

The Valley Skywatcher

Official Publication of the Chagrin Valley Astronomical Society

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Founded 1963

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Comet Garradd C/2009 P1 on August 1, 2011

Photograph by CVAS Member David Mihalic

Asteroid 2005 YU55 Close Approach

By Aaron Worley

On the night of November 8th, 2011, I viewed the asteroid 2005 YU55 during a close approach encounter with the Earth. This is my observation report for this Near Earth Object, based on the notes I made that night.

2005 YU55 is relatively large for an Earth-crossing asteroid, and this encounter represented the first time astronomers had advance warning of a NEO this large passing this closely to Earth - within the Moon's orbit! The event received quite a bit of press in the popular media and I had many family and friends asking me about it, and whether I was planning on viewing it. Honestly, I did not plan on attempting to observe it because I was not very confident that I would be successful in tracking down such a fast moving object. I didn't have any experience in viewing NEOs, and very little experience viewing asteroids in general. Not to mention I was also recovering from a bad sinus infection. But I had a change of heart at the last minute, figuring I'd be kicking myself if I didn't at least give it a try.

Conditions were not optimal that evening, with high clouds moving through the area off and on, and a

bright moon was present as well. I set up in fairly light-polluted my backyard, where I have a naked eye limiting magnitude near the zenith of 4th Mag on good nights.

I used a Celestron 9.25" SCT on an Orion Telescope Atlas EQ-G equatorial mount for observing that night. I viewed the asteroid through a Televue Ethos 17mm eyepiece and 2" diagonal, which gave me approximately a 40 degree true field of view at 150x magnification. The Atlas mount was driven from my Windows XP laptop using the Cartes du Ciel (CdC) software application and the EQMOD telescope drivers. I don't normally use the laptop to run the mount, preferring to use the Atlas hand controller on most nights instead to keep things simple. But I do find the laptop software useful to track down dim objects, because it's pointing accuracy is better, so I made sure to bring it along that night.

I rolled the assembled telescope, sitting on its Scope Buggy, out of my garage and out onto the driveway. I turned the buggy to point the scope north and popped a crosshair eyepiece into the diagonal. I powered on the mount and ran the 3-star alignment procedure. Next, I plugged the laptop into the hand controller and selected "PC-Direct" mode from the controller menu. I launched Cartes du Ciel on the laptop, initialized the connection to the mount, and verified that I could send slew commands to the mount. So far, so good.

Cartes du Ciel allows you to add an arbitrary number of stars to the alignment model used to point the mount. I set up three alignment points in a triangle surrounding 2005 YU55's position. At this point, it was 8:45 PM EST, my GOTOs were pretty well dialed in, and I was ready to observe. I put my Televue eyepiece into the diagonal, refocused the telescope, and switched back to the laptop.

Plan A was to use Cartes du Ciel's built-in asteroid ephemeris download utility to get the latest projected positions for 2005 YU55, then simply click on the asteroid on the screen and tell the scope to slew to that position. This didn't work and I abandoned the idea after a few minutes. The asteroid's position on the screen did not seem to match the track on the map I pulled up from Sky & Telescope's web site, which made me suspicious that CdC had not



Image credit: NASA/JPL-Caltech
A radar image of asteroid 2005 YU55 taken at 7:45 PM UT on November 7, 2011.

downloaded the very latest ephemeris. The asteroid's position on the screen was also jumping around a little strangely, and I suspect that the software is not optimized to handle such a speedy object.

So time for Plan B. I re-read CVAS member Ron Baker's email from the previous day that discussed his tips for observing the event. He mentioned using the Minor Planet Center's Ephemeris Service to get accurate coordinates. I quickly pulled up the [MPC web site](#), plugged in Indian Hill's observatory code "H75", and generated a list of topocentric RA/Dec positions for 2005 YU55 at five minute intervals for that night. I had a hunch that Indian Hill was close enough geographically to my house that coordinates would still be accurate if I used the "H75" observatory code instead of digging up my exact latitude and longitude. I cross checked my list of positions with a chart for a time earlier that night which was also based on the topocentric coordinates. I was relieved when my list appeared to match the chart. That meant I had used the MPC's service correctly and had a valid ephemeris to work with.

It was now 9:20 PM and I decided my strategy would be to try to "ambush" the asteroid by pointing the scope at the next position on my list and waiting at least five minutes for the asteroid to wander through the field of view. I made several attempts in a row with no success. I'm not positive, but I suspect that I was missing the asteroid in part due to lack of dark adaptation and in part due to transient issues with sky transparency. I am confident that I was pointing in the right place, because my first "ambush" location had a distinctive grouping of three stars and a galaxy that I subsequently recognized on a CCD image of the asteroid I saw online:

<http://www.skyandtelescope.com/community/skyblog/newsblog/133550828.html>

Finally, at my 9:50 PM location, a very dim point drifted slowly across the field of view. It was right at my limit of visibility, especially at first when it actually drifted in and out of detectability a few times. Quite a bit slower than a low-earth-orbit satellite or chunk of space junk. It was so slow that it was hard to detect the movement unless there were background stars nearby to serve as a reference. And it was moving in a direction that matched the Sky & Telescope chart. It was in the right place at the right time, traveling the in right direction. This was certainly 2005 YU55!

After watching it for half a minute as it crossed fairly close to the center of the eyepiece field, I quickly grabbed the hand controller and started manually tracking the asteroid. I examined it closely as it plodded along. I did not detect any color in the object, and visually its brightness seemed steady to me once my eyes were better adjusted. It was exciting to have made such an unusual visual observation, an asteroid passing so close to Earth that its motion was plainly visible.

I followed the object for fifteen minutes. Heavier clouds started to roll in, so I said good bye to our asteroid visitor and packed up for the night.

The 2005 YU55 close approach has me thinking about attempting to observe other NEOs in the future. Opportunities for visual observations are pretty rare, but it may be possible to take CCD images from my location a few times a year. It'd be great to get a little practice in so I'm fully prepared the next time we have an important close approach. These are really interesting objects and it's fun to be able to study them from your own backyard! ☺

¹Authors note: I have subsequently learned that I could have skipped this step. The online documentation for the EQMOD telescope drivers state that the hand controller's 3-star alignment is ignored once the EQMOD software takes over. In the future I'll bypass the hand controller alignment on nights I'm using the laptop to drive the mount, and skip straight to setting alignment points in the software.

Astronomy Pictures of the Season

Winter Astronomy

By David Mihalic

Brrr...Winter in Cleveland! If autumn is the best time for astronomy in Cleveland, then winter must surely be the worst. That is, of course, unless you are of very hardy stock. The weather may not cooperate much this time of the year but the skies *can* be outstanding. Some of my very best planetary observations have been made during the winter. But the winter skies also offer one of the most recognizable constellations in the night sky, Orion the Hunter. This constellation and nearby structures are a rich area for visual and photographic astronomy.

Many of the nebulae in and around Orion are too small and faint for visual observations without fairly large instruments. But at least one is not only a great photo op but a visually stunning apparition as well. That, of course, is Messier 42, the *Orion Nebula*. From my red zone in Cleveland Heights, this nebula is astonishing to view in my 8" SCT even without the use of a narrow band filter. And yes, I can see it with my naked eye even from the city.

Messier 42 is a stellar nursery about 1344 light years distant with a span of about 20 light years. Its reddish color indicates a vast complex of hydrogen gas. It is actually just a portion of what is known as the *Orion Molecular Cloud Complex*, which includes other nebulae such as *M43* (the rounded upper portion of M42), the *Running Man* nebula, *Barnard's Loop*, the *Horsehead* nebula, the *Flame* nebula and the reflection nebula *M78*.



**The Orion Nebula M43/M42
December 25, 2010 02:39 UTC, 0.5 meter corrected Dall-Kirkham
F/6.8 telescope, Camera: FLI ProLine 9000**

Astronomy Pictures of the Season

Winter Astronomy (cont.)

One of my other winter favorites is Barnard 33, the *Horsehead Nebula*. This is not something you are likely to detect visually but is a great object to photograph. The resemblance to an actual horse's head is unmistakable. The Horsehead itself is a dark nebula silhouetted against the red emission nebula behind it, IC 434. It is about 1500 light years distant.



The Horsehead Nebula, Barnard 33 and IC 434
December 13, 2010 23:53 UTC, 0.5 meter corrected Dall-Kirkham F/6.8 telescope
Camera: FLI ProLine 9000

Astronomy Pictures of the Season

Winter Astronomy (cont.)

Lastly, let's take a peek at a reflection nebula, *The Running Man*, NGC 1977. It is located right above M43 by about $\frac{1}{2}$ degree. Once again, visually difficult but photographically a very nice target that strongly resembles its name.



The Running Man Nebula, NGC 1977
October 31, 2010 02:00 UTC, 0.5 meter corrected Dall-Kirkham F/6.8 telescope
Camera: FLI ProLine 9000

All images in this article were acquired with Slooh telescopes on Mt. Teide, the isle of Tenerife, Canary Islands, and processed with Photoshop Elements 9.0. Image acquisition and processing by David Mihalic. √

Astronomy Pictures of the Season

By Sam Bennici



M1 Crab Nebula, Supernova Remnant, November 2004
Visually guided 64 min exposure, 8-inch Schmidt-Cassegrain reduced to F5
Starlight Xpress MX516 CCD



M16 Eagle Nebula, Open Cluster, July 2010
Visually guided 168 minute exposure, 5-inch homemade F3.3 Maksutov Newtonian
Starlight Xpress MX516 CCD with RGB filters γ

Transit of Earth

By Ron Baker

Transits of the Sun by Mercury and Venus are great events for earth-bound observers. During the next 50 years there will be 7 transits of Mercury, the next one occurring on May 9, 2016. And perhaps the observing highlight of the coming year will be the much anticipated transit of Venus on June 5, 2012. But what would a transit of the Earth look like from the vantage point of another solar system body?

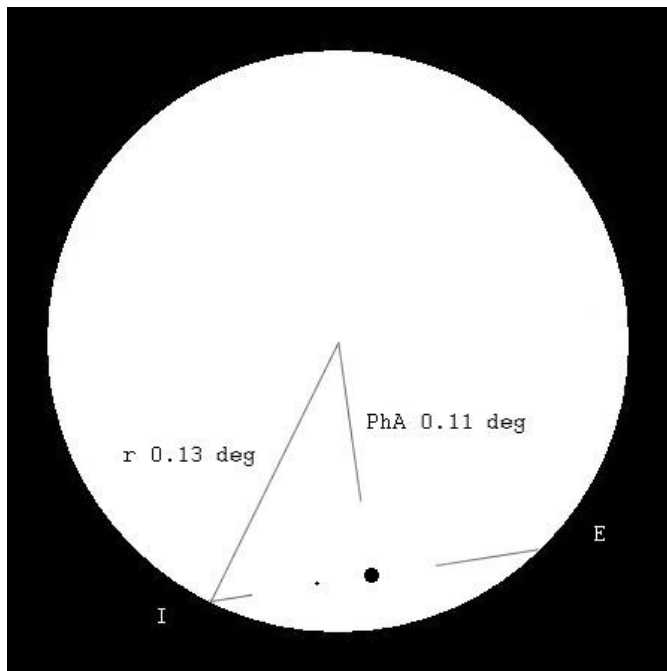
Dr. Richard Miles is the Director of the Asteroids and Remote Planets Section of the British Astronomical Association. Currently, he is directing a project designed to study the "opposition effect" of selected asteroids. The study is yielding information about the physical nature of the objects. Some asteroids exhibit a surge in brightness when near opposition. The surge is caused by shadowing effects from irregularities on the asteroid's surface. The phenomenon is best observed when an object passes through opposition at a very low phase angle. At perfect opposition, the

phase angle (sun-target-observer) is zero. Images are obtained by team members with CCD cameras equipped with photometric V filters. The photometry is placed on the standard magnitude system and lightcurves are plotted which reveal the extent of the opposition effect.

In support of this project, I recorded CCD images of the main-belt asteroid (1045) Michela at opposition. The observations were made with the 12-inch SCT at Indian Hill Observatory around 1:50 UT on November 26, 2011. The asteroid's phase angle was only 0.11 degrees at this time. Viewed from an asteroid, the phase angle is the arc distance between the Earth and the center of the Sun. (1045) Michela was roughly 2 astronomical units from the Sun, so the apparent radius was 0.13 degrees (half the size as viewed from Earth). An "observer" at the asteroid looking toward the Sun would have seen the Earth in transit.

When the apparent radius of the Sun is larger than the true minimum phase angle (as in this case), the apparent radius becomes the "effective" minimum phase angle and no further brightening due to the opposition effect will be observed. Rotational orientation of the asteroid is a complicating factor, but maximum brightness related strictly to phase occurs when light from the Sun shines straight down on the surface of the asteroid from our vantage point. Theoretically, if the Sun was a point source, the brightness would continue to increase all the way to 0 phase angle. But since the Sun has an apparent diameter some of its light cancels the shadowing effects throughout the duration of the transit, which effectively limits continued brightening. Observations of a different asteroid a couple of years ago by our team did appear to show this subtle phenomenon.

To help visualize this transit of Earth, I used Aldo Vitagliano's fine [Solex](#) software. The position of the Earth in mid-transit on the accompanying graphic was calculated by *Solex* using a current set of orbital elements. At the scale of the graphic the Moon appears to be trailing the Earth by only about 40K miles. But since the Moon is 1-day old at this time most of the lunar distance (roughly 240K miles) is directed toward the Sun. If the moon had been 7 days old at the time of the observation it would appear trailing the Earth by the full lunar distance, and would not move on to the Sun's disk (ingress) until the Earth was close to exiting (egress). ☿



This graphic depicts the Earth and Moon in transit across the Sun's disk as observed from the main-belt asteroid 1045 Michela, and was produced with the software *Solex*. Mid-transit occurred at 1:50 UT on November 26, 2011. Apparent solar radius (*r*) and minimum phase angle (*PhA*) are annotations added by the author. Ingress (*I*) and Egress (*E*) are the points of entry and exit, and the line connecting the points represents the transit path.

President's Corner

By Russ Swaney

I want to first thank our President for the last 3 years, Ian Cooper, for not leaving me any issues that needed to be resolved (especially the updating of the constitution!). I only hope that I can do the same for the next CVAS President.

If you haven't been to Indian Hill in a while, I encourage you to do so. Ken Fisher and Tom Puklavec spent most of their summer clearing trees to the east, south and west of the North Observatory. Thanks to all their time and hard work we now have an unobstructed view of those important parts of the sky. One of the highlights I had this year was being present during an exoplanet confirmation by Ron Baker - could you ever have imagined doing that with "amateur" equipment 10 years ago?

Going into 2012 I would like you, the membership, to think about what CVAS needs to accomplish in the next year or two. If you could send me your thoughts and/or suggestions I'll compile a list and present it for discussion. I'm also looking to you for how we can use our facilities and broad expertise in astronomy to develop and improve science education, communication and literacy in our communities.

Finally, although I won't be your President in 2013; October of that year is the 50th anniversary of the founding of the Chagrin Valley Astronomical Society. Tom Quesinberry has volunteered to chair a planning and organizing committee. Please consider offering your assistant to Tom for this historic event. ☺

TALKS AND PRESENTATIONS

OCTOBER

CVAS member Russ Swaney gave a presentation entitled *Physics of Cosmology* to attendees at the October membership meeting. Russ spoke about many topics such as Hubble's discovery of red-shifted galaxies indicating an expanding universe, the cosmic microwave background, gravitational lensing, and theories about an open, flat or closed universe. He also touched on the current state of important cosmological theory such as dark matter and energy, and the potential for string theory. The talk was graphically illustrated with many interesting plots, charts and photos.

REFLECTIONS

After crossing the threshold of the asteroid belt earlier this month (*Nov 2009*), Dawn will travel 7.7 astronomical units (AU), or nearly 1.2 billion kilometers (almost 720 million miles), to its July 2011 rendezvous with Vesta. Yet in all that time, and across all that distance, the closest the probe will come to a catalogued asteroid is 1.0 million kilometers (greater than 600 thousand miles), or more than 2.5 times the distance between Earth and the moon. Certainly travelers on Earth would not consider something that far away to be a hazard (especially compared to what many Dawn team members regularly experience on the freeways in Los Angeles), and neither would our intrepid explorer.

Dr. Marc Rayman
Chief Engineer JPL
Dawn Mission to Vesta and Ceres
November 2009

Indian Hill Facilities and Grounds Update

By Ken Fisher

With winter nearly upon us, Indian Hill is in pretty good shape. Over the summer we have managed to get a fresh coat of paint on the railings and posts around the property, clean and polish the observatory dome, open up some south horizon for the North Observatory, open up a line-of-sight from the top of the hill to Polaris, and still keep the grass cut in spite of all the rain. Once the snow starts accumulating, that will pretty much wrap things up for this year. However, there are a number of items on the agenda for next summer and anyone wishing to lend a hand is more than welcome! Projects for 2012 include:

- 1) Apply another coat of polish to the Dome.
- 2) Replace the wood on the front of the shed (and clean the thing out).
- 3) Re-paint the shed and the North Observatory.
- 4) Continue some tree clearing where it will benefit observing.
- 5) Repair/replace a couple of the lights that need attention in the row of red lights going up the hill.

There are a number of other projects as well such as burning up all the brush from the trees that we've cleared, doing some re-grading in areas, and seeing if we can't improve the drainage on the east side of our property. As soon as the weather breaks next spring, I will be putting up a chain or rope across the property in the area of the North Observatory which will block access from driving further toward the hill. Once the

More Early CVAS History

By G.W. Gliba

Recently I found out from CVAS Charter member Tom Quesinberry, that on November 11th 2011, CVAS founding member Don Tuson died of pneumonia. Quiz found out about this when he was trying to contact him and Rick Wilkins about a possible CVAS 50th anniversary reunion. But now, like the reunion of the Beatles, it can never happen. He was living in Binghamton, New York at the time. He and Rick

ground becomes dry enough to drive on, this barricade will be removed. The section of mowed field between the North Observatory and the base of the hill that most of us drive on is actually not our property – Shirley very kindly allows us use of it so we do not want to rut it all up by driving on it while it's still soft. Please keep this in mind when you head out to Indian Hill in the spring.

As far as the telescopes, our on-going problem is the 16". Earlier this year it was having drive/tracking problems and Marty was able to get it up and running again by replacing one of several circuit boards in the control box. As of late, the scope is not functional along one axis. Tom and I opened up the control box and pulled everything out. As I mentioned at our November meeting, we were hoping an unattached capacitor was the problem. Tom reattached it and we put everything back together but that did not do the trick. We will continue trying to isolate the problem and then look at our options for resolving it. The problem does seem to be with one of the boards that controls the drive motors. We ultimately may need to have that board repaired or replaced.

Please do not use the 16" until further notice. Hopefully this is something we can get resolved before too long so that the main scope will be available for next season. If we're fortunate it will be well before that...I'll keep everyone posted.

If there is anything you would like to lend a hand with or if you have any suggestions or questions please feel free to get in touch with me. As long as the weather is decent, I usually try to get out to the Hill once a weekend either Saturday or Sunday morning for a few hours. You can always stop by. If you want to call, my mobile number is 216.502.9144 or you can email me at fisher45014@yahoo.com ☺

Wilkins from Chagrin Falls, along with myself and Tony Mallama, started CVAS in September 1963 when we had the first meeting at Don's home on Kenton Road in Chagrin Falls. Although Don didn't stay active in CVAS very long, he had the largest telescope in CVAS when it started, which was a 6-inch F/10 Newtonian that he assembled from parts, which included an A. Jaegers equatorial mount, a Vernonscope plate glass primary mirror of excellent quality, and a nice welded aluminum tube. This scope gave great views of the heavens.

Inspired by his example, I soon afterwards build my own homemade 6-inch F/12 with a Criterion Crico Grade A pyrex mirror, that had a crude pipefitting mounting and a stovepipe tube. Rick Wilkins was the first CVAS member to grind a mirror, a 6-inch during that time. He had a 55 gallon drum set-up in his bedroom for that, but he became an inactive member shortly after CVAS started, so we never found out if he ever finished the project. Last I heard about him was in the mid-70s, when someone told me he was living in a Commune in West Virginia. I hope he is doing well wherever he is. I last saw Don Tuson in 1973 when he stopped by a Riverside Park Star Party. Both Rick and Don were excellent amateur astronomers even before CVAS started.

I remember sleeping over at Rick's home on East Washington Street near the Rec. Center one night, and we woke up early that morning to get a look at the starry eastern sky. I remember clearly seeing and splitting epsilon Lyrae for the first time from his balcony just outside his bedroom. When I commented to Rick that there was a beautiful double star near Vega, he was just quiet. Maybe he was just awestruck, as I was, by the sight of the Milky Way (which we could see easily less than a mile from downtown Chagrin Falls back then), or maybe his eyes weren't as good, as he always wore glasses. Anyway, that object is considered a good test for excellent eyesight, as it is near, or at the naked-eye limit (3.5 arc minutes) of human resolution. My eyes aren't anywhere near that good nowadays, and haven't been for years, but I remember that for me it was an easy wide bright naked-eye double star way back then.

Rick and I both had Science Fair projects that ended up going to the regionals at Kent State University. I had a model of an observatory, with a dome made out of an old toy plastic bowling ball that was painted white with shutters added, that turned on an old 45 RPM record player hub inside a tinker toy building. The observatory was inside a large wooden box with a glass front window. The inside walls of the large box had constellations painted with white paint on a black background, showing the Winter Sky. It looked OK, but was not great, but Rick's Science Fair Project was a beautiful model of the Arecibo Radio Telescope that he build, made of paper mache,

balsa wood, and wire, which was painted nicely. I thought it was awesome, but for some reason he only got a "Good" score from the judges while I got an "Excellent". His display was clearly better than mine, but my B.S. must have won over the judges more, as Rick was probably more reserved than I was. We were all very interested in science, but Rick and Don were better at math than I was at Chagrin Falls Junior High School. We were all members of the Chagrin Falls Junior High School Astronomy Club, which I was elected President of. It was started by seventh grade Physical Science teacher Pete Olive. Other members were John Patton and Duke Gerald, but John and Duke didn't join us in starting CVAS later in 1963. I remember that Don Tuson was very enthusiastic about amateur astronomy and was also very interested in Natural Science in general. He had a beautiful old brass Bausch & Lomb microscope his dad got him, which I was envious of, as mine was a cheap plastic one, but Don never bragged that either his telescope or microscope were better than mine, although they clearly both were. His family was also wealthier than ours, as we were rather poor, but he was never a snob or arrogant, unlike many of the other spoiled rich kids from Chagrin Falls at the time. Don was considerate of others, and would always be eager to explain a few of the complexities of science to me that he understood and I was having trouble with. Rick was also never a snob or arrogant, and we all seemed to get along smoothly in 1963 when CVAS was started in Chagrin Falls.

I never met Marty Niemi, the other admired CVAS member who passed away in 2011. Marty was also a CVAS Backbone awardee, which says a lot, because it is hard to get this award. I remember both Ian Cooper and Tom Quesinberry telling me that Indian Hill Observatory wouldn't be what it is now if it wasn't for Marty. CVAS president Russ Swaney told me that Marty had a hand in every building and telescope at Indian Hill, and that he never made problems, he always found ways to solve them, and that he took CVAS to another level. So, on the eve of our 50th anniversary, farewell to both Don Tuson and Marty Niemi, We should think of them when looking at the starry sky, and remember that everyone has a limited number of starlight nights left, regardless of their age. Be grateful, and always keep your sense of wonder about nature.

Happy New Year and Starry Skies for 2012. ♀

CONSTELLATION QUIZ

By Dan Rothstein

This issue's questions, all of which were obtained from old S&T's:

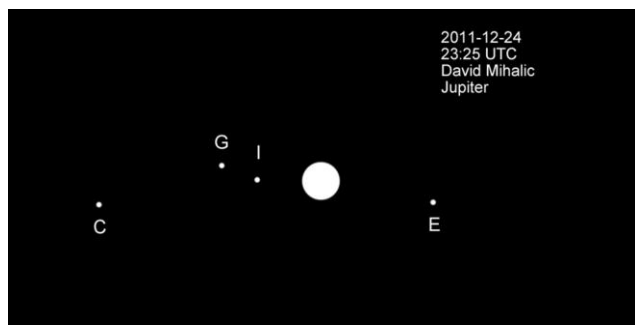
1. Where among the summer stars are the rabbit tracks, a Navajo asterism?
2. This constellation, when in the western sky, is known in Japan as a tall gate, the two brightest stars being known as silver star and golden star, or as the cat's eyes
3. The only constellation of the ancient Egyptians in the northern sky that has been firmly identified was called the foreleg. Near the foreleg, the Egyptians saw a hippopotamus, a crocodile, a chain and two mooring posts. Where are they?
4. What popular asterism (quite new in origin) can also be described as Fulcrum, the see-saw?

Answers to last issue's questions:

1. Alpha Pavonis, the brightest star in the constellation of Pavo the Peacock is also called the Peacock. It may also be the only star whose name is an English word. Does anyone know of another?
2. The Egyptian X is formed by two lines of stars which intersect at Sirius. The first includes Procyon, Sirius, and a star right on our southern horizon (23 degrees farther to the south) known as Phaet (Alpha Columba). The second line stretches from Betelgeuse to Sirius to Naos (Zeta, the rowlock of the Argo). In 1930, the IAU broke up the monstrous constellation Argo Navis, placing Naos in Puppis the poop deck (stern), but the old Bayer letters were not reassigned, so Naos is Zeta Puppis. Due to precession both Puppis and Columba are now much closer to the horizon than they were in the classical age of Greece. The X can also be seen as two equilateral triangles which have Sirius as a common point. One consists of Procyon, Betelgeuse, and Sirius (our traditional winter triangle). The other is Sirius, Naos, and Phaet.
3. The boy with the bow and arrow, which lies just south of Aquilla, between it and the constellation Capricornus, is Antinous, an actual person. This group was introduced by the Roman emperor Hadrian in AD 132 and was described as his "companion." It was lost until the Renaissance, and for a time portrayed in old star charts, being dropped only in modern times.
4. The falling overboard should have been the clue to identify Delphinus the dolphin. Another legend is associated with the same Arion, evidently a player of the lyre. He was aboard a ship returning from a performance in Sicily, carrying a substantial cache of treasure given to him by a grateful audience. The rough, pirate-like crew planned to abscond with the goods after throwing him overboard. When confronted by the crew, he pleaded to be allowed to play one last selection on his lyre. The music attracted a school of dolphins, who rescued him when he jumped (or was pushed) overboard, and carried him to shore. He then journeyed to his final destination of Corinth, arriving before the ship. The surprised crew were arrested and hanged, Arion retrieved his treasure, and the dolphin figure was placed in the sky.

CVAS OBSERVER'S LOG

I decided since it was clear to grab a quick view of Jupiter from my front yard. The temperature was about 34 degrees; the time was 6:35 pm EST. The date was December 24, 2011. I looked high in the south east for Jupiter using my 10x30 Canon Image Stabilized binoculars. Much to my surprise all four Galilean moons were visible and easily seen because of the image stabilization processor. I used Photoshop to create a quick "sketch. – D. Mihalic



Callisto, Ganymede, Io, Europa

.....

A spectacular display of the aurora borealis was widely visible from our viewing area in NE Ohio on October 25, 2011 around 1:30 UT. I happened to be at the Indian Hill Observatory at the time. Stretching from the NW all the way to the NE, and from the horizon to almost the zenith, the sky was glowing deep red with occasional white vertical bands especially due north. The vertical features came and went, but there did not appear to be much general shimmering. The intense display lasted about 15 minutes but lingered on as it faded for an hour or so. – R. Baker

2012 WINTER SKIES

JANUARY

- 4 Wed Quadrantid meteors
- 5 Thu Earth at perihelion (0 UT)
- 5 Thu Latest sunrise at Indian Hill (12:22 UT)
- 8 Sun Mars at greatest latitude N of ecliptic plane (24 UT)
- 18 Wed Mercury at aphelion (6 UT)
- 20 Fri Sun enters Capricornus (7 UT)
- 25 Wed Mars stationary in right ascension, begins retrograde motion (0 UT)
- 28 Sat Uranus crosses celestial equator N where it will stay until July 16, 2053
- 31 Tue Saturn at greatest latitude N of ecliptic plane (8 UT)

February

- 2 Thu Mars and Neptune at heliocentric opposition (18)
- 8 Wed Saturn stationary in right ascension, begins retrograde motion (11 UT)
- 10 Fri Venus 0.31 deg NNW of Uranus (1 UT)
- 15 Wed Mars at aphelion (21 UT)
- 17 Fri Sun enters Aquarius (2 UT)
- 29 Wed Leap Day

MARCH

- 1 Thu C/2009 P1 Garradd at opposition (0 UT)
- 3 Sat Mars at opposition (20 UT)
- 5 Mon Mars nearest to Earth (17 UT)
- 13 Tue Venus 3.0 deg NNW of Jupiter (22 UT)
- 20 Tue Vernal equinox (5:13 UT)
- 21 Wed Venus at perihelion (1 UT)
- 29 Thu Summer solstice on Mars (18 UT)

NOTES & NEWS

Don Tuson, one of the founders of CVAS, passed away recently in Binghamton, NY. George Gliba has written about Don's involvement in the early days of CVAS. George's article, "More Early CVAS History" appears in this issue of *The Valley Skywatcher*.

The CVAS website has information about upcoming astronomy events and activities in our area. In addition to a special member's login, there is a host of astronomy related information, and links to interesting and useful sites. Send comments and suggestions to webmaster, Russ Swaney russ.swaney@ameritech.net.

The Valley Skywatcher has a long tradition as the official publication of the Chagrin Valley Astronomical Society. All material in this issue has been written and provided by individuals within our membership community. CVAS welcomes astronomy related contributions from all members and friends, and this journal provides a unique opportunity for us to share interests. Published quarterly, the next issue will be available near the end of March. If you would like to contribute material to the publication please contact the editor, Ron Baker rbaker52@gmail.com.