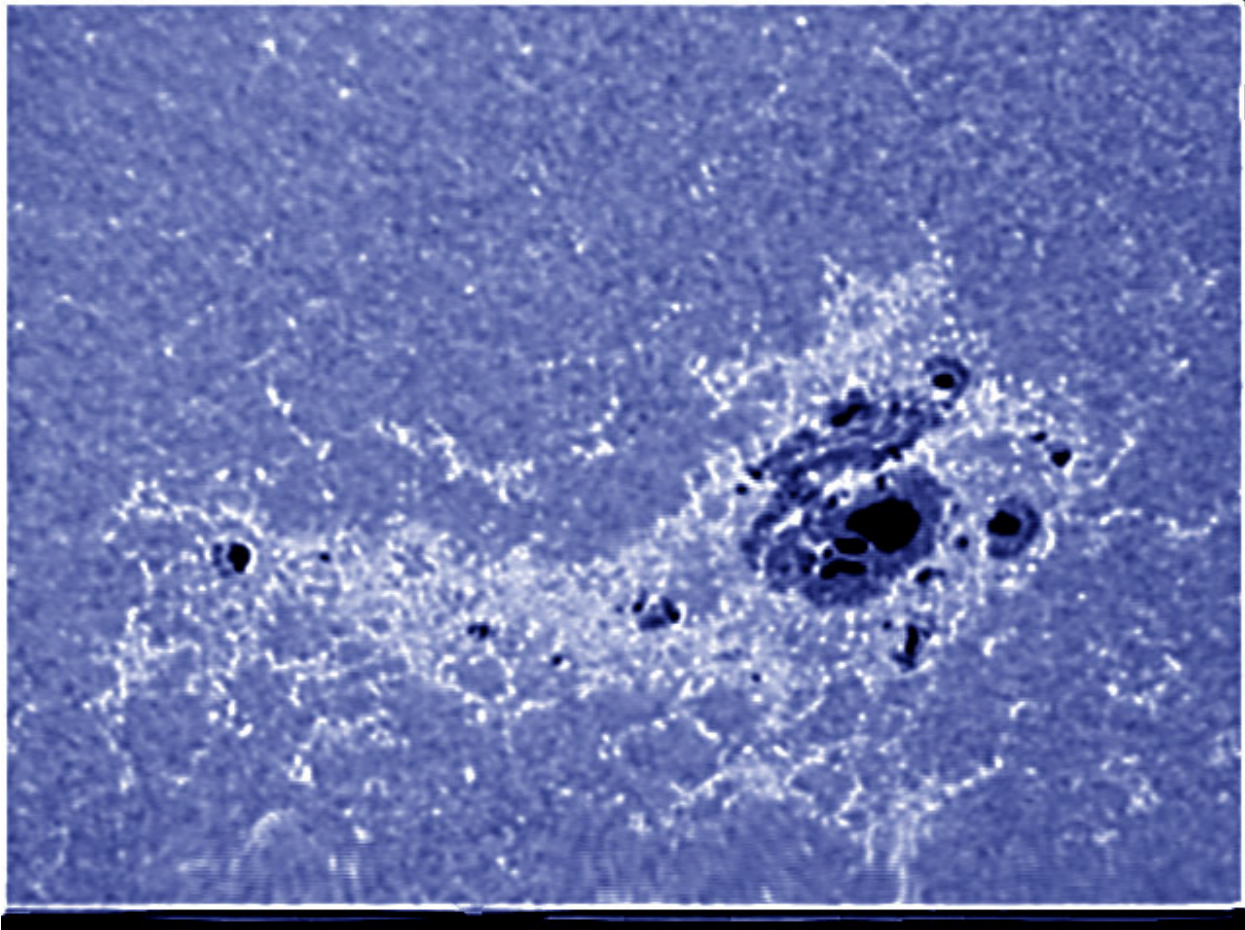


# Sky WAA tch



## **An Active Sun**

John Paladini took this image of a Sunspot using a Lunt CaK 90mm solar-scope (with meade 902 video eyepiece, tint added). Sunspots are temporary features of the Sun's photosphere, lasting from several days to occasionally several weeks. They are associated with intense magnetic activity, which inhibits the convection primarily responsible for heating the photosphere to its regular temperature of about 5800K. Cooler and darker, Sunspots usually register a temperature of about 4500K. Sunspots vary in size and can reach 80,000 km in diameter.

# Events for June 2012

## WAA Lectures

### **"Tracking the Evolution of Galaxies through Chemistry"**

**Friday June 1<sup>st</sup>, 7:30pm**

**Miller Lecture Hall, Pace University  
Pleasantville, NY**

Duane Lee, a doctoral candidate at Columbia University, will speak on the uses of chemical techniques to promote our understanding of galactic evolution. He attended Wesleyan University where he obtained a M.A. in Astronomy in 2006. His research interests include galaxy evolution and structure, chemical enrichment of galaxies, as well as optical and radio surveys of galactic structure. Free and open to the public. [Directions](#) and [Map](#).

## Upcoming Lectures

**Miller Lecture Hall, Pace University  
Pleasantville, NY**

There will be no lectures in July and August. Lectures will resume in September.

## Transit of Venus

**Tuesday June 5<sup>th</sup>, 6:00pm-8:20pm**

**The West Veranda, the James House,  
Campus of Phelps Memorial Hospital  
Center, Sleepy Hollow**

WAA will host Transit of Venus viewing at the James House on the campus of Phelps Memorial Hospital Center in Sleepy Hollow on Tuesday, June 5th (weather permitting). This is your last opportunity to see this phenomenon unless you survive to the year 2117. The transit starts at 6:04 pm and will be visible until sunset at 8:20 pm, about 35% of the way through the whole event. Several members will be bringing properly filtered telescopes. [Directions](#).

## Starway to Heaven

**Saturday June 16<sup>th</sup>, Dusk**

**Meadow Picnic Area, Ward Pound  
Ridge Reservation, Cross River**

This is our scheduled Starway to Heaven observing date for June, weather permitting. Free and open to the public. The scheduled rain/cloud date is June 23<sup>rd</sup>. Participants and guests should read and abide by our [General Observing Guidelines and Disclaimer](#). [Directions](#)

## New Members. . .

Ernest Wieting - Cortlandt Manor

## Renewing Members. . .

Paul Alimena - Rye

George N. Thomas - Irvington

Dante Torrese - Ardsley

Tom & Lisa Cohn - Bedford Corners

Tom Crayns - Brooklyn

Karen Seiter - Larchmont

Erik & Eva Andersen - Croton-on-Hudson

Rob & Melissa Baker - West Harrison

William Forsyth - Hartsdale

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

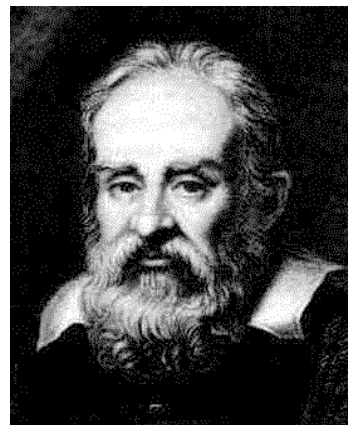
## WAA APPAREL

Charlie Gibson will be bringing WAA apparel for sale to the June meeting. Items include:

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

## WAA Picnic

The WAA picnic for members and their guests is scheduled for July 14<sup>th</sup>. Further details will be provided in the July issue and by email blasts.

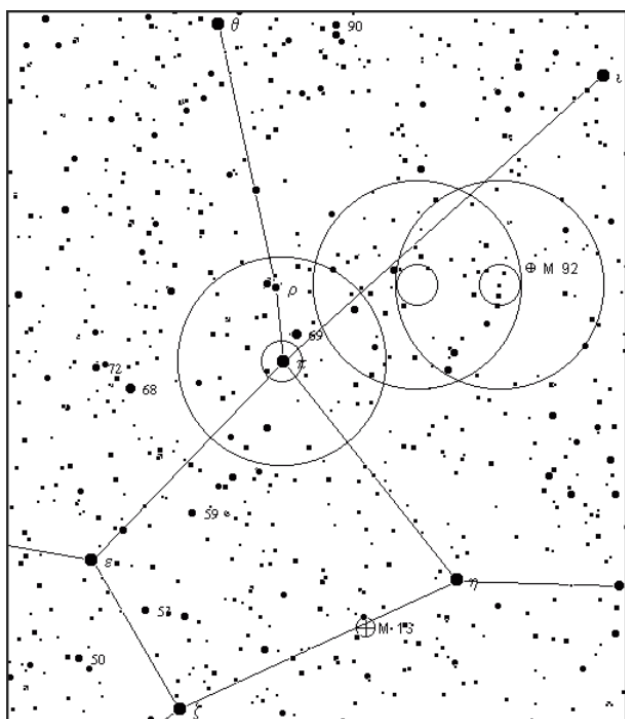


# Articles and Photos

## Getting There is Half the Fun by Larry Faltz

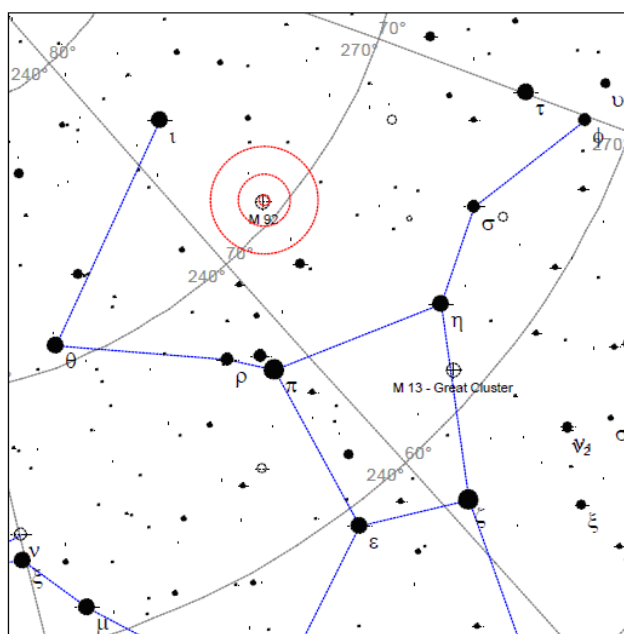
Many amateurs buy a telescope and then get frustrated finding anything other than the brightest objects. There are a variety of techniques to hunt down “faint fuzzies”, as deep sky objects (galaxies, open and globular clusters and nebulae) are quaintly known. The traditional technique is “star hopping”, using the finder and a decent star map (many are available, including free on-line planetarium programs) to work one’s way from finder field to finder field until the object is visible in the telescope eyepiece.

To star-hop, first determine the field of view of the finder (often it’s stated in the product literature) and then match it to a star map. You can use any decent star map; I like the Sky & Telescope *Pocket Sky Atlas*. Make an overlay out of a sheet of transparent plastic, like a page protector, to help envision the field. After centering on a bright star, move the scope by overlapping adjacent fields until you match up with the target’s location.



Finder fields to acquire M92 (Hercules) by star hopping from  $\pi$  Herc, a fairly bright (mag 3.6), easily found star

This is a good way to learn the sky, but it’s time-consuming and can be difficult and frustrating if the orientation of the finder doesn’t match that of the sky map. It’s a good idea to mount a finder with the “correct image”, upright and not-mirror reversed. To save your neck, a “right-angle correct image” (RACI) finder is often the best solution, especially when the target is above 45 degrees, although there are some straight-through finder fundamentalists among us. If you use a computer planetarium program, you can reverse or invert the sky map to match the finder view.



A portion of the Mansfield & Sutton Telrad map for M92. The Telrad reticle circles are 0.5°, 2° and 4° in diameter.

You can short-cut this process by using a “unity power” finder like a Telrad, with special star charts made for these devices. You can get these in the form of spiral-bound laminated books by Brent Watson that are easy to use in the field. Free maps of the Messier and Caldwell objects as pdf files are published on line by the Mansfield & Sutton Astronomical Society (Nottingham, UK) at [http://www.solarius.net/Pages/Articles/dbArticle.aspx?artid=messier\\_finders](http://www.solarius.net/Pages/Articles/dbArticle.aspx?artid=messier_finders). You simply match up the visual view through the reticle of the Telrad to the



star map. You'll be pretty close and a low-power eyepiece in the main telescope should bag the object.

A variation on this technique is to use a green laser pointer instead of a Telrad. Match up the position of the laser on the sky with the target on the map and you'll be pretty close to the object. I used this technique out in Colorado when I was observing with a 6" f/5 Orion StarBlast (see the [August 2010 SkyWAatch](#) newsletter). One major advantage is that you don't have to sight along the telescope tube as you would with a unity-gain finder, and again your neck will be happy about that. Never use a laser when others are imaging.

For many Dobsonian telescope users, finding objects near the zenith poses a peculiar problem. It's very hard to figure out which direction to move the instrument when going for final approach using the scope rather than the finder, since the image is reversed and it's hard to know which direction is north, south, east or west. More than a decade ago I kept a 10" f/4.5 Coulter Odyssey at a friend's house in Jamesport, Long Island. The skies there were pretty dark and I had some nice views, but trying to find anything overhead was frustrating.



Argo Navis (L) and Intelliscope (R) hand controllers

The development of relatively inexpensive optical encoders has automated the finding process dramatically. Encoders placed on each axis count how far the scope moves by scanning a pattern on a disc and simply counting. Typical encoders in modern telescopes have from 4,000 to 10,000 divisions per revolution, permitting very fine resolution along each axis. For example, my CPC800 claims a motor resolution of 0.14 arc-seconds. The simplest use of encoders is in "push-to" telescopes, which lack motor

drives but still know where they are pointing. Orion's Intelliscope device (available on a number of Orion's Dobsonian scopes) or Wildcard's Argo Navis (for aftermarket installation), are very easy to set up and use. Once aligned, you punch up an object in the hand control computer, which has coordinates for thousands of objects, and direction arrows on the display tell you in which direction to push your scope in each axis. As you get closer to the object the numbers count down to zero. If you overshoot, you just reverse direction until the read-out settles on zeros. The arrows always direct you.



Orion Intelliscope Display. (L) When object is inputted, (C) getting close (numbers to the right of the arrows are tenths), (R) You have arrived.

I used an Orion 8" SkyQuest XT8i Dobsonian with Intelliscope in Arizona last spring. It was supremely easy to set up. After you turn the hand control on, you point the scope straight up, then sight on two bright stars and that's it. Argo Navis is an aftermarket device. You purchase the controller and encoders to mount on your telescope (a wide variety of Dobsonians, alt-az and equatorial mounts are supported). You've got to be handy: the installation can be difficult with some mounts. It can be an expensive proposition but it's a good way to salvage an older, non-computerized equatorially-mounted scope. Jim's Mobile also makes add-on encoders and small computers for various older mounts. Orion's Intelliscope comes already mounted on a variety of inexpensive Dobsonian scopes and seems to me to be an extraordinarily good value.

The ultimate solution to the finding problem is a motorized go-to mount. All of the manual effort (after the initial alignment, which in some new Meade scopes is completely automatic) is gone. Punch in the name of the object and push a button, and the telescope quickly slews to the target with remarkable accuracy. These are now familiar instruments at star parties, particularly the Meade LX-90 and LX-200 Schmidt-Cassegrains and Celestron NexStar and CPC SCTs, as well as smaller SCT and Maksutov scopes by these two manufacturers. Many equatorially mounted scopes sold these days are also go-to's. Most new go-to scopes have internal GPS, which is useful (but not critical) to get your exact location and time.

If you have a telescope that you like and want to upgrade the mount to go-to capability, you can buy equatorial or alt-az go-to mounts of varying capacities (the larger the payload, the higher the weight and price). Portable mounts by Celestron, Meade, Orion, Vixen, and Takahashi, to name a few, range from \$600 to \$5,000, and there are larger observatory-grade mounts by Software Bisque, ASA and Chronos, costing up to \$65,000.

One of the reasons to favor an alt-az mount if you are not going to do long-exposure imaging is that you don't need to align on Polaris. That means that if you have limited sky exposure from your observing site you can still manage to get accurate tracking and go-to's.



iOptron MiniTower

iOptron made a splash a few years ago with inexpensive alt-az "Cube" go-to mounts. These light-duty mount/tripod combinations have plastic gears and won't carry most serious telescopes (even small serious telescopes), although I did pick one up at NEAF this year solely to use with my very light weight Coronado 40mm hydrogen-alpha scope. Its light weight and battery operation make it perfect to take to Hawaii for the Transit of Venus. iOptron's MiniTower (recently upgraded to the MiniTower II) and MiniTower Pro alt-az mounts are a different matter, capable of handling a 4" refractor or 8" SCT. The hand control has 130,000 objects. iOptron also makes two go-to equatorial go to mounts to compete with more established vendors, and recently released a light-duty computerized equatorial for \$400, the

SmartEQ, which will handle telescopes under 11 pounds.

I have an iOptron MiniTower, which I purchased for \$750 two years ago (the current list price for the MiniTower II is \$999). I upgraded the original tripod, which is a little flimsy, to the one sold with the MiniTower Pro (2" diameter legs, similar to tripods sold with Meade and Celestron 8" SCT's) for another \$150. The mount is easy to set up. A counterweight (supplied) on the altitude shaft opposite the scope is needed to balance the weight of the optical tube. This puts less stress on the motors and gears and enhances the go-to and tracking accuracy. You balance the scope on the altitude axis by sliding it along the dovetail shoe or adding counterweights. The initial alignment routine is a little peculiar. After ensuring the mount is level (it has a bubble level in the base), you balance the telescope in altitude, then point the tube straight up (a small carpenter's level laid across the aperture of the scope is useful). Then you point a mark on the base due south (a compass is useful). Now you are in "park" position. You tighten the clutches and turn on the scope. It acquires the GPS signal fairly quickly. You select an object (pick a bright star or planet) and the scope slews to it. I have found that the initial slew is usually off, primarily because the mount is not pointing exactly due south. Using the "Sync to Object" function, you find the alignment object using the hand control's direction buttons and when centered press "Enter" to sync to it. After that, the go-to's are fast and accurate. You can refine the alignment by re-syncing on subsequent objects. There's also a two-star initial alignment routine, but doing the one-object alignment with a second object sync works just as well.

There are some minor issues with this mount. It has a reputation for a few quality control problems in the circuit boards, which so far has not been an issue for me and may be a thing of the past now that iOptron has become a well-established company. The connector to the GPS antenna can work loose during shipping (it did in mine) but it's a simple matter to tighten it, since it lives in an easily accessible recess at the top of the mount. The altitude clutch can slip if there's a lot of torque on that axis, for example when you have a long refractor and change eyepieces or add a binoviewer (or someone grabs the eyepiece when they want to view, a common reflex of children and uninitiated adults). The slippage is counted by the encoders and you simply reposition the mount manually without loosening the clutch (I always re-sync when this happens). But once going it seems very reliable and it finds targets faster than my

Celestron CPC800. I like using the Minitower with my 60mm Lunt H-alpha solar telescope, where the one-object alignment is an obvious advantage. A neat feature is that when you select the sun as a target, it first asks you if you really want to do that (and provides an appropriate warning about eye damage) and then, if you confirm the choice, it selects the solar tracking rate automatically, rather than leaving the drive at the sidereal rate and forcing you to change it manually. In addition, like nearly all computerized go-to scopes the hand control can be easily connected to a computer. iOptron designed the interface to be a direct USB connection, so you simply need a small serial port driver running on your computer rather than some interface device like a serial-to-USB adapter. The program USB2COM can be downloaded from iOptron's web site. Plugging in the wire and running the driver makes the mount ASCOM compliant (iOptron's web site has the ASCOM drivers) and you can easily control your scope from planetarium (such as *Cartes du Ciel* or *The Sky*) or planning programs (such as *AstroPlanner*, *SkyTools* or *Deepsky Astronomy*).



Meade LX-80 mount in equatorial configuration

By the time you read this, the first Meade LX-80 mounts will be ready to ship and there may even be some on-line reviews. This new mount was announced in September, with shipping planned for early 2012, but the date kept slipping. At the Meade booth at NEAF, company representatives ascribed the delay to the need to make various last-minute

improvements and modifications. Perhaps. Both in concept and in execution the LX-80 is remarkable in that it is both an alt-az *and* an equatorial mount. This makes it a far better imaging platform than a pure alt-az mount, since field rotation is eliminated in the equatorial configuration, permitting longer exposures. It's one of those "why didn't I think of that?" creations. Listing at \$999, the price point will be a real challenge for iOptron, since the similarly-priced MiniTower II can't easily be configured for equatorial use, even though its firmware has routines for aligning and controlling equatorially mounts. In its equatorial configuration, the LX-80 has the necessary tweaks, including periodic error correction and autoguiding. One caveat is that it can't be set up for polar mode at less than 25 degrees latitude.

I examined the LX-80 at the Meade booth at NEAF. It's a very solid instrument, nicely machined and detailed. I suspect that the clutches are similar to those on the MiniTower, which means care must be taken when changing on-scope equipment (you don't want the clutches in this type of mount to be rigidly locked, since that could risk motor or gear damage if there's a major imbalance).

The hand control has 30,000 objects, which can be augmented through an ASCOM-compliant computer connection. Like many of Meade's new scopes, it also has "Astronomy Inside" audio files with narration for 500 objects. That would save your voice at star parties when you are repeatedly asked "What are we looking at?"

Beginners or frugal observers looking for an inexpensive, high-quality, simple encoder-based telescope would do well to consider one of the Orion Intelliscope Dobsonians. That's been the scope that I've been recommending for newbies (generally the 8" or 10" models, \$599 and \$749 respectively) who seem to be reasonably serious and can observe in moderately dark skies. The wide field of view provided by their large, fast mirrors mean DSO's will stay in the eyepiece long enough to make "push-to" tracking tolerable. They're not too big, but not too small. For real motorized go-to's and continuous tracking, you have a lot of possible choices: *de novo* scope/mount combinations if you want a new optical tube or a new go-to mount for use with your current telescope.





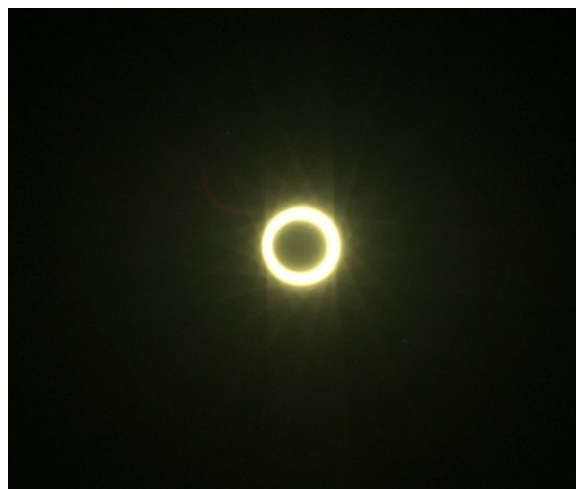
### WAA at NEAF

The WAA booth at the 2012 Northeast Astronomy Forum was manned throughout the two day show by more than a dozen dedicated and enthusiastic club members. This photo, taken early on Saturday, shows (L to R) former WAA President Mike Virsinger, current President Doug Baum and Doug's son Ben, a formidable amateur astronomer in his own right. Behind is the club's historic 1948 Saturn 6" f/15 refractor, which proved to be a real attraction for the many antique scope buffs who attend NEAF. Mike looks serious because his brain was occupied figuring out how to succeed in buying a used but pristine Lunt 100mm hydrogen-alpha scope that was being offered privately, which he managed to do, resulting in him having a broad smile on his face for the rest of the show.

## Almanac

For June 2012 by Bob Kelly

The big news for June is the Transit of Venus! Mark your calendar for 6pm EDT until sunset on the evening of Tuesday the 5<sup>th</sup> for this sight. See Larry's article from last month for the many ways you can see this twice-in-a-lifetime event. (Previously in 2004 and next in 2117 and 2125.) For this event, Venus looks like a small, solid black dot like a large sunspot moving ever-so-slowly in front of the Sun. And that's just the first of many planetary movements this month that show the dynamic motion of our solar system. Let's hope the weather is good. I'd like not to be remembered as a meteorologist and amateur astronomer who

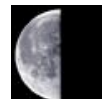


### Solar Eclipse

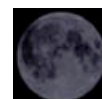
Karen Seiter captured this photo of the May 20<sup>th</sup> eclipse from the International Balloon Museum parking lot, just north of Albuquerque. Notes Karen: I took my regular camera, set it to 1/4000 sec, f22, ISO 80 (the fastest it goes) and just aimed in the general direction of the sun (without looking).



June 4



June 11



June 19



June 26

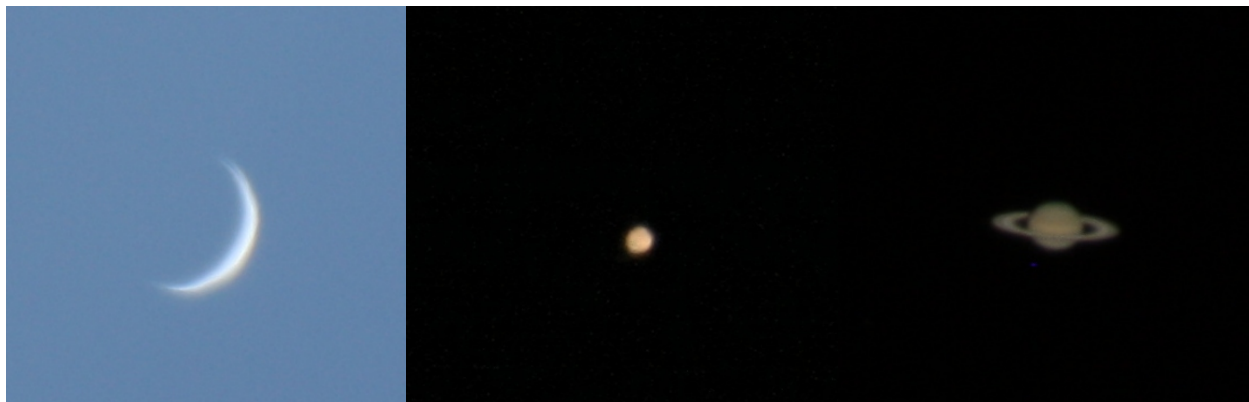
combined his passions by being struck by lightning while trying to see the transit of Venus.

Mars is much less spectacular, but perhaps he is worn out trying to avoid being trampled by Leo's paws, so he moves east (left) of Leo toward Saturn. Word is that Mars will enjoy Saturn's neighborhood in Virgo and spend the summer there.

Crystal clear night skies, when matched with a steady atmosphere, are best for viewing the dimmer denizens of the sky. Crystal nights are hard to come by in the hazy summertime! (In my day job, I'm working on plans to reduce that haze.) But the

Virgo cluster of galaxies is overhead, and the galaxies near the rear paws of Leo may be easier to get to (see Larry's directions in May's newsletter). Planets make nice targets for viewing on hazy nights, since the haze is often a sign of a smooth airflow that makes the views of planets less bumpy. Often planets are the first 'stars' to be seen, which is good since the latest sunsets of the year occur in the last week of June, making a late start for our evening observing. Saturn will give you many opportunities to test this advice, as the planet, with its rings and brightest moon Titan, is well placed high in the southern sky after sunset. Glimpsing Saturn's fainter moons is a nice extra, but with Saturn's rings now open  $12\frac{1}{2}$  degrees wide, the smaller moons are a little harder to see. Using averted vision – looking to the side of the planet like you do to see faint fuzzies better – will help your brain pick out the fainter moons.

At our star parties, the 'magic' of magnification can make all the planets seem to have similar sizes, but in June, as in May, the different sizes of the planets are readily noticeable when viewed at the same power. Here are three of our planets – a crescent Venus, ruddy Mars and ringed Saturn in that order - in photos taken within a day of each other in May with my Canon XS attached to my 8" dob telescope. I've cropped them to the same number of pixels in each photo to show their different sizes as seen at the same magnification in the scope.



Mercury does a valiant, but sadly inferior imitation of Venus' domination of the evening sky, rising ten degrees above the western horizon 45 minutes after sunset. But it's one of his easier-to-see trips into the evening sky this year.

After the transit, crescent Venus pops up rapidly into the morning sky, making a play for Jupiter, which is already appearing to move higher in the dawn sky. Sad that sunrise is so early (earliest on the 13<sup>th</sup>). But getting up for this 5am show is rewarded by the sight of Venus and Jupiter reprising their spring evening sky courtship amid the bright stars of Taurus the Bull.

The Space Shuttle test craft Enterprise moves by barge June 4<sup>th</sup> through 6<sup>th</sup> to be lifted up onto the deck of her new home on the Intrepid.

The International Space Station, with its new visitor – SpaceX's Dragon cargo craft – has several overflights each night through the 27<sup>th</sup>. The Chinese station Tiangong 1 has moderately bright overflights in the evening skies through the 13<sup>th</sup>.

The Moon horns in on Jupiter and Venus' tryst near the horns of the Bull from the 16<sup>th</sup> to the 18<sup>th</sup>, a great camera shot for cameras of all kinds! A thin Moon lies low with Mercury on the 21<sup>st</sup> in the evening sky, marks Mars on the 25<sup>th</sup>, and sits with Saturn on the 27<sup>th</sup>. The first quarter Moon looks like it's in a hammock between Saturn and Mars on the 26<sup>th</sup> and 27<sup>th</sup>.

For our fans on the west coast, Hawaii and Asia, in addition having a better seat for the Transit of Venus, they get to see the full Moon dimmed in a

partial (one-third) lunar eclipse from 3am to 5am PDT on the 4<sup>th</sup>.

Bob's blog is at [bkellysky.wordpress.com](http://bkellysky.wordpress.com)