Sky WAA tch

The Upside of the Downside

Sharon Gould snapped this photo of a sunset at Ward Pound Ridge on May 31st at the WAA Starway to Heaven. Amateur astronomers in the humid Northeast face the occasional problem of clouded-out evenings. It's a chancy endeavor viewing the night sky through a telescope—nights start out cloudy and then clear; or as happened this night, they don't. Still you're outside experiencing nature and the upside can be a beautiful vista such as this.

It's a good idea to check the WAA hotline if in doubt before heading out to Ward Pound Ridge: 1-877-456-5778 (toll free)

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Events for July 2014

WAA Lectures

Lienhard Lecture Hall,
Pace University Pleasantville, NY

As usual, there will be no WAA lectures for the months of July and August. Our Lecture series will resume on September 12th. During the Fall we have tentatively scheduled presentations by Victor Miller on the Galileo Jupiter Probe Mission; Dr. Caleb Scharf on his new book, and Dr. Michael Tuts on gravity. There will also be a Members Presentations Night.

Starway to Heaven

Saturday July 19th, 8:30 pm.
Meadow Picnic Area,
Ward Pound Ridge Reservation,
Cross River, NY

This is our scheduled Starway to Heaven observing date for July, weather permitting. Free and open to the public. The rain/cloud date is July 26th. **Note**: By attending our star parties you are subject to our rules and expectations as described here. Directions.

New Members. . .

Jan Wauters - Larchmont
Stephen Groth - Ardsley
Robert Brownell - Peekskill
Linda Boland - Hyde Park
Peter Wilson - Tarrytown
Adam Klein - Chappaqua

Renewing Members. . .

Charlie Gibson - Scarsdale
Tom Crayns - Brooklyn
William Newell - Mt. Vernon
Steve Petersen - Briarcliff Manor
Rob & Melissa Baker - West Harrison
Glen & Patricia Lalli - White Plains
John Paladini - Mahopac
Robie Burke - Brewster
Sushil Khanna - Katonah
Barry Feinberg - Croton on Hudson

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

RAC SUMMER STAR PARTY
July 25th thru August 3rd

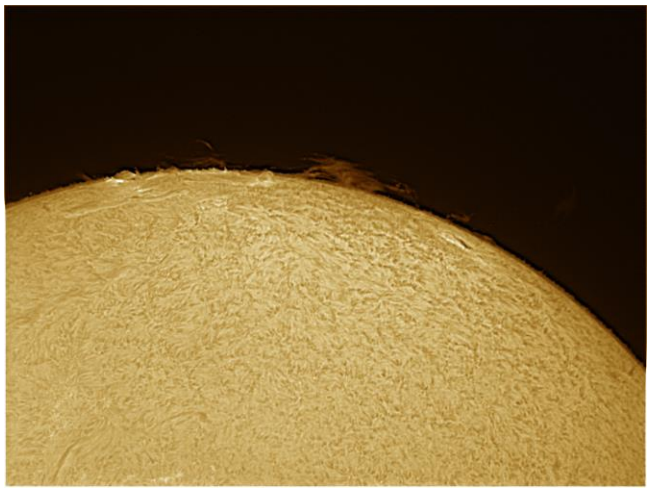
The Rockland Astronomy Club is sponsoring its summer star party July 25th thru August 3rd. This is a wonderful and fun event. For details see page 14 of this issue or go to:

http://www.rocklandastronomy.com/ssp/index.html

WANTED Assistant Newsletter Editor

Seeking an individual to help edit the WAA newsletter. Initial responsibilities to include aid in proofreading as well as learning the layout of the newsletter. The newsletter is laid out in Microsoft Word (either Microsoft or Mac versions) so access to that program is a must.

If interested, Contact: the Newsletter:



After the WAA picnic, John Paladini took this image of the Sun through his homemade solar scope.

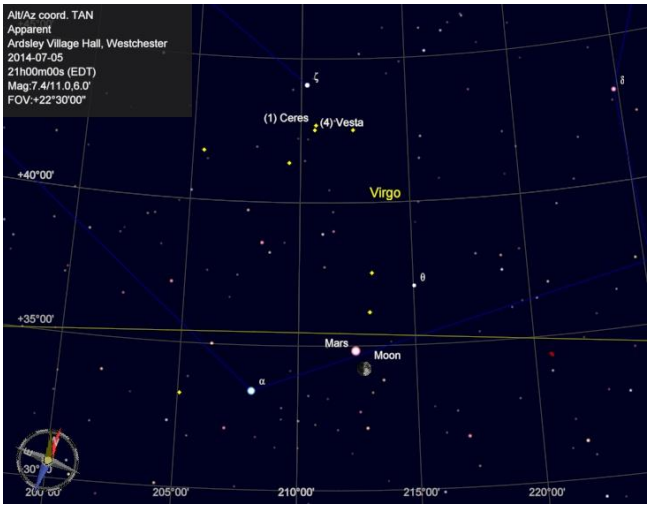
Westchester Amateur Astronomers

Almanac
For July 2014 by Bob Kelly


Jul 5 Jul12 Jul 18 Jul 26

The Fourth of July weekend has a sky full of astronomical sights, if you can see around all the fireworks.

As mentioned last month, asteroids 1Ceres and 4Vesta appear to be flying in tandem. They come closest together around the fourth of July. They may even fit together in the field of view of a medium power eyepiece. Will they show up in a time exposure photo of the area? Maybe if you have dark skies. If you catch them, send the photos so we can put them on the facebook page. Despite appearing near each other, Ceres is 46 million miles behind Vesta.



Also, the Moon passes close by Mars on the 5th. Mars is very tiny at 9 arc seconds (Saturn is 18 arc sec across, for comparison.) Sometimes in a larger telescope, you can still see Mars' color is a mix of gray and salmon.

Mercury is the closest planet to the Sun (always) but is the closest planet to the Earth until the 28th when Mars (!) is left as the closest planet to us as Mercury and Venus flee from us in their faster inner orbits.

In our skies, Mercury shows up, down and to the left of Venus, in the latter two-thirds of the month. Mercury approaches Venus, getting closest on the 16th, but still doesn't reach Venus' height above the horizon, despite being low in the predawn sky.

The Moon is above them, standing off to the upper right on the 23rd, and lower on the 24th and 25th.

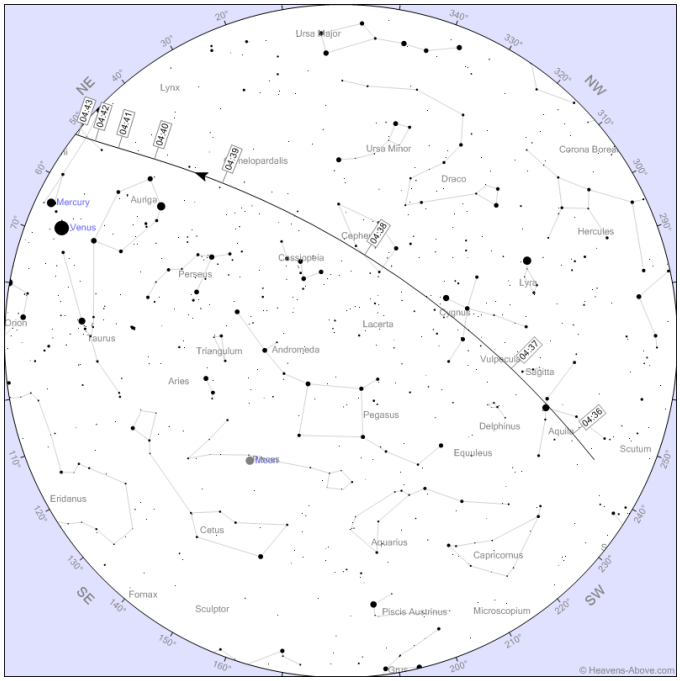
The live camera outside the International Space Station sometimes shows the brilliant planet Venus as a bright dot rising before the Sun. It's worth a look to see what you can see from these cameras when the ground stations capture their signal.

Saturn's rings have a jaunty tilt this year, making it easier to see the space between the rings and the planet. Even the Cassini Division between the A and B rings can be seen at high power. The two main rings are slightly different shades of white. The bright rings make it harder to see some of Saturn's smaller moons, but Titan is readily visible at magnitude +9. Look for Iapetus, which is brightening up to magnitude +10 by July 3rd, as it turns its brighter face toward us during

its 79-day trip around Saturn. Iapetus is ahead, to the west of Saturn, in the sky.

Jupiter is hiding behind the Sun this month. Track it with the SOHO C3 camera from July 14 through August 2.

Even fans of Pluto find it hard to find, even at opposition and at its brightest for the year this month at magnitude +14.1. Being near the naked eye star 29Sagittarius will help you point out the closest member of the Kuiper Belt [Are Kuiper Belt objects closer to Earth than Pluto? Triton, in orbit around Neptune, and Phoebe at Saturn may be displaced Kuiper Belt objects.]



ISS sightings are in the morning sky. Here's one of the better overflights (no one will see, since it's so early!).

The Moon's perigee on the 13th is within 24 hours of the Moon lining up with the Sun, creating larger than normal tides. The Full Moon occurs near the Moon's perigee for the next three months.

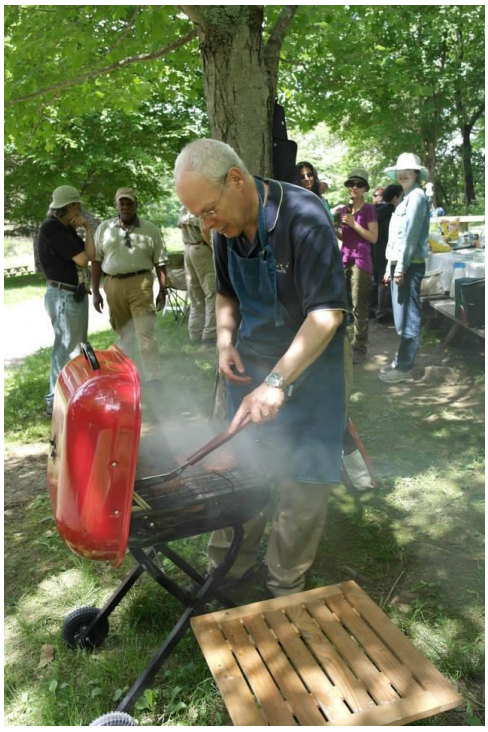
The Sun, on the other hand, is at its furthest from the Earth on July 3rd.

From the WAA Picnic

Group Photo

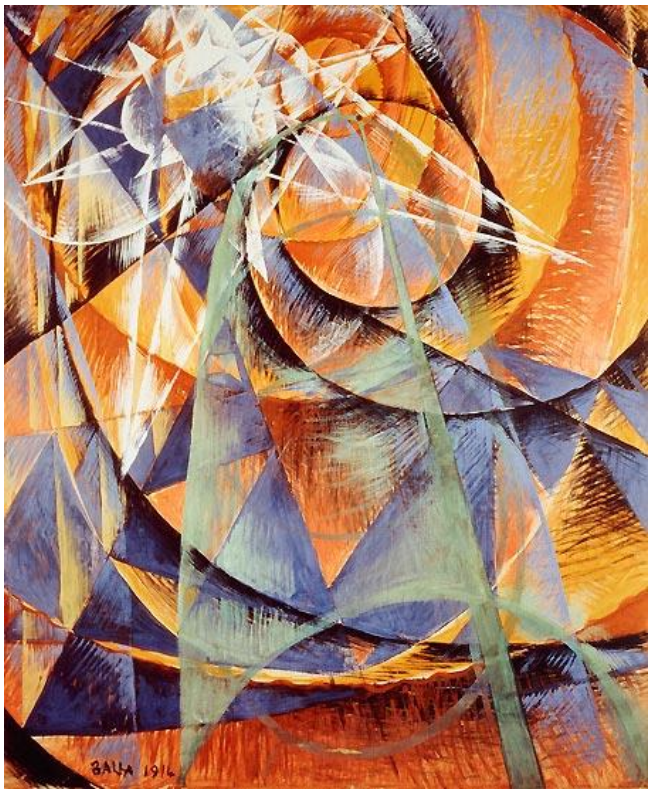
Solar viewing at the 2014 WAA picnic on June 14th. John Paladini, right, is looking through his home-made 90 mm long-focal length hydrogen alpha telescope, which uses a Lunt 50 mm etalon. The tube is made from PVC tubing.

Mike Virsinger using a Meade electronic eye-piece and video glasses to view the sun through his Lunt 100mm double-stacked scope.



Larry Faltz flipping burgers.

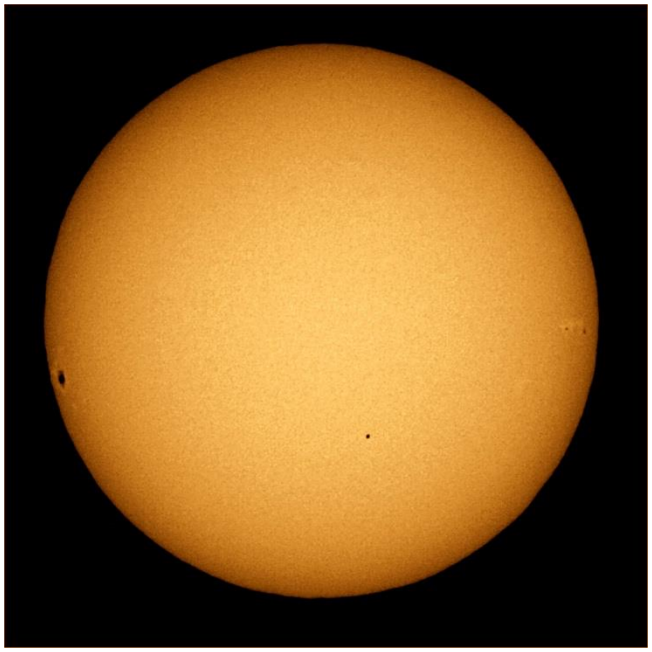
Art & Astronomy: A Futurist View of the Transit of Mercury
Larry Faltz



Elyse and I took in the excellent Italian Futurist show at the Guggenheim Museum in mid-June, and came upon an interesting painting with an astronomical theme, Giacomo Balla's "Mercury Passing Before the Sun" (Mercurio transita d'avanti al sole), painted in 1914. It reminded me that the next transit of the innermost planet will be on May 9, 2016. The 7-hour transit will be visible from the East Coast of the US starting around 6:15 am, weather permitting of course.

Balla was one of the first artists to join the revolutionary Futurist movement, which was announced in 1909 by the Italian poet Filippo Tommaso Marinetti with the publication of his "Futurist Manifesto" in a Milanese newspaper. The Futurist credo was a rejection of every artistic sensibility of the past and the glorification of speed, technology, violence and war, the latter as a way to cleanse society of its prior cultural heritage. The madness of World War I took a big bite out of the Futurists' standing. Eventually they succumbed to the dominance of Mussolini and his Fascist sensibilities and the movement ended with Marinetti's death in 1943. Its leading visual artists, besides Balla, were Umberto Boccioni (killed in 1916) and Gino Severini, both of whom have important works in the collections of the Metropolitan Museum and the Museum of Modern Art.

The Futurist credo for visual art was the concept of "universal dynamism," the manifestation of which can easily be seen in Balla's painting when compared with an actual image of a Mercury transit. Balla's luminous 48x40-inch painting (tempera on paper, mounted on canvas) was inspired by his telescopic observation of the Nov. 14, 1914 transit. I suspect his scope was not properly filtered, thus accounting for the dynamism of the various streaks of light and reflections that emanate from the two circles representing Mercury and the Sun.



Mercury is the dot just below the center of the sun. A sunspot is on the limb at 9 o'clock.

Mercury's orbit is tilted 7 degrees to the ecliptic. The majority of its inferior conjunctions, occurring every 116 days, are either above or below the sun and so no transit occurs. Transits of Mercury happen 13 or 14 times a century; the last one was in 2006 (clouded out in our area). At the 2016 transit, the planet will be 12 arc seconds in diameter, subtending just 0.66% of the solar disk (at its 2012 transit, Venus was 5 times larger). It's still something to see and to image (with proper filtration and eye protection, of course), even though it won't be as dramatic as Balla's painting.

Two Club Events (by Larry Faltz)

Ad-hoc Star Party, May 25th

We took advantage of the 3-day holiday weekend to call, via email blast, for a spur-of-the-moment star party on Sunday, May 25th when it became clear on the morning of the 24th that the regularly scheduled event that evening could not take place because of early-evening thunderstorms. I was expecting just a few folks to be available on such short notice, but there was a wonderful response with at least 13 instruments of all types and sizes, as well as a small number of non-scope-bearing attendees, including WAA Vice President for Programs Pat Mahon.

Among the highlights was the presence of two fabulous refractors. Eric Baumgartner brought his Astrophysics Starfire 130mm refractor on a Losmandy mount, a scope I first looked through in Hawaii in 2012 when we were both on Sky & Telescope's Transit of Venus trip.

Eric Baumgartner and 130mm refractor

Eric's friend Jim Cortina set up a 175mm Thomas M. Back triplet refractor on an Astrophysics mount. This is surely the largest refractor ever to be set up at a WAA star party. It's a magnificent instrument, top-of-the-line in every respect. Tom Back, a brilliant optical designer, sadly passed away a few years ago at a young age, but he left a number of truly outstanding examples of optical design and manufacture.

Jim Cortina and 175mm refractor

Kevin and WAA Assistant VP Claudia Parrington came "light" with a compact Celestron SLT 90. WAA Field Events VP Bob Kelly brought his trusty 8" Orion Dobsonian. Sky*WAA*tch Newsletter Editor Tom Boustead brought his Stellarvue 90mm refractor on a brand-new Celestron AVX go-to equatorial mount. Dave Butler came with his trusty Meade LX90 and a BiPH image intensifier, always a source of fascination for viewers. DeDe Raver had her brand-new Meade 8" Lightswitch (purchased after seeing the Parringtons' "talking scope" in action) for first light. Joe DePietro observed through a 6" Celestron SCT. Art Linker tried out his first go-to mount, a Celestron NS that he bought on eBay, mounting a Stellarvue Nighthawk 80mm refractor. Gary Miller set up his wonderful 12.5" Obsession truss-tube Dobsonian, an optical gem. Erik and Eva Anderson arrived a little later with their Televue NP101, and Leo and Lisa brought a brand-new 12" Orion Intelliscope Dobsonian. It was quite a nice range of optical instruments and mounts.

Elyse and I came with *Locutis*, the Celestron CPC800/Mallincam video astronomy combination. Any scope with as many wires, power supplies, computers and attached bits as *Locutis* deserves its own name. When one of the club members saw it several years ago, he said it was a “Borg,” as in the cybernetic race of characters on Star Trek who have all sorts of appurtenances hanging off of them. Unfortunately, that name is taken by a legitimate Japanese maker of fine telescopes and accessories. Staying with the idea,

though, I thought *Locutis*, the name the Borg gave to Captain Jean-Luc Picard when he was (temporarily) "assimilated," would be perfect.

Elyse and Locutis

The weather was beautiful during the day on Sunday but some high thin clouds were present for the first part of the evening. Nevertheless, seeing was pretty good after twilight with three planets (Jupiter, Mars and Saturn) well-placed for all the scopes. Later in the evening the sky cleared with good transparency (SQM improved from 19.64 when the clouds were present to 20.16 when the sky cleared). Optimal viewing was from about 10:45 pm to 12:45 am, and we, Eric and Jim stayed quite late, finally packing up and exiting the park around 1:30 am.

While Eric and Jim went after a diverse selection of galaxies, planetary nebulae and double stars with their wonderful refractors, I concentrated *Locutis'* video eye on galaxies in the Virgo and Coma clusters as well in Ursa Major. The dust lane in M104, the Sombrero Galaxy in Virgo, was sharp and dramatic. M51 looked great as usual with spiral arms quite evident, including the bridge between the two galactic nuclei. I also looked at the Ring and Dumbbell nebulae when they rose in the east, as well as M16 and its famous "Pillars of Creation," hydrogen gas clouds easily seen with the Mallincam, which is particularly sensitive in the red end of the spectrum. I even showed the 17th magnitude Twin Quasar in Ursa Major to Eric and Jim. It was only a tiny dot on the screen, but at a distance of 8 billion light-years it's the furthest thing any of us have ever directly visualized.

Here are two Mallincam screen shots (remember, they're 28-second video captures, not hours-long, computer-processed CCD images). The first is M63, the Sunflower Galaxy, a mag 8.6 galaxy in Canes Venatici.

M63 (NGC5055) Distance 37 million light-years

The second is M100, a mag 9.4 spiral galaxy smack dab in the middle of the Coma Berenices cluster. Galaxies NGC 4328 (mag 13.0) and NGC 4323 (mag 14.8) are visible just below M100.

M100 (NGC4321) Distance 55 million light-years

Sidewalk Astronomy in Mamaroneck

One of the joys of being an amateur astronomer is showing the wonders of the sky to people when they least expect it. The tradition of "sidewalk astronomy" goes back perhaps two hundred years, maybe longer, although its most famous and intriguing proponent was the late John Dobson. Dobson asked that the film about him (produced by WAA member Jeffrey Jacobs) be called "A Sidewalk Astronomer", with the indefinite article "a" chosen specifically to remind viewers that his efforts were not unique, even if his style was. He was merely carrying on a tradition.

WAA had not done a formal sidewalk event in many years, but there was distinct enthusiasm after seeing Jeffrey's movie at one of our monthly meetings that we should engage the public sidewalk-style. After doing some research and even some surveying (Google Earth and iPhone compass and tilt-meter apps were particularly useful) and considering where the target audience might be most numerous, we decided to spring our enthusiasm on the public on Saturday, May 7th on the north side of Mamaroneck Avenue at its intersection with Palmer Avenue in Mamaroneck. Sky maps showed that Jupiter, Mars and Saturn would accompany a 9-day moon, an auspicious and fairly rare combination perfect for small telescopes in the inevitably light polluted location where sidewalk events have to take place.

We didn't want too many scopes considering the dimensions of the sidewalk and the likely rate of passersby, so we set up 3. Fortunately at the chosen location there's an extension of the sidewalk into the street (there are even a couple of convenient benches), so we wouldn't be blocking any pedestrian traffic. Kevin Parrington brought his 90 mm Celestron Maksutov on a go-to mount. WAA Field Events Vice President Bob Kelly brought his 8" Orion Dobsonian and used a fine wide-field 2" eyepiece, and I brought an Orion 127 mm Maksutov on an iOptron go-to mount. Assisting

were WAA Senior VP Charlie Gibson, who explained celestial concepts to the public using iPad software, and Elyse Faltz, who engaged the crowd and explained who we were and what we were about while the rest of us were busy with the instruments. We answered many questions about the club and handed out a large number of WAA business cards.

The weather could not have been better. The sky was crystal clear and the temperatures were in the low 70's with little humidity. The good weather god Rao certainly smiled on us (although his evil counterpart Roker seems to be controlling the star party weather this spring). Downtown Mamaroneck has lots of bright LED street lamps, including several directly above our location, but the vivid solar system objects made for wonderful viewing in spite of the illumination.

An astonishing number of people from all walks of life and ethnic groups stopped by, quite a few after having dinner at one of the many Mamaroneck eateries or heading to or from the local movie theater. There were quite a few children, even late into the evening. At least 150 people, perhaps more, looked through the scopes during the course of the evening (we started at 8 pm and shut down around 11:15 pm). There were many families among the crowd. Expressions of surprise and thanks were universal.

As usual, Bob Kelly was a fount of information about the heavens. He has a marvelous capacity for explanation, perfect for sophisticates and tyros alike. All of us got a chance to talk science and describe some of the fascinating facts about the objects we were showing.

There were some repetitive themes. Many in the crowd simply asked who we were and why we did this, as did a bicycle-mounted Mamaroneck police officer who showed up around 10 pm. I explained the Dobson tradition of just showing up to do these things, flash-mob style, and he was satisfied that because we didn't charge anything, the absence of a permit was not an issue. Anyway, we were clearly an awfully civilized and educational bunch. A few people were interested in the equipment, how the telescopes differed and how much they cost. People loved the computerized go-to mount.

First views of the moon, Jupiter and particularly Saturn brought the usual range of enthusiastic reactions. "That's not real!" was a frequent outburst after a first glimpse at Saturn's rings. The excitement of first close-up views of lunar craters and mountains provoked squeals and more than one "Oh my God." Jupiter showed all 4 Galilean moons and the North and South equatorial bands. I was able to talk some viewers through the observing patience necessary to pick out surface markings on Mars and the Cassini division in Saturn's rings through lulls in the turbulent atmosphere at 171x with the Mak, a good scope for planetary work. One of the nice things about a go-to is the ability to show the four objects one after another at each observer's turn at the eyepiece without undue delays or fussing, and then do the same for the next observer.

Two or three people owned scopes but weren't members, and we're hopefully going to recruit them. Our discussions with them were happily more technical, and we even found M3 and M5 for them in the 127 Mak, at the limit of visibility because of the light pollution.

This was a special evening, an unparalleled triumph for the club. All of the factors necessary for a successful sidewalk event were present: weather, objects, location, people, enthusiastic club members and positive street energy. And an understanding policeman.

Putnam Valley Cub Scout Pack

Claudia Parrington

The scout pack

While the club was viewing at the Starway to Heaven, Kevin and I went to Fahnestock State Park in Putnam Valley for the Putnam Valley Cub Scout Pack end of year campout event. One of the den leaders, Nicolas De Giorgio, had contacted the club.

Fahnestock State Park is about an hour away, and we anticipated the skies would be darker than at Pound Ridge. When we arrived, the Sun was still out. So we were able to do some solar viewing with the 8-inch Meade LightSwitch. Although the LightSwitch is not made for solar viewing, we just continued to move the scope when the sun moved. The kids enjoyed the event even though clouds intermittently covered the Sun. Once the sun went down, it was dinnertime and then awards time. From the sound of it, the cub scouts were busy over the year.

Kevin Parrington instructing scout on solar viewing

Before the award ceremony the American flag was retired which was interesting to watch. Then we just had to wait for it to get dark. There were a few scouts that explained the process of getting an astronomy belt loop, pin and patch and we were able to help a few with explaining parts of the telescope and their need to focus the telescopes.

The clouds were coming and going all night; so once it was dark enough we had to wait for the clouds to dissipate. While we were waiting for it to get dark, a few of the adults brought over their scopes and asked for help on how to use them. None of them were go-to scopes. But in the end, the adults had a better understanding of how to use their telescopes. Once we saw stars, we were able to align the scopes. By this time, most of the scouts were playing man-hunt and enjoying the camping experience.

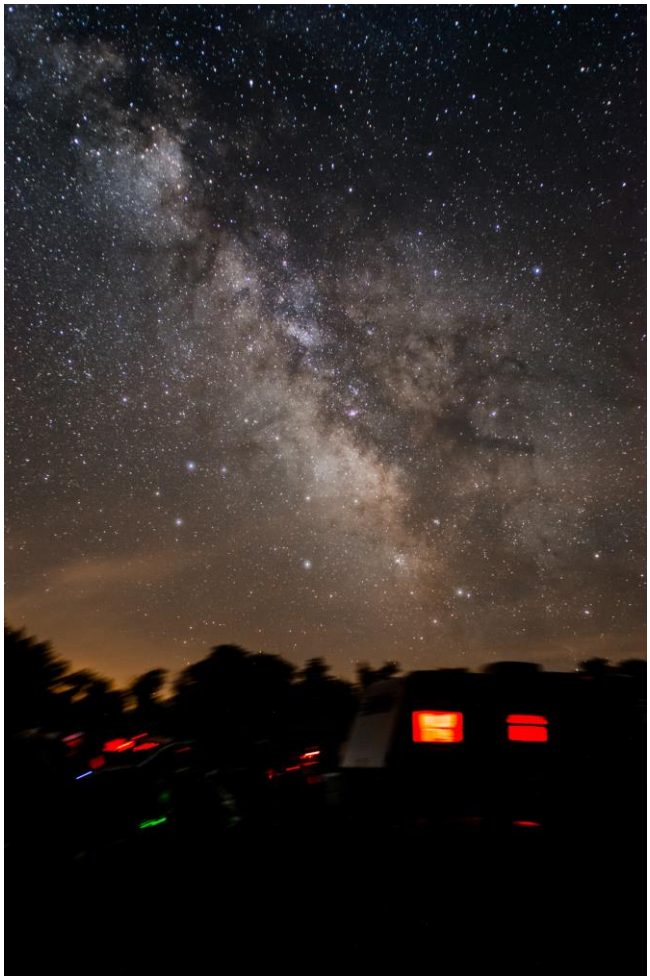
The den leaders and parents were the most interested in viewing: they made a line to look through the scopes. We had the LightSwitch as well as the Celestron SLT 90mm. When I first aligned the Light Switch it failed. I had to try a few times, and then I was good to go. Kevin was able to align the SLT but a scout moved it so we had to re-start. It was to be expected since there were many scouts. When someone would ask what something in the sky was or where something was, Kevin would use the laser pointer to point it out. He also identified constellations and did some star hopping.

Throughout the night, we were able to see Albireo, NGC 457 (ET Cluster), M13 (Hercules Cluster), Mars and Saturn. Saturn was hidden behind trees so we had

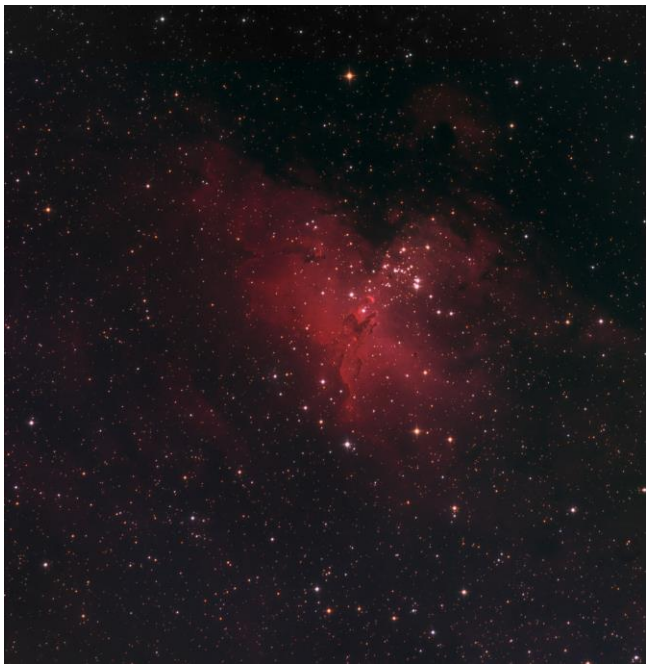
to wait for it to come up. It didn't come up high enough to see until after midnight. By this time, most of the kids were in their tents, but the adults were just waiting. Soon after Saturn came into view, the clouds would cover it again.

We waited until everyone was able to see Saturn before we packed up. We understand that we have seen Saturn and other things in the night sky that we take for granted at times. The best part of this event as well as all outreach events that we do is the reaction that we get. Watching someone see something in the sky close up for the first time is awesome! The Putnam Valley Cub Scout Pack was awesome and we hope to do this again next year.

Astro-Photos



Courtesy of David Parmet is this image of the Milky Way taken at Cherry Springs Park. David used a Nikon D7000 with a 20mm lens - ISO 1600 at f4 (a 5-minute exposure).



Olivier Prache took this image of M16, the Eagle nebula in Serpens Cauda. This is 5:30 hours of exposure (LRGB), through a Hyperion astrograph and FLI 16803 camera. Olivier notes the difficulty of getting the image given the nebula's low altitude and interference from the skyglow over White Plains.

A Glorious Gravitational Lens

By Dr. Ethan Siegel

As we look at the universe on larger and larger scales, from stars to galaxies to groups to the largest galaxy clusters, we become able to perceive objects that are significantly farther away. But as we consider these larger classes of objects, they don't merely emit increased amounts of light, but they *also* contain increased amounts of **mass**. Under the best of circumstances, these gravitational clumps can open up a window to the distant universe well beyond what any astronomer could hope to see otherwise.

The oldest style of telescope is the refractor, where light from an arbitrarily distant source is passed through a converging lens. The incoming light rays—initially spread over a large area—are brought together at a point on the opposite side of the lens, with light rays from significantly closer sources bent in characteristic ways as well. While the universe doesn't consist of large optical lenses, **mass itself** is capable of bending light in accord with Einstein's theory of General Relativity, and acts as a *gravitational* lens!

The first prediction that real-life galaxy clusters would behave as such lenses came from Fritz Zwicky in 1937. These foreground masses would lead to multiple images and distorted arcs of the same lensed background object, all of which would be magnified as well. It wasn't until 1979, however, that this process was confirmed with the observation of the Twin Quasar: QSO 0957+561. Gravitational lensing requires a serendipitous alignment of a massive foreground galaxy cluster with a background galaxy (or cluster) in the right location to be seen by an observer at our location, but the universe is kind enough to provide us with many such examples of this good fortune, including one accessible to astrophotographers with 11" scopes and larger: Abell 2218.

Located in the Constellation of Draco at position (J2000): R.A. 16h 35m 54s, Dec. +66° 13' 00" (about 2° North of the star 18 Draconis), Abell 2218 is an extremely massive cluster of about 10,000 galaxies located 2 billion light years away, but it's *also* located quite close to the zenith for northern hemisphere observers, making it a great target for deep-sky astrophotography. Multiple images and sweeping arcs abound between magnitudes 17 and 20, and include galaxies at a variety of redshifts ranging from z=0.7 all the way up to z=2.5, with farther ones at even fainter magnitudes unveiled by Hubble. For those looking for an astronomical challenge this summer, take a shot at Abell 2218, a cluster responsible for perhaps the most glorious gravitational lens visible from Earth!

Learn about current efforts to study gravitational lensing using NASA facilities:

http://www.nasa.gov/press/2014/january/nasas-fermi-makes-first-gamma-ray-study-of-a-gravitational-lens/

Kids can learn about gravity at NASA's Space Place: http://spaceplace.nasa.gov/what-is-gravity/

Abel 2218. Image credit: NASA, ESA, and Johan Richard (Caltech). Acknowledgement: Davide de Martin & James Long (ESA/Hubble).

July 25 thru August 3rd – The Premiere Summer Star Party for 23 Years Invites You to Enjoy Up to 10-Days of Observing & Camping Nirvana in the Berkshire Mountains!
SSP 2014 is located at Peppermint Park Camping Resort, Plainfield, Massachusetts to provide you with top-notch facilities, camping grounds and on-site food service, as well as fantastic amenities such as FREE WI-FI, beautiful in-ground swimming pool, new kid's playground, and lodge with fireplace, all under the pristine dark skies of the Berkshire Mtns! Whether you're a seasoned astro-photographer, a beginner, or family-oriented, the Summer Star Party has what you're looking for. **Please reserve your space now, campsites are going fast!**

Your WAA Member 25% Discount* gets you our exciting package for just $30 (reg. $40)

Westchester Amateur Astronomers

Just look at what's included:

> **Exclusive Chicken StarBQ** (with all the fixin's), Sunday July 27th

> **FREE Raffle Ticket** featuring great prizes including a Televue Nagler Type 6 Eyepiece (value: $300), Binoculars, plus many more (additional raffle tickets are available at SSP).

> **Exciting Lectures & Observing Guests** including Alan MacRobert, *S&T Editor,* Al Nagler, *Tele Vue,* and others.

> **UNLIMITED Coffee & Refreshments** Every Night

> **FREE Daily Continental Breakfast**

> **FREE Wi-Fi** ($35 value)

> **Food Service On-Site** Lunch/Dinner available every day

> **On-Site Astronomy Vendors**, including Teeter's Telescopes, Camera Concepts & others

> **Nearby Lodging** for Non-Campers†

> **Daily Astronomy Matinee + Classic Sci-fi Movies** on our 10-foot screen on non-observing nights.

> **Children's Activities** with Cool Astronomy Prizes

> **Live Guided Sky Tour** hosted by *Sky & Telescope*

> **Nearby Stellafane Conference,** Springfield, VT

***Note:** Does not include camping fees. To reserve your campsite and dates, directly contact: Call 413.634.5385

Step ONE: Complete the form below & mail with SSP Registration fee*
Step TWO: Contact PeppermintPark.net to reserve your campsite**

* *DEADLINE: Mailed or Online Registrations MUST be received on or before Monday, July 21, 2014.*
***Please call 413.634.5385 or go online to www.PeppermintPark.net to reserve your campsite & dates.*
† *See our web site for lodging options: RocklandAstronomy.com/SSP*

SSP2014 WAA (WESTCHESTER AMATEUR ASTRONOMERS) REGISTRATION

Please complete form below and mail with check to: Rockland Astronomy Club, Inc., Attn: SSP-WAA, 225 Rt. 59, Suffern, NY 10901. You can also register and pay online with Credit Card or PayPal (see below). Remember to reserve your campsite directly at www.PeppermintPark.net or call 413.634.5385.

SSP SUMMER STAR PARTY™ A ROCKLAND ASTRONOMY CLUB EVENT

☐ **WAA MEMBER**

Name (Last) (First)

Street Address City/State/Zip

Email Phone

Choose One*: ☐ AOS Individual ~~$40~~ **$30** ☐ AOS Family ~~$50~~ **$40** # of people in your party: Ages: / / /

Method of Payment: ☐ Check (enclosed) ☐ Credit Card/PayPal - **Register Online:** **rocklandastronomy.com**

**RAC is a 501(3)c nonprofit educational organization, and your SSP Registration Fee is Tax Deductible.*