



alpha

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FEATURE IMAGE THIS ISSUE



The belt of Orion is prominent during early evening skies, as it continues to set earlier and earlier. There's a lot going on at the leftmost star... More info on page 31. © John Nassr

CLUB NEWS

January Meeting



The January meeting was held with dinner Jan. 31 - at Emerald Garden Restaurant. Bulk of the meeting was for finalizing the arrangements for the ALP's celebration of National Astronomy Week. - *James Kevin Ty*

Asteroid Named after ALPer



Congratulations to ALP planetary imager, Christopher Go of Cebu, for having Asteroid 2000 EL157 named as 30100 Christophergo.

This was announced by the International Astronomical Union (IAU) to honor his great planetary imaging! Christopher is the fourth Filipino amateur astronomer (after Asteroid 6282 Edwelda for Edwin Aguirre and Imelda Joson, and asteroid 1988 VB3 - 4866 Badillo, after Father Victor Badillo) to have an asteroid named after him.

Jan. 10 Comet Stargazing Session

On January 10, James Kevin Ty, Christopher Louie Lu, Arnel Campos, Ronald Sison, Shubhashish Banerjee, Saju Pillai, Andrew Ian Chan and Iah Serna went to JohnDel Beach Resort at Nasugbu, Batangas to observe and image Comet C/2014 Q2 Lovejoy and other deep sky objects under dark skies.

James brought his Canon EOS500D DSLR with Canon EF100-400mm f/4.5-5.6 IS L lens mounted on a Vixen GP-DX mount; Andrew his Canon EOS 500D DSLR on Skywatcher 80ED refractor on Vixen GP mount; Christopher Louie his Canon EOS 450D DSLR on Vixen Polaris star tracker; Shubhashish his Canon EOS 350D DSLR mounted on sturdy tripod; Saju his Canon EOS 550D DSLR on sturdy tripod; and Arnel his Explore Scientific AR102mm refractor on Skywatcher HEQ-5 mount.

They arrived at the site around 7:30 p.m. with Arnel and Ronald arriving a bit earlier to observe the sunset. After getting some rest, they set up their equipment and started to locate Comet C/2014 Q2 Lovejoy. After checking for a short while, they located the comet, which was almost visible to the naked eye at around mag 4.5 and sporting a +/- 2 degree tail!

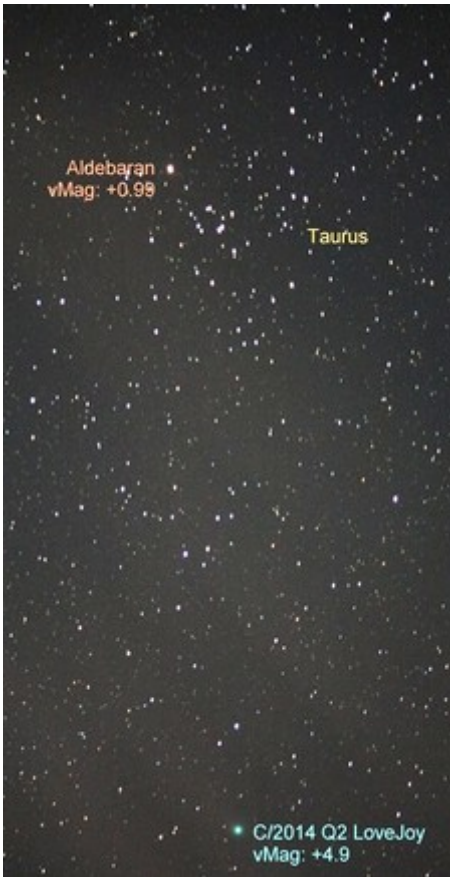


Comet Lovejoy C/2014 Q2 imaged by Christopher Louie Lu with a Canon 450d with EFS 55-250 mm lens mounted on Vixen Polaris. 63 seconds at ISO 1600 and f/5.6.



Comet Lovejoy imaged by James Kevin Ty

The sky was partly cloudy in the early evening but cleared up later. They were able to observe and image M42, M31, and other deep sky objects (⇒ p. 16).



Comet Lovejoy with the Hyades open star cluster in Taurus, by Christopher Louie Lu



Comet Lovejoy imaged by Arnel Campos, with a Canon 550D on Explore Scientific DAR102 refractor. 120 seconds at ISO 1600.



M42, the Orion nebula, imaged with a 3 minute exposure at ISO 800 and f/5.6 by Saju Pillai

The waning gibbous Moon then rose from the eastern horizon at around 11:00 p.m.



Ronald with Celestron C90 on Skywatcher EQ-5 mount



Andrew and Iah beside a Canon EOS500D on Skywatcher 80ED refractor on Vixen GP mount



Shubhashish Banerjee posed beside Arnel's Explore Scientific AR102 refractor on Skywatcher HEQ-5 mount

They continued to observe and image until the Moon had risen near the zenith, thus ending their observation and imaging session. As they were packing up, a magnitude 4+ earthquake was felt at the rooftop.

After a minute of the mild tremor, they jokingly stated that this was ending the event with a bang (or shock).



After getting some rest in the morning, some of them went to the beach for a dip to relax, while others roamed around the resort to get some good shots of the beach front. They left the resort at around 11:30 a.m. - *James Kevin Ty; images by James Kevin Ty, Christopher Louie Lu, Arnel Campos, Saju Pillai*

Jan.16 Comet Stargazing Session

Last January 16, a late afternoon decision by James Kevin Ty, Christopher Louie Lu, Edgar Ang and Edge Lat to go to PAGASA Observatory at UP Diliman enabled them to observe Comet C/2014 Q2 Lovejoy. They met at Jollibee Commonwealth before proceeding to the site.

James brought his Canon EOS500D DSLR with Canon EF100-400mm f/4.5-5.6 IS L lens mounted on a Kenko Sky Memo-R star tracker. Edgar brought his Vixen Polaris star tracker and mounted Edge Lat's Canon EOS 60D DSLR on it. Christopher Louie brought his Canon EOS 450D DSLR with Canon EFS 55-250mm F/5.6 zoom lens mounted on sturdy tripod.



Comet Lovejoy by James Kevin Ty



The sky was partly clear with lots of rapidly passing clouds and a bit of light pollution coming from nearby building construction near the observatory. Despite this, they were able to observe and image the comet. They were also able to meet up with some guests of the observatory and observe planet Jupiter through the observatory's 7" f/15 Meade Maksutov-Cassegrain telescope on LX200 mount (⇒ p. 17).

At around 10:30 p.m., clouds started to cover up the sky and they ended their observing session at around 11:00 with a traditional group shot before heading home at around midnight. - [James Kevin Ty](#); *images by James Kevin Ty, Christopher Louie Lu, Edge Lat*

Breaking News

NEO has a Moon

The mountain-size asteroid that gave Earth a close shave on Jan. 26, 2015, has its own moon, new radar images of the object reveal. Asteroid 2004 BL86 cruised within 1.2 million kilometers of Earth — about 3 times the distance between our planet and the moon. And the space rock wasn't alone: A companion was clearly visible in an asteroid flyby movie compiled from 20 images taken by NASA's Deep Space Network antenna in Goldstone, California.



Radar image showing the near-Earth asteroid 2004 BL86 and its moon flying past Earth on Jan. 26, 2015. Credit: NASA/JPL-Caltech

The radar images "show the primary body is approximately 325 meters across and has a small moon approximately 70 m across," NASA officials said in a statement. "In the near-Earth population, about 16 percent of asteroids that are about 200 m or larger are a binary (the primary asteroid with a smaller asteroid moon orbiting it) or even triple systems (two moons)."

The size measurement for 2004 BL86 is a significant revision; before the flyby, scientists had estimated the space rock's diameter to be about 550 m.

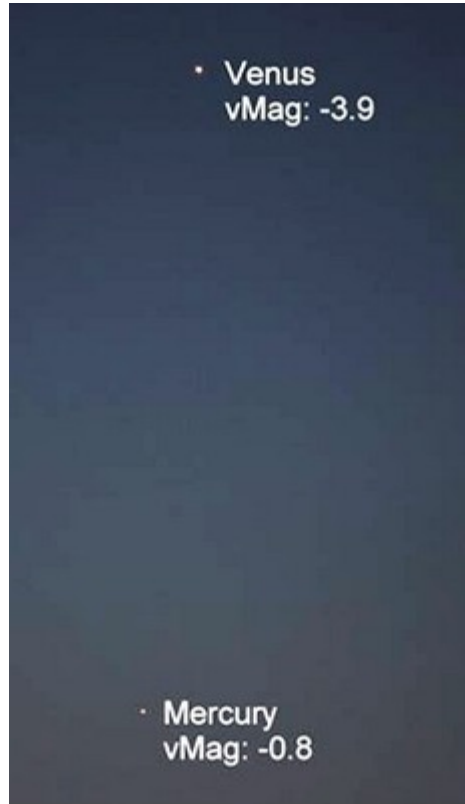
Earth was never in any danger during the encounter, which scientists had known about well in advance, but a known asteroid as big as 2004 BL86 won't come so close to Earth again until 2027, when a space rock called 1999 AN10 zooms past our planet.

To date, researchers have discovered and tracked just over 12,000 near-Earth asteroids — just a tiny fraction of the total population, which is thought to number in the millions. More than 95 percent of the potential civilization-enders out there — space rocks more than 1 km wide — are believed to have been found, and none of them pose any threat in the foreseeable future. Asteroid 2004 BL86 was discovered in January 2004 by the Lincoln Near-Earth Asteroid Research survey in New Mexico. - [Mike Wall](#), [Space.com](#)

Observing Reports

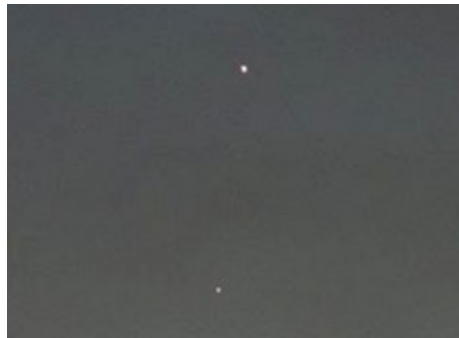
Mercury-Venus Conjunction

Jan. 2.

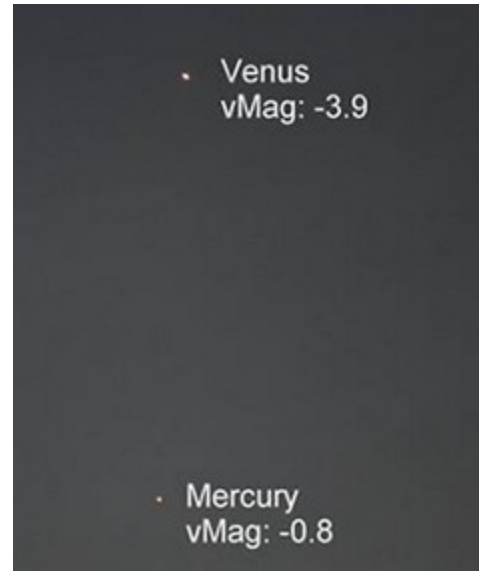


Imaged with a Canon 450d and EFS 55-250 mm lens. ½ second at ISO 100 and f/5.6

Jan. 6.



Just after sunset, planets Mercury & Venus were closer to each as seen from Earth, as they moved along their respective orbits.



We expected to see them pull away from each other. - [Christopher Louie Lu](#)

Jan. 9. Amidst very cold temperatures, I snapped an image of the conjunction of Venus and Mercury through the window of my back door.



- [Jun Lao](#), Mason, Ohio

Moon

Jan. 2.



12-day old waxing gibbous Moon illuminated 92.6%. Imaged with a Canon 450d on Celestron Powerseeker 80EQ. 1/180 second exposure at ISO 100 and f/11. (⇒ [p. 18](#)).



Moon and Aldebaran conjunction, with 1.3 degree angular separation. There will be more of these over the next few months. Imaged with a Canon 450d and EFS 55-250 mm lens. 1/45 second at ISO 100 and f/8.

Jan. 5. First Full Moon of 2015. Also known as the "Wolf Moon."



15.2-day old Full Moon. 1/200 second at ISO 100 and f/11.

Jan. 29.



9.7-day old waxing gibbous 73.6% illuminated Moon. 1/125 sec at ISO 200 and f/11



- Christopher Louie Lu

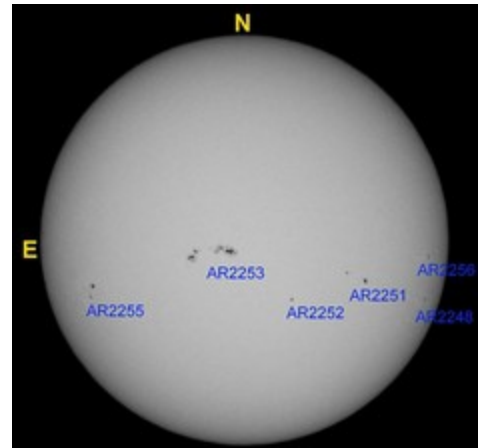
Jan. 3. I had a small window to test my WO Megrez 90FD refractor's focuser on the waning gibbous Moon. I tested it at prime focus with my Canon EOS 500D DSLR and my ZWO ASI120MM webcam and both were smooth and locked on focus easily. Unfortunately, the window was too short to do further close-up imaging of the Moon's craters as the Moon got blocked by our roof.



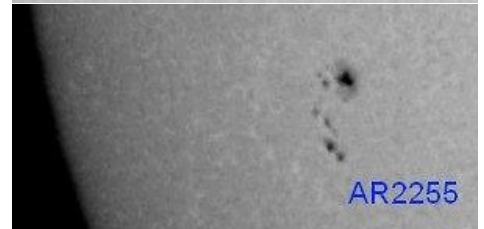
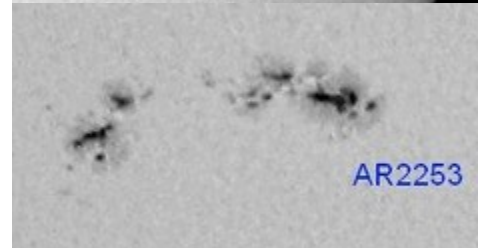
- James Kevin Ty

Sun

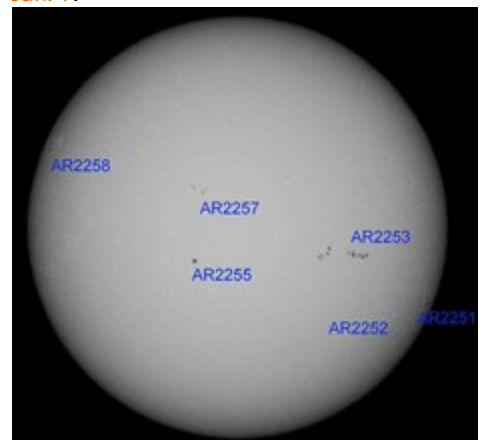
Jan. 4. Imaged with a Canon 450d on Celestron Powerseeker 80EQ.



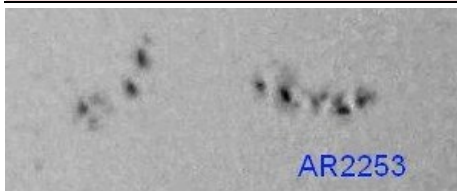
1/4000 second at ISO 100 and f/11 with Baader solar filter density 3.8.



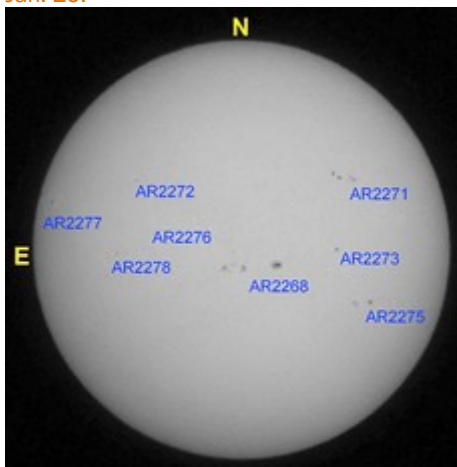
Jan. 7.



Imaged with a Canon 450d on Celestron Powerseeker 80EQ. 1/4000 second at ISO 100 and f/11 (⇒ p. 19).

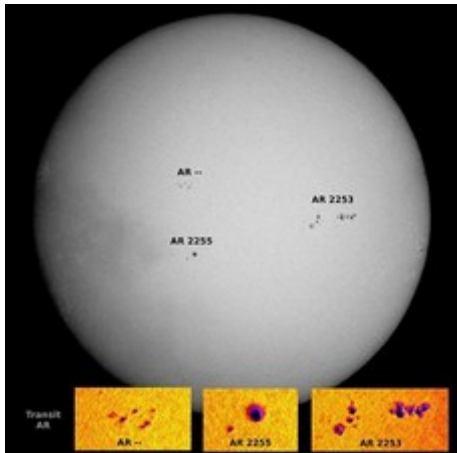


Jan. 29.



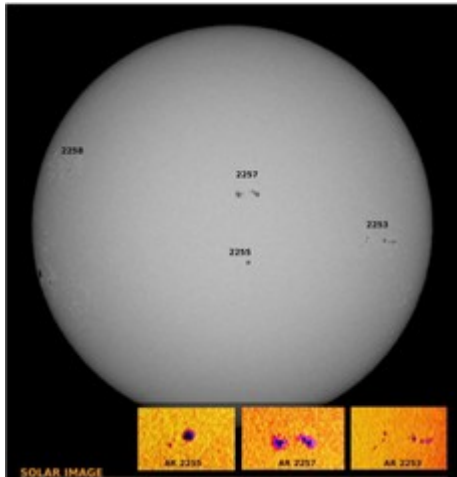
1/3200 second at ISO 100 and f/11
- Christopher Louie Lu

Jan. 7.

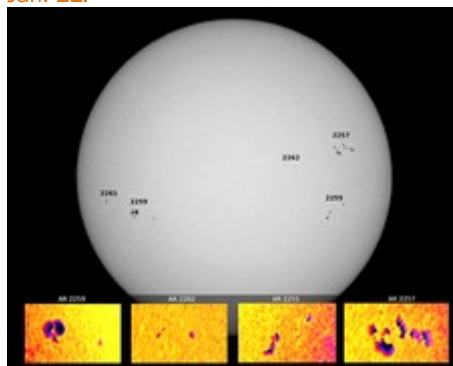


Imaged with a Nikon D3100 on Sky-Watcher Explorer 150PL and Baader filter

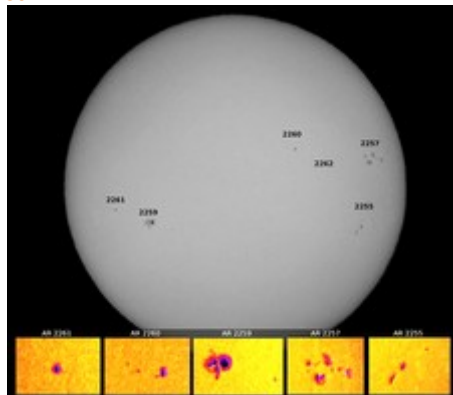
Jan. 8.



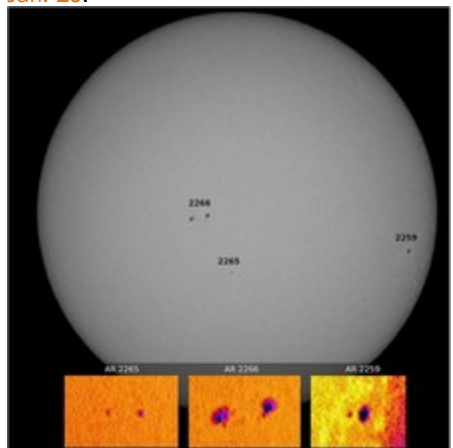
Jan. 11.



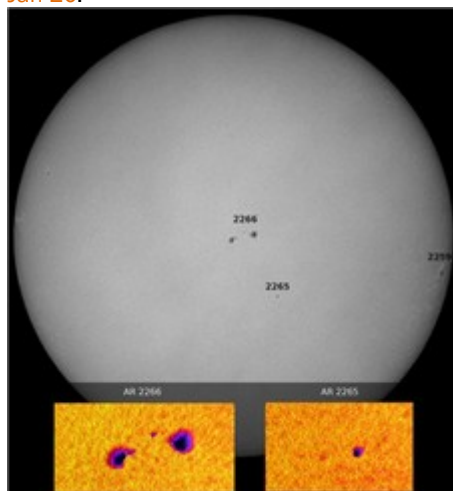
Jan. 12.



Jan. 19.

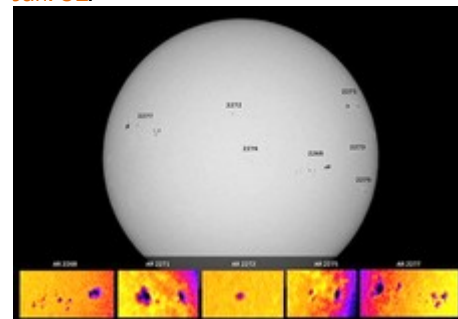


Jan 20.



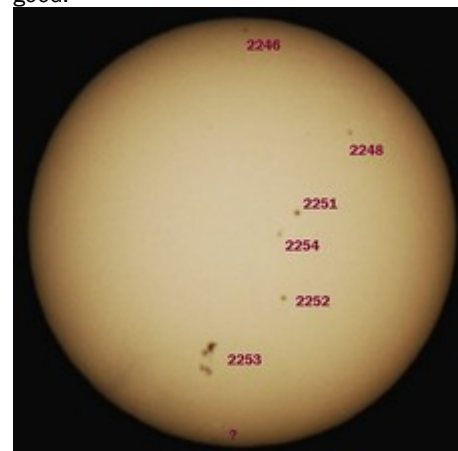
The sky was cloudy earlier this morning. Took this shot earlier through a layer of cirrostratus clouds.

Jan. 31.



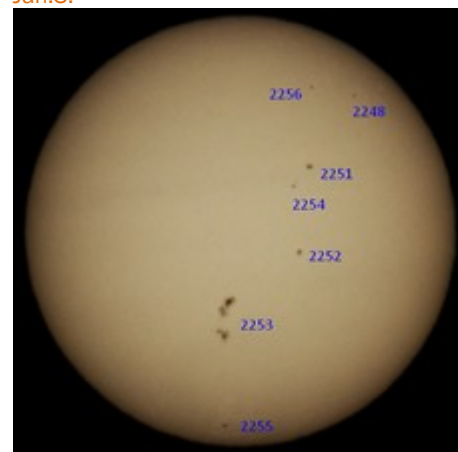
- Norman Marigza

Jan. 2. Skies were relatively clear in the morning over Manila, but seeing wasn't so good.



There was a nice row of sunspots. Imaged with an Opteka 800 mm f/8 lens and 2x tele-extender.

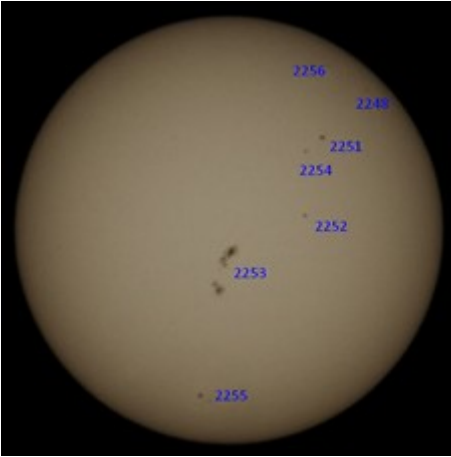
Jan.3.



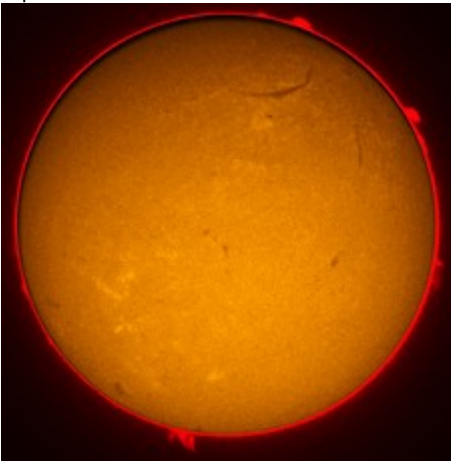
Seeing was a little better in the morning. Same imaging setup as on the previous day.

Jan. 4. Skies were nice in the early morning, but clouds started becoming a problem as the morning wore on, so you needed to be imaging and observing early so that the clouds don't spoil the view. (⇒ p. 20).

Jan. 5. Probably the last shot of the Sun I would be able to take from Manila.



Jan. 16. Back in the wintry depths of the greater Cincinnati area. Taking pics of the Sun with the telescope indoors, but looking through the open window - not ideal with the huge temperature gradient, but cannot keep the scope outdoors for a long time to equilibrate.

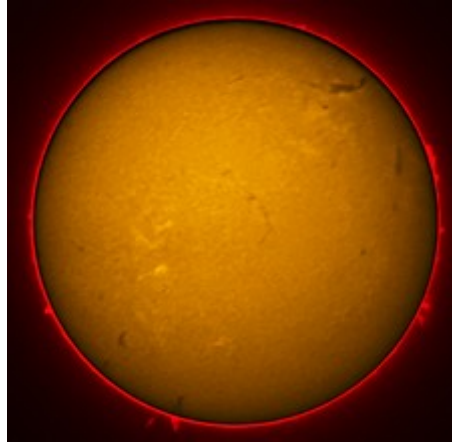


There's a nice dark curved filament on the western limb of the Sun that dominated the disk. Meanwhile, there's a nice set of prominences on the Sun's limb, including a nice, flame-like structures on the eastern limb (6:30 position).

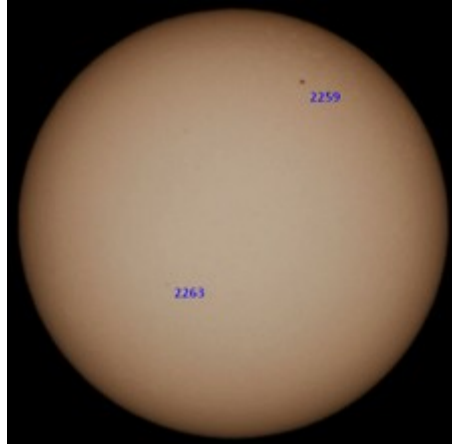


The Sun wasn't so exciting in white light (above) though.

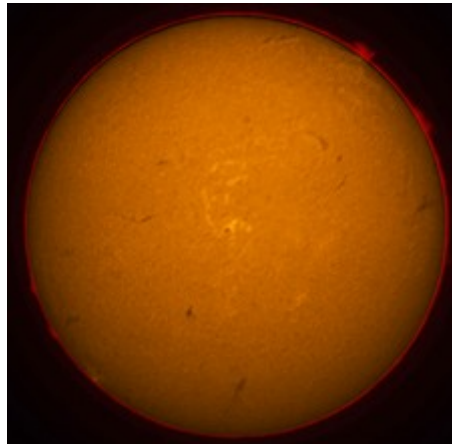
Jan. 17. The curved dark filament showed more structure as it headed toward the limb. There were also a number of nice prominences on the limb of the Sun.



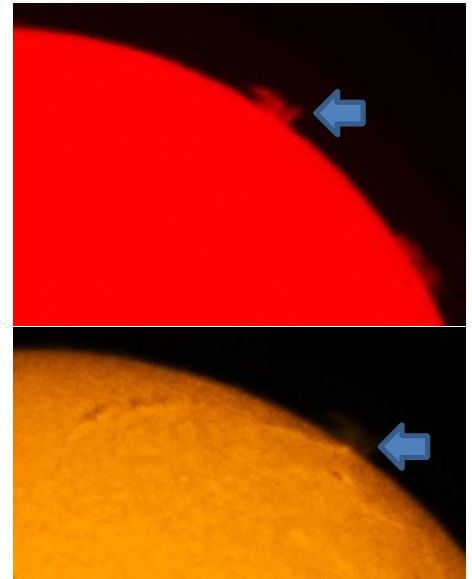
Still not so exciting in white light (below):



Jan. 19. There were a lot of small dark filaments around the Sun, and an interesting bright spiral formation in the active region around AR 2263 in the center.

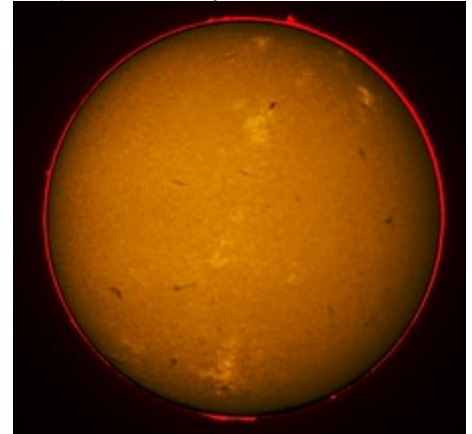


There was a nice fountain-type prominence at the 1 o'clock position, where it might be connected with the large dark filament that had by then reached the limb of the Sun. It was possible that this was connected to the dark filament, which of course is a prominence that's just dark because it is silhouetted by the brighter disk of the Sun.



Different exposures show the prominence and the dark filament that leads to where the prominence is.

Jan. 30. A series of winter storms and cloudy days prevented any viewing of the Sun, except for this Friday afternoon.



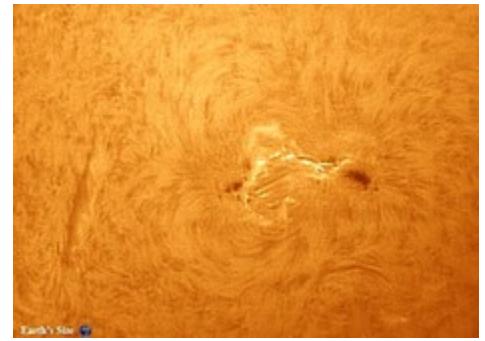
There was a large wide prominence coming in from the east and a spiky prominence opposite in the west. There were again a number of small dark filaments on the disk.



There were a number of sunspots on the disk of the Sun in white light, with two nice complexes - AR2268 and AR2272. - Jun Lao, Mason, Ohio

Jan. 2. I started off my 2015 astro-imaging session on the Sun. The sky was partly clear in the morning and seeing condition was poor. I had a hard time locking focus on high resolution as seeing was not very good, but I still managed to image the giant group AR2253 as well as full disk through thin passing clouds.

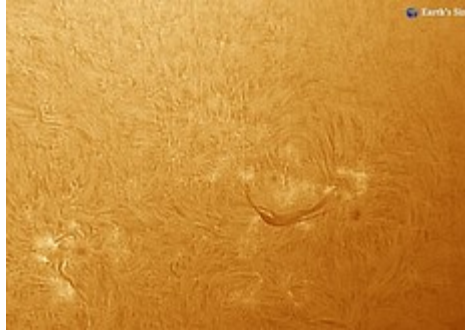
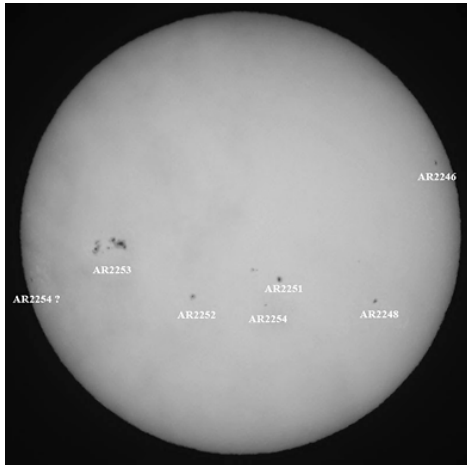
In H α wavelength, there was a very nice huge hedgerow prominence (*right*) together with 2 large dark filaments visible in the southeast limb.



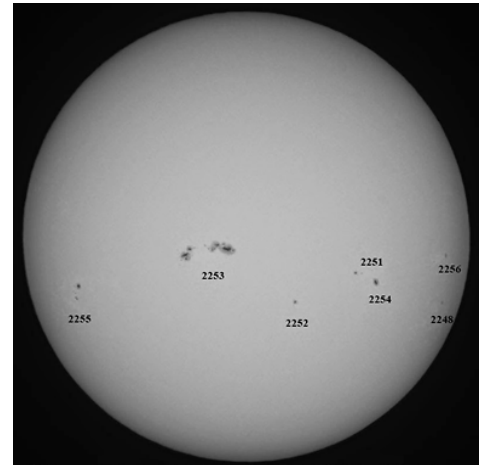
AR 2253

Huge hedgerow and dark filament

Jan. 4. The sky this morning was clear but seeing was not so good. I did my usual white light close up and full disk (*below*) of the Sun before I switched to H α .



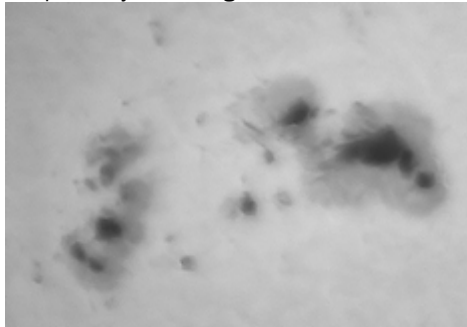
AR 2253 and AR 2251



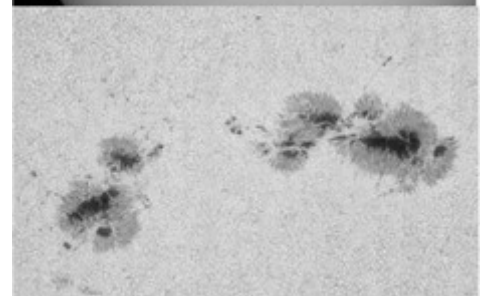
Imaged with a Canon EOS 500D on Televue TV-101 refractor with Televue 2x Big Barlow and Baader 3.8 solar filter. 1/3000 second exposure at f/18 and ISO 100.

Giant group AR2253 (white light and H α *below*) had lots of activity inside its core and will probably be having some nice flares.

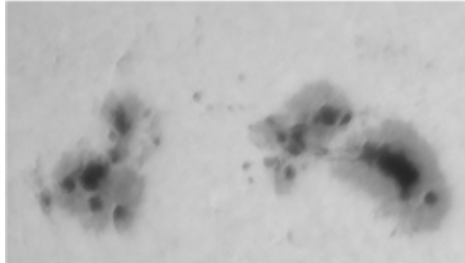
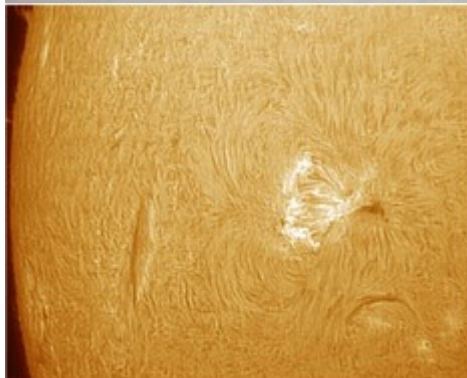
Jan. 3. The sky this morning was clear but seeing was poor. I still proceeded with imaging the Sun. Seeing was terrible that I needed more than 10 AVIs on AR2253 just to get the best of the lot.



In H α , the southeast limb's huge hedgerow prominence was still visible but was a bit dimmer because of the slight haze over the Sun after I imaged in white light.

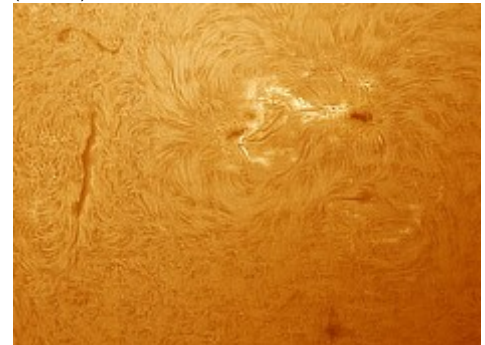


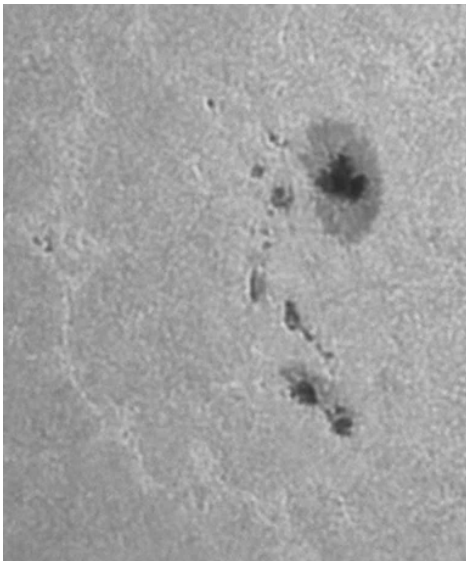
AR2253 (*above, in white light*) was quiet with only some small flaring visible in its core (*below*).



Smaller AR2252 and 2251 sunspot groups were also very active and both had twisted dark filaments.

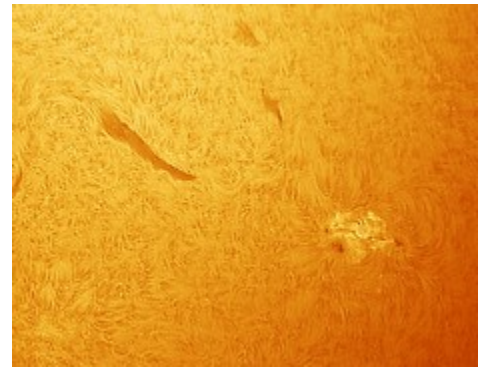
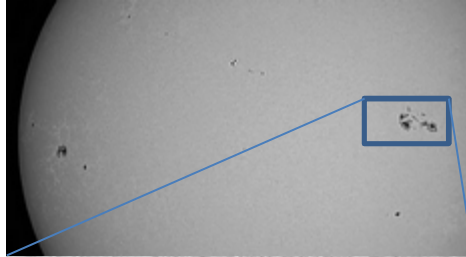
AR2253 in white light (*above*) and H α calmed down compared to yesterday's bright flaring.





In $H\alpha$, AR2253 was quiet with some small flaring activities only, while the region near AR2255 near the southeast limb had more activity with several nice prominences visible, as well as dark filaments.

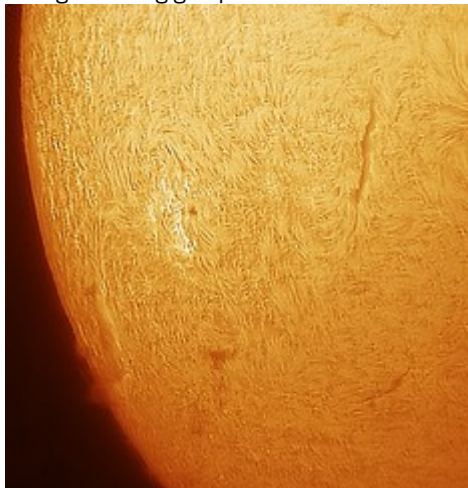
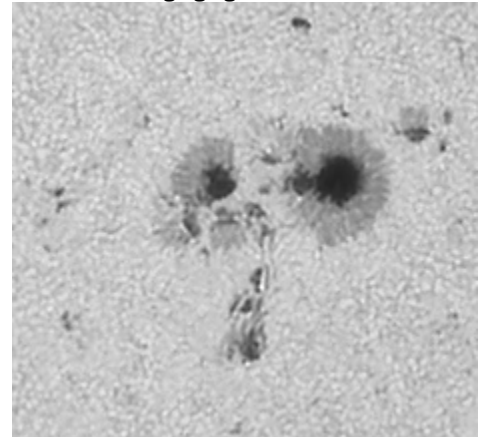
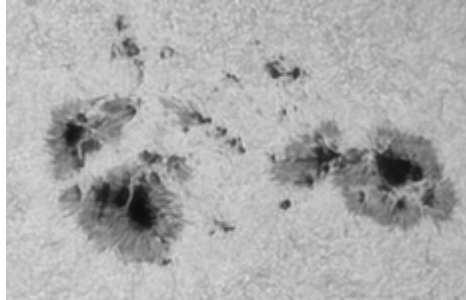
Jan. 10. Seeing condition was very good. AR2257 (below) was large and had a nice core structure much like AR2253 before.



AR 2257

Jan. 15. After 4 days of flu, I was finally able to do solar imaging again.

After I concluded my solar imaging session, I thought of testing the WO Megrez 90FD refractor's focuser once again. As I was testing it out, I was surprised to see that I had an almost perfect seeing that moment so I quickly imaged 2 AVIs on AR2253 (above) before the seeing condition deteriorated after I imaged the big group.



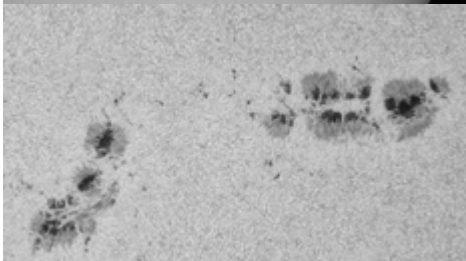
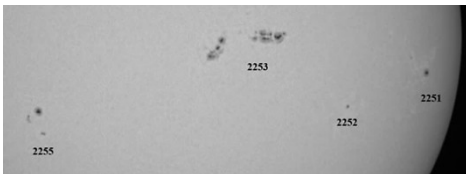
AR 2255

Another new sunspot group, AR2259 (below), was coming out of the southeast limb and showed good prospects of becoming a large sunspot.

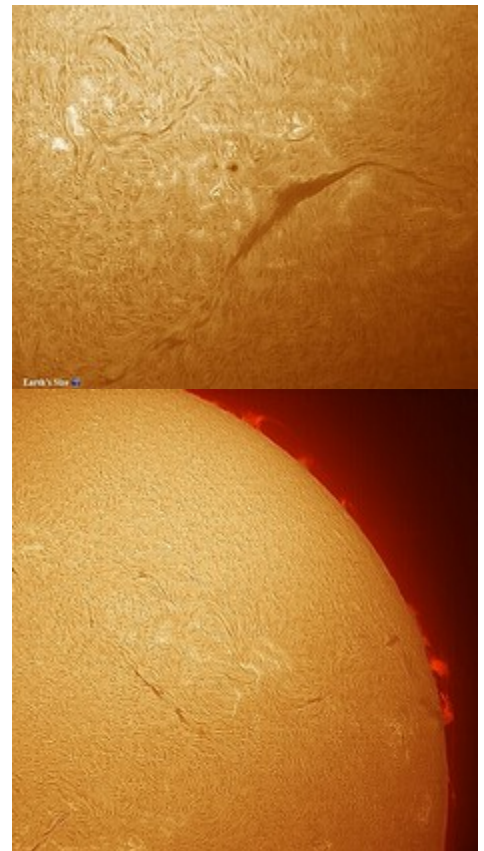


Only AR2259 (above in white light, and below in $H\alpha$) was large and impressive while the rest were small.

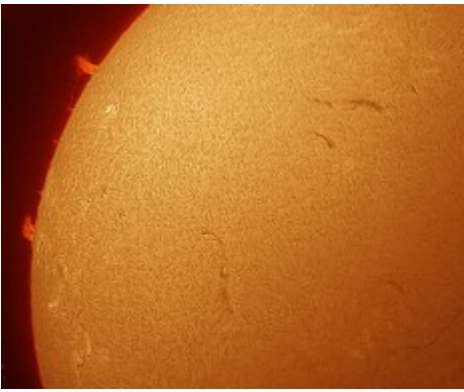
Jan. 5. I was able to get decent shots of AR2253 (bottom) and 2255 in white light as well as in $H\alpha$.



In $H\alpha$ wavelength, there was a huge dark filament (above) beside AR2259. AR2257 was also showing some activity inside its core as well.



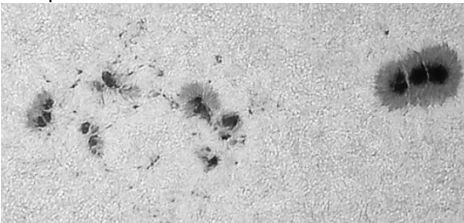
The sun's western limb



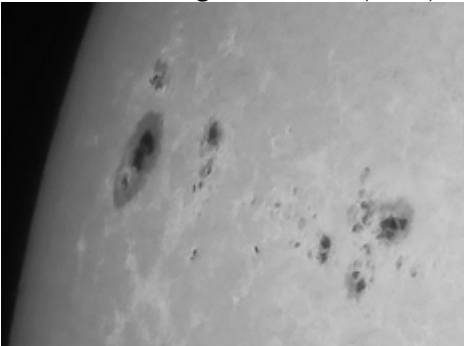
The Sun's eastern limb

In H α , there was a huge dark filament beside AR2259, as well as several large eruptive prominences visible in the eastern and western limb.

Jan. 20. It was partly cloudy but seeing was fair. I probably had a few weeks left to do solar imaging before the tall building in my eastern horizon will block the Sun for several months before I could do any solar imaging except on weekends' lunchtime.



AR2268 (above), featured in the Solar Picture of the Day, was enormous in the aspect of its length as it almost filled the horizontal frame of my camera! In general, the main umbral core of this group was not that big. There was also another big group coming out of the northeast limb designated AR2277 (below).

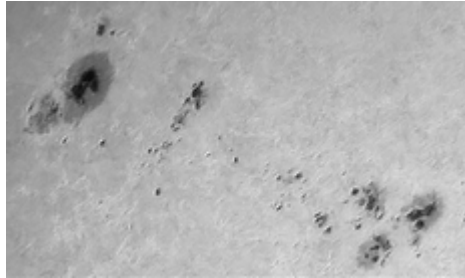


Unfortunately, clouds rolled in before I could image 2 more groups as well as full disk. Anyway, it's good to be back doing solar imaging again after 2 weeks of cloudy skies!

Jan. 31. I woke up late this morning due to tiredness from my provincial trip, but I still managed to get 2 white light high res shots of AR2268 and AR2277 before I got obstructed by the roof. While AR2268's main core was intact, the rest of its clusters of small sunspots were deteriorating fast. Incoming AR2277 looked promising.



AR 2268



AR 2277

- James Kevin Ty

Comets

Dec. 15. Comet PANSTARRS C/2012 K1 flying by galaxy NGC 55 in the constellation Phoenix.



Jan. 24. I have wanted to image Comet 15/P Finlay for some time but weather did not permit it. It was finally clear last night with the comet around 2 degrees from a four-day old moon that caused reflections inside my telescope tube. The height of this 13 minute exposure was just less than one degree.



- John Nassr, Baguio

Comet Lovejoy C/2014 Q2

Jan. 5. At magnitude ~5.0 I was able to see the comet naked eye, looking like a fuzzy ball, green in the camera exposure because its atmosphere was rich with diatomic carbon (C₂) which glows green in near vacuum, passing the great river Eridanus, south of Orion, easily spotted because it was near Rigel.



Comet Lovejoy C/2014 Q2 at 300mm, with double stars HIP 21644 A and double star HIP 21239A. - Dennis Llante

Jan. 7. It's just amazing to me that from a modest setup, a tripod with a simple equatorial mount & a DSLR, under city light conditions, one could catch a comet.



Jan. 10.



At Johndel Beach Resort, Nasugbu, Batangas (⇒ p. 24).



63 second exposure at ISO 1600



3.2 seconds with 50 mm lens at f/1.8 and ISO 800.



Jan. 21. After a long wait for skies to clear, I finally had the chance to image Comet Lovejoy again from my roofdeck.



Great Orion Nebula, 30-second exposure at ISO 1600 and f/5.6.

Jan. 14.



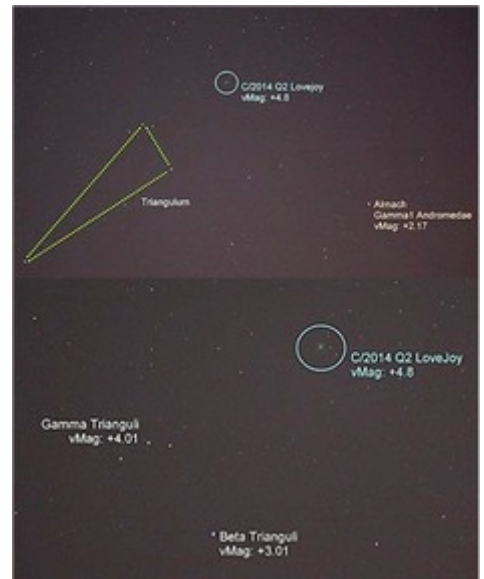
8 seconds at ISO 1600 and f/5.6

Jan. 16. The sky was partly clear with lots of fast-passing clouds and a bit of light pollution coming from nearby building construction near the observatory. Despite these, we were able to observe and image the comet. We were also able to meet up with some guests of the observatory and observe planet Jupiter through the observatory's 7" f/15 Meade Maksutov-Cassegrain telescope on LX200 mount.



Canon 450d, EF 50mm lens, 6 seconds at f/2.2 and ISO 400.

Jan. 29. As Comet Lovejoy now moves farther away from our Sun, before I bid goodbye I took these images to say thank you for the show. Imaged with 6 seconds exposure at ISO 1600 and f/4.



- Christopher Louie Lu

Jan. 8.



Canon 550D with 50mm lens, piggybacked on my scope, mounted on Heq5 Pro. Unguided, 2-minute single exposure.

Jan. 10. Four-tailed Comet Lovejoy C/2014 Q2 from Nasugbu imaging session.



Imaged with a Canon 550D on Explore Scientific DAR 102 telescope. 120 seconds on ISO 1600

Jan. 14. "Comet Fever" - I was surprised to see the sky was clear tonight after 2 days of cloudy skies, so I set up my scope right away and captured some images (⇒ p. 25).



- Arnel Campos

Jan. 15. I got it! Finally, I figured out what I was looking for. It was out of focus.



Great day. First the Pope and now even my first comet. Tripod was not properly aligned but the motor tracking was on. - Manuel Goseco

Jan. 4.



Canon 600D, 4 images stacked at 30 secs exposure, tracked using the Polaris.

Jan. 10. Sky was a little bit hazy thus its tail as not that pretty obvious from the image.



- Raymund Sarmiento

Jan. 9. Drove to Cowan Lake State Park, and arrived when temperature was -13 C with gusting winds (brrrr). Had on layers of clothes and a winter jacket, but it was still soooo cold.



Was able to take a few tripod-mounted pictures - 13 second exposures at 50 mm at f/2 and ISO 6400 before the waning gibbous Moon came out and I had to go back into the car to defrost.



Decided to also capture Orion given the very cold temps also meant very low water vapor in the air. Was surprised to capture the Flame nebula in addition to the Great Orion nebula.

Jan. 14. Was mostly cloudy all day (we had snow flurries in the morning) but when I got home, the sky was clear - we were in a pocket of clear sky in between cloud bands at around 7 p.m.



A short imaging session at -5 C showed the comet (and a hint of tail) in a short, 10-second exposure at ISO 3200 and 50 mm f/2. 20 x 80 binoculars show a large diffuse ball that became more diffuse towards the edges. Also in the image were the Pleiades and Hyades open star clusters.

Jan. 15. We had a very clear crisp sky that was just below freezing. The air was calm and the sky was quite crisp - stars looked like jewels scattered on a nearly black canvas - as close to a perfect night as possible for Cowan Lake State Park.

As you looked overhead, you could see the faint band of light that is the Milky Way - definitely fainter and more diffuse than the summer version.



Comet Lovejoy C/2014 Q2 was visible to the unaided eye, and with the 20 x 80 Vixen binocs, you could see a large fuzball with central condensations and a faint 1 degree tail. Closer in to the head you could see a few "spikes". Note that you can see there was a considerable tail noticeable even in this short (13 seconds) exposure. When I used the same binoculars to view the comet the night before in the suburb of Mason with more light pollution, the fuzball wasn't as large and I did not detect the presence of a tail - it was just a round fuzball (⇒ p. 26).



The Andromeda Galaxy was nice, and was more than just a spindle of light – you could see a central fuzzball surrounded by a more diffuse ellipse of light.



The Orion Nebula was quite bright, with the Trapezium easily visible and seeming so bright and you could actually see the shape of the Orion nebula well-defined in binoculars. It was really a very wonderful night. The cold freezing temperature also meant drier air and that meant cleaner skies.

Jan. 16. Friday night was the monthly meeting of the Cincinnati Astronomical Society. After the meeting, as the cars left the parking lot of the HQ, situated at the edge of the Mitchell Memorial Forest, I set up my tripod-mounted camera and did some imaging - caught Comet Lovejoy Q2 once again, but I did some "framing" of the comet, by imaging under tree branches.

I also did Orion above tree branches. While the sky was clear, a southerly wind was bringing in humidity (fog was starting to build), so the sky was a little bright, as the moisture in the air helped to scatter light. Still it was a great short imaging run at freezing temps.



Comet Lovejoy and the Pleiades amidst tree branches (above) and Orion above the trees (below).



Jan. 19.



I only had a short window of time to capture the comet from home before clouds would take over the sky, but I was surprised that I was able to capture a nice tail that was pointed almost at the Pleiades.

Jan. 21. Another cold day, but again also could capture the comet (right side of the frame) from my suburban backyard. Seeing wasn't so good, so no tail was captured in the image.



Jan. 24. We had a very cloudy day the whole day of Saturday, but at sunset, the clouds opened up, and the weather forecast was for clear skies through about 8 or 9 p.m. After a quick dinner, I looked out and saw the winter constellations still visible outside. I bundled up for the freezing temps and as I drove out, I saw that clouds were already in the sky – and they were gravity wave-type clouds that were preceding the approach of another Alberta Clipper. I decided to still head out to Lake Cowan State Park and try my luck.



As I was headed north on I-75, I saw Jupiter brightly gleaming, so I thought if I could just have an opening in the clouds, I would be good. I arrived at Cowan Lake State Park and took out my binocs to spot the comet.



Orion the Hunter, engulfed with clouds – showing gravity waves propagating ahead of the approaching cold front.

(⇒ p. 27).

As I saw clouds from the horizon moving up, I decided to ditch the binoculars and set up the camera on a tripod and get images of the comet quickly. I was just in time, as the clouds did move up quickly and covered the comet. I captured Orion the Hunter as it was engulfed with clouds.

Jan. 30. Going toward midnight Friday night-Saturday morning (Jan. 30/31), I went to Cowan Lake State Park to see if I could catch Comet Lovejoy Q2, which was at its closest to the Sun.

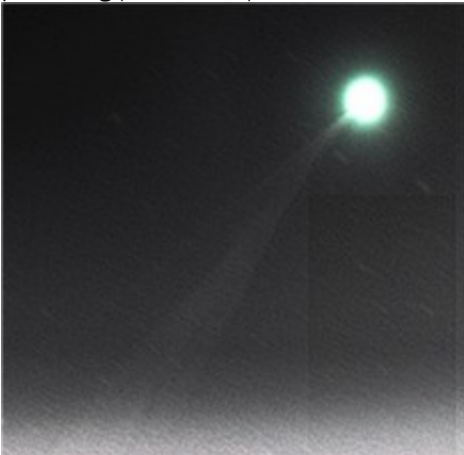


I was able to catch the comet despite the bright moonlight. What astounded me though was the moonlight showed the lake to be covered with solid ice!



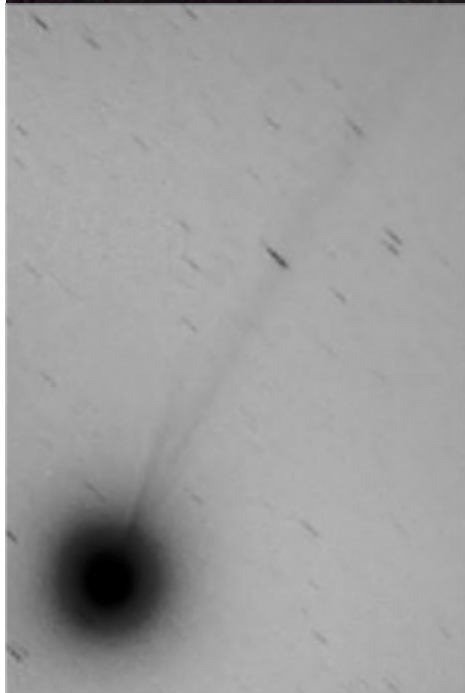
I didn't stay long as the bright moonlight was in the way, and it was a cold -8 C. - Jun Lao, Mason, Ohio

Jan. 5. My first observation and images of the brightening comet Lovejoy. First light also with my Takahashi Epsilon 180ED scope (finally!). Despite the washed out, moonlit, light-polluted city sky, I was able to tease out both its gas and ion tails after image stacking and processing (45 sec subs).



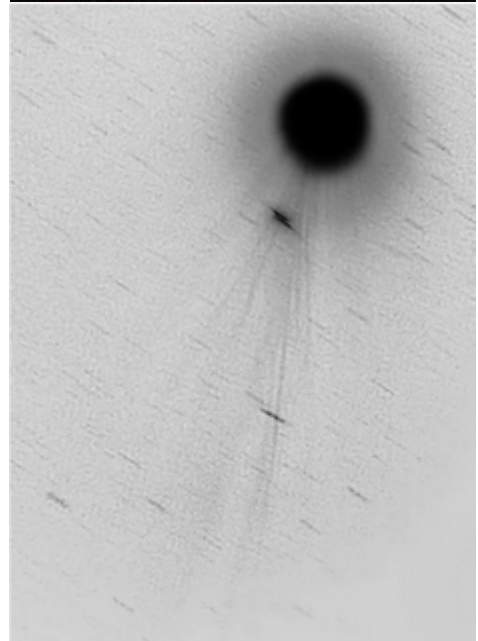
I expect to get better images after the full moon or under darker skies.

Jan. 9. Comet Lovejoy C/2014 Q2 was now putting on a show in the evenings from mid-January to the end of the month.



This comet was discovered last August 2014 by Terry Lovejoy and will not make another appearance until 8,000 years from now. Even under the bright city skies, the comet could be seen using binoculars near the constellations Orion and Taurus.

Jan. 11. Last night, I imaged Comet Lovejoy C/2014 Q2 in Quezon City under hazy skies. It was easily visible in the city using binoculars as it crossed the constellation Taurus. Image processing was able to tease out the complex tail details of the comet.



Jan. 14. The sky was mostly cloudy last night but early in the morning the sky cleared a bit for me to image Comet Lovejoy C/2014 Q2 setting in the western horizon.

Sky conditions were poor due to the haze and heavy light pollution but the comet's tail was still visible in these images.



Jan. 16. My image of Comet Lovejoy passing near the Pleiades under hazy and cloudy skies as tropical storm Mekkhala approached.



- Dr. Jett Aguilar

Jan. 7. The sky this evening was partly cloudy with lots of sky openings for me and my son KC to try to observe and image Comet C/2014 Q2 Lovejoy. It was hard to image the comet as the city lights and waning gibbous Moon were interfering, so I was only able to image a 20-second exposure of the comet at ISO 3200 at prime focus of WO Megrez 90FD refractor through Canon EOS 500D DSLR.



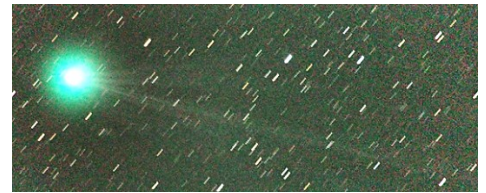
It was good father and son quality time as I explained the difference of comet and stars to him in layman terms and he was excited as well to get a view of the comet through the finderscope as well as through the camera live view screen.

Jan. 9. The sky this evening was hazy with some passing clouds. I had to wait for a clearing at around 9:45 p.m. to set up my portable Vixen Polaris mount with Canon EOS 500D DSLR with EF100-400mm f/4.5-5.6 IS L lens.



With the severe light pollution in my place, it was very difficult to even see the comet with a pair of 10x50 binoculars. I slid back to 100mm and was able to locate the comet, which was about to be blocked by our roof so I took some quick shots before I got obstructed. Not that good but still ok for me. I also had a chance to observe with my son and teach him some bright visible stars like Sirius, Rigel and Betelgeuse and Orion's belt.

Jan. 10. ALPers James Kevin Ty, Christopher Louie Lu, Ronald Sison, Andrew Ian Chan, Iah Serna, Arnel Campos, Shubhashish Banerjee and Saju Pillai went to JohnDel Beach Resort to try to image Comet C/2014 Q2 Lovejoy.



I used a Canon EOS 500D DSLR on Canon EF100-400 mm f/4.5-5.6 IS L lens set to 400 mm f/5.6 mounted on Vixen GP-DX mount to capture the comet.

Jan. 23. I had a chance to image Comet C/2014 Q2 Lovejoy once again under polluted city lights. Although the sky was cloudy, I tried to image the comet through cloud openings with my Canon EOS 500D DSLR on TV-101 refractor at prime focus mounted on Vixen GP-DX mount.



I also was able to image the Crescent Moon as well as Earthshine through thicker clouds low in the western horizon. Images were fair, but who am I to complain? - James Kevin Ty

Jan. 13. The sky finally cleared up last night and so Edwin and I were able to photograph Comet Lovejoy (C/2014 Q2) from our driveway.

On the next page is a 30-second exposure of the comet at ISO 6400 using a Canon EOS DSLR camera attached to our 8-inch f/10 Schmidt-Cassegrain telescope.

It was cold last night - the temperature dropped to 11 degrees Fahrenheit (minus 11 degrees Celsius) so we were bundled up in layers (see our photo with the telescope setup) (⇒ p. 29).



This was our first opportunity to image Comet Lovejoy since we were in Seattle the entire week last week for the 225th meeting of the American Astronomical Society. It was a fun, rewarding event, with more than 3,000 professional astronomers attending.



As viewed from our light-polluted skies in the suburbs of Boston (we live only five kilometers from a major shopping mall), Comet Lovejoy was barely visible to the naked eye in the constellation Taurus - we had to use averted vision. It was an easy target in our 10 x 42 binoculars, appearing like a big, dim fuzz ball.

Jan. 19. After several days of clouds and rain, the sky finally cleared up, so Edwin and I were able to reshoot Comet Lovejoy. This time, we used a small, wide-field telescope – our Takahashi FC-60 refractor – to try and capture the comet's tail, in which we succeeded!



Above's our photo of Comet Lovejoy's faint, elusive gas tail taken from our driveway. It's a one-minute exposure at ISO 6400 with a Canon EOS DSLR camera.

We really had to push our equipment and image processing to the limit to bring out the tail against the bright, light-polluted suburban sky. We also aimed our telescope setup at the nearby Pleiades star cluster, and we were able to record some of its nebulosity. The green comet and the bluish-white Pleiades presented a beautiful contrast of colors! – Imelda Joson and Edwin Aguirre, Massachusetts

Dec. 30. Comet Lovejoy C/2014 Q2 beside globular cluster M79 under a half moon. The galaxy in the glow of the comet head is NGC 1886.



Jan. 6. The comet was making its closest approach to the Earth and grew even brighter. It was a naked eye object even with a full moon shining.



Jan. 8.



Jan. 24. Comet Lovejoy C/2014 Q2 was still an easily spotted naked eye object.



This 18 minute exposure is 4 degrees wide. Its tail was still very prominent after over two weeks past closest approach to the Earth. - John Nassr, Baguio

More Comets

2014 was a busy year for my wife and me, hence the silence in terms of new images. I have quite a roll of data to work through, but in the meantime here are some newly processed pictures.

Comet Lovejoy (C/2014 Q2) was in the news lately, and for good reason. It was putting on a relatively good show (nothing like Hyakutake of 1996 or Hale-Bopp of 1997, but one of the better comets in recent years). Put it this way: from our light-polluted backyard I thought I could see some color in the comet's coma (or head) using a pretty small telescope. So while I can't just look up from our backyard and go "there's the comet", with a small telescope, it's pretty impressive.



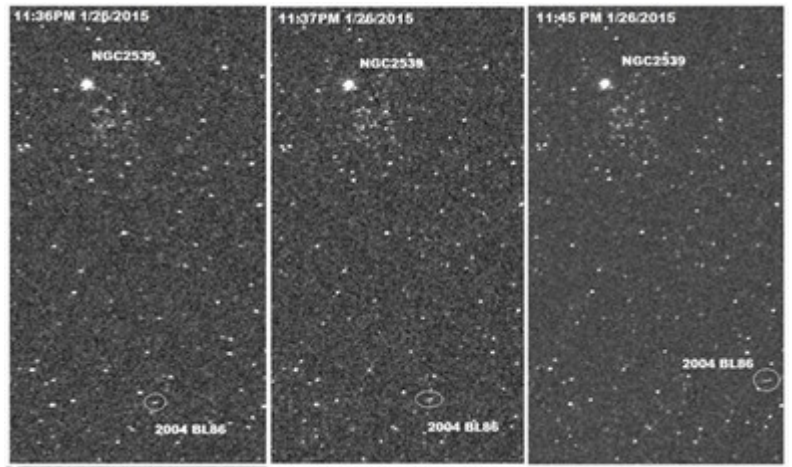
I shot it from our observatory in New Mexico on Jan.16, 2015) with our wide-field setup, a Takahashi FSQ-106N on an AP1200GTO mount and an SBIG STL-11000 camera.

- L: 4 x 1 minute
- R: 4 x 1 minute
- G: 4 x 1 minute
- B: 4 x 1 minute

Since comets have been in the news lately, here are some of my older images.



Comet Lovejoy C/2013 R1 (⇒ p. 30).



First up was another Comet Lovejoy (yes, found by the same person!), technically, C/2013 R1 Lovejoy. This was also shot from New Mexico using the same setup, back in December 2013.

- L: 5 x 1 minute
- R: 6 x 1 minute
- G: 6 x 1 minute
- B: 6 x 1 minute

Last is some less old news. Comet Jacques (C/2014 E2). The image above was shot from our backyard September 2014 using an Astro-Physics AP130EDFGT on a Takahashi EM200 mount and an SBIG ST-2000XCM camera. I was unable to shoot it from New Mexico for a variety of reasons, but at least I have a shot of it from our backyard. This was much later after the comet peaked, and from our backyard it was pretty dim.

10 x 1 minute exposures. The camera used is a one-shot color camera (much like your regular digital cameras), so not separate images through filters for this one. - Eric Africa, West Chester, Ohio

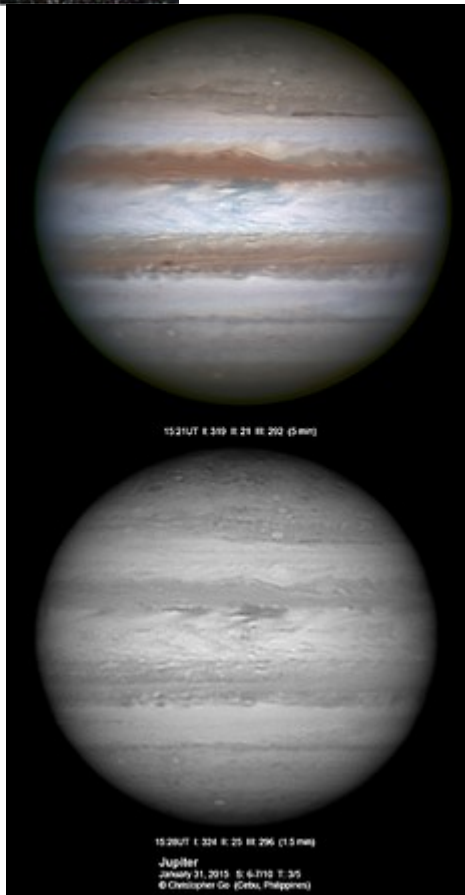
Near Earth Asteroid

At top right are a couple of stills showing the location of the asteroid 2004 BL86 near the NGC2539 open cluster during the 1/26-1/27 2015 Earth flyby. This was captured using a Canon 600D / 100mm lens (zoomed), 30 secs exposure at ISO6400, tracked using the Vixen Polaris Sky Tracker. - Raymund Sarmiento

Jupiter

Jan. 31. It had been a long time since my last image of Jupiter. Conditions had been very bad since my last image. This also comes at a very difficult time for my family because my dad passed away recently.

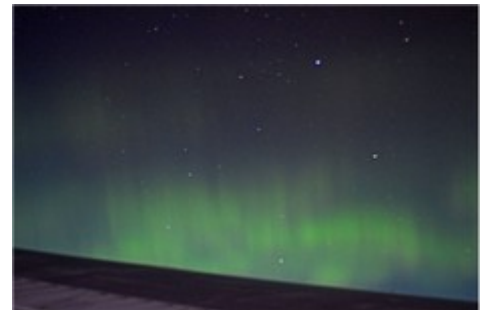
Seeing was average this evening compounded by clouds. I had to image through clouds. I was testing a new camera for this image. The North Equatorial Belt - NEB Oval Z was now back to white in color. The NEB looked quiet in this region. Note the long dark barge on the North Temperate Belt.



The small oval above Oval Z had a light red tinge. The South Equatorial Belt (SEB) looked quiet here. The South Polar Red Spot was visible. - Christopher Go, Cebu

Aurora

Jan. 7. I had the good fortune being on a Delta Airlines flight from Tokyo to Detroit on Wednesday, Jan. 7, and had an economy window seat on the left. At around 8 p.m. Phil Std Time (3 a.m. Alaskan time), I looked out the window and noticed some diffuse light to the plane's north and east that were above the wing of the plane. I took out my Nikon D7000 and took images with a 50 mm f/1.8 lens set at ISO 3200-6400 and clicked away - they turned out green - aurora borealis!



At that time, the plane was flying northwest of Anchorage, Alaska. The display changed quite rapidly (and probably due to the plane also moving rapidly, the perspective also had something to do with the rapidly changing appearance).

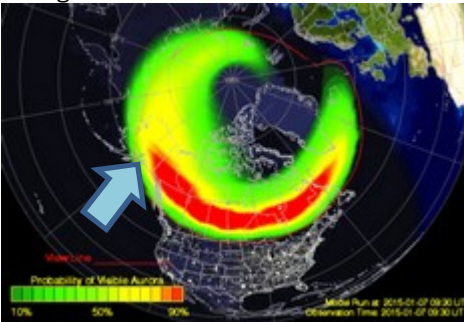


I then set the camera exposure to 1 second at ISO 6400. What I thought was a nice green curtain display then developed into a pretty strong display around 9 p.m. PST. At that point, you could see sheets that were visibly greenish white, with some columns being a strong white. Alas, as the display started to fade and the sky was turning lighter, the plane lights went on for the crew to serve our "midnight" snack (⇒ p. 31).



My fellow passengers were probably wondering why I was clicking away with a camera with the airplane blanket around it, to block the lights and video monitor reflections on the double pane airplane window. I sat at the back of the wing of the 747, so you'll see parts of the wing in the images. I processed some of the images in Photoshop Elements to reduce the stray light and bring out the aurora from the background (I am guessing there were still stray light reflections from the double pane window). All images were captured while holding the camera by hand and trying to block the rest of the window with a blanket or with my body.

When I got home later in the evening, I checked Spaceweather.com and found that it had reported a geomagnetic storm that day! What a nice blessing it was for me to be flying back during a geomagnetic storm event and having a window seat!



From Spaceweather.com: "What happened? The interplanetary magnetic field (IMF) near our planet tipped south, opening a crack in Earth's magnetosphere. Solar wind poured in to fuel the strongest magnetic storm since Sept. 2014. NOAA analysts believe the fluctuation in IMF is related to the arrival of a CME originally expected to miss Earth." The arrow shows where the plane was when I got the images – smack in the red zone! – Jun Lao, Mason, Ohio

Cetus Planetary

NGC 246 is a wispy planetary nebula in the constellation Cetus and one of the brighter and larger planetary nebulae in the sky. It is in the foreground of a far more distant spiral galaxy, NGC 255 glowing in the distance (upper right).



- John Nassr, Baguio

Orion's Nebulae

The line of three bright stars that form the belt of Orion are among the most recognized formations in the night sky. The 7.4 hour exposure featured in the cover reveals a colorful wealth of interstellar activity that dramatically transforms the region.



Below, NGC 1788 is one area in Orion that is often overlooked due to The Great Orion Nebula, M42. It is a reflection nebula with young blue stars illuminating hydrogen gas and dust blown by cosmic winds.



- John Nassr, Baguio

Andromeda Galaxy

45 second subs stacked images of the Andromeda galaxy, M31, taken under a moonlit sky last January 3, 2014 in Quezon City. I was testing the Takahashi Epsilon 180ED f/2.8 astrograph with a Canon 7D DSLR camera. The image looks promising.



- Dr. Jett Aguilar

Bright Comet Prospects for 2015

How fortunate we are to begin 2015 with a naked eye comet. Many of you have undoubtedly seen Terry Lovejoy's most recent discovery, C/2014 Q2 Lovejoy, either in the flesh or in photos across the Web. Topping out around magnitude +3.8, this icy blue gem hovered at around +4.5 as January drew to a close. Who knows – Q2 may turn out to be the best comet of the year.

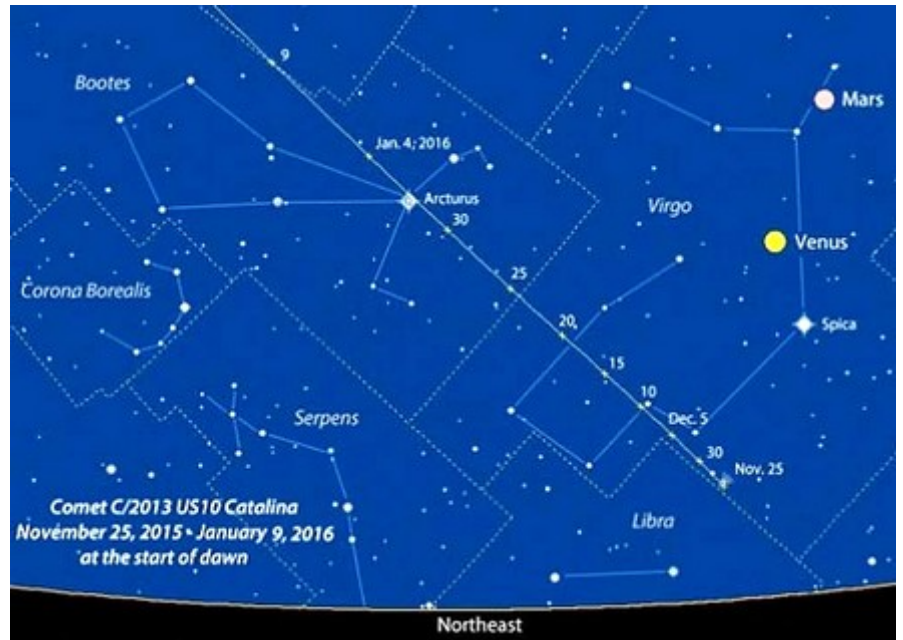
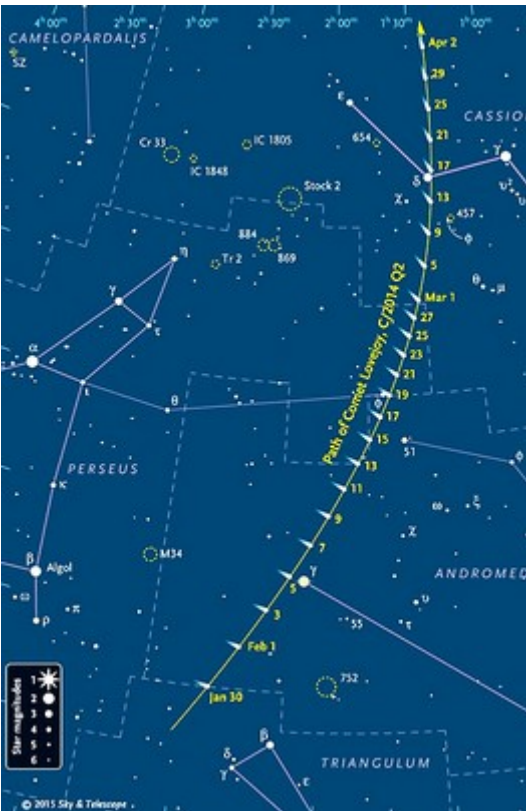
Looking back, 2014 was a generous one for bright comets. Bright could mean "visible with the naked eye," but since naked-eye comets are so scarce, we'll choose a slightly different definition which (I hope) comet aficionados will find acceptable. How about anything visible in an ordinary pair of 7 x 50 binoculars from a reasonably dark sky? That would set our limiting magnitude at about +8.

Using this criterion, 2014 presented skywatchers with six bright comets – C/2013 R1 Lovejoy (6th magnitude in January); C/2014 E2 Jacques (7 in August); C/2013 V5 Oukaimeden (+6.5 in September), C/2012 K1 PanSTARRS (+7.5 in October), 15P/Finlay (briefly at +8.7 during an unexpected outburst in December), and of course Q2 Lovejoy (+5.0 in December).

2015 began with a bang with Lovejoy and a second surge from 15P/Finlay to magnitude +7.5 in mid-January, but we'll soon enter the doldrums as Q2 Lovejoy fades below 6th magnitude sometime next month.

Barring the discovery of a bright newcomer, the new year offers up three bright entries: 88P/Howell, C/2014 Q1 PanSTARRS, and C/2013 US10 Catalina. Let's look at each in turn.

88P/Howell – Discovered with the 0.46-m Schmidt telescope at Palomar Observatory on 1981. It reaches perihelion on April 6th, when it could become as bright as 8th magnitude. Northerners need not apply – this comet will be only be visible from the southern hemisphere during April and May (⇒ p. 32).



At left is a chart showing Comet C/2014 Q2 Lovejoy's path in the northern sky as it continues to fade through March.

Above is a sky chart for a potentially bright comet, if it follows predictions. This might be the equivalent of Comet C/2014 Q2 Lovejoy, at almost about the same time of the year - a treat for the holidays of 2015. Note that Comet Catalina C/2013 US10, comes close to Arcturus on New Year's Day

C/2014 Q1 PanSTARRS — Not only is Hawaii the surfing capital of the world, but it's lately become a hotbed of comet discovery thanks to the Panoramic Survey Telescope & Rapid Response System (PanSTARRS) survey atop Mt. Haleakala, a favorite tourist destination.

Created to discover and characterize Earth-approaching asteroids and comets, the automated survey has bagged more than 80 new comets since full-time science operations began in 2010.

Discovered in August 2014, Q1 PanSTARRS will reach perihelion on July 6, 2015, after passing just 0.3 a.u. from the Sun. Expectations are high for it to grow a long, bright tail and possibly crest to magnitude +3 at nightfall during July and early August in the middle of southern winter.

C/2013 US10 Catalina — Finally, northern folk get their due! US10 was discovered by the Catalina Sky Survey on Halloween 2013. For much of the year, the comet remains the province of southern hemisphere skywatchers. In late July and early August, it reaches magnitude +7 and becomes a south circumpolar object.

By late September the comet achieves naked eye visibility (6th magnitude). After perihelion on November 15th, it surges into view for northern hemisphere skywatchers and peaks at around magnitude +3. As 2015 gives way to 2016, US10 remains bright as it buzzes Arcturus on New Year's night. - Bob King, SkyandTelescope.com

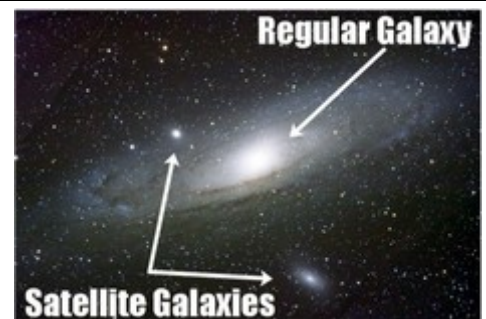


What is a Satellite Galaxy?

Our sun is part of a massive collection of stars in the Milky Way galaxy. These hundreds of billions of stars orbit the galaxy's center. But did you know that there are things that are even bigger orbiting the Milky Way's center? Other galaxies orbit it too!

The Milky Way has a number of satellite galaxies, but the biggest one is the Large Magellanic Cloud. It is about 163,000 light-years away and around 1/100th the size of the Milky Way. Unlike our spiral galaxy, this one lacks a clean spiral shape. Some scientists think that is because the Milky Way and other galaxies are pulling and warping it.

In terms of distance, there are two contenders for closest satellite galaxy. One group of stars is small enough that astronomers consider it a "dwarf galaxy." The other group is so close that they still debate whether or not it is part of our galaxy or its own dwarf galaxy.



Astronomers have named the one that everyone agrees on as the Sagittarius Dwarf Spheroidal Galaxy. It's about 50,000 light-years away from the Milky Way center. It orbits over the top and down below the disk of our galaxy, like a ring over a spinning top.

But there is something even closer to our Milky Way—a cluster of stars named by some to be the Canis Major Dwarf Galaxy. Scientists estimate that it contains around a billion stars. It is so close to the edge of the Milky Way that it is closer to our solar system than to our galaxy's center. It's about 25,000 light-years away from us.

Some scientists don't think the Canis Major cluster of stars is actually its own galaxy or a dwarf galaxy. Instead they think it is just a dense area of faraway stars that are still part of the Milky Way. Either way, it is clear that this bunch of stars has been pulled very close to our Milky Way by our galaxy's massive gravity. Over time, this could be the fate of other satellite galaxies in the area. They could all one day merge into an even larger Milky Way galaxy!