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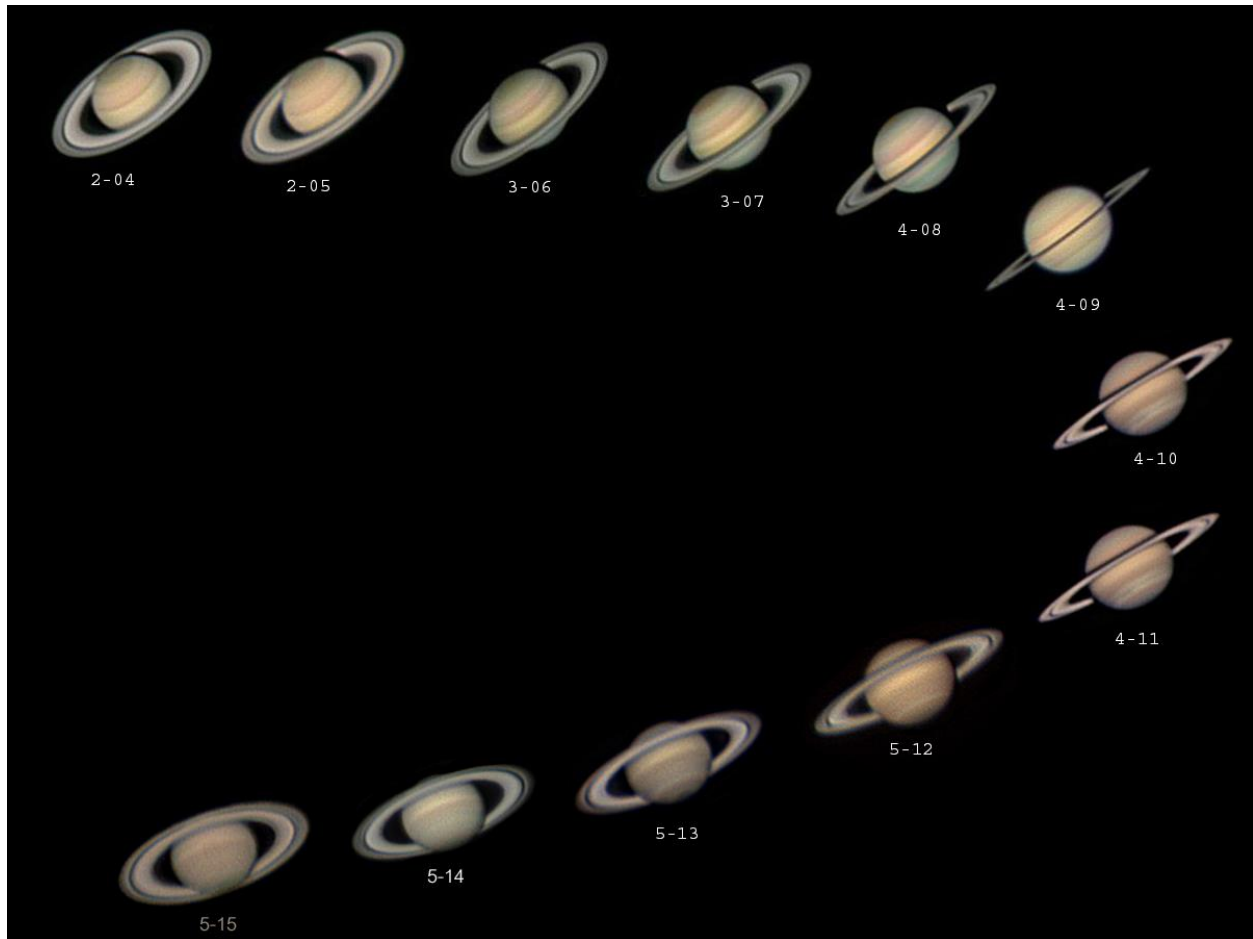


Comet 22P Kopff next to Abell 1516 on May 18 (Credit: Michael Jäger)

A periodic comet discovered in August 1906 by August Kopff wandered against the backdrop of the Virgo Cluster this month. In the above image, the (barred) spiral galaxy at the bottom is M61 (NGC 4303), while the prominent star near the center is the magnitude 6.45 primary component of the double star 17 Virginis. The Abell 1516 cluster of galaxies is to be found in the top-right quadrant, consisting of NGC 4281, 4270, 4266, 4277, 4273 and 4268. Can you spot Comet 22P, whose periodicity is just 6.4 years, with its next perihelion at 1.56AU set for October 25, 2015?

The artistry of Michael Jäger meets the splendor of the night sky in this image, the result of four 10-minute exposures; he imaged this region beginning at 20:51 UT on May 18, 2015 using his 5.6" Newtonian (F/4.0) and a FLI8300 camera. Many thanks to Michael for the use of his images.

Saturn by the Dozen



The Rite of Late Spring

(Credit: Herb Bubert)

He didn't have to wait till the last day of May this year for a good clean shot. Saturn was at opposition on May 22, but **Herb Bubert** simply couldn't restrain himself – *Carpe Diem!* he said (or maybe he muttered *Carpe Noctem!*) and took aim at the ringed planet early to add this year's image to his collage. He continues:

It was shot on May 10 at 1.33am. A little over 5000 frames were imaged with a ZWO ASI 120MC camera at 37 fps with a 1.8x Barlow on the Celestron C9.25, captured with FireCapture, stacked in AutoStakkert and processed in Registax and Photoshop.

Saturn is low in the sky and from my backyard observatory it is in the trees most of the time. I was able to get an image (only one from a half a dozen runs) while it was in a gap between the trees. I have set up my Losmandy GM8 on the flat roof of an addition to the back of my house to get a view that's above the tree line. I will keep trying for a better image at least for the rest of May.

Alas, better opportunities failed to materialize this month. So we go with First Impressions!



Super-Duper Big

If you're like me, you know that a trillion is bigger than a billion and a billion is bigger than a million, and you know the conversion factors between the units but you don't have a gut feeling for the difference. They're all enormously big. So if you read that there's a black hole in a galactic nucleus with a mass estimated at a billion solar masses, you know it's big, super big, super-duper big -- but you probably can't relate it to how much you weigh or how much an elephant weighs.

Let's consider a realm where we might have a more intuitive understanding of magnitudes: money. If you have a million dollars, that's nice. If you have a billion dollars, that's way more than nice. Let's consider a modest one-billionaire, who has only one billion dollars of stock in his Internet startup, and assume that the stock is a hundred dollars a share. On a daily basis, the stock price probably varies by a dollar or so. But that fluctuation means that the billionaire's wealth goes up and down by about ten million dollars a day. What to the billionaire is a minor daily change hardly worth thinking about is a fortune by most peoples' standard.

We can set up this pattern: to a trillionaire, a billion dollars is a minor detail not worth worrying about; to a billionaire, a million dollars is a minor detail not worth worrying about; to a millionaire, a thousand dollars is a minor detail not worth worrying about.

When I look at the Andromeda galaxy with its trillion stars compared to our one and only Sun, maybe it's easier to understand what that means if I think of what a trillion dollars would mean compared to a dollar: our Sun is a cup of coffee at Dunkin' Donuts compared to a thriving Mars colony. For me, that's a comparison that isn't abstract. Does it work for you?

John Bishop
NHAS President

Sky Watch Review

Manchester Girl Scouts, Thetford VT, May 9

This was a long drive, some 104 miles from my door. I hoped I had made the right decision as I packed up and left home around 4:30pm. The forecast was for partly cloudy and the closest clear sky chart also called for a good night for observing. On the way the clouds seemed to be getting thicker and I began to wonder if I had made the right call. When I arrived at Camp Farnsworth, I found **Ramaswamy** and **Marc Stowbridge** already there and with scopes set up. Marc had Jupiter and then Venus in his scope in the daylight. As evening came upon us the skies cleared, becoming

a lovely clear spring evening. We had at least 100 of the girl scouts in camp come by over the course of the next 2 hours, thankfully not all at once. The three of us remained busy for the entire time as small groups came and left. Thetford is delightfully dark, probably darker than YFOS, and we had great views of Jupiter, Venus, M3, M81 and M82, Polaris, Castor, M13 and last of all Saturn around 10:30pm.

One young girl stepped back from the eyepiece in my C9.25 trained on Jupiter and waved her hands as if to fan her face and exclaimed "I'm totally geeking out right now!" Another young lady cried after seeing Saturn.

Lots of great questions from the girls as well. All in all, a wonderful evening well spent under the stars.

- **Gardner Gerry**

Goffstown High School, Goffstown NH, May 14

For a change, this event took place as scheduled. NHAS was represented by **Gardner Gerry, Steve Rand, Bob Veilleux** and **Paul Winalski**. There was a big indoor event at the school, and our observing event attracted some curious students who hadn't planned on attending, in addition to **Mike Veilleux's** class. Unfortunately they cut down some trees between us and the school, so the view to the

north was not as good as at past events here.

Sky conditions were mostly clear, with some haze. Seeing wasn't very steady. In the 14" scope I showed Venus, Jupiter, Mizar, M3, M13, M81 and M82. I tried several times to find Comet Lovejoy, but the lights from the school building which we can't shut off (Mike Veilleux tried), made it impossible to find the comet.

- *Paul Winalski*

Mount St. Mary Academy, Boscawen NH, May 28

Fifteen sixth-graders were camping out at the site (a private residence/farm). I gave the indoor presentation and set up Mr. T. the 14" TScope for observing. **Gardner Gerry** also was there with an 8" Orion dob. It was a delight to be at a site where all of the ambient lighting could be turned off. There was a light dome to the East from Concord, and a just-past-first-quarter Moon was lighting up Virgo, but that was all we had to contend with regarding light pollution. I'd love to observe here at New Moon.

Skies were clear but turbulent. It was neither a good night for double stars, nor for observing planetary details.

I showed Venus, Jupiter (only three moons visible at first, then Io came out later in the evening), an Iridium flare, Saturn (I saw three moons), Mizar, Gamma Leonis, M81 and M82, M44, M13, M4, 61 Cygni, T Lyrae and last but not least, Comet Lovejoy. It is now in Ursa Minor, very near Polaris and dim but visible in Mr. T.

- *Paul Winalski*

Society Activities

First Friday at MSDC, Concord NH, May 1

It was supposed to be a heavily overcast First Friday, so decidedly astronomy-unfriendly that even constant fixtures like **John Rose** and **Mike Townsend** decided to punt. **Marc Stowbridge** and I didn't see any reason to disagree but showed up in the parking lot anyway; indeed a non-skywatch suited our agenda of doing some Lunt solar scope modifications. Marc brought his Takahashi refractor and iOptron MiniTower mount because he usually travels with them, but I did not bring a scope; I didn't even bring my GLP or a camera.

But MSDC is in Concord, which is subject to New England weather. It was perfectly clear for the most part in Concord, with only the horizon overcast in almost every direction. Even that was interesting because of the purple tinge to the clouds seen as the Sun set – Marc wondered if it had anything to do with the Chilean volcanoes going active. The other odd thing was the absence of anyone remotely interested in looking at Venus or Jupiter or the nearly full Moon.

We had to wait until the Planetarium show was done at about 9pm. Many visitors stopped by for a look, including a gentleman from Vermont with a newly acquired telescope that he needed help with – unfortunately he didn't have the unit with him, but at least now he knows that the First Friday program exists to assist in just such cases. A couple of young men, upon being told of the upcoming **Kelly Beatty** talk about Pluto at our next business meeting, actually showed up at the May 8 meeting! But a family of four from Nashua lingered longest and asked the most questions; they were about to borrow the Library Telescope from the NPL the following Sunday.

- *Ramaswamy*



*Moon over Marc and MSDC.
(Photo: Marc Stowbridge)*



The little boy is trying to tell his mom that he'd rather look through a scope than talk to a funny looking creature.

Children's Day, Portsmouth NH, May 3

Children's Day in Portsmouth turned out to be a great day with lots of sunshine and plenty of visitors, and a healthy number of NHAS scopes. **Tom Cocchiaro** set up two H- α scopes, while **Gerry and I** brought our 8" dob with a white light filter and our Lunt H- α scope. **Rags** and **Dave Speltz** were also brought scopes with white light filters. **Matt Marulla** joined us with his Questar in search of Venus in the daytime.

Marc Stowbridge turned up with his Lunt 60 H- α outfitted with the standard fare of "Stowbridged" accessories. A clever lightweight pad fit onto the end of the scope with a bit of velcro to help block the Sun while looking through the eyepiece. Marc also constructed a nifty cord harness to prevent the Lunt's blocking filter from falling off the scope if it ever got loose. I had made a pad similar to Marc's for my Lunt, but it was larger and heavier. The end result was that that it acted like a big sail that took every opportunity to move the Lunt around in the wind. Guess I need a smaller pad or a heavier mount!

The attendance was good. We had a steady stream of kids and adults most of the day. We were somewhat upstaged by the big bouncy house and some furry characters, but none the less we were busy all day. I remember a young

boy that just kept coming back time and again to grab a peek through a scope. Certainly a future NHAS astronomer!

- *Pete Smith*



From the left, Dave Speltz, Tom Cocchiaro and Pete Smith are setting up, Rags is just chill'n by the NHAS tent, while Marc Stowbridge is still fiddling with his mount. (All Photos: Pete Smith)



Marc with his back to us explaining the finer points of astronomy. Behind him is Matt Marulla showing off his Questar, while further back is Rags wishing he too had a Questar. And Tom is putting food and drinks in the cooler.

The Skywatch at Camp Farnsworth, Thetford VT, May 9

[Since when a skywatch is considered a Society Activity, you might well ask. A fair question that will fetch a dubious answer: the 'official' report by Gardner Gerry can be found on page 3, while the ramblings of his two loquacious sidekicks concerning that evening have been 'binned' here. –Ed.]

Marc Stowbridge leads the way:

The trip to Camp Farnsworth was an enjoyable trip down memory lane, as my youngest daughter went there so many years ago. While some of the buildings were new or re-purposed, they had the same almost overwhelming cheerfulness that speaks of a healthy camp.

Ramaswamy and I had planned upon getting there early so we could fiddle with our Lunt solar scopes and compare settings. The clouds and haze that did not inspire hope on the way there grudgingly cleared bit by bit, allowing us to set up and see some solar activity. Gardner arrived right on time to see the scouts launch soda-bottle rockets in the field near our setup. We spotted Jupiter and Venus during daylight, and as scouts and parents trickled by on their way to their cars, we enticed them over to have a look.

As evening fell, the delightful hordes of scouts and leaders descended upon us. There were no long lines, but constant attendance, as the staff mercifully brought the girls over in manageable groups. Many of the scouts were 9 years old and some were young teens. They were very well behaved and quite attentive. The Jovian Moons were a hit, as was the quartered Venus. A bit after 10pm Saturn finally made it above the tree line with the rings on full display. I was able to show them some galaxies, a few double stars and prominent constellations, much to their apparent delight.

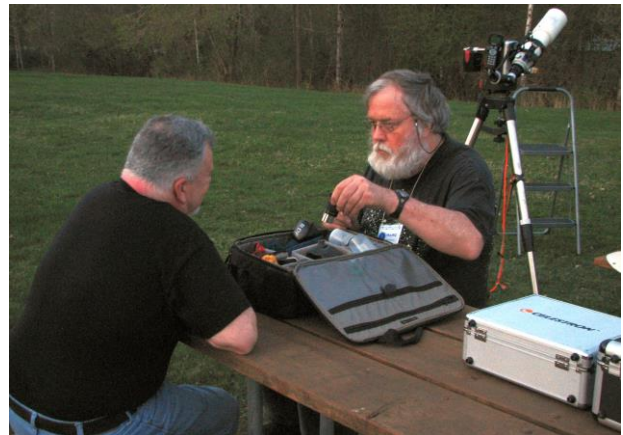
The three of us made a good team, I think. We each had different things in our scopes or focused, as it were, on different aspects of things. We left a bit after 11pm and I had a relaxing ride home.



The rocket launching event was quite the success.



Three tracking scopes plus the dob await the scouts.



Gardner and Marc pass the time talking shop about EPs.

This event was my first out-of-state skywatch and the site was a two and quarter hour drive each way. I got there by 4pm and set up the Lunt away from the main building and near the parking lot; I was assured there wouldn't be much movement of cars there later in the evening and there was to be a rocket-firing event at 6pm in the middle of the open field by the flag. Marc showed up with his scope as well and had better luck attracting the attention of wandering folks. Gardner came by at 7 on the dot. There was practically no activity until after 8:15pm, as everyone was at dinner after the rocketry exercise. And we dealt with neither insects nor dew; a gentle breeze is all it took!

I started with the Jovian moons, all but Ganymede being visible, and told folks that Ganymede was in eclipse until nearly 10pm. 3 or 4 girls remembered that and came back later for a look at the quartet (and called out to friends for a look as well) – it was fun to explain how the eclipsing process worked. I also showed Mizar and M13, but mostly I did GLP tours of prominent stars and constellations. Since Vega was clear of the trees, the precession of the NCP could be illustrated as well. There were a lot of questions, including one from a serious 5-year old: “Which planet has 67 moons?” I estimate about 40 scouts looked through my 80mm, but it was never a rush. The clouds came back a bit before 11pm and we packed up, and in true New England fashion it started to clear as we left. But for a bright spotlight at the Ranger Station to the south that couldn't be turned off, it is an excellent site; folks approaching us from the north were unable to see where we were set up, so the point of light pollution was driven home as well.

- ***Ramaswamy***

Sunspots and Solar Prominences

Active Region AR 2339 announced itself with a bang on May 5, unleashing an X2-class flare at 22:11 UT. The burst of extreme ultraviolet radiation, coupled with a CME that was not directed at the Earth, was thought to be the first of a number of upcoming M-class and X-class bursts. The X-rays and UV pulses generated a prolonged radio blackout over much of the Pacific ocean side of Earth. The flare also caused a radio burst; just after the flare a roar of static was picked up by shortwave receivers all over the Pacific region.



AR 2339 as it rotated across the northern hemisphere of the Sun, on May 6, May 11 and May 14. (HMI Images: SDO/NASA)

In the end AR 2339 turned out to be less than active region, with no major flares resulting from it while facing the Earth. But just as it was rotating out of sight, a magnificent sight could be seen off the opposite northern limb of the Sun. **Ted Blank** notified the NHAS Chat List on May 13 of a massive flare known as a hedgerow prominence and succeeding days showed prominences and filaments in H- α scopes. **Paul Winalski** had these observing reports:

Not only was it huge (Jupiter-size), it was changing second by second as we observed it (I was showing it off to a co-worker). It appeared to be a chromosphere plasma flow along strong and elevated magnetic force lines between a small active region on the side of the Sun facing the Earth, and the opposite magnetic pole of an active region behind the Sun. I had to adjust the H-alpha tuning several times while observing it, which means radical and quick shifts in the plasma velocity. It wouldn't surprise me at all if this event results in a major coronal mass ejection.

It did, twice. And responding to a comment by **Jeff Eitreim** about a loop seen on the surface just in from the limb:

The loop on the surface would be the connection with an Earth-facing active region (and probable sunspot). There is an active region containing a surface of opposite magnetic polarity on the other side of the Sun not yet rotated into view. What we saw was an enormous stream of plasma travelling from the one pole to the other. I estimate the distance of this plasma flow at nearly 100,000 miles. You could certainly drive the Earth under this prominence touching neither the base of the prominence nor the chromosphere of the Sun.

Last Looks at Lovejoy

I thought I had had my last look at comet C/2014 Q2 (Lovejoy) at the Beech Hill School skywatch on April 21. But on May 15 I located it about 6.5° from Polaris, from my backyard no less. My next 'last' sighting was at 10:39pm EDT the next day. And 5 days after New Moon, I looked for it again from Heron Pond Road in Milford on May 23. I had the star charts, I knew I had it in my FOV, but couldn't spot it. Then **Mike Townsend** helped out – he could see it, centered it, and sure enough I could see the fuzz. It was early, about 9:15pm, but I was satisfied with my last look at Q2. Mike joked that it could well have been NGC 188, but it wasn't. And by a strange coincidence, **Ronaldo Ligustri** imaged the region about 3 hours later and [published the result at his web-site](#). NGC 188 was further south!

- **Ramaswamy**

The night I went to look for it at the Mount St. Mary skywatch, Comet Lovejoy was not that far from Polaris and because of that I didn't print out a detailed sky chart of the region. Big mistake. *[On May 28 the separation was about 1°; it just goes to show! -Ed.]* It took me 3 separate tries to find the comet by pointing to where my best guess as to where it was, and then muddling about at 50X in the 14" scope. But find it I did. Very dim. Averted vision and jiggling the scope helps to zero in on it. And it's still a bit green, but I think it's fading pretty fast now. I don't hold out too much hope of seeing it again. I'll have to wait 8000 years until it comes around again. I hope to be there then.

- *Paul Winalski*

Here's Waldo!

If you couldn't tell one fuzzy object from the others, laugh it off. The comet is at the center of this excerpt of Page 1's image (right).

Comet 22P Kopff is a very curious object as it is heavily influenced by Jovian gravity, its current aphelion of 5.33AU placing it just beyond the orbit of Jupiter. Since its discovery in 1906 and the recovery in 1919, its perihelion has been ranging between 1.76AU and 1.5AU and it is projected to dip to 1.19AU by 2039 with an orbital period of 5.59 years. In 1943, Jupiter altered its perihelion from 1.68AU to 1.5AU and also sped up its orbital period from 6.54 years to 6.18. Then came the really close encounter of just 0.17AU in 1954, which increased the orbital period to 6.31 years. The next two close encounters are [predicted by Kazuo Kinoshita](#) to be in 2026 and 2038. Stay tuned!



22P Kopff is dead center, with 17 Vir at bottom edge.



Comet 22p Kopff in the center of this image on June 5, less than a Moon-width from M61.

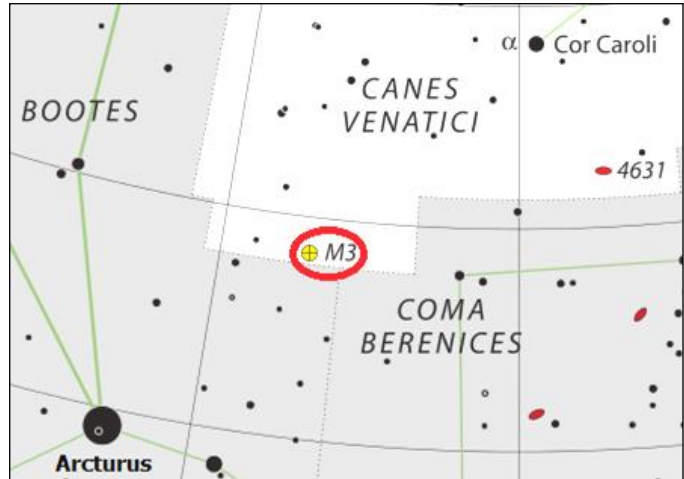
(Credit: Michael Jäger)

Messier 3 (NGC 5272) – Globular Cluster in Canes Venatici

by Glenn Chaple

As May gives way to June, backyard astronomers begin to anticipate the arrival of summer’s globular clusters, and with good reason. The globular-laden constellations Ophiuchus, Scorpius, and Sagittarius are beginning to show up in the early evening sky. We needn’t wait for this globular onslaught.

Already well-placed for after-sunset viewing is Messier 13 in Hercules – grandest of all the northern sky globular clusters. Also available is Messier 3 in Canes Venatici. Compared to M13, it’s slightly fainter (magnitude 6.2 to M13’s 5.8) and smaller (18 arcminutes to 20 arcminutes). But looks can be deceiving, as M3 is about half again as distant as M13 (33,000 LY to 26,000 LY) and is intrinsically the larger of the two.

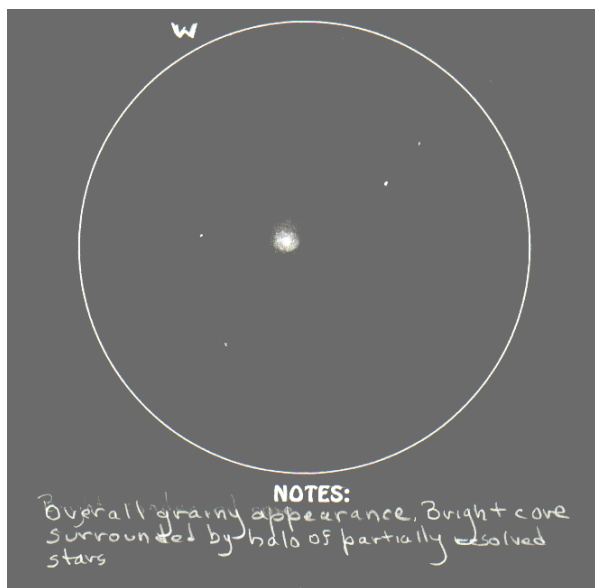


(Courtesy: www.messier-objects.com)

M13 is my globular cluster of choice at public star parties. Conveniently placed between zeta (ζ) Herculis and eta (η) Herculis in the “Keystone” of Hercules, it’s quick and easy to locate – something I consider when a line of people is waiting by my telescope.

When time constraints aren’t an issue, I like to place M3 on the observing menu. It isn’t really all that hard to find, being bright enough to be easily spotted in binoculars and finderscopes (it has even been seen without optical aid by keen-eyed observers in dark-sky locations). To capture M3, point your telescope midway between alpha (α) Canum Venaticorum (Cor Caroli) and alpha (α) Boötis (Arcturus), but slightly closer to the latter (see chart above). A low-power sweep should pick up a roundish smudge of light. Switch to higher magnifications and you’re in business!

While most globular clusters require apertures of 6 inches and above to resolve their individual stars, M3 can be partially resolved in small-aperture scopes. The accompanying sketch shows its appearance as seen through a 4.5-inch reflector. Visible is the core and a smattering of stars near its outer edge. Large telescopes bring the outermost reaches of M3 into view – a spectacular sight, as an image taken by Amateur Telescope Makers of Boston (ATMoB) President Neil Fleming shows. Rotate the Fleming image about 30 degrees clockwise and the scale and orientation of both fields will be identical.



4.5-inch f/8 reflector at 100X (Sketch by Author)

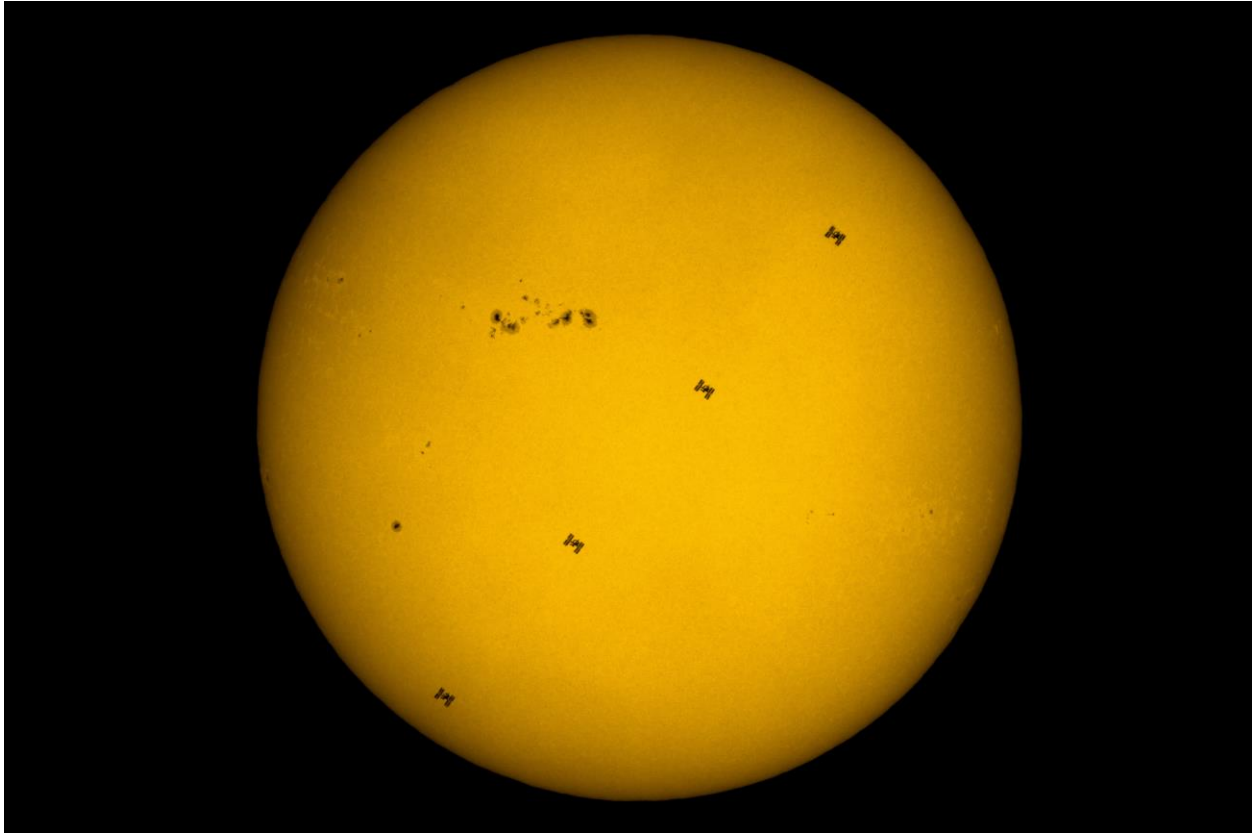


M3 as imaged by Neil Fleming

Think of this as you gaze at M3:

You’re looking at a half million stars packed into a sphere just 190 light years across!

A Sunspot on the Move



A transit of the ISS recorded with AR 2339 and others

(Credit for all images: Levin Dieterle)

Active Region 2339 on the Sun swung into Earth's view on May 5 and was expected to let loose a series of M-class and X-class flares in the week that followed. For whatever reason, it failed to live up to expectations. However on May 10, a transit of the ISS was in the cards and when it happened, and happily for us all, [Levin Dieterle](#) was able to capture it in four frames that form the basis of the composite above.

It was a bit after half past noon Central European Summer Time (CEST, 2 hours ahead of UT). For about a blink of the eye, a dark spot moved across the solar disk and was gone, gone in 0.64 second.

The [Cal Sky](#) prediction for an ISS Transit of the Sun showed him the track across south-west Germany (see the charts on the next page), with a width of just 5.5Kms. Location of the observing spot had to be coupled with precise tracking of the Sun and precise timing of the exposure sequence to have a chance at imaging the transit. The weather had to cooperate as well. Levin, an avid nature and night sky photographer (www.photon-hunter.de) chose a site in *Reutin (Alpirsbach)* in the Black Forest for his attempt. The clouds testing his patience earlier in the morning (right) did not interfere when it mattered.

This was not Levin's first success with an ISS Transit of the Sun; thanks to a CalSky prediction [he managed to capture one in August 2009 as well](#), but that image did not have an arresting backdrop like AR 2339. In addition, this 2015 image was the best possible self-present on his birthday!



Hurry up and wait, as one must.

NHAS May 2015 Business Meeting Report

The monthly business meeting was held at St. Anselm College, Manchester NH on May 8th, with our President **John Bishop** presiding. The Treasurer's report by "**Rags**" follows on the next page.

President's Report

The Summer barbecue plans are in progress; details will be announced at the next meeting. **Ed Ting** will present his "*What Telescope to Buy*" talk in October at MSDC. It will target a general audience but has to be publicized, so some ideas would be welcome. We are still looking for a coordinator for AeroSpaceFest at MSDC next month, and may need one for Stellafane as well if **Joel Harris** is unavailable. There is also the possibility of reassigning the EOC share of funds as activities like LTP appear to be winding down.

Other Reports

EOC: (Steve Rand)

At the last EOC meeting, talk was about organizing AL programs for members as in-reach activity.

Membership: (Larry LaForge)

The Astro 101/201 program is being reinstated. Any resources and past presentations are being sought, as well as feedback on what courses were of interest and what courses could be taught. Please send in any information.

Speaker Search Committee: (Michelle Thomas)

The November talk by **Glenn Chaple** will be on *Double Stars*. This is per a membership poll.

Public Observing: (Gardner Gerry)

Skywatch for the Manchester Girls Scouts in Tethford, VT is on for the Saturday. If you wish to get out to a dark locale, consider participating.



Walt Jablonski (above right) and **Ed Ting** have completed the AL Lunar program and received their certificates from **Ken Charles**.

Astronomy Shorts

Paul Wilanski: Comet Lovejoy is still with us.

Larry LaForge: able to observe southern Caldwell objects at the OzSky 2015 Safari.

Dave Weaver: got a SBIG 8300C CCD camera.

Ramaswamy: observed Mercury in near conjunction with the Pleiades. Mercury was exceptionally bright.

Ed Ting: got a consolation prize from Celestron for entry in the NEAF selfie contest - a Celestron goodie bag.



Kelly Beatty giving his NEAF talk on the *New Horizons* mission to Pluto. (Photos: Dave Weaver and Ramaswamy; Photo at the top: Dave Weaver)

Books of the Month

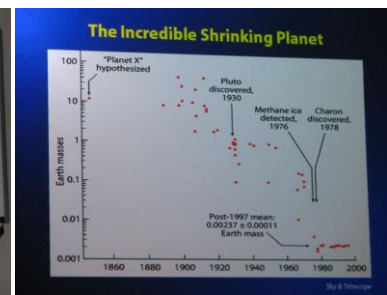
Ken Charles presented a pair of books by Brent Watson on "*Double Stars*" and on "*Overlooked Objects*." The finder charts are all laminated and spiral-bound.

Scope of the Month

Gardner Gerry got a good deal at NEAF on a Stellarvue 60mm f/5.5 refractor that has very good color correction and a good rack-and-pinion focuser.

The Evening Presentation

Kelly Beatty, Senior Editor at *Sky & Telescope* magazine, reprised his talk "*Preparing for Pluto*" given last month at NEAF on the upcoming *New Horizons* encounter with Pluto and its moons. He is also on the board of directors of the International Dark-sky Association (IDA) and at his request 10 NHAS members have joined IDA as new members. Kelly talked of recent developments in Manchester NH regarding less polluting street lighting. The 'real' talk covered the discoveries of the past two centuries that led to Clyde Tombaugh locating Pluto in 1930. Discoveries since about the Pluto system and the solar system were detailed, as we await the July flyby.



NHAS Treasurer's Report
(as of May 5, 2015)

Starting Checking Balance:		\$12,250.45
Deposits:		
Membership	153.76	
Donations	0.00	
Interest	0.32	
Total:		\$154.08
Expenses Paid:		
Rackspace Cloud (Web site)	59.91	
Postmaster (stamps)	49.00	
Southport Print. (adhesive labels)	260.00	
Kalmbach Publishing	34.00	
Total:		\$402.91
Current Checking Balance:		\$12,001.62
Petty Cash:		\$100.00
Current Cash Balance:		\$12,101.62
EOC Share:		\$7,113.52

Membership:	124	
	Single + Family	
Cash Renewals:	0x30.00+0x10.00	0.00
Cash New Members	0x30.00+0x10.00	0.00
PayPal Renewals:	3x28.83+0x 9.61	86.49
PayPal New Members:	2x28.83+1x 9.61	67.27
Total:	5	\$0.00
Current Members:	129	
<i>[15 Family memberships; 65 members paid by PayPal]</i>		
New Members:		
David Lawrence, Jr.		Tyngsboro MA
Melissa "Missy" Puch		Dover NH
Donations:		
Total:		\$0.00

Contact Information

<p><u>How to join NHAS</u></p> <p>Write to us: NHAS P. O. Box 5823 Manchester, NH 03108-5823</p> <p>Send Email to: info@nhastro.com</p> <p>Visit our web site: http://www.nhastro.com</p> <p><u>How to contribute to the Observer</u></p> <p>Email articles and snapshots to the Editor: ramax.astro@yahoo.com</p>	<p><i>NHAS Officers:</i></p> <p><i>President:</i> John Bishop <i>Vice-President:</i> Tom Cocchiaro <i>Secretary:</i> Paul Winalski <i>Treasurer:</i> David "Rags" Gilmore</p> <p><i>Board of Directors:</i></p> <p>Ken Charles Pete Smith Steve Rand</p>
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How to Borrow a Loaner Scope in 3 Simple Steps

- Contact the custodian of scope you're interested in
- Arrange to meet for the transfer (usually at a monthly Business Meeting)
- Sign the requisite papers and leave with the scope

It is a benefit of your membership in NHAS. The loan will be for 2 months; an extension might be granted if no one else is waiting for the unit. The objective is to help new members get to know what will suit them personally, to experiment with options and to understand **what will work** in the time available to them to pursue their new hobby, and equally, **what may not**. A suitable (beginner's) telescope is invariably one that is easy to transport to the observing site and easy to setup, and not necessarily the one with the most aperture or sophistication.

**Orion Starblast 4.5 – LTP-style Telescope**

Custodian: Pete Smith
Contact: psastro60@gmail.com

Equipped with:

Commercial red-dot finder with a special Joel Harris mount.

Celestron 8mm-24mm zoom EP, plus 17mm and 6mm EPs.
A red/white Headlamp and a Lens Cleaning Pen in the pouch.
A simple Collimation Cap to learn to collimate the old way.
A Planisphere, a Moon Map and Richard Berry's "Discover the Stars" Instruction booklet and an Audubon constellations guide.

**Lunt LS60THα/B600PT H-alpha Solar Telescope**

Custodian: Pete Smith
Contact: psastro60@gmail.com

Equipped with:

Tele Vue Sol Searcher
Celestron 8mm-24mm Zoom EP

Feathertouch focuser for smooth and precise focusing.
Celestron CG-4 EQ Mount with RA/Dec. motor drives and controller.
Sun screen to shade the observer, a Marc Stowbridge special.
Booklet with quick start instructions.
Foam-lined custom hard case for the OTA.

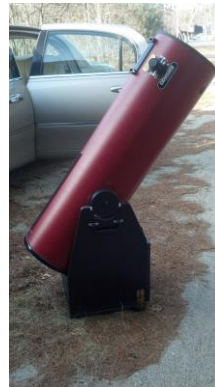
**Orion XT6 – 6" Newtonian on a Dobsonian mount**

Custodian: Tom Cocchiaro
Contact: tomcocchiaro@comcast.net

Equipped with:

Telrad finder with a dew shield
32mm, 25mm and 10mm Plössl
EPs in a case

A Planisphere, Moon map, red light
Orion XT6 user manual
Richard Berry's "Discover the Stars"

**Coulter Odyssey 10" Newtonian on a Dobsonian mount**

Custodian: "Rags" Gilmore
Contact: nhas@ragnorok.net

Equipped with:

Telrad finder with a dew shield
26mm TeleVue Plössl and
15mm Celestron Plössl in a case

A Planisphere and a Moon map
Richard Berry's "Discover the Stars"
Also available in a separate slip-case:
Sky Atlas 2000.0 by Wil Tirion and Sinnott

Sky Atlas 2000.0 Companion by Robert Strong and Roger Sinnott

**Meade 8" Newtonian on a Dobsonian mount**

Custodian: Scott McCartney
Contact: Scott_McCartney@nhb.uscourts.gov

Equipped with:

Telrad finder with a dew shield
25mm and 10mm EPs
A custom-built base (made by
Joe Derek and Chase McNiss)

**Orion XT10 Newtonian on a Dobsonian mount**

Custodian: Pete Smith
Contact: psastro60@gmail.com

Equipped with:

Telrad finder
Assorted EPs: 35mm, 25mm
wide-angle, 17mm and
a mystery one (25mm?).
An EP case
Richard Berry's
"Discover the Stars"

Regional Astronomy Clubs

New Hampshire Astronomical Society
[NHAS] *Skywatches around the State*
Sidewalk Astronomy in Portsmouth
www.nhaastro.com

Amateur Astronomical Society of Rhode Island (North Scituate, RI)
www.theskyscrapers.org

Amateur Telescope Makers of Boston
(Westford, Mass.)
www.atmob.org

Astronomy Society of Northern New England (Kennebunk, Maine)
www.asne.org

Gloucester Area Astronomy Club
(Gloucester, Mass.)
www.gaac.us

McAuliffe-Shepard Discovery Center
[MSDC] (Concord, NH)
First Friday Observing Event
www.starhop.com

Northeast Kingdom Astronomy Foundation (Peacham, VT)
www.nkaf.org

North Shore Astronomy Club
(Groveland, Mass.)
www.nsaac.org

Penobscot Valley Star Gazers
(Bangor, Maine)
www.gazers.org

Online Live Observatories

Astronomy Live (broadcasts)
www.astronomylive.com

SLOOH (Tenerife, Canary Is.)
www.slooh.com/about.php

Worldwide Telescope
www.worldwidetelescope.org

Magazines

Astronomy
www.astronomy.com

Sky & Telescope
www.skyandtelescope.com

Astronomy Gear

Adorama
www.adorama.com

Agena AstroProducts
www.agenaastro.com

Astromart
(Used equipment and advice)
www.astromart.com

Astronomy-Shoppe
(in Plaistow, NH 03865)
www.astronomy-shoppe.com

Celestron
www.celestron.com

Cloudynights
(Used equipment, Articles, Forums and Reviews)
www.cloudynights.com

Explore Scientific
www.explorescientific.com

High Point Scientific
www.highpointscientific.com

Kendrick Astro Instruments
www.kendrickastro.com

Lunt Solar Systems
www.luntsolarsystems.com

Meade Instruments
www.meade.com

Oceanside Photo & Telescope
www.optcorp.com

Orion Telescopes
www.telescope.com

ScopeStuff
www.scopestuff.com

Stellarvue
www.stellarvue.com

TeleVue
www.televue.com

Vixen Optics
www.vixenoptics.com

William Optics
www.williamoptics.com

Astronomy Web Sites

CalSky
(Sky Calendar to plan Observing)
www.calsky.com

Free Star Charts
(Star Charts for MM, Planets etc.)
www.freestarcharts.com

Heavens Above
(on Satellites, Spacecraft, Planets)
www.heavens-above.com

NASA
www.nasa.gov

Dark skies Observing Sites
(Horizons and Clear Sky information)
www.observingsites.com

ScopeReviews
(Reviews by Ed Ting, NHAS)
www.scopereviews.com

Sloan Digital Sky Survey DR10
<http://skyserver.sdss3.org/>

SpaceWeather
(Solar activity, Asteroid passes)
www.spaceweather.com

Computer Software

Cartes du Ciel (*aka Skychart*) (Free)
www.ap-i.net/skychart/

Celestia
www.shatters.net/celestia

Computer Aided Astronomy (Free)
www.astrosurf.com/c2a/english/

Earth Sky Tonight
www.earthsky.org/tonight

SkyMap Online
www.skymaponline.net










Starry Night
(many versions, Novice to Expert)
www.starrynight.com

Stellarium (Free)
www.stellarium.org

WinStars (Free)
www.winstars.net/english/

Event	Date	Time	Location
Alton Central School Skywatch	Thursday, June 4	5:00pm	41 School Street, Alton NH
First Friday Skywatch for MSDC	Friday, June 5	7:00pm	MSDC, Concord NH
Meadowbrook Dads Campout Skywatch	Saturday, June 6	8:30pm	Osceola Vista Campground, Waterville Valley NH
Goffstown High School Skywatch	Tuesday, June 9	8:30pm	27 Wallace Road, Goffstown NH
Goffstown High School Skywatch (backup date)	Wednesday, June 10	8:30pm	27 Wallace Road, Goffstown NH
NHAS Business Meeting	Friday, June 12	7:30pm	MSDC, Concord NH
Market Square Day Skywatch	Saturday, June 13	9:00am	Market Square, Portsmouth NH
AeroSpaceFest at MSDC	Saturday, June 13	10:30am	MSDC, Concord NH
Coffee House Night at YFOS	Saturday, June 13	5:00pm	YFOS
EOC Meeting	Thursday, June 18	6:30pm	Manchester City Library, Manchester NH
Lebanon Public Libraries Skywatch	Thursday, June 18	8:30pm	Kilton Library, 80 Main Street, West Lebanon NH
Epping Middle School Skywatch	Friday, June 19	8:30pm	33 Prescott Road, Epping NH
Rey Center Skywatch	Saturday, June 20	9:00pm	Waterville Valley NH
Sidewalk Astronomy Skywatch	Saturday, June 27	6:00pm	Market Square, Portsmouth NH
First Friday Skywatch for MSDC	Friday, July 3	7:00pm	MSDC, Concord NH
NHAS Business Meeting	Friday, July 10	7:30pm	St. Anselm College, Manchester NH
Coffee House Night at YFOS	Saturday, July 11	5:00pm	YFOS
Castle in the Clouds Skywatch	Tuesday, July 14	8:00pm	455 Old Mountain Rd, Moultonborough NH
Lake Morey Resort Skywatch	Wednesday, July 15	9:00pm	1 Clubhouse Road, Fairlee VT
EOC Meeting	Thursday, July 16	6:30pm	Manchester City Library, Manchester NH
Community Roots Skywatch	Saturday, July 18	8:00pm	118 North River Road, Lee, NH
Rey Center Skywatch	Saturday, July 18	9:00pm	Waterville Valley NH
Mary E. Bartlett Library Skywatch	Tuesday, July 21	8:00pm	22 Dalton Road, Brentwood NH
Mary E. Bartlett Library Skywatch (backup date)	Wednesday, July 22	8:00pm	22 Dalton Road, Brentwood NH
Lane Memorial Library Skywatch	Friday, July 24	8:30pm	931 Ocean Boulevard, Hampton NH

Note: Please check [\[Calendar\]](#) at www.nhastro.com for up-to-date information on upcoming events.

Date	Time	Lunar Phase
Tuesday, June 2	12:19pm EDT	 Full moon
Tuesday, June 9	11:42am	 Last quarter
Tuesday, June 16	10:05am	 New moon
Wednesday, June 24	7:03am	 First quarter
Wednesday, July 1	10:20pm	 Full moon
Wednesday, July 8	4:24pm	 Last quarter
Wednesday, July 15	9:24pm	 New moon
Friday, July 24	12:04am	 First quarter
Friday, July 31	6:43am	 Full moon

Credits

Contributors to this month's **Observer:**

John Bishop, Ted Blank, Herb Bubert, *Glenn Chaple*, Tom Cocchiario, *Levin Dieterle*, Jeff Eitreim, Gardner Gerry, "Rags" Gilmore, *Michael Jäger*, John Rose, Pete Smith, Marc Stowbridge, Mike Townsend, Dave Weaver and Paul Winalski.