot to our guests...I know because they told me. Plus I felt that way on my first visit to a club meeting. So don't discount the worth of your interaction with someone where our hobby is concerned. Again, thanks to everyone for their help.

Also, thanks so much for your patience with our changing the meeting times. We did that for the programs in November, December and January to accommodate guests with children. For the How-To programs we wanted to end at a reasonable time and still get everyone's questions answered and not be out too late if they brought their children. We had a great time at the Holiday Get-Together in December and again we started early to allow our PAC families with young kids to attend and not be out too late. We'll be back to our normal meeting times this month (7:30 PM at Hyde Observatory).

This month we are pleased to present our own club member John Reinert presenting a program entitled “Working on the Shuttle Engines” (How technology is packaged and sold for the benefit of large scale engineering projects like the Space Shuttle.)

John will provide an overview of his experiences working with Space Shuttle Main Engines in Southern California twenty years ago. At that time it was thought that advanced instrumentation might play a leading role in reducing engine recycle times and promoting the general Health and Condition Monitoring of liquid rocket engine propulsion systems.

Technologies included: Plume Spectrometry, Non-intrusive Speed Sensing, Bearing Wear Analysis, Robotic Welding, Particle Impact Noise Detection, among others.

John first joined PAC while attending Pound Junior High, some 36 years ago. After graduating Lincoln Southeast H.S. and Nebraska Wesleyan University with a B.S. in Physics he moved to Denver to perform Air Pollution Control Research. In the aftermath of the Challenger disaster an employment opportunity with the Rocketdyne Division of Rockwell International propelled him to Canoga Park, CA. John attended the Riverside Amateur Telescope Makers Conference at Big Bear Lake on at least seven occasions, but then this is another presentation (careful John, we'll hold you to that additional presentation ☺).

I've been putting this at the end of my article, but I think perhaps it bears a more prominent place. The members of the PAC Executive Committee work together to plan the monthly PAC Programs. Our goal for the programs is to provide a good mix of information, entertainment (including time to visit with one another), and to make them relevant for all experience levels as well as to hit all interests in astronomy (that is to say not only observational but also internet, space

exploration, NASA, etc.). In addition we want to get club members involved with giving presentations as there are a lot of levels of expertise in different areas that we all could benefit from. But we also would love to have your comments and suggestions concerning what you'd like see in those programs. Let us know your ideas, suggestions, do you like what were doing, etc. Call me at 402-467-1514 or email me at weber2@inebraska.com.

That being said, following are upcoming programs you won't want to miss.

March 2011: How to Sketch Your Observations by Jim Kvasnicka. For years Jim has sketched what he sees in his telescope adding an extra measure of enjoyment to his viewing and creating some very good work – in fact many of his sketches look more like photographs. Jim will share some of his secrets and tricks, show you step by step how he does it and help you get started in sketching your own observations.

April 2011: A Dummy's Guide to Filters by Dave Knisely. This will be a very beneficial program as filters can enhance your observing enjoyment of many objects and Dave is extremely knowledgeable about them. He'll try to give you in plain English a good idea of what to use, which are the best, and which are the best for the money. And NO – I don't think he'll have a review of Ron Veys' Cloud Filters!!!

May 2011: Safely Viewing the Sun by Dave Churilla. This will be a short presentation on Solar Filters, both White Light and H-Alpha, how to view the sun safely, how to get started, what's new in the past few years and what are the best buys. It will be, by necessity, very NON-TECHNICAL (meaning I'm Techno-Challenged). If the sky is clear I will be giving the presentation at the beginning of the meeting and outside with the telescopes for a more hands experience with White Light and H-Alpha filters and will have slides on my laptop. We'll then adjourn to inside Hyde for the main meeting. But you know my reputation so it's likely we'll be INSIDE (due to clouds) with a regular PowerPoint presentation.

June 2011: We are considering a swap meet & possibly a BBQ in June. If so it will feature Cajun Bob K's Smoked Pulled Pork sandwiches. Stay tuned for details.

I'll try to keep you apprised of upcoming programs so you can plan to attend.

Challenge Observing Objects for February

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 2438

A planetary nebula in the constellation Puppis. It was discovered by William Herschel in 1786. The planetary nebula NGC 2438 appears to lie within the cluster M46, but it is most likely unrelated since it does not share the cluster's radial velocity. The case is yet another example of a superposed pair, joining the famed case of NGC 2818. The central star of this planetary nebula has a magnitude of 17.7.



Beginner Object

Trapezium Cluster

A tight open cluster of stars in the heart of the Orion Nebula. The Trapezium is a relatively young cluster that has formed directly out of the parent nebula. The five brightest stars are on the order of 15-30 solar masses in size. They are within a diameter of 1.5 light-years of each other and are responsible for much of the illumination of the surrounding nebula.



Astronomy Day Volunteers: Dave Churilla

May 7, 2011 is Astronomy Day. This is a day across the nation that we celebrate the science and hobby of Astronomy and Space Exploration. For those new to the club, PAC joins with other groups to man stations at the UNL Museum, Morrill Hall, to allow the public to experience first hand the fun and fascination of the different disciplines of Astronomy. Last year PAC had 9 stations and we will need volunteers to man those stations again this year. It encompasses several floors and generally draws over 500 people. It's a great outreach opportunity for PAC not to mention a lot of fun.

This year I'll be organizing the volunteers ahead of time and assigning the stations, and Kris Gainsforth will be task master the day of the event to help you get to your assigned stations as I can't be there because my son is graduating from UNL that day. I'll be emailing everyone in PAC as a reminder about the event and volunteering then I'll try to email you individually or talk to you at a meeting to see if you can help out and assign you a station to work if you don't have a preference. We like to have the same stations we did last year although we'll be replacing a couple of the stations with new ones. But if you know ahead of time you want to work, please email me and let me know at weber2@inebraska.com or call me at 402-467-1514. Now this is not a warning to hide when you see me emailing you for help or asking for it during meetings. But it is a heads up that we will be looking for people to work Astronomy Day. So please be thinking of what you want to do. And mark May 7th on your calendars and I'll be in touch!!!

Universe Could be 250 Times Bigger Than What is Observable: Vanessa D'Amico of Universe Today

Our Universe is an enormous place; that's no secret. What is up for discussion, however, is just how enormous it is. And new research suggests it's a whopper – over 250 times the size of our observable universe.

Currently, cosmologists believe the Universe takes one of three possible shapes:

- 1) It is flat, like a Euclidean plane, and spatially infinite.
- 2) It is open, or curved like a saddle, and spatially infinite.
- 3) It is closed, or curved like a sphere, and spatially finite.

While most current data favors a flat universe, cosmologists have yet to come to a consensus. In a paper recently submitted to Arxiv, UK scientists Mihran Vardanyan, Roberto Trotta and Joseph Silk present their fix: a mathematical version of Occam's Razor called Bayesian model averaging. The principle of Occam's Razor states that the simplest explanation is usually the correct one. In this case, a flat universe represents a simpler geometry than a curved universe. Bayesian averaging takes this consideration into account and averages the data accordingly. Unsurprisingly, the team's results show that the data best fits a flat, infinite universe.

But what if the Universe turns out to be closed, and thus has a finite size after all? Cosmologists often refer to the Hubble volume – a volume of space that is similar to our visible Universe. Light from any object outside of the Hubble volume will never reach us because the space between us and it is expanding too quickly. According to the team's analysis, a closed universe would encompass at least 251 Hubble volumes.

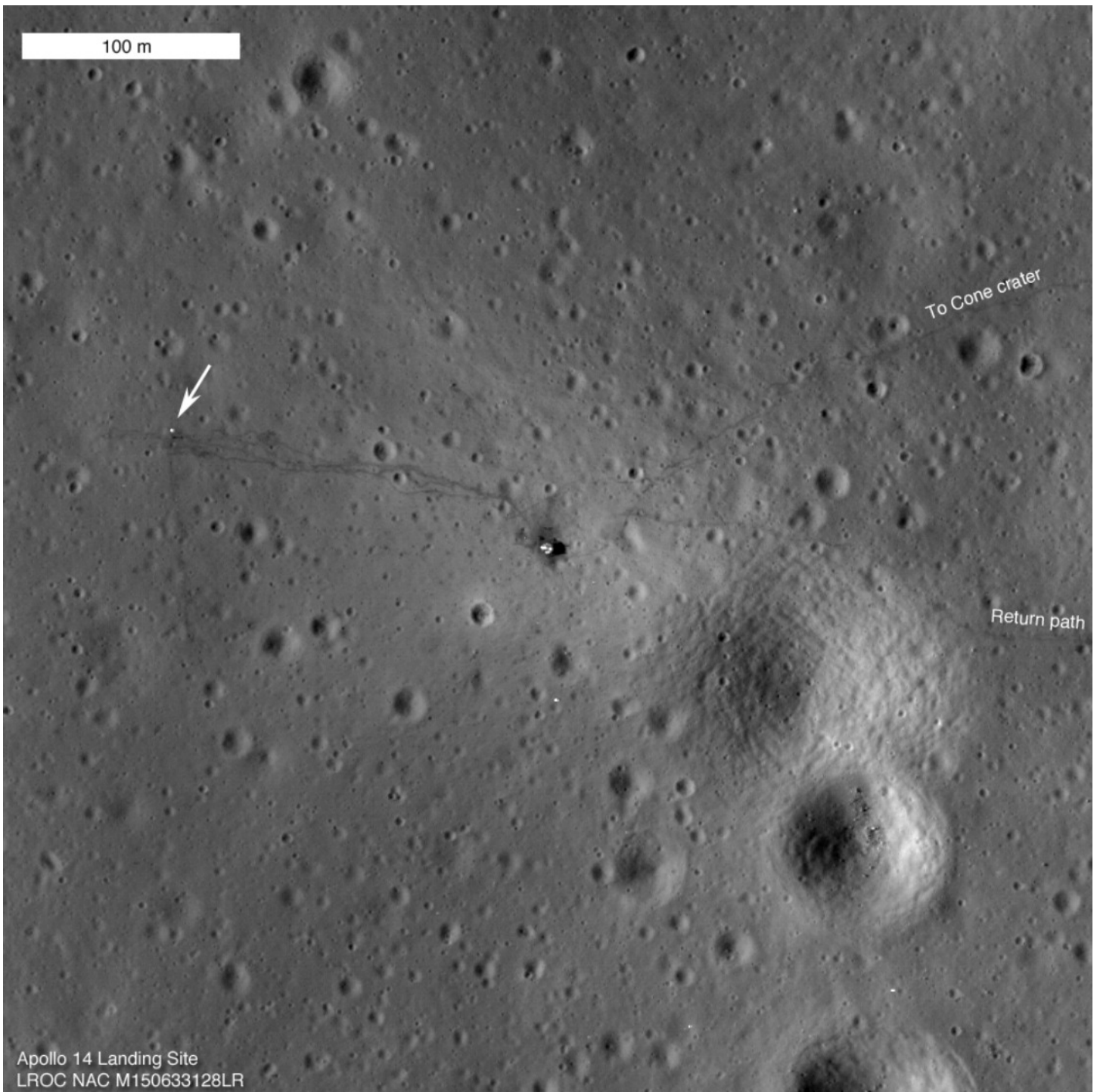
That's quite a bit larger than you might think. Primordial light from just after the birth of the Universe started traveling across the cosmos about 13.75 billion years ago. Since special relativity states that nothing can move faster than a photon, many people misinterpret this to mean that the observable Universe must be 13.75 billion light years across. In fact, it is much larger. Not only has space been expanding since the big bang, but the rate of expansion has been steadily increasing due to the influence of dark energy. Since special relativity doesn't factor in the expansion of space itself, cosmologists estimate that the oldest photons have travelled a distance of 45 billion light years since the big bang. That means that our observable Universe is on the order of 90 billion light years wide.

To top it all off, it turns out that the team's size limit of 251 Hubble volumes is a conservative estimate, based on a geometric model that includes inflation. If astronomers were to instead base the size of the Universe solely on the age and distribution of the objects they observe today, they would find that a closed universe encompasses at least 398 Hubble volumes. That's nearly 400 times the size of everything we can ever hope to see in the Universe!

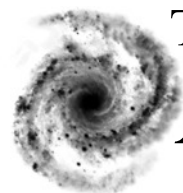
Given the reality of our current capabilities for observation, to us even a finite universe appears to go on forever.

Brand New Look at Apollo 14 Landing Site: Nancy Atkinson of Universe Today

40 years ago this month, the Apollo 14 crew landed on the Moon. Here's the latest look at their landing site, just downloaded from the Lunar Reconnaissance Orbiter's Narrow Angle Cameras. Even though LRO has imaged this area before, this seems to be a much better, crisper view of the lander and the ALSEP experiment package left of the Moon by Al Shepard and Edgar Mitchell. Also visible are the tracks left where the astronauts walked repeatedly in a "high traffic zone" and perhaps by the Modularized Equipment Transporter (MET) wheelbarrow-like carrier used on Apollo 14



Credit: NASA/GSFC/Arizona State University



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 oegrad2002@yahoo.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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FIRST CLASS MAIL

Next PAC Meeting
TUESDAY
February 22 , 2011
7:30 PM
Hyde Observatory