



Reflections

The Newsletter of the Popular Astronomy Club

ESTABLISHED 1936



October 2022

REFLECTIONS from the President



Dale Hachtel

At our public programs this year, it seems that the “popular” is returning to astronomy.

We have had a very busy year for our public observing

programs, and requests for more continue to arrive. Although we’ve had to cancel some public observing due to weather, the sessions we had in clear weather were well attended, with many visitors indicating it was the first time they came to a public astronomy observing program.

Our recent program in Port Byron, hosted by the River Valley District Library, the Cordova Library, and the Riverdale Schools, was attended by more than 128 guests.

Recent astronomy news has spurred public interest in astronomy, with many questions being asked about the news from space.

The James Webb Space Telescope has been of significant interest to the public, with news media generally covering new images from it almost weekly. The recent OSIRIS-REx (Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer) spacecraft which is returning an asteroid sample has also generated some questions from visitors.

So has the recent DART (Double Asteroid Redirection Test) mission to de-

flect a space object as a test for future defense against asteroids that stray near earth. The new NASA Artemis Program to return to the moon and go beyond, although delayed several times, has generated a lot of interest.

Some visitors have also asked about new astronomical observation methods, such as the robotic exploration on Mars, the infrared imaging capability of the Webb Telescope, and the future of radio astronomy after the Arecibo radio telescope went out of service a couple of years ago.

The solar eclipse of 2017, and the upcoming eclipse in 2024, also are contributing to the public interest in astronomy.

At the Popular Astronomy Club, we will continue to learn more about the future of astronomy with our upcoming meetings. For our banquet speaker on October 22, we will hear Dr. Dennis Roscoe talk about the Webb Telescope and new ground-based telescopes being developed to give us even greater capabilities.

At our November meeting, we will hear Jim Dole, from the Doug Firebaugh Observatory in Freeport, Illinois, talk about radio astronomy.

Don’t forget to renew your membership in PAC as soon as possible (*see page 18*), and RSVP for the annual banquet by October 8 (*see page 3*).

This increased interest in amateur astronomy is a great reason to keep looking up.



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Peoria astro club welcomes guests

Members of the Popular Astronomy Club, the Quad Cities Astronomical Society, and all other clubs in the Midwest are welcome to attend meetings of the Peoria Astronomical Society, either in-person or virtually.

The meetings are held live at the Peoria Riverfront Museum, and can also be viewed online via Zoom. When you log onto Zoom, please be sure to include your club name (e.g. PAC, QCAS) with your on-screen name.

Meetings are generally held on the first Wednesday of the month, with the next scheduled for October 5. At that meeting, Rob Landis from NASA will give a presentation on planetary defense.

The meeting on November 2 will feature a presentation on archaeoastronomy by Dean Regas from the Cincinnati Observatory. The "big news" in astronomy for 2022 will be the topic of a talk on December 7, by guest speaker Dr. Shannon Schmoll from the Abrams Planetarium at Michigan State University.

More information is available from Sheldon Schafer, program chair of the Peoria Astronomical Society, at sschafer7@gmail.com.



ANNOUNCEMENTS / INFO



NCRAL Seasonal Messier Marathon Program

NCRAL's Seasonal Messier Marathon observing program is NOT designed to qualify observers for the Astronomical League's Messier Observing program; the two programs are unrelated and observing requirements are quite different. In the NCRAL program, the main requirement is to quickly observe and essentially check off items from one of four seasonal lists of Messier objects as noted in the section to follow.

NCRAL recognition will consist a suitable printed certificate and a 3/4-inch enameled star pin (a different color for each season). There will be no direct cost to the membership for participating in the award program; the cost of the program (pins, certificates, mailers, postage) will be borne by the Region as a benefit of affiliation. Relevant program documents are linked below

[NCRAL Seasonal Messier Marathon Rules](#)

[NCRAL SPRING Seasonal Messier List](#)

[NCRAL SUMMER Seasonal Messier List](#)

[NCRAL AUTUMN Seasonal Messier List](#)

[NCRAL WINTER Seasonal Messier List](#)

HOW'S THE WEATHER?



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If you have questions or request, or want more information on PAC, send an e-mail to: popularastronomyclub@gmail.com

Annual PAC banquet scheduled for October 22

The Popular Astronomy Club will hold its annual banquet on Saturday evening, October 22, beginning at 5:30 p.m. at the Riverfront Grille in Rock Island.

The keynote speaker at the event will be Dr. Dennis Roscoe, who will make a presentation titled "Next Generation Telescopes."

Dr. Roscoe teaches courses in astronomy and astrophotography at the University of Wisconsin–Waukesha and was recently named as a NASA Solar System Ambassador.

Dr. Roscoe holds a Ph.D. in neurophysiology from the University of Arizona and has been a professor of biomedical engineering at Case Western Reserve University in Cleveland, Ohio, and a professor of neurology at

the University of Wisconsin College of Medicine. During his career, he developed several medical devices and was founder and president of two medical device companies.

After developing a passion for astrophotography, Dr. Roscoe built his own observatory. Roscoe Skies Observatory is located near Wales, Wisconsin, outside of Waukesha.

The banquet will feature a buffet meal with a choice of two meats and side dishes. Awards will be presented during the banquet and a drawing for door prizes will be held.

The cost is \$26 for adults, and \$16 for children under 12. RSVPs should be received no later than October 8. The RSVP form can be found below.

PAC ANNUAL BANQUET

October 22, 2022, 5:30 p.m.

Riverfront Grille

4619 34th Street, Rock Island

RSVP: Kindly respond on or before October 8, 2022

Cost per adult: \$26 Children: \$16 (age 12 and under)

Full Buffet Dinner and Cash Bar

Include payment with RSVP; checks made out to Popular Astronomy Club

Mail to Michael Haney, 564 36th Avenue, East Moline, IL, 61244, Phone: (309) 755-7935

	Name
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SUMMARY OF PAC BOARD MEETING

The board of the Popular Astronomy Club held a meeting via Zoom on September 9. PAC President Dale Hachtel called the meeting to order at 7 p.m.

Those present were Past President Alan Sheidler; Treasurer Michael Haney; Secretary Paul Levesque; Observatory Director Rusty Case; and ALCOR Correspondent Roy Gustafson. Vice-President Dino Milani was absent due to a work conflict.

Michael presented a treasurer's report covering the timeframe June through August 2022. Significant expenses incurred during that time included payments for the insurance and registration on the PACMO, and the plaque purchased for the Terry Dufek memorial. Due to these expenses, the club operated at a slight deficit during the quarter.

After reviewing and discussing the report, board members agreed that it would be submitted to the whole membership for their review and approval.

Rusty reported that both the Paul Castle Observatory and PACMO were operating well "with no issues." He said that the deck at the

observatory could use another coat of stain and that he could do the job using left-overs from the last time the deck was stained. Paul apologized for erroneously sending out the September 2022

"Reflections" newsletter marked as August 2022. A corrected version has been posted to the PAC website.

There was discussion of the secretary's duties in regard to keeping a log of attendance at meetings, observing sessions, public outreach events, etc. Attendance at PAC events is a factor when determining the winners of some annual awards.

Paul admitted that he had not done a good job of counting and logging attendees. This has become more difficult now that PAC membership meetings are held both "live" and via Zoom. It is difficult to determine who is attending a meeting via Zoom, and it is uncertain whether these individuals should be counted as actually attending or not.

The group photos taken by Al and others at observing sessions and public outreach events should prove helpful in determining attendance, although not everyone always makes it into these photos.

In regard to other secretarial duties, Dale pointed out that formal minutes of board and membership meetings have not been submitted and approved. Paul said that he had written up summaries of these meetings for the newsletter (such as this article) and had sent advance copies to some board members for their review. Nevertheless, some system of formally posting these summaries as minutes should be developed.

Roy had nothing to report on ALCOR but did say that PAC had a new member, Rob McDonald of Muscatine. He asked whether or not the club should pay for a full year's subscription to "The Reflector," the Astronomical League magazine. It was agreed that members would share copies of the magazine until a full year begins, when a separate subscription will be purchased.

In regard to the new member, Dale noted

Popular Astronomy Club Balance Sheet As of August 31, 2022	
	Aug 31, 22
ASSETS	
Current Assets	
Checking/Savings	
Business Special	45.44
Cash	0.66
Checking	10,587.17
Money Market	5,415.61
Savings	10.23
Total Checking/Savings	16,059.11
Total Current Assets	16,059.11
TOTAL ASSETS	16,059.11
LIABILITIES & EQUITY	
Equity	
Opening Balance Equity	9,422.33
Net Income	6,636.78
Total Equity	16,059.11
TOTAL LIABILITIES & EQUITY	16,059.11

A detailed treasurers report for the quarter is found on page 17.

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PAC Board meeting

Continued from Page 4

that Rob had limited online access, and that he generally accessed email and the internet at the local library. He will be emailed copies of "Reflections" monthly, which he can access later. Dale said that the club should not rely on email alone to contact Rob and other members with limited online access.

A 10-inch Meade "go-to" telescope has been donated to PAC; it is usable but in need of some rehabilitation. Rob has asked to borrow a telescope and the equipment rental fee of \$5 will be charged, per the policies and procedures manual.

The meeting on September 12 will consist of a short business meeting followed by a "smorgasbord" of member presentations. So far, only two members have agreed to be presenters. Paul said that he may also prepare a presentation and would contact Dino if he did.

The fall public outreach schedule was then presented and discussed. A public observing session sponsored by the River Valley District Library will be held September 22 (September 29 rain date); Cordova Library will also assist. The session will be held at Riverdale Middle School in what should be a relatively dark environment. Objects that should be visible after dark were listed.

Other upcoming events include the Eastern Iowa Star Party on the weekend of September 23-25; an outreach for Girl Scouts at Camp Liberty on October 8; and outreach events at schools in Kewanee and Cambridge on October 20 and 21, respectively.

A homeschool group in the Morrison-Rockwood area has requested an observing session in November; they have agreed to pay for gas and other expenses.

Chad Potter from John Deere Middle School has asked for four observing sessions

during the school year that has just begun; these will need to be scheduled.

The Moline Public Library has asked that PAC participate in a "Technology for Teens" program that will run from October through May; this is pending a grant that has not been finalized.

In addition, the Silvis Public Library is celebrating its centennial in 2023 and has asked PAC to participate.

Discussion then turned to the annual banquet on Saturday, October 22, at the Riverfront Grille in Rock Island. The number of attendees expected (usually around 50) the menu (choice of chicken or ham) and the price that should be charged were discussed. Last year a price of \$25 per adult attendees was charged; expenses have gone up slightly since then, as outlined by Dale in a summary of charges he received from the Riverfront Grille.

Al then moved that the charge for adults for the banquet should be \$26 per adult; Roy seconded the motion, which passed. A separate, lower price may be charged for children under the age of 12.

It was agreed that those who plan to attend the banquet should RSVP and pay in advance, since those who say they will pay at the door often fail to show up. The Riverfront Grille will need a count on attendance about a week in advance.

Board members will need to decide on who should receive awards at the banquet; a discussion on awardees may be held separately. An honorarium plus travel costs will also be presented to the guest speaker, Dennis Roscoe, who is coming to the banquet from the Milwaukee area. The subject of his presentation will be "Next Generation Telescopes."

The meeting adjourned at 8:20 p.m.

‘Moonikin’ honors Hispanic engineer

Arturo Campos played key role in Apollo 13 rescue

When the thrice-delayed Artemis I moon rocket finally does get off the ground, it will carry a “moonikin” honoring a Hispanic engineer who helped bring the Apollo 13 astronauts home safely.

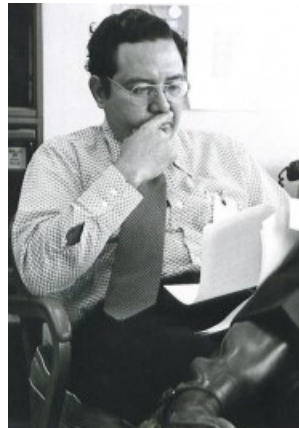
NASA is launching Artemis I to test the rocket’s ability to carry astronauts on future moon missions. Riding about the rocket will be three mannequins – cleverly dubbed as moonikins – wearing space suits equipped with sensors that will collect data showing how well the suits shield radiation and otherwise protect the astronauts who will someday be wearing them.

Earlier this year, NASA held a contest to select a name for the moonikin sitting in the middle seat, a spot reserved for the mission commander. When the contest ended, NASA announced that the moonikin would be named for Arturo Campos, an engineer who was working at Mission Control in Houston at the time of the Apollo 13 launch in 1970.

Campos was born in 1934 into a Mexican-American family living in the border city of Laredo, Texas. His father was an auto mechanic, and young Arturo was considering the same career until one of his high school teachers recognized his potential and urged him to go to college.

While working part-time in his father’s repair shop, Campos took classes at Laredo Junior College. He then went on to the University of Texas, graduating in 1956 with a degree in electrical engineering.

Campos was hired by NASA in the early 1960s, a time when the first American astronauts were headed into space. He was assigned to research, develop and design the electrical systems that would be used in manned spacecraft, and played a key role in creating the electrical system for the lunar



The ‘moonikin’ named for Arturo Campos will fly on the Artemis mission.



module used in Moon landings.

When an oxygen tank on Apollo 13 burst, Campos was among the NASA employees who were called in to help get the spacecraft home and save the three-member crew. He led the effort to find a way to provide electrical power to Apollo 13’s command module, in order to enable the crew to survive and find their way back to Earth.

Fortunately for the astronauts aboard Apollo 13, Campos had earlier written a plan outlining procedures for such an eventuality. After arriving at Mission Control, Campos immediately began revising that plan to fit the particular circumstances faced by Apollo 13 and worked with his fellow engineers to implement the procedures and communicate them to the astronauts.

You know the rest of the story: As famously depicted in the 1995 movie “Apollo 13,” the astronauts returned to Earth safe and sound, and received a hero’s welcome. But there were many unsung heroes who made their rescue possible, including Arturo Campos, who is not mentioned in the movie.

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SUMMARY OF SEPTEMBER PAC MEETING

The Popular Astronomy Club held its monthly meeting on September 12 at 7 p.m. at the Butterworth Center in Moline. Ten PAC members attended the meeting “live,” with another eight joining via Zoom.

After PAC president Dale Hachtel called the meeting to order, the quarterly treasurers report was presented by Michael Haney. The report, covering the time period June through August showed that the club had over \$16,000 in total assets, but that net income was down over \$107 for the quarter.

Michael explained that the drop in income was caused by a significant annual expense – the payment of insurance and registration for the PACMO, which amounted to \$965. Total income for the quarter amounted to over \$1,030, which most of that coming for payments made for public outreach programs.

Following a motion by Dino Milani and a second by Roy Gustafson, the report was accepted as submitted.

Secretary Paul Levesque apologized for erroneously labeling the September 2022 edition of the “Reflections” newsletter as August 2022. The newsletter posted on the website is correctly labeled. Paul encouraged members to submit stories and photos for the newsletter.

Observatory director Rusty Case said that the Paul Castle Observatory is in good condition and added, “It’s available for members, so come out and use it.” He said that he planned to reseal the wooden deck at the observatory when the weather allows.

ALCOR Correspondent Roy Gustafson said that he had a Master Outreach Award to present to Alan Sheidler.

New member Rob McDonald from Muscatine was present at the meeting, and he was welcomed to the club and presented with a new member packet.

A Meade LX200 “go-to” telescope (one



This telescope, which has been donated to PAC, was displayed at the meeting.

that can be programmed to automatically find any object in the sky) has been donated to PAC, as delivered by new member Rob, but it may need some controller repair. Another telescope, a Meade ETX-125EC has been donated, and it may need an eyepiece, but there are many eyepieces available that would fit.

Dale then reviewed a number of upcoming public outreach events scheduled for fall, and encouraged member participation in these events. He then reviewed the upcoming annual PAC banquet, scheduled for October 22 at the Riverfront Grille in Rock Island.

Despite inflation, Dale said that the price of the buffet meal at the banquet had only increased by \$1. Adults will be charged \$26 and must RSVP by October 8 so that an accurate count can be provided to the Riverfront Grille.

The guest speaker, appearing live, will be Dr. Dennis Roscoe, who will come from the Milwaukee area to speak on “Next Generation Telescopes.”

The meeting then continued with three “smorgasbord” presentations by Alan Sheidler, Paul Levesque and Dino Milani.

Al’s presentation was titled “Parallax Observations of Saturn, Neptune and Vesta,” and showed how he had used nightly observations and mathematics to calculate the movement of the two distant planets and the Solar System’s largest asteroid.

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PAC September meeting

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Paul's presentation was on the "Astronomer Royal," a position established by King Charles II of England in 1675 that now serves the newly crowned King Charles III. Though the title is now honorary, the individuals who've served as Astronomer Royal over the years have made substantial contributions to the science of astronomy.

Dino's presentation concerned the possibility that a comet strike about 1,700 years ago may have led to the end of the Hopewell civilization in what is now Ohio. Evidence for this includes earthwork on a mound that appears to be a comet, and oral histories that speak of a catastrophic event similar to a comet strike.

A number of member observations were then displayed, including astrophotos taken by Al, Roy, Rusty and Byron Davies. Jeff Struve then showed some photos showing progress made on the construction of a new building at Menke Observatory, noting that members who come to the Eastern Iowa Star Party could see the building for themselves.

A recording of the meeting is available on YouTube via the following link: <https://www.youtube.com/watch?v=9sxvKON4pUk>

The meeting adjourned at 8:35 p.m. There will be no PAC membership meeting in October; instead, all PAC members and guests are invited to the annual PAC banquet on Saturday, October 22.

Arturo Campos

Continued from Page 8

Instead, "Apollo 13" sticks with the stereotypical image of a Mission Control engineer: A white guy wearing a white shirt and a dark tie. To be fair, nearly all NASA engineers at the time fit that description, with Campos being one of the few Hispanics employed by the space agency.

Campos continued to work at NASA until retiring in 1980. He took an active role in efforts to recruit more Hispanics for the space program and encourage them to pursue careers in science and technology. Campos died at his home in Texas in 2001.

Today, NASA is a much more diverse place than it was in 1970. About 17 percent of the current NASA workforce identifies as Hispan-

panic, and more than one-third are women.

Hispanic Heritage Month, which continues through October 15, is an appropriate time to recognize and remember pioneers like Arturo Campos. Stories like his remind us of the value of our nation's diversity, and the ongoing need to extend opportunities as widely as possible.

The Apollo 13 astronauts might never have made it home if Arturo Campos had not gotten the opportunity to pursue the path that took him to NASA. We can honor his memory by spotting and developing the potential in young people of all backgrounds, and setting them on paths that could lead to greatness.

Paul Levesque

WELCOME TO NEW MEMBER

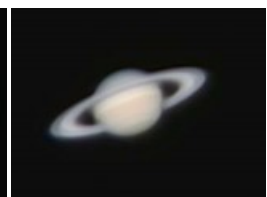
Robert McDonald



MEMBER OBSERVATIONS & CLUB ACTIVITIES

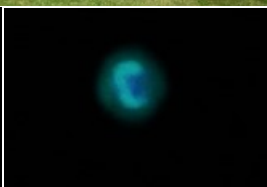
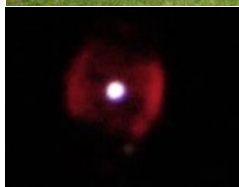


More than 125 people turned out for a public observing session at Riverdale School in Port Byron on September 22. Clear, dark skies enabled views of Saturn and its moons, as seen in the image captured that evening; the Dumbbell Nebula and the core of M31 were also photographed.



An observing session on August 26 at Paul Castle Observatory yielded these nice images of Jupiter and Saturn.

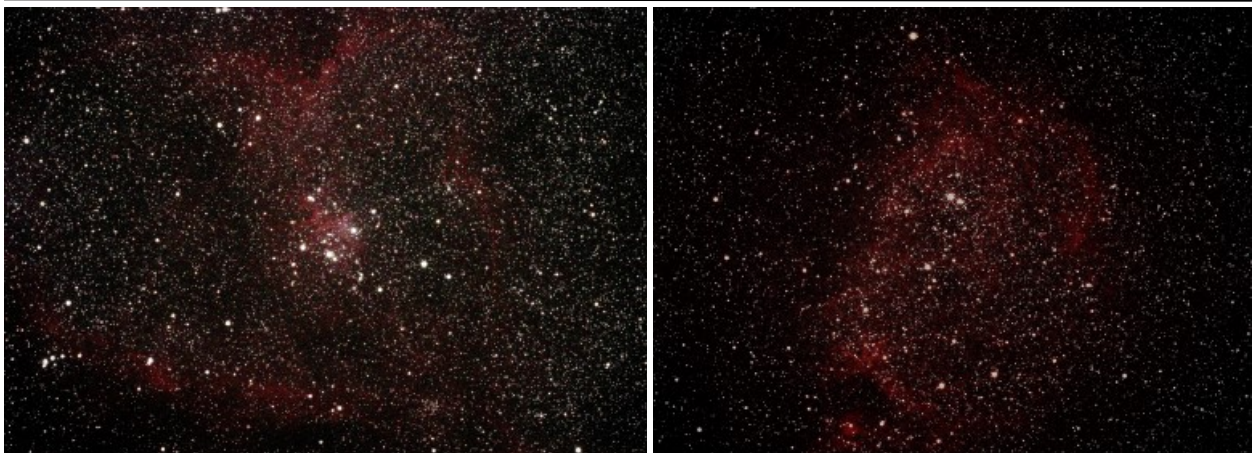
Recent group observing sessions at both Castle Observatory and the Menke Observatory resulted in these astrophotos of some deep-sky objects, including this beautiful image of the famous Andromeda Galaxy (M31).



MEMBER OBSERVATIONS & CLUB ACTIVITIES



Rusty Case sent in these great images he took recently of (left, from top) NGC 4023 (spiral galaxy), NGC 6960 (Witch's Broom Nebula), NGC 6995 (Bat Nebula), and (above) M31 (Andromeda Galaxy) and NGC 7000 (North America Nebula).



"Heart and Soul" was the theme song for Byron Davies as he captured these outstanding images of the Heart Nebula (IC 1805, above left) and the Soul Nebula (IC 1848). Byron also sent this image of NGC 7293 (Helix Nebula).



MEMBER OBSERVATIONS & CLUB ACTIVITIES



The Eastern Iowa Star Party was scheduled for the weekend of September 23-25 at Menke Observatory, but cloudy skies meant no observing on Friday. But nine amateur astronomers made it to the party on Saturday and 11 were there on Sunday, capturing these astrophotos. The event also served as a time work on the observatory's new 30-inch telescope.



Astronomical League Observing Programs

The Astronomical League offers more than 70 different observing programs, ranging alphabetically from "Active Galactic Nuclei" to "Youth Astronomer." The programs are designed to provide goals and directions for your observations and cover a full range of observable objects and skill and experience levels.

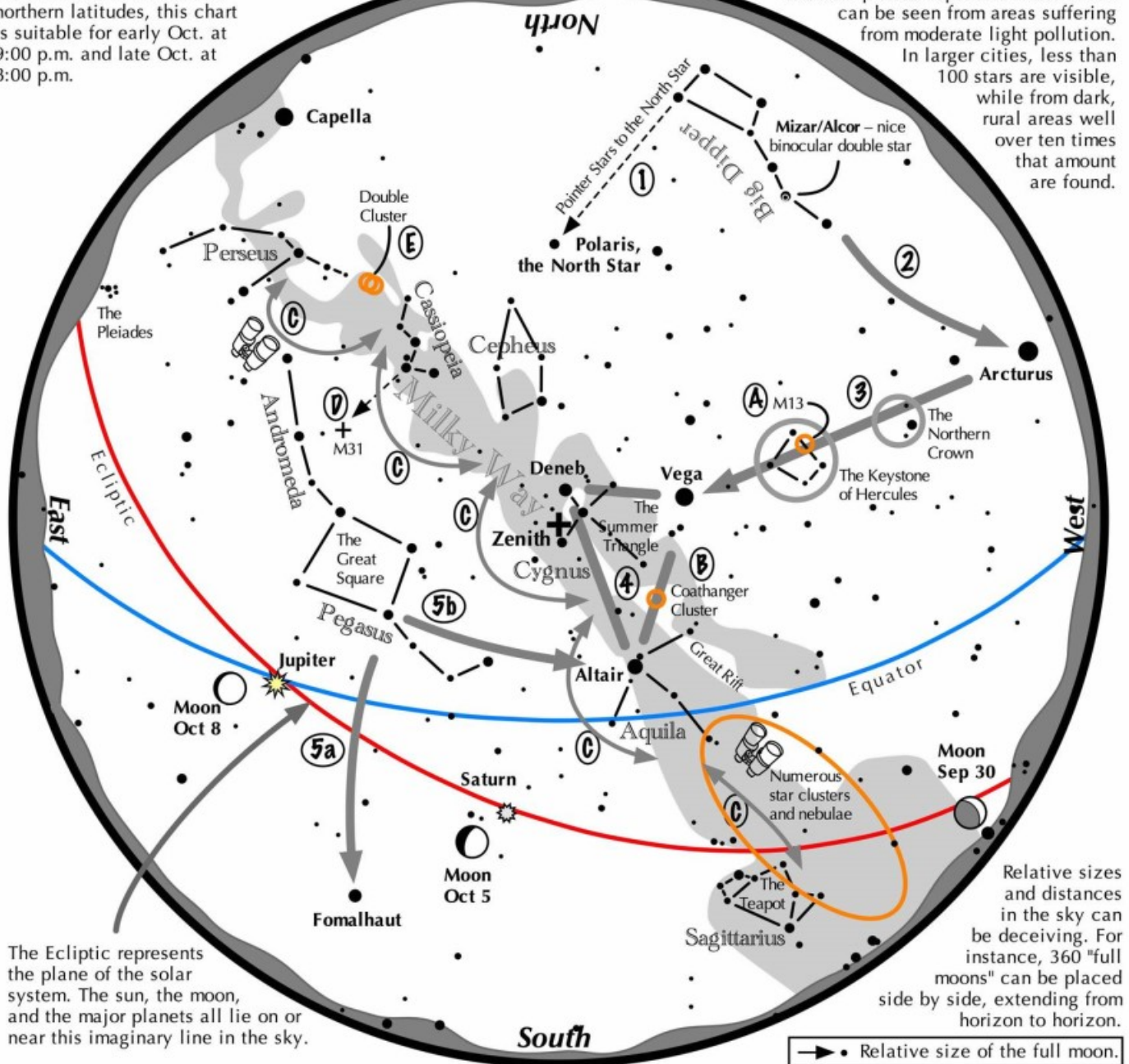
You can earn certificates and pins for completing the programs. Click on this link - [Observing Programs](#) - to find an alphabetical list of observing programs.



Navigating the October Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Oct. at 9:00 p.m. and late Oct. at 8:00 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

Navigating the October night sky: Simply start with what you know or with what you can easily find.

- 1 Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
- 2 Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the early October evening sky.
- 3 To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
- 4 Nearly overhead lie the summer triangle stars of Vega, Altair, and Deneb.
- 5 High in the east are the four moderately bright stars of the Great Square. Its two southern stars point west to Altair. Its two western stars point south to Fomalhaut.

Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster, a ball of 500,000 stars. B: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger. C: Sweep along the Milky Way for an astounding number of fuzzy star clusters and nebulae amid many faint glows and dark bays, including the Great Rift. D: The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. E: Between the "W" of Cassiopeia and Perseus lies the Double Cluster.





**October
2022**

An obituary for Donald Edward Machholz

Dear Don,

You left us far too soon, my friend. From your home in California and later in Arizona, you lived quietly and well, with a passion for stargazing that dominated your life.

As the English poet Gerard Manley Hopkins wrote, *"I am like a slip of comet, Scarce worth discovery."* He wrote his poem in 1864, but it might have been composed with you in mind.

You were born on October 7, 1952, in Portsmouth, Virginia. I first heard of you during the 1970s, when you were popularizing a program to observe all (or almost all) the Messier objects in the sky in a single night.

I did not take the idea seriously for a long time. I have seen all the Messier objects, but I found them over a relaxing period of five years, from Messier 45 (The Pleiades star cluster) during the summer of 1962, to the distant and ethereal galaxy Messier 83 in the spring of 1987.

Your idea was to learn the sky far more thoroughly than I did, and catch all the clusters, clouds of gas and dust, and distant galaxies that Charles Messier carefully recorded.

Thank you for inspiring me. By the mid-1980s, I was more proficient in observing than I was in earlier decades. One clear night in the early spring of 1983, I successfully observed all but one of the Messier objects. Messier 30 was the only one I missed.

By that time, Don, you were already

During his lifetime, Donald Machholz was credited with discovering 12 comets that bear his name.

famous. In 1978, after some 1,700 hours of searching, you discovered your first comet using your simple telescope. (You never gave up, did you?)

In 1985, on the final night of the Riverside Telescope Maker's Conference, you discovered a second comet after another 1,700 hours, using a beautiful 10-inch cardboard and glass telescope for that second comet.

Luck began to go your way after that. Your third comet arrived in 1986. You used a pair of 29 x 130 binoculars for that one.

Between the passages of your second and third comets, Comet Halley, the most important and famous of them all, rounded the Sun on February 9, 1986. I like to think that as the great comet made its pass through the inner solar system, it was guarded by these two other comets discovered by you.

Don, you never, ever quit. No one would have criticized you if you had. Instead, you spent the remaining years of your life searching the sky.

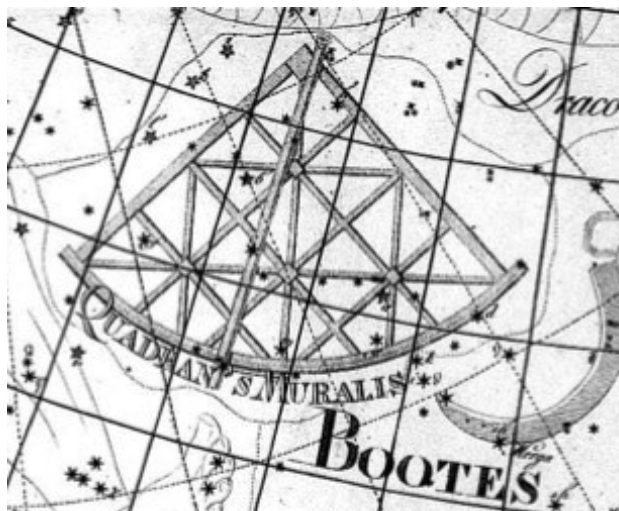
You spent almost nine thousand hours over the course of your life comet hunting. Through it all, you never lost your passion.

You and I share that one important aspect, Don. As many comets as you and I might have

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Constellations that didn't make the cut



In 1922, the International Astronomical Union announced the names of 88 constellations that would be used to form the boundaries of sky maps going forward. To mark the centennial of adoption of the modern constellation list, Reflections is looking back at some constellations that were once found on some sky maps, but didn't make the final cut.

Quadrans Muralis, Latin for the “Mural Quadrant,” was yet another constellation created by French astronomer Joseph Jérôme de LaLande during the late 18th century. The collection of stars, referred to in some French atlases as “Le Mural,” was meant to depict a wall-mounted quadrant used by LaLande and his nephew to chart objects in the celestial sphere.

LaLande placed Quadrans Muralis near the tail of the constellation Ursa Major, somewhere between Boötes and Draco. The stars forming “Le Mural” have since been incorporated into those neighboring constellations.

Though no quadrant is found on modern star maps, this obsolete constellation is the namesake of the Quadrantid meteor shower, which radiates from Boötes and peaks in early January.

Donald Machholz

Continued from Page 13

found, it was the search that was so important, for “in no better way,” as Leslie Peltier wrote, “can we come face to face, night after night, with such a wealth of riches as old Croesus never dreamed of.”

In recent years, the professional astronomers have taken over comet discoveries. But still you kept on searching. Despite their great big telescopes, you kept going, always searching, with a series of small telescopes. You found two new comets in 1994, one of which broke apart into several pieces.

By the start of the new millennium, amateur astronomers had pretty much given up. Visual comet hunting was passé. Only not for you.

You discovered not one, not two, but three comets since the year 2004. As of August 2022, you were the leading discoverer of comets by visual means in the world.

Don, I wish I had known you better. I do know I shall miss you, and our friendship which has evolved over the years, very much. I conclude this letter, this obituary, with the end of the Hopkins poem:

*But then her tether calls her. She falls off,
And as she dwindles sheds her smock of
gold...*

*So I go out. My little sweet is done.
I have drawn heat from this contagious
sun,
To not ungentle death now forth I run.
Rest in peace my friend.*

Donald Edward Machholz died on August 9 in Wikieup, Arizona, at the age of 69.

More sad news: David Levy's wife, Wendee Levy, died on September 23. On behalf of the Popular Astronomy Club, Reflections sends condolences to David over the loss of his close friend and his life partner.

Fomalhaut: Not So Lonely After All

Fall evenings bring a prominent visitor to southern skies for Northern Hemisphere observers: The bright star Fomalhaut!

Sometimes called “The Autumn Star,” Fomalhaut appears unusually distant from other bright stars in its section of sky, leading to its other nickname: “The Loneliest Star.” Since this star appears so low and lonely over the horizon for many observers, is so bright, and often wildly twinkles from atmospheric turbulence, Fomalhaut’s brief but bright seasonal appearance often inspires a few startled UFO reports.

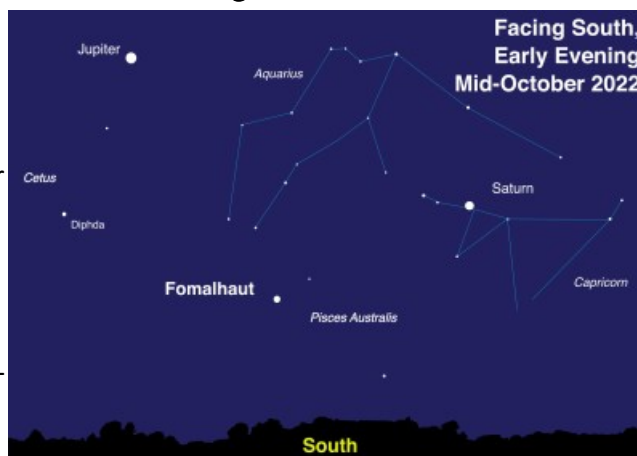
While definitely out of this world – Fomalhaut is about 25 light years distant from us – it has been extensively studied and is a fascinating, and very much identified, stellar object.

Fomalhaut appears solitary, but it does in fact have company. Fomalhaut’s entourage includes two stellar companions, both of which keep their distance but are still gravitationally bound.

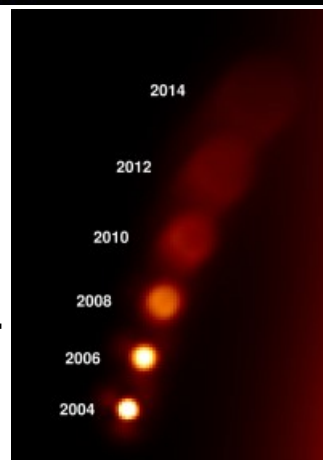
Fomalhaut B (aka TW Piscis Austrini, not to be confused with former planetary candidate Fomalhaut b*), is an orange dwarf star almost a light year distant from its parent star (Fomalhaut A). Fomalhaut C (aka LP 876-10) is a red dwarf star located a little over three light years from Fomalhaut.

Surprisingly far from its parent star – even from our view on Earth, Fomalhaut C lies in the constellation Aquarius, while Fomalhaut A and B lie in Piscis Australis, another constellation – studies of Fomalhaut C confirm it as the third stellar member of the Fomalhaut system. Despite its immense distance, it is still within Fomalhaut A’s gravitational influence. So, while Fomalhaut is not truly “lonely,” its companions do keep their distance.

**Astronomers use capital letters to label companion stars, while lowercase letters are used to label planets.*



Though it stands alone as a bright star, Fomalhaut actually has two companion stars. The dust cloud around Fomalhaut b has been observed expanding over the years.



Fomalhaut’s most famous feature is a massive and complex disc of debris spanning many billions of miles in diameter. This disc was first detected by NASA’s IRAS space telescope in the 1980s, and first imaged in visible light by Hubble in 2004.

Studies by more advanced telescopes, based both on Earth and in space, show the debris around Fomalhaut to be differentiated into several “rings” or “belts” of different sizes and types of materials. Complicating matters further, the disc is not centered on the star itself, but on a point approximately 1.4 billion miles away, or half a billion miles further from Fomalhaut than Saturn is from our own Sun.

In the mid-2000s, a candidate planetary body was imaged by Hubble and named Fomalhaut b. However, Fomalhaut b was ob-

Continued on Page 16

Visit to Witte Observatory set for October 29

Members of the Popular Astronomy Club and the Quad Cities Astronomical Society are invited to join an upcoming visit to the John H. Witte Jr. Observatory Complex.

The visit is scheduled for Saturday, October 29. The following Saturday, November 5, will be the rain date.

The Witte Observatory is located at the Big Hollow Recreation Area in Sperry, Iowa, about 12 miles north of Burlington. It is operated by the Southeastern Iowa Astronomy Club, and members of that club will lead the tour.

The complex consists of three buildings: The Witte Observatory Building, a dome which houses a 12-inch refracting telescope believed to be the largest of its type in Iowa; the Prugh-Carver Observatory Building, a roll-off building housing an 8-inch refractor; and the Stone-Kelly Observatory Building, which



The observatory is located near Sperry, Iowa, about 12 miles north of Burlington.

houses a 16-inch Ealing Cassegrain telescope.

More information about the observatory is available at the Des Moines County website, at www.desmoinescounty.iowa.gov/516/Witte-Observatory-Complex.

To reserve a spot for the visit and for car-pool arrangements, contact Alan Sheidler, at adsheidler@gmail.com, or Dr. Robert Mitchell, at mitchellrobertc@sau.edu.

Fomalhaut

Continued from Page X

served to slowly fade over several years of observations, and its trajectory appeared to take it out of the system, which is curious behavior for a planet.

Scientists now suspect that Hubble observed the shattered debris of a recent violent collision between two 125-mile-wide bodies, their impact driving the remains of the now decidedly non-planetary Fomalhaut b out of the system.

Interestingly enough, Fomalhaut A isn't the only star in its system to host a dusty disc; Fomalhaut C also hosts a disc, detected by the Herschel Space Observatory in 2013. Despite their distance, the two stars may be exchanging material between their discs, including comets.

Their commingling may help to explain the elliptical nature of both stars' debris discs.

The odd one out, Fomalhaut B does not possess a debris disc of its own, but may host at least one planet.

While Hubble imaged the infamous "imposter planet" of Fomalhaut b, very few planets have been directly imaged by powerful telescopes. NASA's James Webb Space Telescope could soon change that.

In fact, Webb will be imaging Fomalhaut and its famous disc in the near future, and its tremendous power is sure to tease out more amazing discoveries from its dusty grains. You can learn about the latest discoveries from Webb and NASA's other missions at nasa.gov.

David Prosper

This article is courtesy of NASA's Night Sky Network program, which supports astronomy clubs across the USA and is dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to learn more.

Popular Astronomy Club
Income & Expenses Detail
June through August 2022

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Date	Num	Name	Memo	Amount
Ordinary Income/Expense				
Income				
Donation				
Program				
6/4/2022	220604	Giant Goose Conservation Club	Popular Astronomy Club Observing	200.00
6/14/2022	DEP	cash	Pacmo Donations	53.00
6/14/2022	DEP	Girl Scouts	Girl Scouts 6/4/22	60.00
6/14/2022	15322	QC Alarm LLC.	Doll Museum 6/4/22	100.00
6/14/2022	1469	Friends of the LeClaire Library	LeClaire Library 6/3/22	50.00
6/14/2022	DEP		PACMO Donation	0.10
8/8/2022	1373	Friends of Eldridge Library	6/23/22	100.00
8/8/2022		cash	6/23/22 Eldridge Library Donations	47.00
8/8/2022	343081	City of Moline	Moline Library 7/19/22	200.00
8/8/2022	25732	Kewanee Public Library District	Kewanee Library 7/20/22	150.00
8/8/2022		cash	Illiniwek Park 7/30/22	57.00
Total Program				1,017.10
Total Donation				1,017.10
Interest Income				
6/30/2022	DEP		Deposit	0.04
7/30/2022	DEP		Deposit	0.05
8/31/2022	DEP		Deposit	0.05
Total Interest Income				0.14
Sales				
8/8/2022		cash	PAC T-Shirt	15.00
Total Sales				15.00
Total Income				1,032.24
Expense				
Charitable Contributions				
6/5/2022	1188	Messiah Lutheran Church	Donation for Zoom access	50.00
Total Charitable Contributions				50.00
Dues and Subscriptions				
8/8/2022	1191	Roy Gustafson	Illinois Annual Report	10.00
Total Dues and Subscriptions				10.00
PACMO				
Operation				
6/10/2022	1189	Secretary of State	License Renewal	158.00
8/3/2022	E Ch...	Auto-Owners Insurance	Insurance	807.00
Total Operation				965.00
Total PACMO				965.00
Reimbursement				
6/2/2022	1187	Alan Sheidler	Terry Dufek Plaque	100.00
6/13/2022	1190	Alan Sheidler	Terry Dufek Plaque	14.69
Total Reimbursement				114.69
Total Expense				1,139.69
Net Ordinary Income				-107.45
Net Income				-107.45



POPULAR ASTRONOMY CLUB



Thank you for your interest in the Popular Astronomy Club. To renew your membership or to apply as a new member, please fill in the information and either mail this form to the address below, or bring it to a PAC event. The membership year runs from October 1st through September 30th. There is a pro-rated amount if you join anytime during the year (see below). Our club newsletter, REFLECTIONS, will be e-mailed to you and it will be posted on the club website.

Submission of this application and payment confirms the applicant's agreement to abide by the policies and procedures detailed in the PAC Policy & Procedures Document available at our website:
www.popularastronomyclub.org.

Membership pro-rated (for new members) amount by month:

Oct-\$30.00, Nov-\$27.50, Dec-\$25.00, Jan-\$22.50, Feb-\$20.00, Mar-\$17.50, Apr-\$15.00, May-\$12.50, Jun-\$10.00, Jul-\$7.50, Aug-\$5.00, Sep-\$2.50

PAC renew or new member:

(a) Regular Membership \$30.00 \$ _____

(b) Additional family member (\$7.50 each) x (#) _____ \$ _____

Or you can elect c, d, or e (this includes the \$30.00 membership, with the balance a tax deductible gift to PAC):

(c) Supporting Member \$40.00 \$ _____

(d) Sustaining Member \$60.00 \$ _____

(e) Patron Member \$80.00 \$ _____

(f) Student Member \$10.00 \$ _____

Grand Total \$ _____

Your Name: _____

Address: _____

City _____ State _____ Zip _____

E-Mail _____

Home Phone: _____ Cell Phone _____

Please enter name (s) of ADDITIONAL FAMILY MEMBERS:

Emergency Contact: _____ phone # _____

THANK YOU!! Welcome to the Popular Astronomy Club!!

Make your check payable to the Popular Astronomy Club, Inc. Mail or present at a PAC meeting to:

Michael Haney (treasurer)
564 36th Ave.
East Moline, Illinois 61244
cell # 309-781-4150

MEMBERSHIP FORM AVAILABLE ONLINE HERE: <https://www.popularastronomyclub.org/club-documents>

UPCOMING EVENTS



Date: October 22, 2022

Event: PAC Annual Banquet
Location: Riverfront Grille, Rock Island
**Program: "Next Generations Telescopes
by Dr. Dennis Roscoe**

*No regular membership meeting in October
RSVPs due by October 8; see page 3*

*All these events, dates
and times are tentative
and subject to change!
Please check your emails
for any updates and
changes!*

UPCOMING EVENTS

- **October 8:** Girl Scout campout at Camp Liberty
- **October 11:** Program at John Deere Middle School, Moline (*October 18 rain date*)
- **October 15:** Niabi Zoo public viewing
- **October 17:** QCAS meeting, McCarthy Hall, St. Ambrose University / Zoom
- **October 22:** Annual PAC Banquet (*see above*)
- **October 29:** PAC/QCAS field trip to Witte Observatory, Sperry, Iowa (*Rain date November 5*)
- **November 4:** East Moline Library Fall Festival
- **November 12:** Homeschool group in Morrison, Illinois (*November 13 rain date*)
- **November 14:** PAC membership meeting; presentation on radio astronomy by Jim Dole from the Doug Firebaugh Observatory, Freeport, Illinois
- **November 15:** Moline Public Library; first of four programs planned for school year
- **November 19:** Niabi Zoo public viewing (*last of season*)

Concrete poured at new roll-off building



Here's some photos from the recent concrete pour for the new roll-off structure at Menke Observatory. The photo below shows a platform being set for a telescope that will be placed in the building. You're invited to come to Menke to see progress on the new building and other improvements that are being made there.

