Next Meetings:

April 13 (14 alt.)
Public Viewing @ DHO
7:00 pm - ??

April 20/21
Member Session @ DHO
7:00 pm - ??

JOIN THE SAS!
[See Back Page for Details]

Astronomical Events Calendar

April 21, 6:00 p.m. New York Mills, NY
The Mohawk Valley Astro. Soc. (MVAS) has invited SAS members to its annual club banquet. A separate email was sent to the SAS list.

April 24, 6:00 p.m. Cicero, NY
The SAS hosts its first library lecture of the year at Northern Onondaga Public Library in Cicero.

April 16 - 26, All Night Outside!
Comet C/1861 G1 Thatcher provides the entertainment we know as the Lyrid Meteor Shower, which reaches its peak on the 22nd.

May 1/9, Late Night Outside!
Comet 1P/Halley (Halley’s Comet) provides the entertainment we know as the Eta Aquarids Meteor Shower, peaking on May 6 pre-dawn.

The Constellations: Orion

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Venus, Mars, and Saturn will be prominent for much of these sessions and Saturn is perfectly angled for detailed observing! Check the website for more information on Friday at 5:00 p.m. We hope you can join us!
Greetings fellow astrophiles!

Our Messier Marathon was scheduled on a week that provided us several fantastic nights of warm, clear observing (I snuck out to Darling Hill on the Tuesday of to get a little practice in and left only because my Wednesday morning schedule required). Friday morning welcomed thick cloud cover that continued all through Saturday, clearing only on, of course, Sunday night.

This second edition comes to you with all haste in time for our first official (hopefully successful) Public Viewing Session of the year, one providing us our last golden opportunity to observe some of the finest constellations of winter before the Spring Skies welcome the river of stars of the Milky Way back to us.

Soliciting Venus Transit Location Ideas

According to my copy of Starry Night Pro 6, at 6:08 p.m. on June 5th, Venus will begin its transit of the Sun that will last far longer than the 7:40 p.m. sunset will allow us to follow. We are still making plans for the event, including a location that will provide us as much clear western sky (horizon) as possible to follow as much of the transit as possible. The best suggestion so far (from facebook) is the Eastern Shore of Lake Ontario (in one of the parks). We’re still collecting ideas! If you can recommend a good, high, clear-west location, please send an email off to me at sas@somewhereville.com.

Sun And ISS Through A 70mm CaK Scope

This image, of the ISS dotting its way across the Sun, made its way to my inbox recently, taken by MVAS’s Charles Higgins through the CaK-filtered optics of Barlow Bob himself. Description from Chuck below...

Yesterday it turned out that not only was it clear in the morning, but the ISS was scheduled to pass overhead. Drove to a spot outside of Oriskany Falls NY and setup my camera on Barlow Bobs 70mm CaK scope. As predicted, at 11:48:38am the ISS passed overhead and I got some pictures of it. I’ve attached a picture that combines the 20 frames that had the ISS in them.

The detail isn’t that great. The sun was only at 26 degrees, ISS was 500+ miles away, and a front was coming in (lots of wind both on the ground and high in the air). Even so, I was pretty pleased to get anything. The entire transit lasted about 1.5 seconds.

In Memoriam - Celestron’s Tom Johnson

You likely don’t know his name, but you do know his work. The amateur astronomy community was saddened to hear of the passing of, quite possibly, the most important person in the field in March. Briefly, Tom made the inexpensive telescope possible with the creation of the Celestron Brand, providing a product for a market (we amateurs) that was priced far out of all the available telescopes of the day. If you’re looking through a Celestron, Meade, Orion, or most any other scope with a brand name on the side, you owe no small debt to Tom. More info can be found at the followings links: LINK1, LINK2

Space is the place,
Damian G. Allis, Ph.D.
sas@somewhereville.com
# 2012 Events Calendar

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Location</th>
<th>Website/Links</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 20 - 26</td>
<td>Winter Star Party - Florida Keys, FL</td>
<td><a href="http://www.scas.org/wsp.html">www.scas.org/wsp.html</a></td>
<td></td>
</tr>
<tr>
<td>Mar 22 - 25</td>
<td>Zombie Star Gaze - Atlanta, GA</td>
<td>atlantaastronomy.org/Zombie/</td>
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<tr>
<td>Apr 19</td>
<td>Delmarva Star Gaze Star Party - Tuckahoe State Park, MD</td>
<td><a href="http://www.delmarvastargazers.org">www.delmarvastargazers.org</a></td>
<td></td>
</tr>
<tr>
<td>Apr 20 - 22</td>
<td>Spring Stokes Star Party - Stokes State Forest, NJ</td>
<td>teeter望ascom/stokes/</td>
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<tr>
<td>Jun 14 - 17</td>
<td>Cherry Springs Star Party - Cherry Springs Park, PA</td>
<td>astrohbg.org/CSSP/information.html</td>
<td></td>
</tr>
<tr>
<td>Jul 4 - 7</td>
<td>ALCON 2012 - Chicago, IL</td>
<td>aicon2012.astroleague.org/</td>
<td></td>
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<tr>
<td>Jul 18 - 22</td>
<td>Mason Dixon Star Party - Shreveport Airport / Footlight Ranch, York, PA</td>
<td><a href="http://www.masondixonstarparty.org/">www.masondixonstarparty.org/</a></td>
<td></td>
</tr>
<tr>
<td>Jul 20 - 21</td>
<td>The Conjunction 2012 - Northfield, MA</td>
<td>philharrington.net/astroconjunction/</td>
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<tr>
<td>Aug 10 - 19</td>
<td>Rockland Summer Star Party - Savoy, MA</td>
<td>rocklandastronomy.com/SSP</td>
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</tr>
<tr>
<td>Aug 16 - 19</td>
<td>Stellafane 2012 - Springfield, VT</td>
<td><a href="http://www.stellafane.com">www.stellafane.com</a></td>
<td></td>
</tr>
<tr>
<td>Aug 17 - 19</td>
<td>Hidden Hollow 2012 - Mansfield, OH</td>
<td>wro.org/hiddenhollowinfo.html</td>
<td></td>
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<tr>
<td>Sep 14 - 16</td>
<td>Black Forest Star Party - Cherry Springs State Park, PA</td>
<td><a href="http://www.bfsp.org/starparty/index.cfm">www.bfsp.org/starparty/index.cfm</a></td>
<td></td>
</tr>
<tr>
<td>Oct 7 - 14</td>
<td>Peach State Star Gaze - Deerlick Astronomy Village, Sharon, GA</td>
<td><a href="http://www.atlantaastronomy.org/SSP">www.atlantaastronomy.org/SSP</a></td>
<td></td>
</tr>
<tr>
<td>Oct 11 - 14</td>
<td>KAS Astrofest 2012 - Vestal, NY</td>
<td><a href="http://www.kopernik.org">www.kopernik.org</a></td>
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</tr>
<tr>
<td>Oct 12 - 22</td>
<td>Mid Atlantic Star Party - Robbins, NC</td>
<td><a href="http://www.masp.us/">www.masp.us/</a></td>
<td></td>
</tr>
<tr>
<td>Nov 12 - 18</td>
<td>Chiefland Fall Star Party - Chiefland Astro Village, FL</td>
<td>chieflandstarpartygroup.com/fall.html</td>
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</tbody>
</table>

Barlow Bob has been called “The Godfather Of Solar Observing.” He is a member of the Rockland Astronomy Club and organizer of the Annual NEAF Solar Star Party. To find out more about Bob, NEAF, and the NEAF Solar Star Parties, visit the Rockland Astro Club website, www-rocklandastronomy.com.
Setting Sights On The Regional Market

The Syracuse Regional Market is as much a tradition as it is a phenomenon to those who were dragged out at young ages for Amish cherry pies or crates of canning tomatoes. Above all, it’s a fun walk for seeing unbelievably old stuff in various states of (dis)repair, boxes full of 500 of the same thing, and really cheap... er... inexpensive laptops (those looking for a machine for outside image collection would do well to consider spending $150 on a refurbished Dell, something easy to do at the Market).

I’m writing this because I scored my second excellent pair of binoculars there and, despite risking someone else reading this and grabbing the next great deal, I wish to convey to you that astronomy tools can be collected locally on the very-cheap.

Saturday is the day for consuming, Sunday is the day for perusing. Sunday at the Market is the non-produce day when the whole place is one big flea market. To say you’ll never know what you’ll find is an understatement and, as some people specialize in “general merchandise,” you really have to keep keen eyes on everything to not risk missing a great deal. Halfway through a completely random search, I came across an old leather case with the faded letters “Bushnell” on the front. Upon inspection, an old pair of wide-field Bushnell Rangemaster 7x35’s, covered in a thin layer of grime, almost rubbed flat in some of the covering, with perfect (post-cleaning) lenses. Not a scratch, no dulling of any reflective coating, and only fingerprints to clean off. Gave’em the quick tour of the building, found them perfect right to the edges. My sales representative, John, said "$25."

After a brief discussion, I mentioned my astro-intended use of the binos, then spent a good 10 minutes with John talking about Darling Hill (he’d been there many Moons ago), Karl Schultz (I hope you’re well and enjoying the newsletters!), Ray (“yup, still there.”) and Stu. I left John with a brochure and mention of the next session, and was on my way home with 1960’s-era no plastic-to-be-found Bushnells. After a thorough cleaning, I applied the Goodson Maneuver to the glassware - after a light canned-air dusting to get the big stuff off, take a Q-tip in high % isopropyl alcohol ( > 91%), place it at the center, and GENTLY swirl your way out to the edge. Repeat as necessary (I needed five Q-tips per surface to get them all cleaned out), then they’re ready for microfiber wiping to get the residual haze off.

$25, some bathroom supplies, and 15 minutes of cleaning later, I’ve a pair of wide angle binos with fantastic optics (I mean MINT. Everything is still aligned because these binoculars are all-metal and a brick in your hands) to hand out at the next tour of the Night Sky. For those asking the first question my younger brother asked, a same pair had just sold for $75 on ebay. Someone online is particularly overconfident in their price, listing the same pair for $499 (link active as of April 2012).

What did I not pick up of interest? A cheap telescope (that, decidedly, was not ready for prime-time), three other binoculars (one good, one bad, one quite ugly), six heavy-duty tripods (for mounting binoculars or cameras, both of which get regular use at Darling Hill), some astronomy books (and some ooooold books at that. I’d fear committing to memory something in a 60-year-old astronomy book at this point), all kinds of cables and adapters (for those setting up a webcam astrophotography system), flash lights (even some red LED flavors!), and all kinds of heavy clothing (why spend $100 on a jacket you’ll be getting bug spray all over?). And the merchandise turns over often enough that a monthly visit will likely yield new gear. As for the optics quality, if you can get a good clear view in the daytime, you’ll likely have no problem at night (I found the clock against the far wall and used that to test).

It is mostly the case that any magnification will reveal new detail as you study the Night Sky. Having a primo tool on the cheap makes the study all the more worthwhile.

- Damian Allis
Snow partially fills in the spaces between the wires of a chain link fence Sunday morning. Photo: Bob King

Snow – especially the 22 inches of it that’s fallen in the past few days – has remade our world. Trees, roads, homes, even my dog are clad in fluffy white. While it makes for extra work to clear, most of us marvel at the sheer beauty of the transformation. Nature can change a landscape overnight. It can also remake a chaotic mess of hydrogen gas and dust into a brand new generation of stars.

The **Orion Nebula**, located just below Orion’s famous three belt stars, is a turbulent place. Just look at photographs, or if you’ve got a telescope, see for yourself. Swirls of glowing gas snake around fresh-faced stars while clumps of nebulosity look like clouds on the move.

Buried within the nebula’s foggy folds are hundreds of newborn stars, only a handful of which are old enough to have blown away their dusty birth cocoons and show as brilliant, blue-white beacons in a typical telescope.

The Orion Nebula, located about 1,500 light years from Earth, is home to hundreds of newborn stars created when clumps of gas and dust contract under the force of gravity. Credit: NASA/ESA

Enter NASA’s **Spitzer Space Telescope** and the European Space Agency’s **Herschel Mission**. The two orbiting observatories gaze at the universe through infrared-sensitive eyes. Infrared light lies just beyond the red end of the rainbow spectrum. Though invisible to our eyes, we sense it as heat. Because infrared can penetrate dust and gas with relative ease, Spitzer and Herschel can see inside Orion’s clouds and spy stars in the earliest stages of firing up as feisty newborns.

This new view of the Orion nebula highlights embryonic stars hidden in the gas and clouds. It was taken by the Spitzer Space Telescope and Europe’s Herschel mission. A star forms when a clump of this gas and dust collapses, creating a warm glob of material fed by an encircling disk. The red dots are the glowing globs. Credit: NASA/ESA/JPL-Caltech/IRAM
Spitzer sees shorter wavelengths of infrared light (closer to the color red) and Herschel sees longer. By combining the two, scientists created this beautiful image of glowing cores of warm, contracting gases that in a several hundred thousand years will be hot enough to initiate nuclear fusion and blaze as true stars. This is how it all gets started. From dark clouds, light is born.

Not only do we see the earliest beginnings of stardom happening in Orion, but these hatchlings are changing right before our eyes, rapidly heating up and cooling down. Some of them vary in their brightness by up to 20 percent in a matter of weeks.

Two views of the heart of the Orion Nebula centered on the four bright stars called the Trapezium. The visible light view at left shows lots of gas and only a few stars. The infrared view penetrates the dust to reveal hundreds of newborn stars clustering around the Trapezium. Credit: NASA/ESA

One possibility for the rapid changes might be that “lumpy filaments of gas funnel from the outer to the central regions of the star, temporarily warming the object as the clumps hit its inner disk. Or, it could be that material occasionally piles up at the inner edge of the disk and casts a shadow on the outer disk,” according to scientists involved in the study.

Humans of the distant future will have the privilege of looking Orion-ward to see a brilliant star cluster swathed in a few remaining tendrils of dust – a landscape as radically transformed as the one outside my window today.

This content distributed by the AAVSO Writer’s Bureau, From the American Association of Variable Star Observers (www.aavso.org).

When the binary star system Eta Carinae experienced a spectacular outburst in 1837 -- dubbed the “Great Eruption” -- there were no cameras or other sophisticated scientific instruments around to record the event for posterity.

But now, 170 years later, remnants of light from the Great Eruption are finally reaching Earth, providing new insight into how massive stars behave when they are on the brink of exploding.

Astrophysicists at the University of California, Santa Barbara and the Las Cumbres Observatory Global Telescope Network, announced the detection of this “light echo” in a Feb. 16 letter to the journal Nature.

UCSB Postdoc Federica Bianco, who compared the light echo to eyewitness reports from the 1800s, phrased the phenomenon best: “You are at the stadium, watching the game, and your team scores. But you do not have modern instruments, detectors and spectrographs to study it,” she said in a press release.

"Now we are getting a replay -- an up-close detailed view of our cosmic eruption," she
continued. "And just like with the replay, we get to see the outburst from a different point of view, as the light that we see now was originally traveling in a different direction than the light seen in the 1840s."

Eta Carinae is a rare, massive binary star, and the dominant partner in this cosmic coupling belongs to the class of luminous blue variable stars. When it erupted 170 years ago, it became one of the brightest stars in the sky for a time. So why are we suddenly seeing light from that event again?

The astrophysicists explain that originally, the light traveled away from Earth, and then bounced off dust clouds, which rerouted it to Earth -- just like an echo. The longer path means we are only now seeing that echo.

There might not be photographs, but there are a few historical eyewitness accounts on record to help astrophysicists determine that what they are seeing really is a "light echo" from Eta Carinae's 19th century outburst.

In the 1830s, astronomer Sir John Herschel noticed an especially bright star in the southern sky while conducting a survey from Cape Town, South Africa. He dutifully sketched the region where the star appeared, particularly noting a dark ring in the upper part of the Carina Nebula that resembled a keyhole (see image, left).

Within a few years, however, that star had so faded in brightness that Herschel's telltale keyhole was barely visible.

Today we know that Herschel's bright star was Eta Carinae, experiencing a sudden burst of brightness thanks to a "supernova imposter" event, in which the star system shed a whopping 20 solar masses worth of outer shell.

You can still see the remnant of this stellar explosion in the Homunculus Nebula. It's called that because Argentine astronomer Ernest Gaviola, who first observed it in 1950, thought it looked like a human figure, with a head, legs and folded arms.

There is even evidence that Australian aborigines may have spotted the Great Eruption around the same time, according to a paper that appeared last year in the Journal for Astronomical History and Heritage. Co-author Duane Hamacher maintains that the Boorong people of northwestern Victoria were aware of celestial objects and cast them as characters in their oral stories of the Dreaming -- including the eruption of Eta Carinae.

The evidence can be found in a paper by William Edward Stanbridge, a 19th century Australian astronomer who did a bit of star-gazing with two men of the Boorong clan, who recited those stories to him while pointing out the relevant stars overhead. Stanbridge dutifully recorded this information, matching the Boorong stars with their Western counterparts using a star atlas.

Alpha Centauri, for instance, was Berm-berm-gle, while Antares was Djuit, and Canopus was known to them as War (pronounced "Wahh", meaning "Crow"). But when they pointed out Collowgullouric War ("Wife of Crow"), Stanbridge was stumped. He couldn't identify the star on his chart. So he simply wrote, "Large red star in Robur Carol, marked 966. All the small stars around her are her children."

In 1996, astronomer John Morieson came across Stanbridge's work and re-analyzed it. You can see the constellation Carina to the left in the image below. (Eta Carinae is the brightest dot in the lower right corner.) On the right, Morieson "connected the dots" into something resembling a bird in flight -- what he believes the Boorong would have pictured as the "wife of Crow."

Morieson never published his thesis, but Hamacher and his collaborator, David Frew, came across it as they were rifling through historical records to build their case.
Hamacher figured folks would be skeptical of their claim that the Boorong story was a direct reference to Eta Carinae’s Great Eruption. That’s why he proffered an explanation on the Aboriginal Astronomy blog last year as to their reasoning process:

During the early 1840s, when Eta went through its great outburst and the time that Stanbridge was learning firsthand about Boorong astronomy, it was one of the brightest stars in the night sky (“large star”), it had a reddish color, was located in the now-defunct constellation of Robur Carol....

Star charts from the period refereed to the Carinae Nebula (surrounding Eta Carina) as ‘966’. Eta Carinae itself was designated ‘968’, but was labeled as a 4th magnitude star. This was probably a simple transcription error by Stanbridge, who did not recognize the bright star where his star charts claimed was a fairly mundane 4th magnitude star. Finally, this region of the sky is rich in 4th and 5th magnitude stars, which would have been the “small” stars representing the children of the female Crow.

Armin Rest of the Space Telescope Science Institute in Baltimore led the latest study, and spotted the echoes of Eta Carinae’s Great Eruption while comparing visible light images he’d taken of the star in 2010 and 2011.

That’s when he noted light “that seemed to dart through and illuminate a canyon of dust surrounding the doomed star system.” He concluded that it couldn’t just be material moving through space, which would only show up over decades of observation, not a single year.

It had to a light echo, giving the illusion of moving through time because each flash was reaching Earth at a different time after bouncing off dusty clouds. Comparison with historical records showed it was a remnant from Eta Carinae’s Great Eruption.

The color image at left shows the Carina Nebula, a star-forming region located 7,500 light-years from Earth. (Eta Carinae is near the top.)

The three black-and-white images pictured here show light from the eruption illuminating dust clouds as it moves through them. The images were taken over an eight-year span by the U.S. National Optical Astronomy Observatory’s Blanco 4-meter telescope at the CTIO.

This new study has already found some intriguing anomalies in Eta Carinae’s behavior compared to its fellow luminous blue variables, using spectroscopy, which gives a detailed “fingerprint” of stars telling astronomers the temperature and speed of ejected material.

For instance, the temperature of its outflow is much cooler that usual, around 8500 degrees Fahrenheit (5,000 Kelvin). Rest and his colleagues are revisiting their models for such stars to determine how this behavior might have occurred. They will continue to monitor Eta Carinae, and expect to see more brightening in six months or so, matching a similar period outburst in 1844.

"It’s as if nature has left behind a surveillance tape of the event, which we are now just beginning to watch," said Rest. "We can trace it year by year to see how the outburst changed."
The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is driven by, for example, global winds and ocean currents, polar ice (melting and freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there’s the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth’s carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA’s Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth’s land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models. CloudSat’s unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun’s energy in the atmosphere. See animation of this data simulation at http://www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html.

For a listing and more information on each of NASA’s (and their partners’) Earth data-gathering missions, visit science.nasa.gov/missions/earth.html. Kids can get an easy introduction to Earth system science and play Earthy word games at http://spaceplace.nasa.gov/ecosphere.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.
Much can be said about the old hunter Orion. To Central New York observers, it had (until very recently) been the case that Orion made his way across the Night Sky during the coldest and least hospitable (to most nighttime observers) months of the year. Conditions would keep observers in hiding from him (some of the best CNY observers I know would risk surgical strikes on the Orion Nebula with their fastest to set-up and tear-down equipment). The abbreviated winter of 2011/2012 and reasonably early start of the SAS observing season have provided us with excellent opportunities in the past few months to make Orion The Hunter now the hunted. The mid-April observing session will be the last “official” opportunity to observe Orion before he disappears behind the Western horizon until the most nocturnal of us can next see him in our Eastern sky before sunrise in late August. I then take this opportunity to discuss Orion, one many CNY/SAS members may know the best by sight but may know the least by observing attention.

One of the topics covered in the 2011 SAS lecturing series was how we observe. Not the discussion of optics or the physics of planetary motion along the ecliptic, but the visual and mental mechanisms we use to translate the photonic triggers in our retina into mental pictures of celestial objects. Orion was the astronomical example I used to describe Pareidolia, how we impose a kind of order on things we see despite
that order not being present in the actual collection. When you look at a cloud, you may see a face, an animal, or something your mind triggers as being something it clearly is not. I often placed the infamous “Face On Mars” next to the Constellation Orion to show clearly how we see despite all reasonable evidence to the contrary (or the two can be mangled together, as shown at left). The clouds may look like an animal, the “Face On Mars” looks unmistakably like a shadowed face, and Orion, as it happens, has looked like a human figure to virtually all peoples for as long as we have record of Constellations, the same way Scorpius has appeared as a scorpion to every civilization for which this little monster was part of the local biosphere.

Pareidolia is not just for cognitive neuroscience! One of the keys to learning the sky I discussed last year was to let your mind wander while staring at the sky and see if certain things jump out at you. The constellations are, for the most part, made up of the most reasonably bright star groupings, but if you see any type of geometry that makes some part of the sky easy to identify, run with it. This same philosophy may be responsible for the rise of the asterism, or “non-Constellation star grouping,” as the distillation of mythological complexity into more practical tools for everyday living. For instance, I suspect everyone reading this can find the asterism known as the Big Dipper, but how many know all of the stars of its proper Constellation Ursa Major? Our southern tree line and Cortland obscure some of the grandeur of Sagittarius, which means we at the hill identify the location of its core (and several galactic highlights) by the easy-to-see “teapot.” The body of Orion is a similar case of reduction-to-apparent, as the four stars marking his corners (clockwise from upper left)...

Betelgeuse (pronounced “Betelgeuse Betelgeuse Betelgeuse!” - marking his right shoulder; a red supergiant of very orange-ish color even without binoculars)

Bellatrix - the left shoulder (so you now know the Constellation is facing us as originally defined) - a blue giant known also known as the “Amazon Star”

Rigel - the left foot; a blue supergiant and the star system within which the aliens that make the Rigel Quick Finder reside

Saiph - the right foot; a star dim in the visible but markedly brighter in the ultraviolet. Saiph and Rigel are about the same distance away (Saiph 50 light years closer at 724 light years, a point to consider as you observe them both)

... and the three stars marking his belt (from left)...

Alnitak - A triple-star system 800 light years away with a blue supergiant as its anchor star

Alnilam - the farthest star of the belt at 1359 light years, this young blue supergiant burns as brightly as the other two, making the belt appear equally bright “al across”

Mintaka - 900 light years away, this is an eclipsing binary star system, meaning one star passes between us and the main star in its orbit (about every 5.7 days)

... are obvious to all, while the head and club stars require a longer look to identify.

Sticking to Naked Eye observing for a moment, Orion is not only famous for its historical significance and apparent brightness. Orion is ideally oriented to serve as an order of alignment for several nearby Constellations and is surrounded by enough bright stars and significant Constellations that curiosity alone should have you familiar with this part of the sky in very short order. As an April focus, it is of benefit that all of the Constellations we’ll focus on either hit the horizon at the same time as Orion or they rest above him.

I’ve color-coded the significant stars marking notable Constellations in the image below. If you’re standing outside on any clear night, the marked stars should all be quite obvious (we’re talking a hands’ width or two at arm’s length). From right and working our way counterclockwise...
Following the belt stars to the right will lead you to the orange-ish star Aldebaran, marking the eye of Taurus the Bull. This is a dense part of the sky, as Aldebaran marks both the head of the Bull and also marks the brightest star in the Hyades star cluster (a gravitationally-bound open cluster 150 light years away composed of over 100 stars). Just to the right of this cluster is the "Tiny Dipper" known as the Pleiades (Messier 45), another dense star cluster worth observing at all magnifications. Both of these clusters are simultaneously easier and harder to find at present, as Venus ("1") is resting just above them, providing an easy way to find both clusters but plenty of reflected light to dull the brilliance of the two open clusters.

(ORANGE) Auriga, featuring Capella (the third brightest star in the Night Sky), is an oddly-shaped hexagon featuring a small triangle at one corner. Auriga, like Ursa Minor in last month's discussion, is made easy to find by the fact that the five marked stars are in an otherwise nondescript part of the sky (relatively dim generally, but brighter than anything in the vicinity). Venus will dull Hassaleh (Auriga's closest star to Venus and the two open clusters below it) but Einath and Capella will be easy finds.

(YELLOW) Castor and Pollux, the twins of Gemini, are literally standing on Orion's club. Making an arrow from Mintaka (the right-most star of the belt) and Betelgeuse will lead you to Alhena (Pollux's left foot), after which a slow curve in a horseshoe shape will give you the remaining stars.

(GREEN) Canis Minor is two stars (which is boring), but is significant for containing Procyon, the 7th brightest star in the Night Sky (which means it will be an EASY find). But don't confuse it with Sirius, which is the big shimmering star in...

(BLUE) Canis Major is the larger of Orion's two dogs and contains Sirius ("The Dog Star"), a star so bright (magnitude −1.46) and so close (8.6 light years) that it appears not as a star but as a shimmering light. Some would say an airplane, others would say a hovering UFO. Part of my duties as president involve intermittently explaining that it is not the latter.

And, with respect, Monoceros is an old Constellation but not a particularly brilliant one. Having Canis Minor and Canis Major identified will make your identification of Monoceros quite straightforward.

We now turn to the other "stellar" objects in Orion, composed of three Messiers and one famous IC. M78 is a diffuse nebula almost one belt width above and perpendicular to Alnitak. You will know it when you see it. M43 and M42 (marked as "4" in the image below), on the other hand, are so bright and close that you can see their nebulosity in dark skies without aid of any optics.

M42 - The Orion Nebula is, in the right dark conditions, a Naked Eye sight in itself. For those of us between cities, even low-power binoculars bring out the wispy edges and cloudy core of this nebula. For higher-power observers, the resolving of Trapezium at M42's core serves as one of your best tests of astronomy binoculars (I consider the identification of four stars as THE proper test of a pair of 25x100's. Ideal conditions and a larger aperture will get you six stars total). You could spend all night just exploring the edges and depths of this nebula. You can take a look back at the Astro Bob article in this edition of the Astronomical Chronicle (From
My Driveway To Orion: Nature Works Wonders for a more detailed discussion of this part of Orion.

M43 - de Mairan’s Nebula is, truth be told, a lucky designation. M43 is, in fact, part of the M42 nebula that is itself a small part of the Orion Molecular Cloud Complex (not THAT’S a label). M43 owes its differentiation to a dark lane of dust that breaks M43 and M42, just as the lane of dust in our own Milky Way we know as the “Great Rift” splits what would otherwise be one continuous band of distant stars the same way a large rock in a stream causes the water to split in two and recombine on the other side.

Finally (and the one you’ll work for), IC 434, the Horsehead Nebula, lies just to the lower-left of Alnitak (1). The Horsehead is itself a dark nebula, a region absorbing light to make it pronounced by its difference from the lighter regions around it. To put the whole area into perspective, The Horsehead is itself STILL within the Orion Molecular Cloud Complex. The sheath of Orion’s Sword and nearly the entire belt is contained in this Complex, like dust being rattled off with each blow from Orion’s club.

I close by taking a look at the perilously ignored club attempting to tear into Taurus. At present, asteroids surround Orion’s Club like pieces of debris flying off after a hard impact. All are in the vicinity of 12th magnitude (so require a decent-sized mirror), and all are also moving at a sufficiently fast clip that their paths can be seen to change over several observing sessions (if, by miracle, enough clear days in a row can be had to make these measurements). I have highlighted the five prominent ones in the image at left.

Is it an oddity to have Orion so full of asteroids? Certainly not! Orion is placed near the ecliptic, the apparent path of the planets in their motion around the Sun. Orion’s club just barely grazes the ecliptic at the Gemini/Taurus border, two of the 12 Constellations of the Zodiac, the collection of Constellations that themselves mark the ecliptic. As nearly all of the objects in the Solar System lie near or within the disc of the Solar System, you expect to find all manner of smaller objects in the vicinity of the Zodiacal Constellations. In effect, Orion’s club is kicking up different dust all year long as the asteroids orbit the Sun. You only have a few more weeks to watch the action happen before Orion’s return in the very early early morning of the very late summer.

- Happy Hunting, Damian
Syracuse Astronomical Society
Amateur Astronomy in Central New York
www.syracuse-astro.org

Darling Hill Observatory (DHO) Directions

If it is dark, remember to turn your headlights off and use your parking lights (otherwise you will affect the night vision of fellow observers who arrived before you).

* Park in the meadow and proceed up to the observatory building, where our 16 inch Newtonian Telescope resides.

SAS Viewing “Dress Code”

At 1800 ft. above sea level, DHO is often 20º cooler than Syracuse. In summer, long sleeves can make for more comfortable viewing. Even in early fall, consider hat and gloves.

When To Use The Website

The website contains information about weather conditions at Darling Hill, if/when viewing sessions are cancelled (check the website by 5:00 pm the evening of announced viewings), and when SAS members are at the Observatory for viewing. Check the Main Page and the Who’s Observing page for information. To post your own questions or check on viewing opportunities, simply join the Bulletin Board (please also specify your location so we can sort member from spammer). Please allow up to 24 hours for account activation.

2012 Official Observing Schedule

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<td>May 11 (12)</td>
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SAS Newsletter Online!

This newsletter is mailed in grayscale. A full-color PDF of this and previous issues is available at our website for free download.

Ways To Help The SAS

The Syracuse Astronomical Society is a non-profit, member-driven organization dedicated to educating the public about astronomy, preserving a national heritage – the night sky, and exploring the splendors of our universe.

How can you help? Contribute an article to the newsletter. Recommend a speaker for a meeting. Let others know about our viewing sessions. Tell people to turn off unnecessary lights! Most of all, the SAS meetings are best when YOU SHOW UP!

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Jeff Funk
Join The Society Or Give This To Someone New!

Annual Membership Dues

___ Individual or Family Membership             $30
___ Youth Membership (22 or younger)           $5
___ Reduced-Rate Subscription to “Sky and Telescope” Magazine $33
___ Additional Donation                              ______

Total:_____

The yearly subscription to Sky & Telescope (www.skyandtelescope.com) is optional, but SAS membership provides a discount over the standard subscription rate.

Name: __________________________
Address: __________________________
________________________________
Phone: __________________________
Email: __________________________

Do you own a telescope? Yes ___ No ___
Do you own binoculars? Yes ___ No ___

Please enclose a check payable to:

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c/o Ryan Goodson
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The Syracuse Astronomical Society is a non-profit organization dedicated to educating the public about astronomy, preserving a national heritage – the night sky, and exploring the splendors of our universe.

We invite you to join us. We have Free Public Observing Nights at our Darling Hill Observatory in Vesper, NY. Public observing is held once a month from April through November, around the new moon. Other viewing sessions occur throughout the year when the night sky is clear and available SAS members go to the observatory. Check the “Who’s Observing” link on the website for more information.

The Observatory “Cave” is a 16 inch Newtonian telescope, capable of showing you heavenly objects in great detail. For those with telescopes and large binoculars, the Observatory has four concrete pads and accessible outlets.

We also have monthly society meetings throughout the year.

Come and join us!