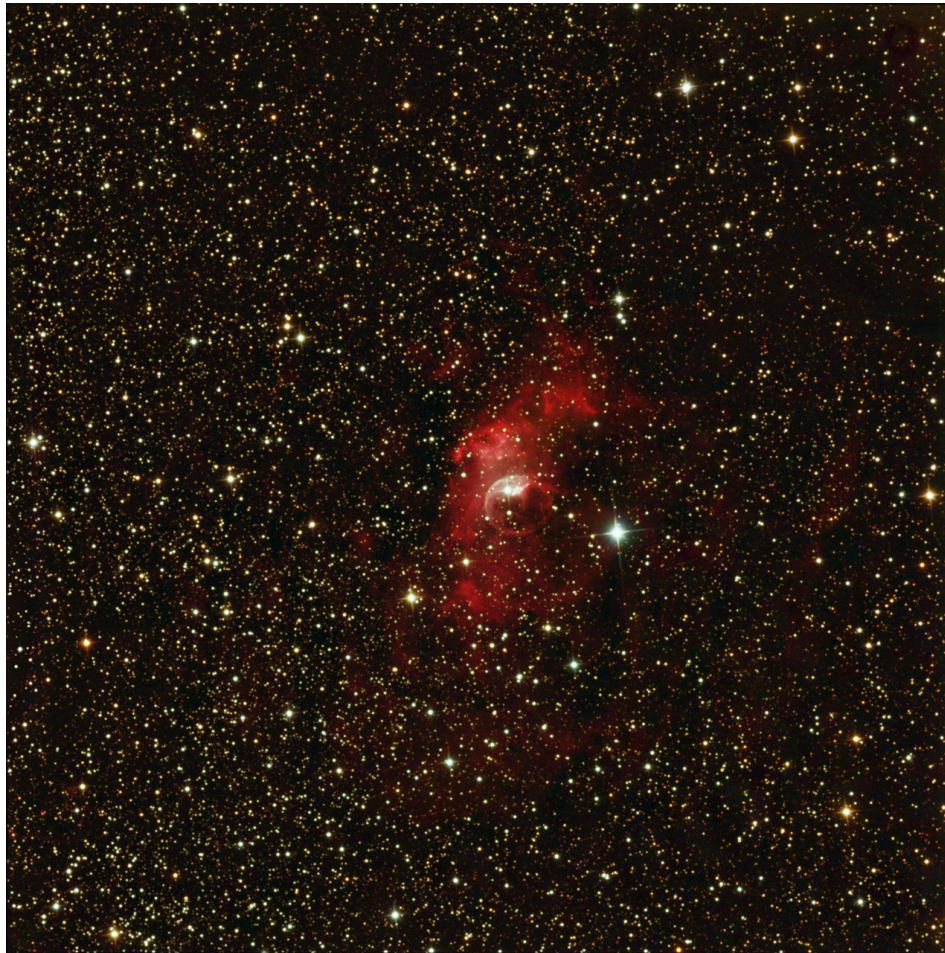


Sky WAA tch



Bubble Nebula

Olivier Prache provided this image of NGC7635 in Cassiopeia, the Bubble Nebula. The image was taken over 7.6 hours (4.5 Luminance and 1 hour each R,G,B) with a Hyperion astrograph (12.5" F/8) and FLI ML16803 camera.

At a distance of 11,000 light years, the Bubble Nebula is an emission nebula where a molecular cloud is heated by a massive central star. The nebula is approximately 10 light years in diameter.

Events for October 2012

WAA Lectures

“The End of the World...But Don't Lose Any Sleep Over It”

Friday October 5th, 7:30pm

Miller Lecture Hall, Pace University
Pleasantville, NY

Alan Witzgall will provide his answer to the Mayan calendar prediction of the end of the world on December 21, 2012. Mr. Witzgall holds a Bachelor's degree in Earth Sciences from Kean University. He is an active long-term member of Amateur Astronomers, Inc. of Cranford, NJ, and is a past president of that organization. He is also active at the New Jersey Astronomical Association in High Bridge, NJ, serving there as its Vice-president. He is currently a Senior Optician for Fastpulse Optics in Saddle River, NJ. His career in optics came from building telescopes in his basement during his high school years. In 1977, one of them, a 10-inch reflector, took First Award at Stellafane. He has created precision optics for the Lawrence Livermore Labs' Nova fusion reactor, optics for the imaging infrared spectrograph of the Canada-France-Hawai'i Telescope, the GALEX ultraviolet satellite, the NICMOS camera at the Pic du Midi Observatory, and the spectrograph for the Gemini North telescope. Free and open to the public. [Directions](#) and [Map](#).

More Upcoming Lectures

Miller Lecture Hall, Pace University
Pleasantville, NY

On Friday November 2nd our speaker will be Dr. Caleb Scharf, who is the Chairman of the Astrobiology Department at Columbia University. His talk will be entitled “Planets, Stars, Black Holes and the Quest for Our Cosmic Origins” and will elaborate on the subject of his latest book, *Gravity's Engines*. On December 7th, Jeffrey Jacobs will be showing his film “A Sidewalk Astronomer,” followed by a Q&A session. Lectures are free and open to the public.

Starway to Heaven

Saturday October 13th, Dusk

Meadow Picnic Area, Ward Pound
Ridge Reservation, Cross River

This is our scheduled Starway to Heaven observing date for October, weather permitting. Free and open to the public. The scheduled rain/cloud date is October

20th. Participants and guests should read and abide by our [General Observing Guidelines and Disclaimer](#).
[Directions](#)

Renewing Members. . .

Kevin Doherty - White Plains
Anthony Monaco - Bronx
Matthew Fiorello - Bedford
Scott Nammacher - White Plains
Thomas Boustead - White Plains
MaryPat Hughes - Briarcliff
Josh & Mary Ann Knight - Mohegan Lake
Michael Clark - Pound Ridge

CALL FOR SUBMISSIONS

The *SkyWaatch* is always looking for contributions. Write an article or share your astrophotos, observing reports or book reviews with fellow WAA'ers. Material should be related to amateur astronomy or space science. Send the materials to the [Newsletter](#).

WAA APPAREL

Charlie Gibson will be bringing WAA apparel for sale to WAA meetings. Items include:

- Caps, \$10 (navy and khaki)
- Short Sleeve Polos, \$12 (navy).

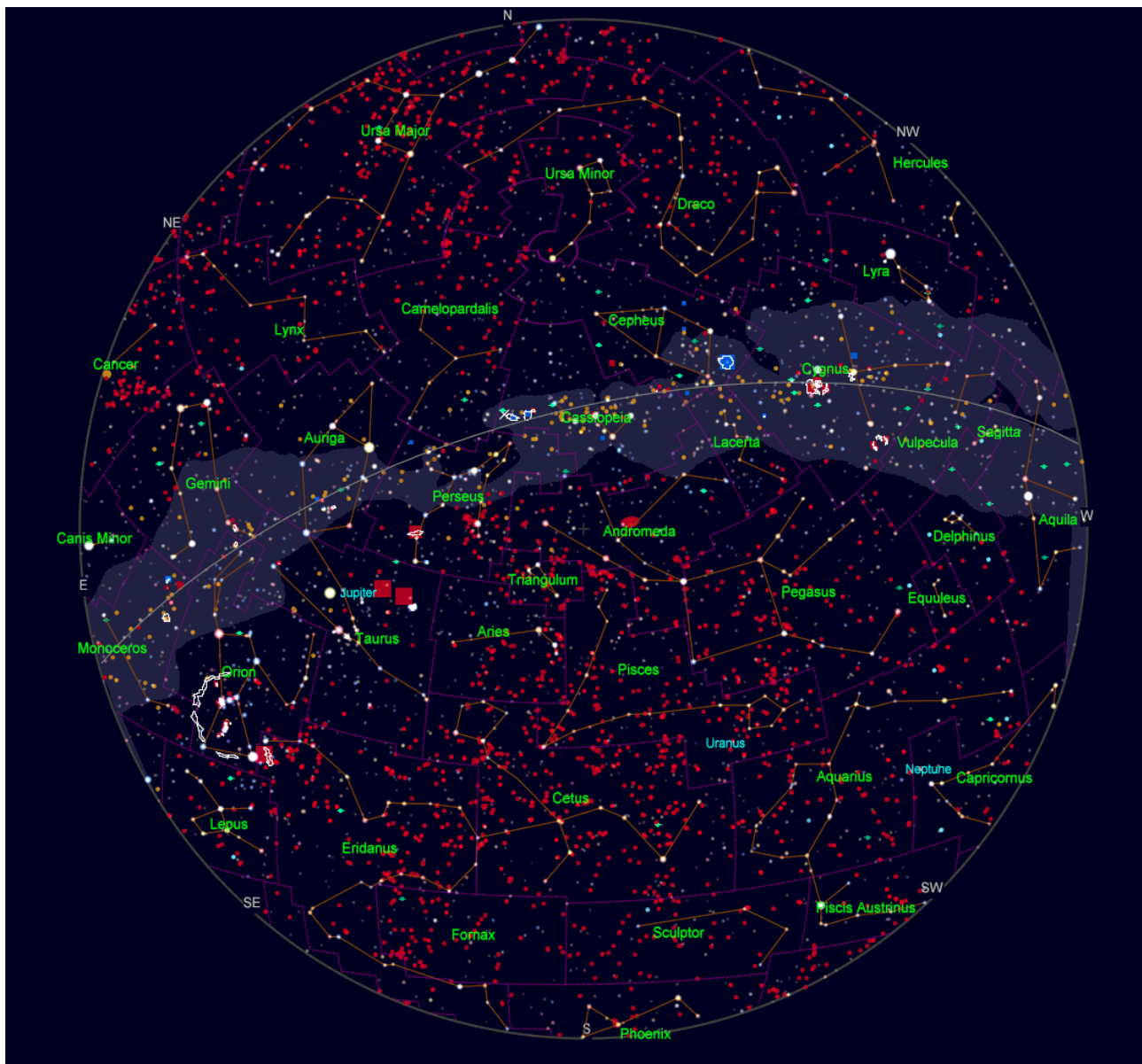
Call: 1-877-456-5778 (toll free) for announcements, weather cancellations, or questions. Also, don't forget to periodically visit the [WAA website](#).



Credit: Tycho Brahes Glada Vänner

Articles and Photos

Galaxies of Autumn by Larry Faltz



The entire night sky on Nov 10, 2012 at 10 pm local time (map from Cartes du Ciel). Brighter NGC galaxies are red.

As the weather turns crisp in the autumn and the Summer Triangle sets in the west, the galaxies of autumn come into view. These galaxies are out of the plane of the Milky Way in the opposite direction from the rich clusters of spring galaxies that I wrote about in the [May newsletter](#). There are still excellent opportunities for viewing emission and planetary nebulae and some wonderful open clusters, especially with Cepheus and Cassiopeia overhead, but the

greatest glories of the fall are in Andromeda, Triangulum and constellations further to the south. Here we peer through the veil of the Milky Way to island universes millions of light years away.

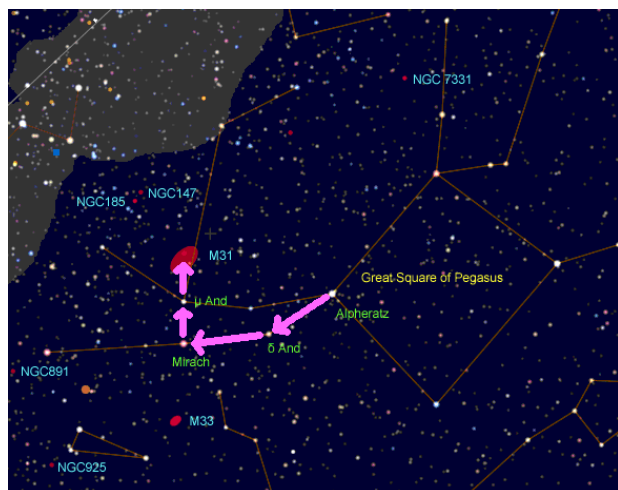
Everyone knows M31, the Andromeda Galaxy. It's the nearest spiral galaxy, only 2 million light years distant and heading towards us for a collision in about 4 billion years' time. It's easy to spot with the naked eye on even a moderately dark night, working your

way down from the easternmost star of the “Great Square” of Pegasus, a useful and easy to find asterism.



M31 (NGC224) (Andromeda)

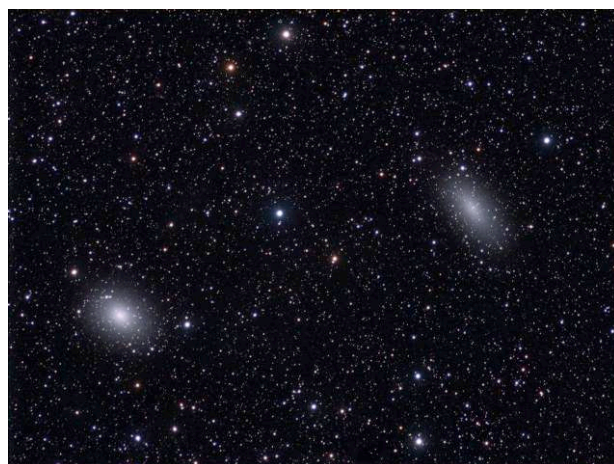
Find 2nd magnitude Alpheratz (Alpha Andromedae), then find the two bright stars to the east (3.27-magnitude Delta Andromedae and 2.07 magnitude Mirach, Beta Andromedae) equidistant from each other. From Mirach, make a right turn and north, finding first 3.86 magnitude Mu Andromeda and an equal distance above it, the slightly fuzzy nucleus of the Andromeda Galaxy. The whole galaxy is considered to be 3.5 magnitude.



Finding M31 with the naked eye

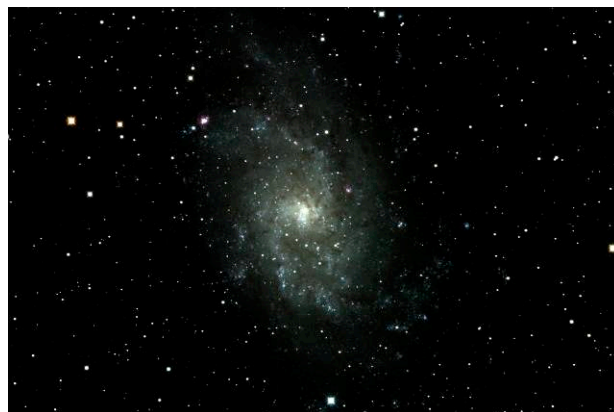
In binoculars, the large nucleus of M31 is very evident. It swamps the spiral arms unless you are out in really dark skies. It's hard to see the dust lanes unless you have a very large aperture scope and good skies, or unless you image. The galaxy's full extent is almost 3 degrees (6 times the full moon), making it a difficult object to see its full extent in most telescopes. Fast refractors or reflectors with long focal length wide-field eyepieces are necessary to

encompass the spiral and its two dwarf elliptical satellites, star-like M32 (NGC 221, magnitude 8.20, 7' diameter) and the larger M110 (NGC 205, magnitude 8.0, 19' diameter) a bit further away.



NGC185 (L) and NGC147 (R) (Cassiopeia)

Seven degrees nearly due north of M31, just over the border in Cassiopeia and just 1 degree apart, are two lovely galaxies, the dwarf elliptical NGC147 (magnitude 9.5 but low surface brightness, 13' diameter) and NGC185 (magnitude 9.2, 12.5'). These galaxies are both members of the Local Group, just like Andromeda and its companions.



M33 (Triangulum)

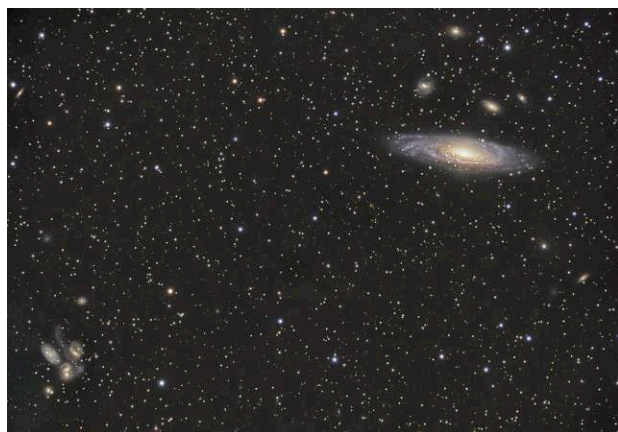
If you go an equal distance from M31 to Mirach in the opposite direction, you can find M33 (NGC 598) in Triangulum. It shares the nickname “Pinwheel” with Ursa Major's M101, and it's a similar face-on spiral with somewhat low surface brightness, making it difficult in less-than-dark skies. A light pollution reduction filter in a good-sized scope will be useful in making out the structure of this 5.7 magnitude galaxy, which is 3 million light years away. Its full extent is over a degree, but that's hard to make out without a very large mirror and wide-angle eyepiece.

If you use the line between M31 and M33 as the base of an equilateral triangle facing away from the Great Square, you can find NGC891, an edge-on spiral galaxy with a distinct dust lane, on the opposite vertex. This 9.6 magnitude object is 13' in longest extent. It's compact and has good surface brightness, so should not be difficult in most reasonable-size scopes.



NGC891 (Andromeda)

Heading higher in the sky above the “top” of the Great Square is NGC7331, a lovely 9.5 magnitude spiral (10' diameter) surrounded by a clutch of smaller (14-15 magnitude) escorts, making up the “Deer Lick Group”. The companions may be hard to see visually although I can spot a few of them with the Mallincam and 8” SCT on a good night.



Deer Lick Group (with NGC7331) and Stephan's Quintet (Pegasus)

Only half a degree away in a southerly direction are the five faint (12.7-13.5) galaxies that make up Stephan's Quintet. The brightest member is NGC7320 (magnitude 12.7, 2.2' diameter). These spiral galaxies, which are undergoing tidal

deformations as they interact, are contained in an area just 4 minutes in diameter. These are challenging objects for visual observers in our area. You might recognize them from the opening scene in the 1946 film *It's A Wonderful Life*, where they are used to embody the voices of angels.



Close up of Stephan's Quintet

There are actually 6 galaxies; but two of them are very close and appear to be merging. Observations with research telescopes show incredible rates of star formation in these galaxies.



NGC7217 (Pegasus)

Even higher in Pegasus is an interesting face-on spiral, NGC7217. This object resembles the Sunflower Galaxy M63 in Canes Venatici a bit although it's a good deal fainter (magnitude 10.1 vs 8.6) and smaller (4' diameter vs. 12.3'). The core has good surface brightness so it should be fairly easy to spot.

On the other side of the magnitude 3.0, 3.5 and 4.0 stars that make up Triangulum from M33 is the coarse spiral NGC925. It's magnitude 10.1 and 10' in length.



NGC925 (Triangulum)

Equidistant from NGC891 and 925, but a little towards the north pole, we find 9.4 magnitude NGC1023, a lenticular galaxy that has good surface brightness and therefore should be reasonably easy to see. It's a member of a group that includes 891 and 925 among others. It's about 8' in length.



NGC1023 (Perseus)

Heading south below Andromeda and Triangulum is the large constellation Pisces. The brightest galaxy in this area of the sky is M74 (NGC1068), another pinwheel-type face-on spiral, magnitude 9.4, 10' in diameter. Because of its low surface brightness, it is considered the most difficult of all the Messier galaxies to observe visually. Eleven degrees further south is NGC488, a delicate face-on spiral, magnitude 10.3, just 5' in diameter. Only 0.1 degree north of 488, some small 15th magnitude galaxies would make a challenging project for a CCD imager.



M74 (Pisces)



NGC488 (Pisces)

There are some wonderful galaxies in Cetus and Sculptor. The most famous of these is NGC253, the "Sculptor" or "Silver Dollar" galaxy. It's a bright, almost edge-on spiral, magnitude 7.2 and almost half a degree in length.



NGC253 (Sculptor)

Across the border in Cetus, just 4½ degrees due north of NGC253, is NGC247, a 9.1 magnitude 21' spiral.



NGC247 (Cetus)

Up near the head of Cetus is a pair of galaxies in a ½-degree field. M77 is a face-on spiral with an active nucleus. It's a typical "Seyfert" galaxy. Seyferts have strong Doppler-shifted emission lines from ionized hydrogen, helium, nitrogen and oxygen which are thought to arise from hot gas in an accretion disk surrounding a massive black hole. Although it's a very large galaxy in absolute size (170,000 light years in diameter), M77 is not large in the sky, just 7.3' diameter, because it's 60 million light years distant. It's fairly bright at magnitude 8.9. Nearby NGC1055 is an edge-on spiral, magnitude 10.6, 7' in length, with a prominent dust lane.



M77 (L) and NGC1055 (R) (Cetus)

These galaxies are fairly low in the south (NGC253 is at -25° declination) and you have to fight the New York City light dome to get a good look from Westchester. A light pollution filter is a must if you are to have any shot at seeing them.

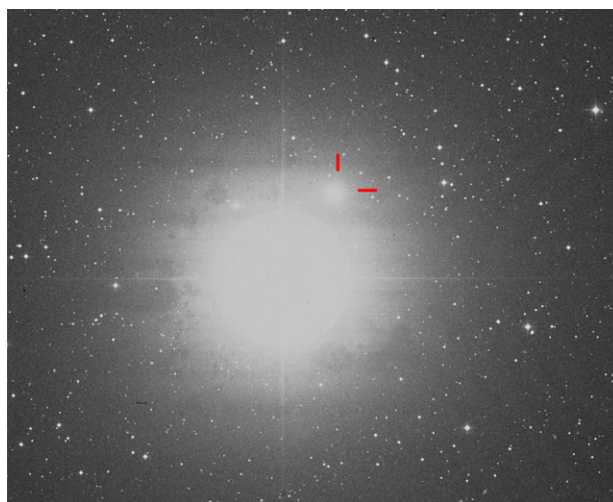
The brightest galaxy in Aries is NGC772, an irregular spiral, magnitude 10.3, 7' in diameter. It's 130 million light years away. A 14th-magnitude elliptical companion, NGC770, is just 4 minutes to the

southwest and less than a minute in diameter. A large scope would be needed to see it.



NGC772 (Aries)

A final challenge is to go back to Mirach (Beta Andromedae), which you used to find M31 with the naked eye. Just 7 minutes west of Mirach is the 10.3 magnitude NGC404. It's a small (4.3') elliptical galaxy that's hard to see because of the glare of nearby 2nd magnitude Mirach.



NGC404 (Mirach's Ghost) (Andromeda)

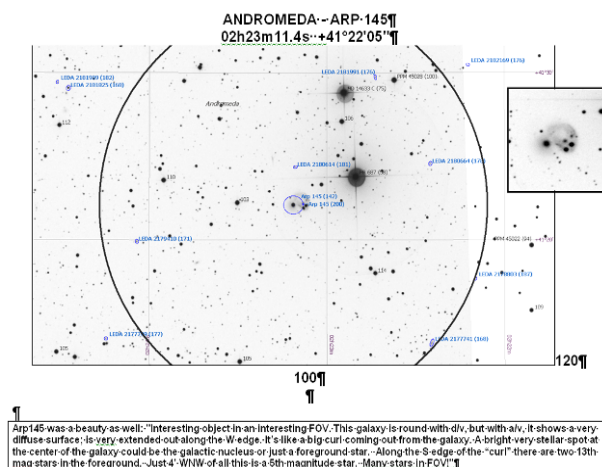
There are quite a few galaxies in the 10-12 magnitude range in this part of the sky, and if you have a large enough scope they make for satisfying hunting, if you're into "faint fuzzies" of course. As always, clear, dark skies with excellent transparency help galaxy viewing. Those are rare gifts in our part of the world. Averted vision is usually necessary except with the largest scopes. A light pollution filter often increases contrast, and generally higher powers are useful once you've gotten the object centered. Of course, you can cheat like me and use a Mallincam video camera.

Internet Corner: Two Web Sites for Faint Objects by Larry Faltz

There are a number of amateur sites that provide information and maps for faint objects, many of which are beyond the scope of go-to telescope object libraries. Their deep sky catalogs are generally limited to Messier and NGC objects. Although planetarium programs often provide access to add-on catalogues, like the Principal Galaxies Catalog (PGC) with 1 million galaxies down to magnitude 18, it's nice to have some idea of what the field is actually going to look like.

You can always go to research sites, like the [Sloan Digital Sky Survey](#) or [Aladin](#), the vast research database and imaging tool run by the University of Strasbourg, but it's handier to have the basic information you need at your fingertips.

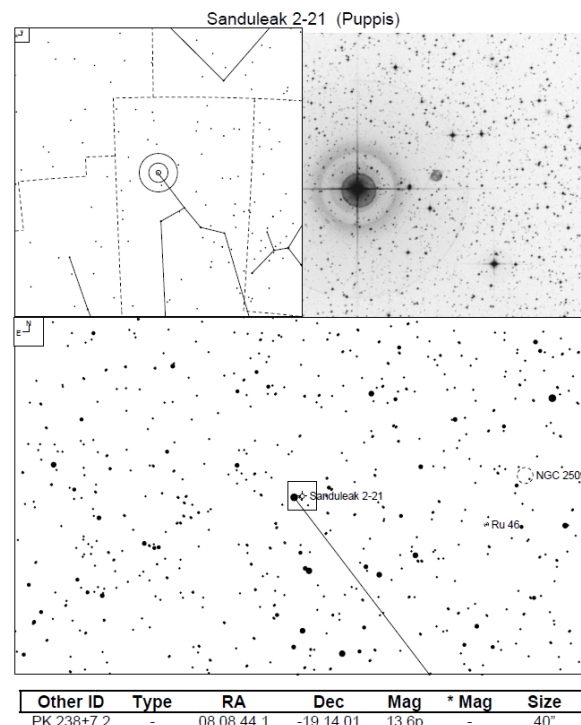
Two amateur sites offer a large number of finder charts for faint objects. Although fairly spare, [Paul's Page](#), set up by Paul N. Alsing, has annotated photographic/map pages for a variety of NGC objects and many beyond. There are descriptions by different observers for some of the objects.



Even better is www.faintfuzzies.com, the site of Alvin Huey, who observes faint objects through 22" and 30" Starmaster reflectors from northern California. He has compiled catalogs with finder charts and annotations for a huge number of faint objects. Currently there are 10 catalogs available on the site in pdf format for free download.

- The Local Group (55 pages)
- Selected Small Galaxy Groups (151 pages)
- Galaxy Trios and Triple (241 pages)

- Selected Shakhbazian Galaxy Groups (76 pages)
- Abell Galaxy Clusters (430 pages)
- Globular Clusters above -50 degrees declination. (111 pages)
- Planetary Nebulae (322 pages)
- The Rose Catalogue of Compact Galaxies (88 pages)
- Flat Galaxies (192 pages)
- Ring Galaxies (347 pages)



There's a large amount of information on equipment, viewing techniques and even how to dress for an observing session. There's a page with a vast number of links to sites of interest, including many other deep-sky observers' personal sites.

Most of these objects aren't going to be visible visually from Ward Pound, but the brighter ones might make interesting imaging targets for the increasing number of club members who are trying their hand at astrophotography. And it's nice to think about what rarities you would want to observe if you found yourself on a moonless night at the eyepiece of a 30" reflector on a mountaintop. And the catalogs themselves are really impressive.

September Starway to Heaven

We had a fantastic turnout at the September Starway to Heaven (September 15th) with perhaps 20 scopes of all kinds and many public visitors. There were refractors from 60mm to 120mm, reflectors of 6, 8, 10 and 12.5-inch diameters, a clutch of 8" SCTs and Kevin Parrington's 11" Celestron. Claudia brought her brand-new Meade LS with talking video screen, self-leveling, self-aligning.

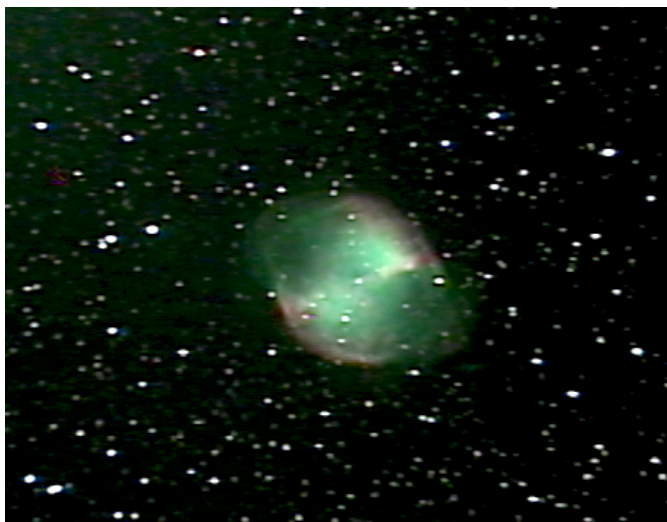
Tom Boustead used his 102mm refractor (Stellarvue 102T) to examine objects in Sue French's *Celestial Sampler*. He concentrated on star clusters. These included globular M22, M13, M15, NGC6712 as well as open clusters M11 and NGC 457.

Larry Faltz brought his 8" Celestron CPC800 SCT goto (aka Locutis). Notes Larry: The sky was great at dark, but turned somewhat cloudy around 9:30. That and the cool weather sent many people packing, but those of us who stayed were rewarded with crystal clear skies beginning around 10:15. The times are approximate, because I was having a good time with Locutis. My goto's were spot-on after aligning on Altair and Alkaid (top choice from BestPair II, plus

it's nice when they are early in the list so you don't get scrolling fatigue).

Early on I showed several galaxies--M51, M82, M81 and M101 but they were low to the north, so I swung over to M27 (Dumbbell nebula) and M57 (Ring nebula) and came back to M27 on numerous occasions for new visitors.

I looked at some of the galaxies near Andromeda, including the Deer Lick group NGC 7331, NGC 185, NGC 147 and of course M33. The various parts of the Veil, the Crescent Nebula and the Bubble Nebula were also very nice, the latter needing 56 seconds on the Mallincam for full effect, but everything else was fine at 28 seconds. I also looked at M76 (the Little Dumbell), M74 and of course M13. At the end of the evening, I found the large planetary nebula NGC 246 (PK 118-74.1) in Cetus (mag 10.4) and finally, for the first time, the Helix NGC 7293, which was pretty low to the south, about 21 degrees above the horizon in the NYC light soup. Below are some some Mallincam screen captures (which Larry stacked and tweaked in Photoshop).



M27



The Helix nebula NGC 7293

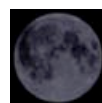
Almanac

For October 2012 by Bob Kelly

Is it always 'darkest before the dawn'? Hold that thought, while we celebrate October as one of the best



Oct 8



Oct 15



Oct 22



Oct 30

months for astronomy! Sunset comes earlier, even with DST still in effect sunset moves up from about

quarter of seven to around six pm by the end of the month. So there is plenty of time after work to enjoy dark skies while most of us come home in daylight. The morning darkness, with some of the latest sunrise times of the year, is disconcerting to most people, but we have a head start on the star-packed winter skies. Now the morning dark overlaps the time many of us start our days, so viewing the sky is a sport that can be enjoyed from outdoor train, subway and bus platforms. Even now, I can step outside when we first get up on a clear, fall morning, and see our two brightest planets against the backdrop of the winter stars and star clusters high in the sky. There appear to be so many stars then, as if proving that it really is 'darkest before the dawn'. At least that's true in our modern era, as the light pollution from businesses, traffic and buildings is least in the early morning hours.

Have you ever wondered what a moon of Venus would look like from Earth? Venus, the brightest object in the morning sky in early October, is very near the bright star Regulus from September 29th through October 7th. On the morning of the 3rd, Venus gets within 0.2 degrees from Regulus. According to an on-line trigonometry calculator, at Venus' present distance of 99 million miles from Earth, a moon 0.2 degrees away from Venus as seen from Earth would be about 345,000 miles from Venus (about fifty percent more than our Moon's distance from Earth). So you can imagine Regulus as if it were a Moon of Venus. Get out there on the morning of the 3rd and see what it looks like – with and without optical aid. Then go and check out how the Earth and our Moon look from the next planet out, Mars, at <http://hirise.lpl.arizona.edu/earthmoon.php>, or the Solar System Simulator site. Then think about what effects a noticeable moon of Venus would have made on science and mythology on our planet.

Meanwhile, Venus is waxing past 3/4 full but getting smaller overall, down past 14 arc seconds, making it hard to get a good photo of the slightly out of round planet. But Venus will be out there greeting us as the morning star right through into the new year. While you're out, look up, way up, and there will be Jupiter, swelling past 44 arcseconds wide. Check out the changes in the Jupiter's belts. Which belt is larger now? – It's different from last year's arrangement. It's great that these changes are visible in most telescopes, so check Jupiter every few days.

So, what do we have in the evening sky? Saturn is bowing out into the sunset, soon to be seen only on

the SOHO solar observatory C3 telescope as it passes in back of the Sun from our point of view. Mercury slides out from the Sun, but so low in the evening sky, it's hard to catch without binoculars. Mars is still staying ahead of the sunset, passing by its 'rival', the star Antares, but it's harder to see the resemblance because they are so low, so soon after sunset. But get a clear southwestern horizon and see for yourself. Binoculars can help.

If you can stay up later and don't mind a wavy picture in your telescope like an old-fashioned analog TV tuned to a distant station, Jupiter and it's escort, Aldebaran, soar over the horizon north of east after 10pm in early October, but as early as 8pm in late October, making an impressive entrance visible without optical aid.

Going deeper, Vesta and Ceres, targets for the Dawn space probe, are well placed in the morning sky to the east of Jupiter and will go from magnitude 8 to 6½ (Vesta) and 9 to 7½ (Ceres) as the year ends. Uranus (mag 5.7) and Neptune (7.9) get higher in the evening sky, becoming better to see as the evening advances. Having a sky version of AAA routing maps can help find these worlds.

The Orionid meteor shower, fragments of Comet Halley, puts on a modest show, punctuated with bright fireballs in the midnight and morning skies, peaking around the 21st.

Our Moon finds itself nearing Mars, low in the evening sky, on the 17th; posing with Mars and anti-Mars Antares on the 18th. The Moon plays in Jupiter's neighborhood in the sky on the 5th and 6th, makes the scene with Venus on the 12th, and a new moon hides near Mercury on the 16th. Telescopic viewers of the Moon have Luna high in the morning sky as the sunset shadow crawls across its face for several mornings centered on the 6th.

The International Space Station is visible in the morning sky through the 6th and then returns to the evening sky from 8th onward. Tiangong, the Chinese space station, has bright overflights in the mornings from the 14th onward. Check <http://www.heavens-above.com/> for times for your location!

Bob's blog is at bkellysky.wordpress.com