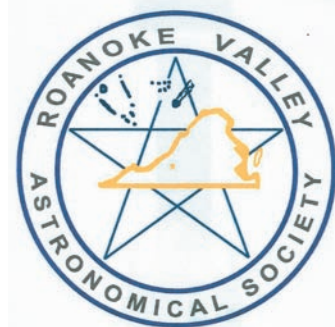




Roanoke Valley Astronomical Society



Amateur Astronomy News and Views
in Southwestern Virginia

Volume 28 – Number 1

January 2011

RVAS 2011 Highlights

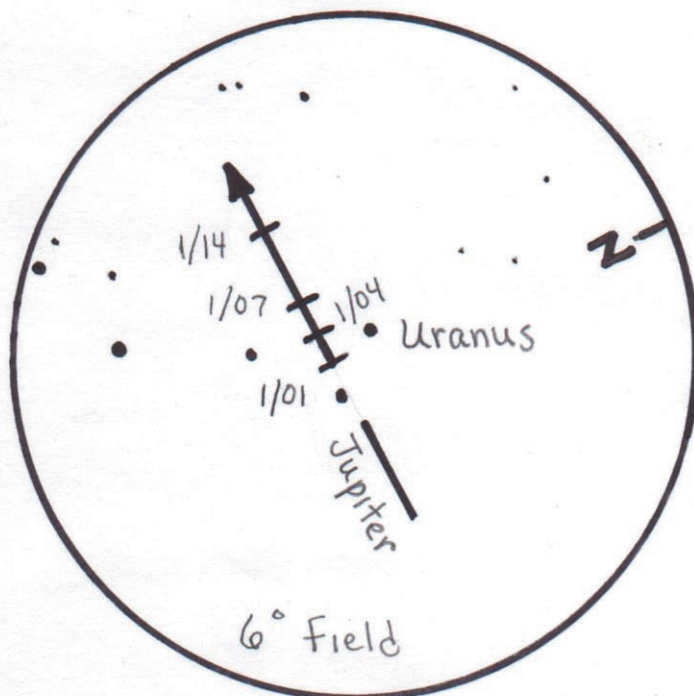
by John Goss

Every year brings many celestial treats for those amateurs who make the time to see something interesting. Here is a list of worthy sights in 2011 that can be viewed through binoculars or telescope. They also give you an excuse to dust off your camera and practice shooting through the eyepiece. So, mark your calendars and get out there and observe!

1. Jupiter points the way to Uranus.

While Uranus isn't hard to see through a telescope, it isn't all that easy to find. Early January offers amateur astronomers a convenient guide for locating the seventh planet: the fifth planet. **Big Jupiter passes small Uranus on January 4, coming to**

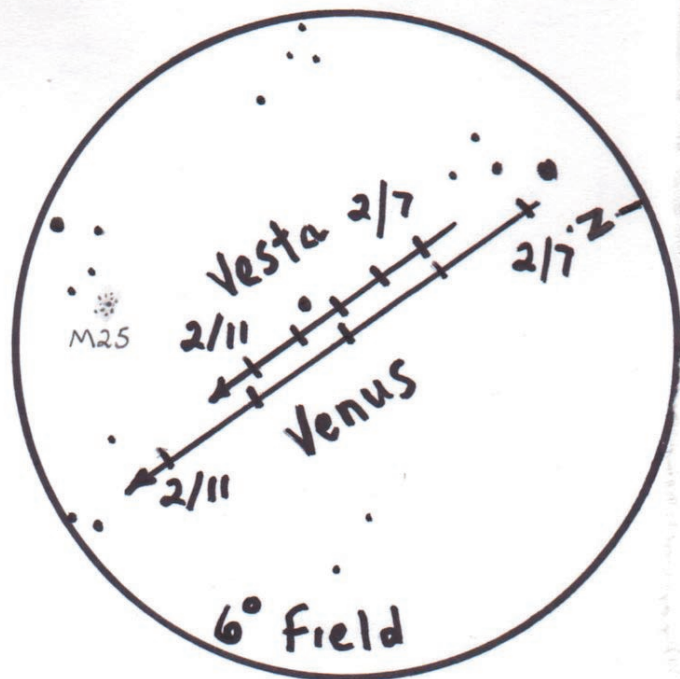
within 30 arc minutes of the dim world. On that night, Jupiter is positioned about half way between Uranus and the similarly bright star 24 Piscium. Both planets should fit within the same field of a low powered eyepiece allowing direct comparisons of their sizes, brightnesses, and colors. A few days later, Jupiter says farewell to its smaller "gas giant" cousin. They won't meet again until 2024. Tootle-loo!



2. Vesta visits Venus.

As asteroids go, Vesta is a bright one. Compared to brilliant Venus it is dimmer than dim. **The first week of February gives amateurs a chance to directly compare them when Venus moves below Vesta on the 9th.**

Compare the appearance of the 580 miles wide atmosphere-less rock lying 255 million miles away, with the 7500 miles wide cloud enshrouded world sitting just 85 million miles away. Quite a difference, you will see!



3. "Near" and far.

- **An interesting photo opportunity** occurs on the mornings of February 3, 4, and 5, and again on February 9, 10, and 11. Venus moves near M20 and M8 in Sagittarius on the first set of dates, then passes M25 on the second set.

A tracking camera should be able to capture these events about 6:00 a.m. when Venus rises high enough above the southeastern horizon to capture a good image. There won't be much time to experiment, though, since the sun rises about 7:20 a.m. and the sky brightens long before then.

- **As a test for observing along a bright horizon, try catching Mercury positioned in front of M44, the Beehive star cluster, on July 6** around 9:30 p.m. This will likely be a challenge. Magnification can bring out stellar objects in a bright background, so it may be



possible to see the Beehive through a telescope while not through binoculars. If the sky transparency is good, you just may be successful!

- **Gemini's M35** isn't normally a subject of interest in the August early morning sky. However, when it rises just after 3 a.m. on August 6 and 7, the Red Planet lies 30 arc minutes next to the bright star cluster. Shining at 1.4 magnitude, Mars certainly won't be overwhelmingly bright, but it still will be easily seen and will be slightly brighter than nearby Beta Tauri (Elnath).

- **Mars continues its journey along the ecliptic, reaching M44 on September 30.** Wait until a hour after the 1.3 magnitude planet rises at 2:15 a.m. before beginning observations. It will take three days for Mars to pass this large star cluster, allowing you an opportunity to take a sequence of photos of the encounter.

4. Lunar Occultations.

Even though they are very large, stars are very far away. So far away that from Earth they appear and act as pinpoints of light — even through a telescope. The moon occasionally moves in front of — or "occults" — a star, blocking its light. 2011 has two occultation events where you can witness a moderately bright stellar pinpoint suddenly disappear behind the dark, leading edge of the moon. And both of

them occur at reasonable times of night!

- **March 13: 2.8 magnitude Mu Geminorum disappears** about 7:45 p.m. and reappears about 9:12 p.m. The sun sets at 7:23, so the sky should be dark enough by 9:00 to find the star and see it "wink out."

- **August 10: 2.9 magnitude Pi Sagittarii disappears** about 9:58 p.m. and reappears about 11:10 p.m. The reappearance of Pi may be difficult to spot since it will emerge on the bright edge of the near full moon.

DINOSAURS EAT HALF THE CLUB!!!

by Various Survivors

This isn't how Christmas parties are supposed to play out:

The powers that be in the RVAS decided to enliven this year's Christmas gala by having it in the planetarium – on the 13th, no less – and by showing dinosaurs before we ate.

Anybody who has seen *Jurassic Park* or *Night at the Museum* knows you don't mess with Mother Nature. Our resident technological guru, Mark Hodges, runs the planetarium. Unknown to the festive attendees, Mark had drunk too much Christmas punch, and he got inspired to "spice up" the show. Result: big bad dinosaurs jumped off the screen and invited themselves to the gala – but WE were their menu!

The blood bath that followed shrank our membership horribly. (New members welcome.) Nevertheless, we survivors want to say that "the show went on." We are a very hardy lot, able to stand out in the cold for hours looking for faint meteors and for faint fuzzies, before the clouds rush in and our fingers freeze.

After things "settled down," and the well fed dinosaurs were put back on the screen by Guru Mark, the surviving RVAS membership enjoyed a very fine array of people food that had been ignored by T-Rex and his rapacious buddies. On the following page are some snapshots of the lucky survivors.

Our president, Paul Caffrey, led us through a drawing of door prizes left over from the

Continued next page

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of astronomical observational and photographic activities. **Meetings are held at 7:30 p.m. on the third Monday of each month, at the Center in the Square in downtown Roanoke, Virginia. Meetings are open to the public.** Observing sessions are held one or two weekends a month at a dark-sky site. Yearly individual dues are \$20.00. Family dues are \$25.00. Student dues are \$10.00. Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS or its editor.

RVAS web page: <http://rvasclub.org>

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recent VAAS gathering in Salem – which had no invited hungry dinosaurs to complicate matters.

We also had a lovely pot luck event outside the planetarium seating area. Many people brought nice dishes to share, and we had two crock pots of cider, and cold drinks.

Rick Rader provided a prophetic dinosaur cake, which means we got to eat one of THEM!

As our membership had been instantly halved, each survivor enjoyed twice as much food. All in all, the evening was a lovely success, except for the unpleasanties. The club promises to have guests other than rapacious dinosaurs at the next Christmas season gala.

Here are two photos of the happy survivors, and one of the dino cake. Mr. Goss provided the photos.



CONSTELLATION OF THE HAND

by Jack Gross

The Lakota Indians have a neat legend about their Constellation of the Hand. This star pattern is made mostly from the bottom half of the familiar winter constellation of Orion. It represents the hand of a great Lakota chief. The tale goes something like this:

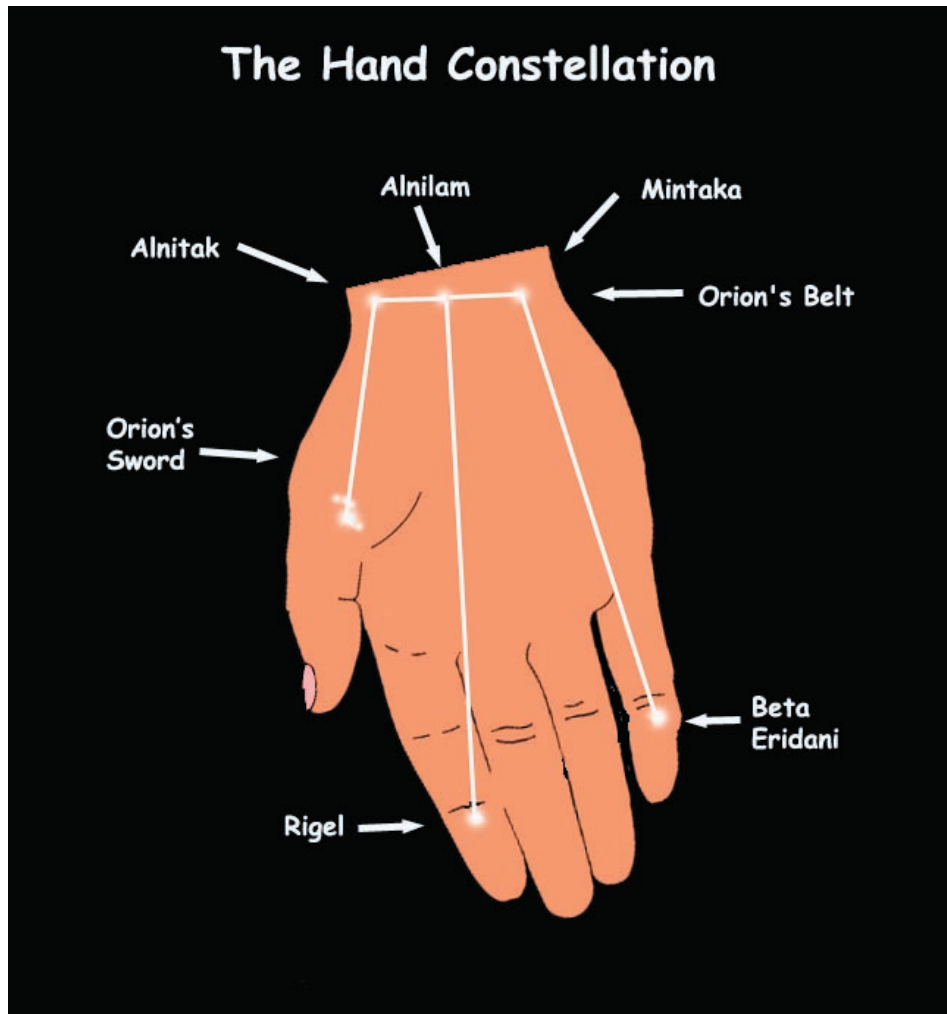
The gods wanted to punish the Lakota's chief for his selfishness and made the Thunder People cut off his hand, or according to some accounts, it was his arm. The chief's daughter offered to marry anyone who would recover the severed body part.

Fallen Star, a young warrior whose father was a star and whose mother was human, returned the hand and married the daughter. Presumably it was reattached, although *recherche microchirurgie* isn't mentioned.

The return of the hand to the chief symbolizes harmony between the gods and the people - with the help of the younger generation.

I leave the implication of this myth for our modern world in your hands. Bad pun; good thought.

So, let's find out what the Lakota actually see in the sky: The hand of this great chief is outlined using stars in Orion and Eridanis. The detached wrist is made up from Orion's belt stars, Alnitak, Alnilam and Mintaka. The index finger is the bright star Rigel, while the thumb is the Orion Nebula. The pinky is Beta Eridani, a star in the constellation of Eridanus.



The great Chief's severed hand appears to be dangling in the winter sky, facing downward. Once you see his hand, you may never again view Orion in quite the same way.

Remember, when someone in winter tells you to "talk to the hand" - face south and look up.

DECODING THE HEAVENS

A book review
by Rand Bowden

Decoding the Heavens, by Joe Marchant, is a book that takes you to many places and times. This true story centers around an artifact that was discovered on a sunken ship in 1900 in the Mediterranean Sea by sponge divers. Since it was found near the island of Antikythera, it has been named the Antikythera mechanism. (Pronounced ANT-i-ki-THEER-a or ANT-i-KITH-a-ra).

As the Greek curators began examining this artifact, they were amazed. Seeing the gearwheels, pointers, inscriptions, and scales, they couldn't believe that it was 2,000 years old. Marchant says, "The ancient Greeks... weren't supposed to have had complex scientific instruments... And clockwork wasn't supposed to have been invented until... a thousand years

later. It's hard to overestimate the uniqueness of the find. Before the Antikythera mechanism, not one single gearwheel had ever been found from antiquity... Apart from the Antikythera mechanism, they still haven't."



A number of science historians studied the fragments of the mechanism through the years up to World War II, and speculated on its true purpose and age. They were constrained in how much information they could extract from the device because of the limestone deposits covering it and because when they tried to clean it, it

crumbled into powder.

In the 1960's and 70's, Derek De Solla Price, an English PhD, became fascinated with the

Continued next page

Frank Baratta's Astro-Quiz

What are the altitudes of the Sun on the Equinoxes and on the Solstices, as seen from Roanoke?

Answer to Last Month's Astro-Quiz: If only visual evidence will convince some people that the Moon landings occurred, our technology is not yet up to the task. At the Moon's distance from the Earth, the five-meter-wide lunar landers span an angle of about 0.003 arcseconds. The Hubble Space Telescope's resolution in the visible range is about 0.03 arcseconds, a factor of 10 too coarse to resolve the landers. Through active and adaptive optics and additional wave-front correction technology, the Large Binocular Telescope promises to achieve a resolution of 0.005 arcseconds. A phenomenal advance, but still not quite the level needed to see the landers.

Antikythera mechanism. He was able to see a great deal more of the device because new techniques allowed more of the device to be cleaned. Using this additional information, Price began to realize that the device was a very complex mechanism for keeping track of and forecasting astronomical events. His research indicated that the device calculated the 19-year cycle of the 235 synodic months!

In the 1980's, two men, Wright and Bromley, were able to x-ray the Antikythera mechanism and gain even more detail about the gears and inscriptions. Wright was able to confirm that the device was able to calculate the 19-year cycle of 235 months. He also discovered a little dial that was divided into four. This produced a 76-year period that got rid of the awkward quarter day from the 365 1/4 day year. He also found evidence that the device had a window in front that showed the phases of the Moon using an ivory ball half blackened by ink. He was not done yet.

Marchant reports: "... he saw a double wheel system in which one small wheel sat almost, but not quite, on top of the other. The bottom wheel had a pin sticking up from it, which engaged with a slot in the top one, so that when the wheel rotated it drove the other wheel around. Because the wheels rotated around slightly different centres, the pin from the bottom wheel would slide up and down in the slot ... introducing a wobble into its speed of rotation." This mimicked the actual elliptical orbits of the Moon and planets. It would be 1,500 years before this idea would be rediscovered.

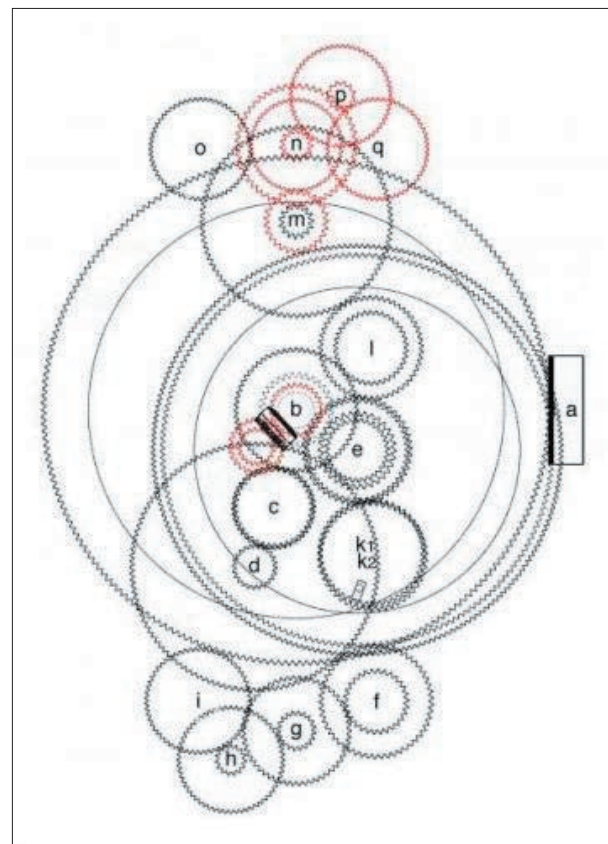
In 2005, Tony Freeth and Roger Hadland teamed up to make further discoveries about the purposes of the Antikythera mechanism. Using microfocus X-ray imaging, a technique developed by Hadland, they were able to read and translate many more of the words and symbols on the front and back of the device.

Using this additional information, Freeth was able to determine that the device was a truly

marvelous mechanism that could be used to predict solar and lunar eclipses! By turning the gears forward the operator could look into the future and predict the exact time and location of eclipses. The knowledge and skill needed to produce it, the author says, ... "was breathtaking... and beyond any but the most skilled clock-makers today." Furthermore... "The mechanism was now not just of interest for the history of technology. It became a key piece of evidence in the history of astronomy..." It provided evidence of the extent of knowledge of astronomy possessed by the Greeks at the time it was made.

I found the book to be interesting and well written, and now I have a better understanding of eclipses.

One copy of this book will be available for loan at the January RVAS meeting.



Gear plan for the device.

The E.T. Cluster

by Clem Elechi

Beside its official designations, NGC 457 in Cassiopeia has been called many names. It is often called the ET Cluster (after the movie critter) and the Owl Cluster. It has also been called the Kachina Doll Cluster (from Hopi mythology; apparently it resembles one of the Hopi figures), the Dragonfly Cluster, the Nazgul Cluster (another literary reference; this one should be a slam-dunk for an association of nerds) and sometimes the Phi Cas Cluster. It has been likened to a military plane with afterburners glowing, and even some kind of a wraith. If the orientation of the picture is right, I see an ancient prophet, eyes burning with fervor and righteous indignation, arms held high to call down lightning on those who have strayed from The True Path.

People perceive so many different things when they look at that collection of stars that I wonder if it could not serve as a Rorschach test for astronomers.

NGC 457 is an open cluster almost 8000 ly away. It contains roughly 100 stars. The bright Phi Cassiopeiae, after which some have named the cluster, is not thought to actually belong to it. It is in the foreground, about 2300 ly away.

My widefield view also contains NGC 436, another small open cluster. Both NGC 457 and NGC 436 were discovered by William Herschel.

To see an annotated and wide field version of this image, including both clusters, see: <http://tinyurl.com/2cvd2nk>

I took this picture of the Owl Cluster and its region of the sky – only the “owl” portion of which is shown here – on November 27, 2010, the first clear night after my CG5 had returned following vivisection at Celestron. I had sent in the equatorial head and hand control per their instructions. I had received the standard disclaimer of “...30 working days...” To this day, I have no idea what they actually did to the



mount. No one at their repair facility has bothered to respond. Celestron must be one of those supermassive astronomical entities into which everything falls and no information can ever escape.

This was a nice target, not needing much fiddling during the setup, and

not really requiring guiding. The 30 second and 45 second exposures seemed to work. The stars away from the center show elongation, from field curvature. As the commercial goes: “There is an app for that.” In astronomy, there is a gadget for that. A field flattener should help with some of that star elongation in future.

ET Cluster: 53x30sec, 35x45sec, Darks, No Flats. Canon 450D. Celestron Onyx EDF, Celestron AS-GT.

What if the Night Sky Had No Stars?

by Clark Thomas

The Sun dominates the days; the biosphere is full of happy life. What if the night skies were always pitch dark, devoid of stars? What kind of world would that be for us humans?

This odd scenario is not impossible to imagine: What if our newly formed Sun had been ejected from the Milky Way into deep space, so that we were far away from all other stars; and we were also inside an intergalactic dust cloud? That should do it.

We humans dislike water cloud sheets blocking the sky show. After a storm breaks the stars break out, and all seems good. With thousands of stars and fuzzy spots overhead, it's playtime for the eyes again. We are no longer star-starved. It's the pageant of life on our planet.

During humanity's early era our eyes were our astronomical instruments. Andromeda was just another fuzzy spot, a nebula. So too was Omega Centauri. M42 actually is a nebula.

With telescopic instruments the detectable cosmos has seemingly transformed into a sparkling zoo populated by amazingly large objects, some of which could harbor ETs.

Under an absolutely dark night sky all that scintillating joy would be visually beyond reach.

How could the ancients populate the sky with fanciful constellations? How could lovers pick out their own special star? How could Van Gogh paint his *Starry Night* gems (two of which are seen here)? Even the deep oceans host bright points of light from clever bioluminescent hunters.



In everyday life it is easy to take for granted the blessings we have. Those who are healthy go along with their daily lives taking their good health for granted. Mindlessness can be a good situation, except when self-destructive habits, such as mindless smoking, lead to self-induced disease decades

later. Indeed, it is only when we would lose the stellar skies we have that we would miss them – or maybe not, if we never knew otherwise.



Not to worry. The stellar firmament we love won't vanish for many billions of Earth years. We frail mortals will vanish much sooner. Let us seize our opportunities to enjoy the boundless beauty of our starry nights.

When we stand in a dark field below stars, nebulae, star clusters, planets, comets, meteors, and other gems – it is every bit as thrilling as standing during the day in a large field of spring flowers. Best of all, our stellar night skies are available to us for free every month, not only in spring. Just look up!

Galaxy 7331 in Black and White

by Michael Good



As we watch the clouds roll by...

Attached is only 7x15min (105min - 1hr 45min) of lum data on my friend in Pegasus. I love the spiral structure - I love the dust lanes.

Working with under-sampled data in AIP4Win, and then ported into Photoshop. I used a gamma-log before MEDIAN combining, then 40+ iterations of Lucy-Richardson deconvolution.

In Photoshop CS4 I fiddled with levels and curves, shrunk the stars, masked the arms to be more contrasty, and added a frame. Oh yes, and the center of 7331 is a hot cauldron of stars, so the entire middle third is blindingly

bright and void of any structure... so I had to create multiple feathered masks and "drill" down to the core, highlighting the dark arms as I went (and this only worked due to the gamma-log, which preserved the structure in the data).

I like the three galactic boys up above 7331, the one on the upper left in particular. Anyway, since I am photon starved, and the moon is back, thought I would play with the data I got at the end of November.

Black and white data has its own advantages in displaying faint structure. Of course, in converting to 8 bit from 32 bit, I lost some of the image's luster, as viewed on my own screen.

In Radio Astronomy, OSCAR is Neither an Academy Award, Nor a Fish

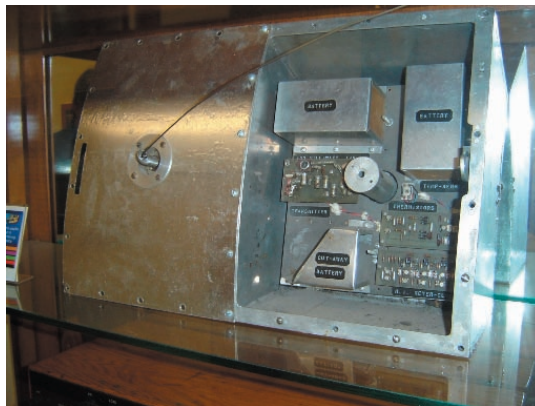
by Dave Thomas

Orbiting Satellite Carrying Amateur Radio, was the little satellite that could. Launched in December of 1961, just four years after Sputnik, it allowed licensed radio amateurs to communicate over long distances on various amateur radio bands from 15 meters and into the centimeter wavelengths. Of the 70 OSCARS launched so far 31 are still operational.

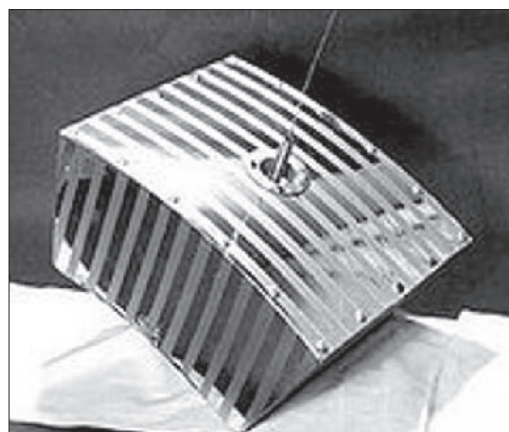
The satellites act as repeaters, and use different frequencies on the uplink and downlink. The most common modes of modulation are FM, frequency modulation, and SSB, single sideband. Because the OSCARs are in low Earth orbit, and due to the orbital speed of the satellites, the Doppler Effect requires the ham gear to be tuned slightly above or below the assigned operating frequency. Software is available to calculate Doppler shift and the frequency to tune when the satellite is approaching or moving away from the ground location. FM is less susceptible to the Doppler Effect than SSB.

The USA, Japan, China, Russia, Korea, and the UK are among the several nations around the world that have launched OSCARS. These little workhorses have helped pioneer the development of current technology used by the communication satellite industry. This is also true of many advances in electronic and space age technology.

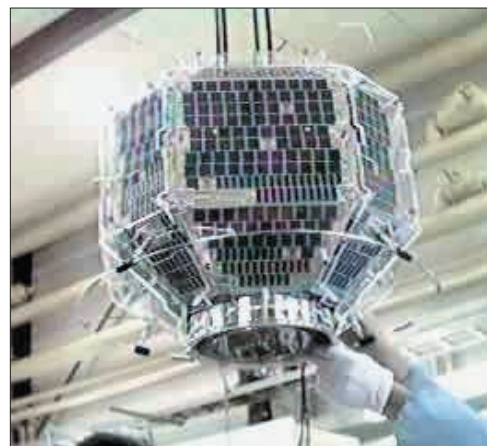
Several of the OSCAR satellites would be visible in binoculars. Anyone with a receiver that tunes to the satellite frequencies can monitor any activity. You only need a license to transmit. The following URL will link to a prediction tool which will give the date and times the satellites will pass over a given location:
<http://www.amsat.org/amsat-new/tools/predict/index.php>



OSCAR One Mock-Up



OSCAR One



OSCAR 29

Arp's Loop is RR1

by Clark Thomas

Recently I installed on my desktop the beautiful December 9, 2010 "M81" image from the Astronomy Picture of the Day (APOD), a small portion of which is the image at right. Then I got very curious about a mysterious feature on the image.

Mysteries entrance me, because they often are portals ("entrances") to new knowledge. In this case the mystery seems like a broken dust lane stretching straight across virtually the entire visible galaxy just to the right (in this image) of the galaxy's core. It slightly curves, as if around a distant center away from M81's core.

There is another nearly straight, broken dust lane, parallel to and outside the first. (This second dust lane is not nearly as bold – and in some areas appears to be three or more lines – nor does it seem to extend clearly from outer arm to outer arm.) It too does not seem to be randomly formed and placed, but concentric with the first lane. This would be consistent with multiple explosions from one source to the right.

In the 1960s the overall "looped" feature, especially nebulosity outside the extended M81, was named **Arp's loop**. The initial idea was that this galactic feature resulted from gravitational effects, a tidal tail, associated with interactions between M81 and nearby M82.



A 2010 study based on more data hypothesized that Arp's loop is not merely a tidal tail from M81. It appears to be a feature found within the cirrus-like dust "clouds" floating several hundred light years above the plane of M81. A summary of that article is located at <http://arxiv.org/abs/1004.1610>. The full study is located at <http://arxiv.org/pdf/1004.1610v2>. The summary says:

"The morphology of the Arp's loop has been investigated with deep wide-field optical images. We also measured its colors using IRAS and Spitzer-MIPS infrared images and compared them with those of the disk of M81 and Galactic dust cirrus that fills the area where M81 is located. Results: Optical images reveal that this peculiar object has a filamentary structure characterized by many dust features overlapping M81's field. The ratios of far-infrared fluxes and the estimated dust-to-gas ratios indicate the infrared emission of Arp's loop is dominated by the contribution of cold dust that is most likely from Galactic cirrus. Conclusions: The above results suggest that the light observed at optical wavelengths is a combination of emission from i) a few recent star forming regions located close to M81, where both bright UV complexes and peaks in the HI distribution are found, ii) the extended disk of M81 and iii) scattered light from the same Galactic cirrus that is responsible for the bulk of the far infrared emission."

Here is where we must reconsider our tendency to see space in two dimensions. The ancients perceived their skies in two dimensions, and it is very easy for us to think likewise. Nevertheless, space is very three-dimensional. Things that appear close may be quite distant, almost like an optical double star. There are things that initially appear to be, but are not. Stellar asterisms are arrangements of stars that appear to be something from a given perspective, but not from other perspectives. The Big Dipper, for example, would not be anything like it is from a very different direction 80 ly away in space. Fortunately, space is randomly full of amazing objects, which helps increase the probability of two or more being in our line of sight, creating a visual hybrid.

Multiple images of Arp's loop, both amateur and professional, show three features that have not been clearly explained in the literature:

First is the neatness of that part which is away from M81 toward the direction of M82, as seen in the detail at right from the APOD2008May12 image. [View image at right in a darkened room, through a paper towel tube.] The persistent circularity of the loop in this direction leads one to wonder what really is going on – considering that M82 and M81 are now sufficiently far apart that any M81/M82 tidal shapes should have distorted and dissipated millions of years ago.

On the other hand, there is a deep image of Arp's loop and M81, produced by Tony Hallas, which shows the loop as being rather ragged, and broken in places. The form we see today is consistent with sufficient time for local forces to distort and spread out the less dense elements – but not so much time as to erase its presence, nor seriously disrupt a density wave. The visual "breaks" are explainable by sporadic distribution of local galactic cirrus. Reference: <http://www.astrophoto.com/M81LRGBDEEP.htm>



Second is the amazing linear nature of the dust lanes superimposed over the entire visible M81. If they were the product of an elastic M81 being stretched, tearing, and returning to its original shape, it would be hard to model our current view of M81.

Third is the unresolved relationship of this loop/ring to the local **I**ntegrated **F**lux **N**ebula above the Milky Way in the direction of M81. The **IFN** are areas of amorphous cold dust scattered in certain regions a few hundred light years above the plane of the MW. They reflect light from billions of MW stars. Here is a site that explains and maps this phenomenon: http://www.galaxy-images.com/UNP_IFNebula.html

It is worth noting that nowhere else in the deep intergalactic volume between M81 and the MW are there apparent, galaxy-sized dust rings.

What then could create such a structure? **I hypothesize that "Arp's loop" is primarily the remnant of a nova's repeated explosions above our own galaxy, within the IFN, a portion of which is by chance superimposed over M81.**

These nearby MW explosions would therefore be much smaller events than something associated only with M81 almost 12 mly away. Arp's loop would, like an optical illusion, appear large by projection perspective in relation to the much more distant galaxy directly behind.

A remnant nova – sufficiently ancient, but away from the galactic cirrus/IFN – will only have unseen shock waves, or density waves.

Arp discovered his loop/ring structure in the 1960s from Palomar Schmidt plates, and so his name got attached to the "loop." I suggest a better name for this ring (not a loop) would be the **Roanoke Ring 1 (RR1)**.

An exploding nova does not expel nearly as much matter as does a supernova. However, its relatively weaker shock waves continue outward, interacting with surrounding local nebulosity. At the leading edge of each nova's density wave in the IFN we would expect to find a compression of dust, which could form a gently curved cold dust lane in space, ultimately constituting a ring. Sufficient galactic dust in the form of the "cirrus" would provide enough matter, beyond the very small amount of matter ejected from the nova itself, to allow the creation of multiple rings and density wave dust lanes – but not sufficient dust to stimulate star birth.

It is likely that subsequent rings within RR1 could be the result of less productive density waves from subsequent explosions. Place all of these concentric nova waves over and in line with the face of M81, and you have an hypothesis that explains much of what we see.

One final question has lingered: What if the Arp's loop/ring is unique, and it has not been replicated, or nearly so, anywhere else? That would diminish the argument for this being a new type and population of celestial phenomenon (as seen from Earth's perspective).

Consider the example of a few planetary nebulae that show rings, such as M57. It is possible that some of what we are observing are planetary nebular remnants. These rings in the IFN are likely generated either by late stage planetaries, or by nova density waves. This question is possibly resolvable by finding RRs above the galactic plane, but away from the IFN/galactic cirrus.

Back to the uniqueness question. I didn't notice it at first, but we have for two years been looking at what may be a **second IFN RR!** This ethereal object shows itself right here in the APOD2008May12 image. Look below toward the lower right corner, and about an inch to the left.

[To see both rings clearly, you should be looking at your monitor in a dark room. I recommend looking with one open eye through the cardboard tube of a roll of paper towels. This tubular light baffle will help you avoid light pollution from the white "page" areas. You may also need to go to the APOD web sites herein themselves, as there is some loss of contrast translating and compressing through three image formats.]



This second ring, which I name **RR2**, is not as coherently circular as RR1. (Both appear to us somewhere between edge-on and face-on.) This may be due to a greater age, and/or differences in local gravitation and magnetic fields. Differences in local dark matter may also come into play. The main point is that there is no M81-like structure directly behind, nor an M82 nearby, to help "explain" the looping of RR2..

At the very least, RR2 is not a random figure. It looks a bit like the supernova remnant we call the Veil Nebula. RR2 is probably not a supernova remnant – but neither is it random, nor associated with RR1.

How many other formerly unseen RR structures can we now locate in the MW IFN with the latest imaging technology? The seemingly simple linear dust lane appearing over central M81 has opened a new scientific playground within the MW, both for professionals and advanced amateurs.

Calendar of Events

by Frank Baratta

MONTHLY MEETING:

**Monday, January 17th, 7:30 p.m., top floor,
Center in the Square, Roanoke.**

The featured program for the evening will be something very secret and very exciting, cooked up by our illustrious Vice President.

RVAS WEEKEND OBSERVING SESSIONS: Unless otherwise indicated, observing sessions are held at Cahas Mountain Overlook, milepost 139 on the Blue Ridge Parkway. Remember to dress for the Arctic — including feet, hands, neck and head.

- ◆ **Friday and Saturday, 28th and 29th. Sunset is at 5:41 p.m. Astronomical twilight ends at 7:11 p.m. The Moon sets at 12:45 and 1:29 p.m., respectively.**

- ◆ **February Sessions: 4th and 5th; 25th and 26th**

ROANOKE CITY PARKS and RECREATION PUBLIC STARGAZE: Saturday, January 29th, 6:30 p.m., Cahas Overlook, Milepost 139 Blue Ridge Parkway. Nonmembers must register with Parks & Rec. at 540-853-2236. Members can call 540-774-5651 for information. (Next session: February 26th, 6:45 p.m., Cahas Overlook.)

FRANKLIN COUNTY PARKS DEPT. PUBLIC STARGAZE: No sessions scheduled until later in 2011.