alpha

Astronomical League of the Philippines' *HerAld*

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Francisco Lao, Jr.
Editor-in-Chief
e-mail at:
<appulse2000@yahoo.com >

Comet C/2012 K5 LINEAR quickly burst into the scene and then faded away in early January, but Comet PANSTARRs is something to look forward to in mid-March. Comet LINEAR image © *John Nassr*

CLUB & LOCAL NEWS

January Meeting

Last January 6, members of the Astronomical League of the Philippines (ALP) held their monthly meeting at the Manila Planetarium. Members who attended were ALP President James Kevin Ty and son Kendrick Cole (KC); Secretary Christopher Louie Lu; VP Jett Aguilar; PRO Armando Lee, wife Mia and son Jason; directors Christopher Lee & Peter Benedict Tubalinal; Ma. Belen Pabunan; Liza Quitlong; Nel Lagda; ALPha editor Francisco "Jun" Lao, Jr; Mike Enage; Ronald Sison; Norman Marigza; Per Edman; and newest member, Eugene Yap.

The meeting proper started at around 3 p.m. with ALP Secretary and NAW 2013 chairman Christopher Louie Lu discussing updates on ALP's planned NAW activities:

February 17, 2012: NAW – PAC 2013 Opening Ceremony
Venue: National Museum Planetarium

12:00 pm: Registration
1:00 pm (1:30 pm): Philippine National Anthem
Prayer/Liturgy
Opening remarks by Astronomical League of the Philippines President James Kevin Ty
National Museum Planetarium curator Bel Pabunan*
2:00 pm Introduction to Comets & Asteroids: Film Showing: Asteroids, Meteors & Impact
First Lecture on PANSTARRS & ISON by:
- Norman Marigza – The Physics of Comets
- Dr. Jett Aguilar – Observation & Photography of Comets

15 (20) minute break
3:20 pm or 3:30 pm Second Lecture on Astrobioloby by Dr. Armando Lee
4:15 pm Product presentation of Celestron Prodigy Telescopes by Cutting Edge
4:30 pm Awarding of the Fr. Victor Badillo Astronomy Service Award Posthumously to Dante Ambrosio
4:45 pm or 4:50 pm Awarding of Certificates and Honorarium
6:00 – 6:30 to 10 pm Free Public Viewing at Rajah Sulayman Park

February 20, 2013: NAW – PAC 2013 Mid-week Free Public Viewing
3 – 9 pm AstroCamp Observatory in SM Mall of Asia, San Miguel By the Bay, Pasay City

February 23, 2013: NAW – PAC 2013 Closing Ceremony
Venue: Rizal Technological University

12:00 pm Registration
1:00 pm (1:30pm): Philippine National Anthem
Prayer/Liturgy
Opening remarks by Christopher Lu ALP and RTU President Dr. Jesus R. Torres*
2:00 pm First Seminar/Lecture: Philippine Space Agency Bill HB6725 by Dr. Deocaris
2:45 pm Second Seminar/Lecture: Search for Exoplanets by Bamm Gabriana
15 (20) minute break
3:45 pm Third Seminar/lecture: Surviving the Messier Marathon by Peter Tubalinal
4:30 pm Product Presentation on Celestron Prodigy Telescopes by Cutting Edge
5:00 pm Open forum & Awarding of Honorarium
Closing Remarks by ALP President James Kevin Ty
6:00 – 6:30 to 10 pm Free Public Viewing, RTU Quadrangle

*Subject to change

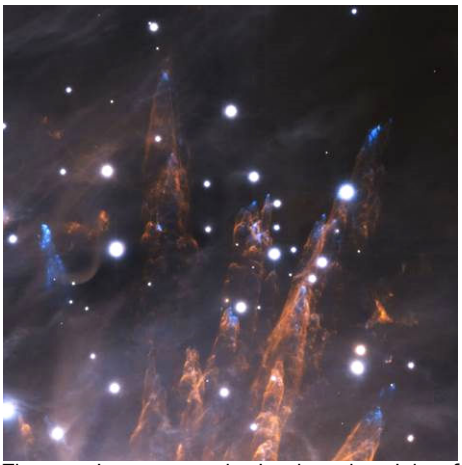
Lastly, ALP President James Kevin Ty discussed the January 12, 2013 (weather permitting) Caliraya stargazing, as well as the ALP 10th year anniversary yearbook project to the members and asked members to help out to make the project a successful one.

The meeting ended at around 6:00 p.m. with a group shot of those who attended the meeting together with US-based ALPha editor Francisco "Jun" Lao, Jr. - *by James Kevin Ty & Christopher Louie Lu*

Breaking News

Cosmic 'Bullets' Slam Orion Nebula

Astronomers have unveiled a spectacular new photo of cosmic "bullets" slicing through thick gas clouds at supersonic speeds in the famed Orion nebula. The so-called Orion bullets are actually enormous clumps of gas packed with iron atoms. They appear as distinctive blue features in the new image captured by the Gemini South Observatory in Chile.



The new image was obtained on the night of Dec. 28 using a new adaptive optics system at the Gemini Observatory South telescope in Chile. The system is equipped with five laser guide stars and three deformable mirrors to correct image distortions from the Earth's atmosphere in real time.

The result is a stunning view of the outer regions of the Orion nebula. Each cosmic bullet is about 10 times the size of Pluto's orbit around the sun. Pluto is about 49 times farther from the sun than the Earth, which is only 150 million kilometers away.

Astronomers think the cosmic bullets were ejected from deep within the nebula, likely propelled by strong winds expelling gas at supersonic speeds from a region of massive star formation outside, and below, this image's field-of-view. The gas clumps leave behind tubular wakes as much as one-fifth of a light-year in length, which are the result of molecular hydrogen gas being heated up in the nebula.

At 1,500 light-years away, the Orion nebula is Earth's closest known star factory. Scientists suspect the sun was born in a similar environment about 4.5 billion years ago. The Orion nebula's bullets were first spotted in a visible-light image in 1983, and followed up by infrared observations in 1992. – *Space.com*

Reports

Sirius and the Winter Milky Way

Star Shooting at Trece Martirez. It was a really good night. The skies were clear and Mrs. Michelle Campos' carbonara was just awesome. Arnel Campos also got a chance to take his new rig out for a spin around the block.

Sirius (*above*) is the brightest star in the night sky with a visual apparent magnitude of -1.46. Its name is derived from the ancient Greek "Seirios" which means "glowing" or "scorcher."

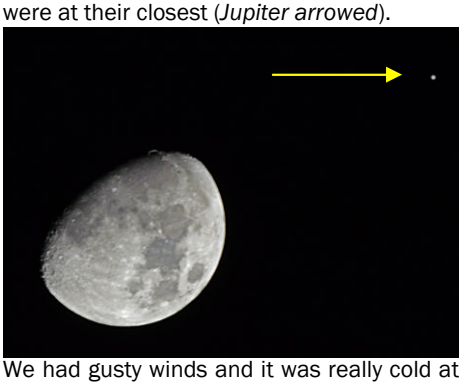
It is also known as the Dog Star, reflecting its prominence in its constellation, Canis Major, or Greater Dog.

What the naked eye perceives as a single star is actually a binary star system consisting of a white main-sequence star, Sirius A, and a faint white dwarf companion, Sirius B, also affectionately called the "Pup."

Sirius appears bright because of both its intrinsic luminosity and its proximity to Earth. At a distance of 8.48 light years, Sirius is one of earth's near neighbors. – *Gary and Steinar Andreassen*

Conjunctions

Jan. 21. It was quite cold this night, and it was likely because the skies were clear. The night started out clear with the Moon near Jupiter, then the skies clouded over, then cleared again, when I took this image between 11 and 11:45 p.m., when the pair were at their closest (*Jupiter arrowed*).



We had gusty winds and it was really cold at 10° below 0 C, with wind chill making it feel like -20 C. It was hard to focus with the Moon high in the sky, with the gusty winds, and freezing temps, yet seeing Jupiter just a moon's width away was worth it. Imaged with a Nikon D7000 and an Opteka 800 mm f/8 mirror lens at 1/1000 sec at ISO 3200. - *Jun Lao, Mason, Ohio*

Jan. 22. Moon, Jupiter & Aldebaran Conjunction. I had to image through haze-filled skies *(⇨ p. 19).*

- *Christopher Louie Lu*

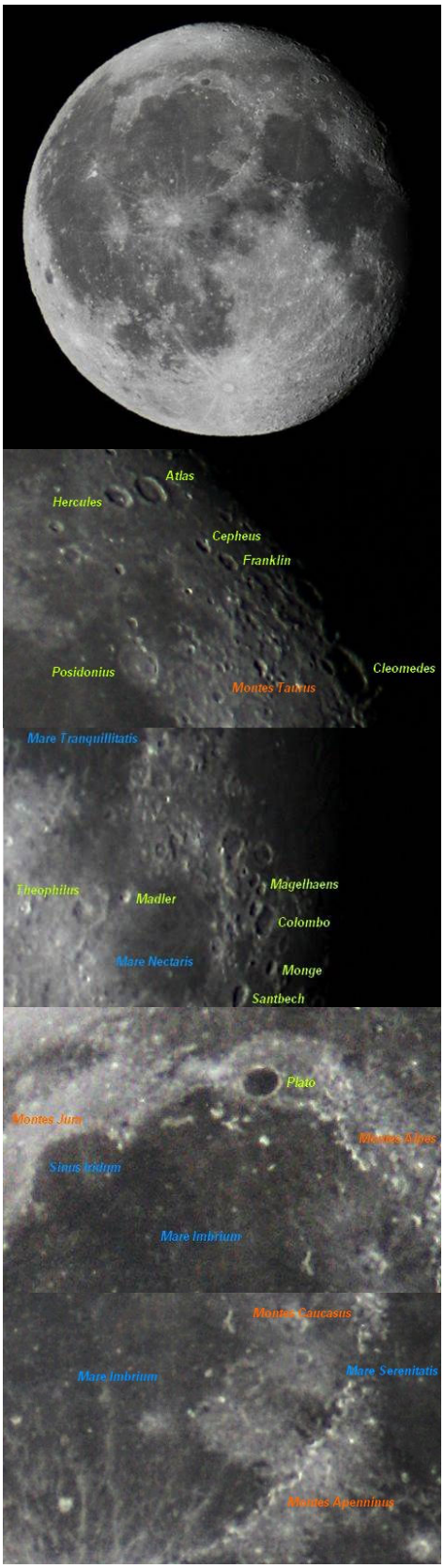
Moon

Jan. 16. 5-day old waxing Moon with 24.5% illumination. Imaged with a Celestron Powerseeker 80EQ on CG-2 mount, 80 mm f/11, 1/30 sec on ISO 200.

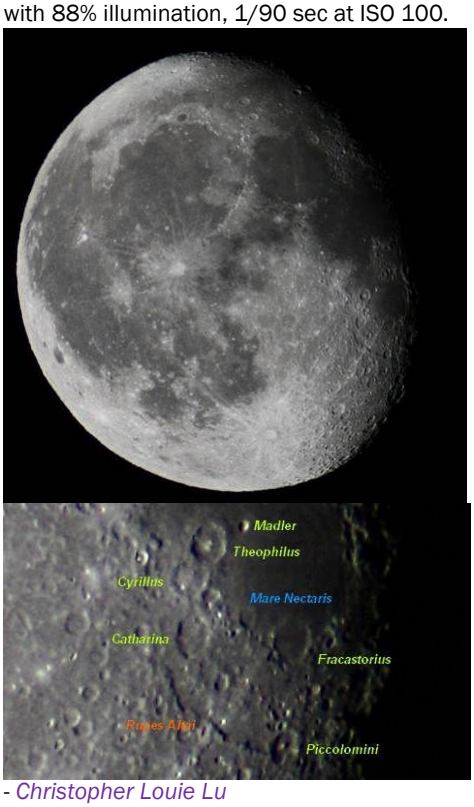
Jan. 19.

8-day old waxing Moon with 55% illumination. Looking at the Moon floating in the darkened void was just so 'magical', yet in the back of my mind I kept reminding myself that it was just Newton's Law of Gravity at work.

Jan. 29. 17-day old waning gibbous Moon with 94% illumination.



Jan. 30. 18-day old waning gibbous Moon with 88% illumination, 1/90 sec at ISO 100.



- *Christopher Louie Lu*

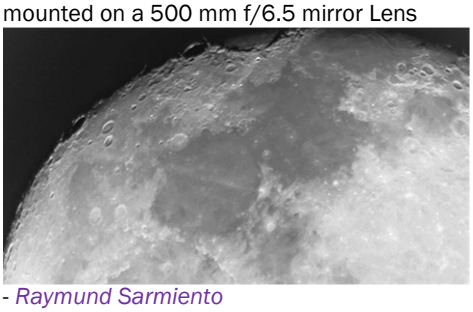
Jan. 5. Morning Moon

Jan. 15

(⇨ p. 20)

Jan. 23. Moon imaged via Logitech C615 HD Webcam, tracked using Polarie with 800 mm lens at prime focus.

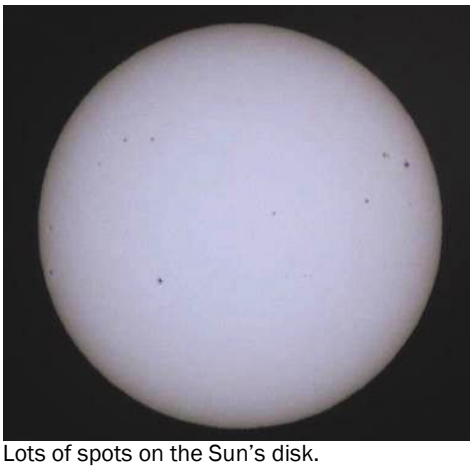
Jan. 29. Shot using a Logitech C615 webcam mounted on a 500 mm f/6.5 mirror Lens



- *Raymund Sarmiento*

Sun

Jan. 5.

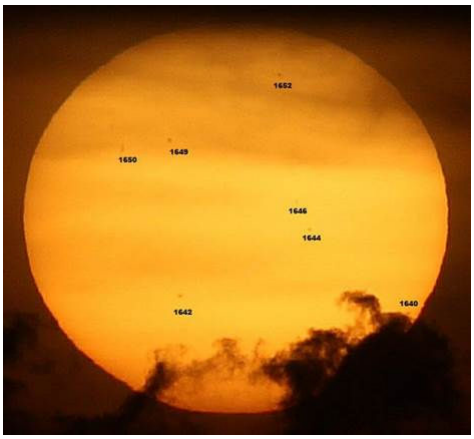


Lots of spots on the Sun's disk.

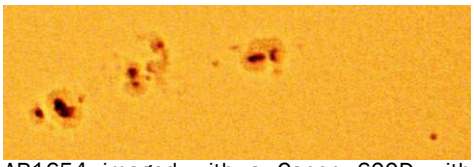
Jan. 13. Very huge Sunspot group.

Imaged with a Canon EOS 450d + 60mm Meade refractor with T-adapter + Baader solar filter. - *Mark Ian Singson*

Jan. 8.

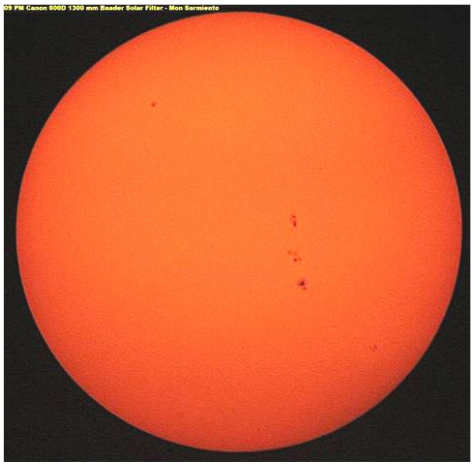


Jan. 14. Solar imaging through office window.

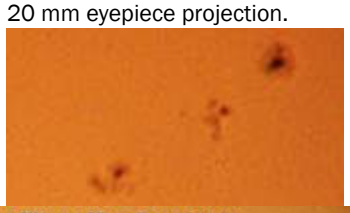


AR1654 imaged with a Canon 600D with 1300 mm at prime focus.

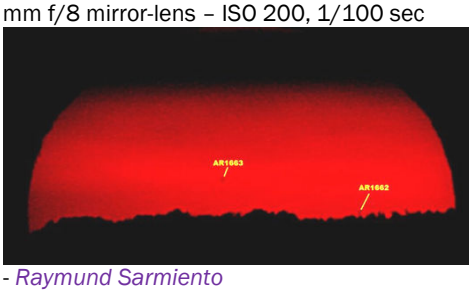
Jan. 15.



Jan. 17. Today's Sun (cropped) using 1000 mm + 20 mm eyepiece projection.

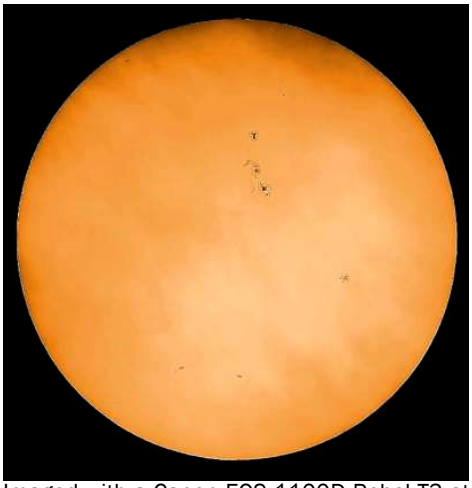


Jan. 29. Sunset with sunspots touching ground, shot using a Canon 600D and a 800 mm f/8 mirror-lens – ISO 200, 1/100 sec

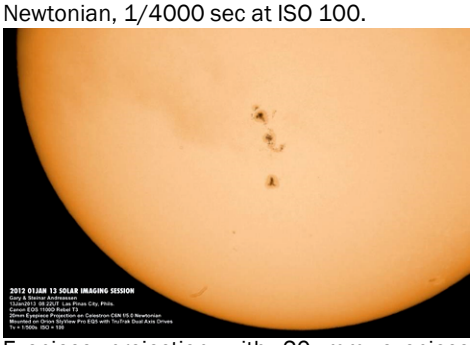


- *Raymund Sarmiento*

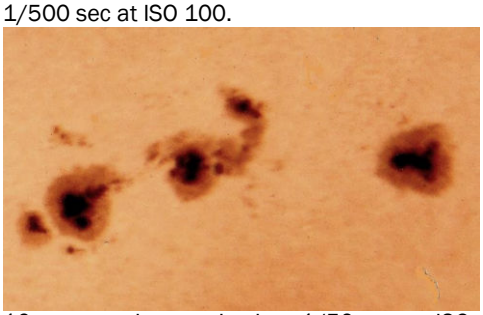
Jan. 13.



Imaged with a Canon EOS 1100D Rebel T3 at prime focus on a Celestron C6N f/5 Newtonian, 1/4000 sec at ISO 100.

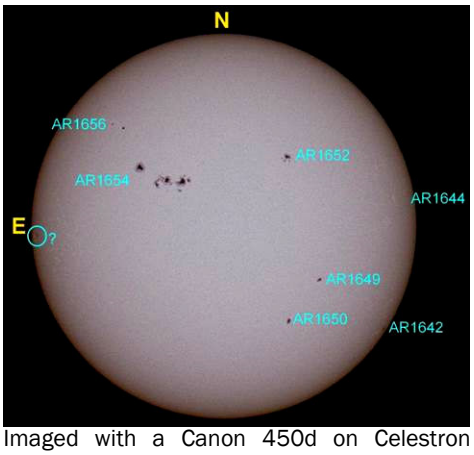


Eyepiece projection with 20 mm eyepiece 1/500 sec at ISO 100.



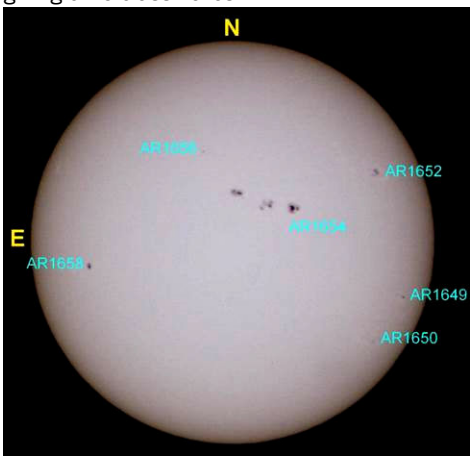
10 mm eyepiece projection. 1/50 sec at ISO 100. - *Gary Andreassen*

Jan. 13. AR1652 and AR1644 were now setting on the western limb. AR1649 and AR1650 remained stable. AR1652 continued to give off C-class and M-class flares. AR1654 was also giving off many C-class flares, while AR1656 was following not far behind.

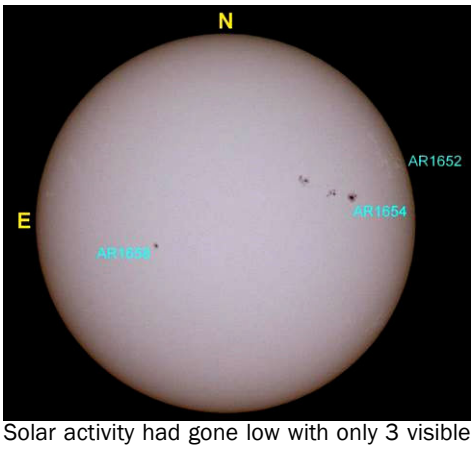


Imaged with a Canon 450d on Celestron Powerseeker 80EQ with Baader solar filter, density 3.8, on CG-2 mount, 80 mm f/11, 1/4000 sec at ISO 100.

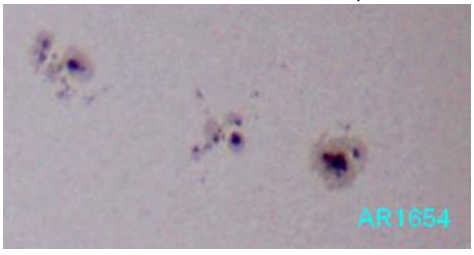
Jan. 15. AR1659 was about to set on the western limb. AR1650 was following behind, while giving off C-class flares. AR1652 and AR1654 appeared to be decaying while releasing C-class flares. AR1656 was now decaying while AR1658 was stable and also giving off C-class flares.



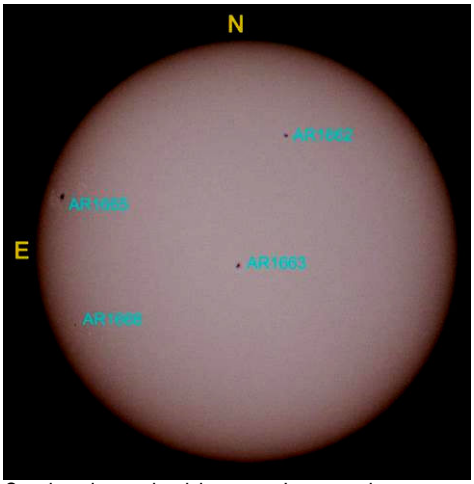
Jan. 17. Solar activity had gone low with only 3 visible sunspot groups. AR1652 was decaying as it set on the northwest limb. AR1654 and AR1658 had remained stable but quiet.



Solar activity had gone low with only 3 visible sunspot groups. AR1652 was decaying as it set on the northwest limb. AR1654 and AR1658 had remained stable but quiet.



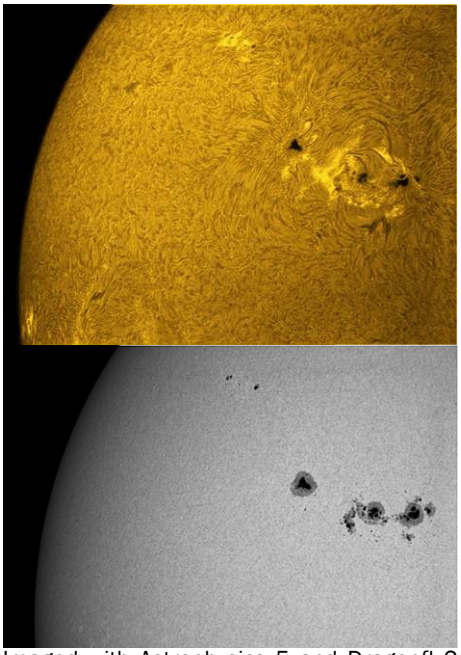
Jan. 30. Skies this morning was less than 'ideal' - cloud cover was about 56% - 69%, seeing was 1.5" - 2", transparency was 0.5 - 0.6.



Our local star had been quiet, yet there were a few active regions visible. AR1662, AR1665, and AR1666 had remained stable as they transited across the solar surface. - *Christopher Louie Lu*

Jan. 13. The current solar cycle was nearing solar maximum when activity is supposed to be at its highest, but this solar cycle seems to be one of the least active in history.

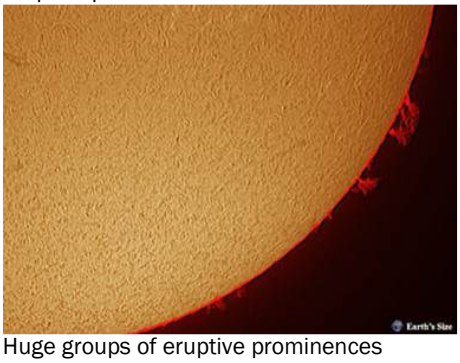
Here are comparative hydrogen alpha and while light images of AR1654, the largest sunspot group in months to appear on the sun *(⇨ p. 22).*



Imaged with Astrophysics 5 and Dragonfly2 Camera and Hydrogen alpha and Baader Herschel Wedge filters. - *John Nassr, Baguio*

Jan. 4. The sky this morning was partly cloudy and hazy. I went ahead despite so many clouds passing in front of the Sun. AR11640 was huge but was nearing the northwest limb, while another nice large group, AR11644, just entered the northeast limb. Several sunspot groups - AR11642, 11643, 11641, and 11638 - were scattered across the solar disk. A huge group of eruptive prominences could be seen in the southwest limb.

AR11638 and AR11640 with nice large eruptive prominence



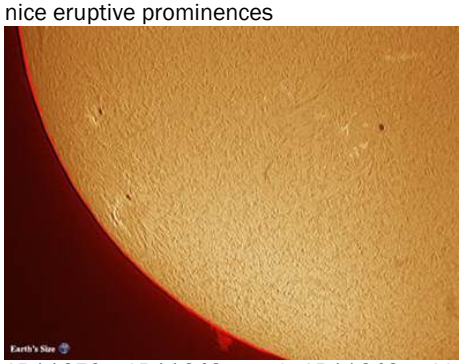
Huge groups of eruptive prominences

AR116644 and AR11641

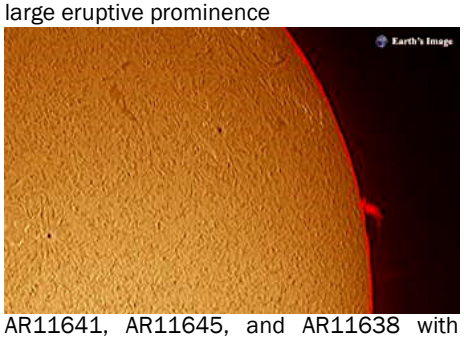
As I was about to finish my Hα imaging, clouds started to get thick and covered the Sun, so I wasn't able to image in white light, as I was late for work already.

Jan. 6. The sky this morning was partly clear but seeing was not that good. I was able to do my usual Hα imaging routine - lots of action on the surface of the Sun in Hα. More than 14 sunspot groups were on the Sun's disk today!!! There were lots of long dark filaments as well as huge hedgerow prominences!!!

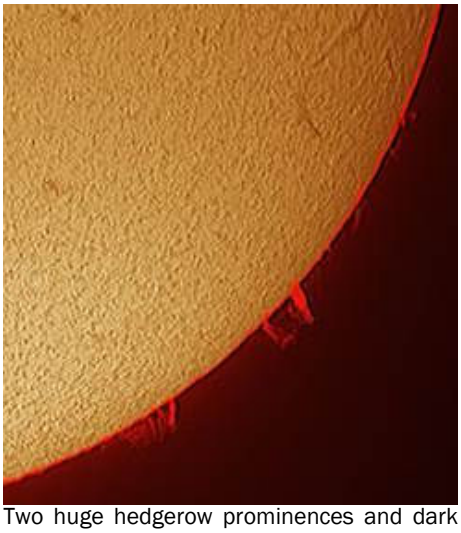
AR11640, AAR11647, and AR11638 with nice eruptive prominences



AR11650, AR11649, and AR11642 with large eruptive prominence

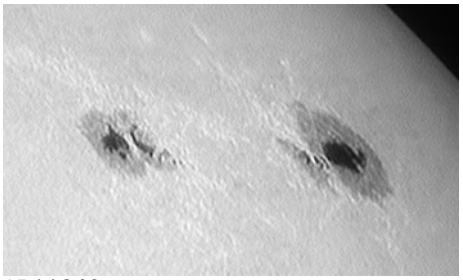


AR11641, AR11645, and AR11638 with nice eruptive prominences



Two huge hedgerow prominences and dark filament

Possible AR11651 and AR11652 together with AR11648, AR11651, AR11646, and AR11644 sunspot groups, with long dark filaments



AR11640

It was a very nice imaging session as I had to do several overlaps of areas just to fill in all the visible active details on the Sun.

Clouds started to cover the sky after I started to do white light imaging, thus I was able to image only the huge departing sunspot group AR11640.

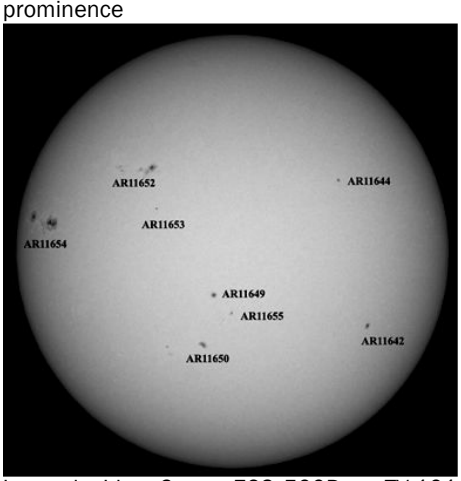
Jan. 10. The sky this morning was partly clear and seeing condition was fair. More than 8 sunspot groups were scattered around the Sun's disk with 2 huge sunspot groups - AR11654 and AR11652 – that were worth observing and monitoring.

In Hα wavelength, there were also 2 huge hedgerow prominences that were visible in the western and southwestern limb *(⇨ p. 23).*

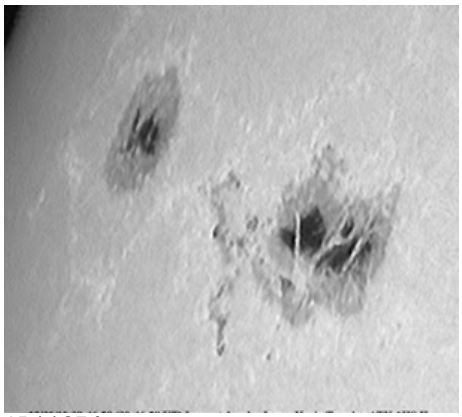
AR11654, AR11652, and AR11655 with nice dark filaments

AR11644 with huge hedgerow prominence

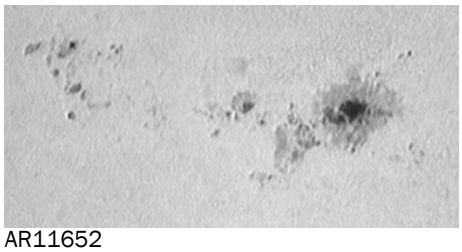
AR11642 with huge faint hedgerow prominence



Imaged with a Canon EOS 500D on TV-101 refractor with 2x Televue Big Barlow, effective focal length of 1780 mm with Baader 3.8 solar filter. 1/3000 sec exposure at ISO 200



AR11654



AR11652

I was also able to image in white light the full disk as well as the 2 huge sunspot groups - very photogenic, especially AR11654.

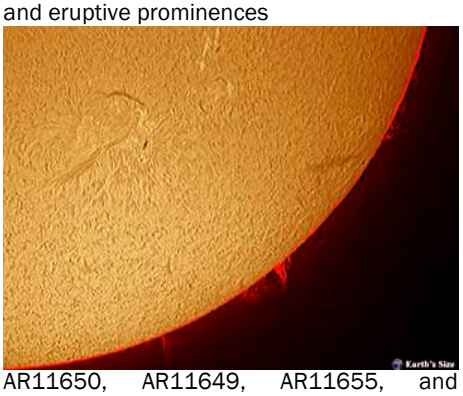
Jan. 13. I was so tired last night and I woke up late and saw clear blue sky! The Sun was almost past halfway my observing window and I had less than one hour to observe and image the Sun.

I started doing Hα imaging and was surprised how large AR11654 had become after missing the Sun for more than 3 days because of bad weather.

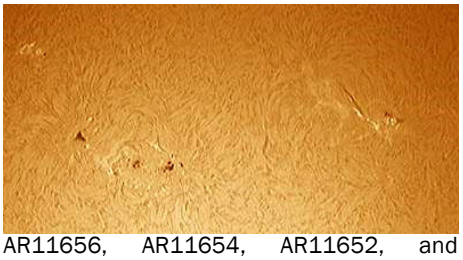
AR11656 with several large eruptive prominences

The Sun was quite active with more than 10 groups on the disk. Possible AR11658 was entering the Sun's eastern limb. Several large eruptive and hedgerow prominences could be seen in the northeast and southwest quadrants, while numerous long twisting dark filaments could be seen as well, which were a joy to look at and image!

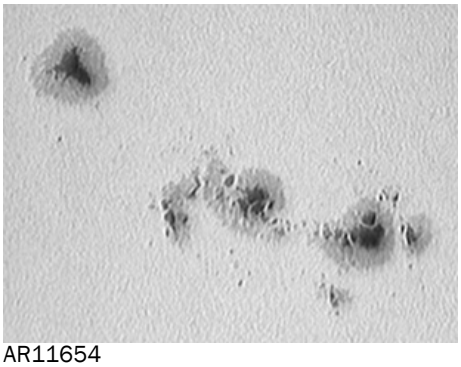
Possible new AR11658 with dark filament and eruptive prominences



AR11650, AR11649, AR11655, and AR11642 with huge hedgerow prominences and dark filaments

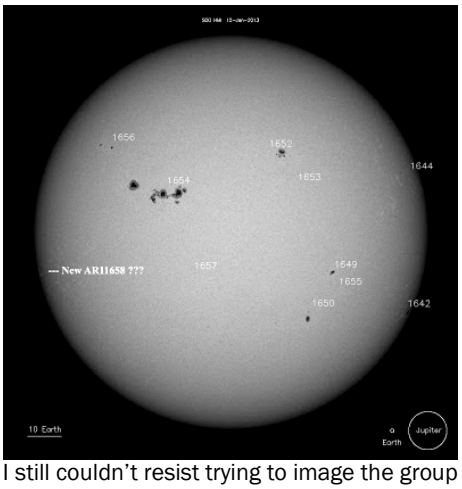


AR11656, AR11654, AR11652, and AR11653



AR11654

With my observing window narrowing down to less than 15 minutes, I had to quickly take an image of AR11654 in high resolution white light but my usual imaging scale using 5x Barlow couldn't fit the entire group as it was so huge that I needed to use my double stacked 2x Barlow lens to fit it all in *(⇨ p. 24).*

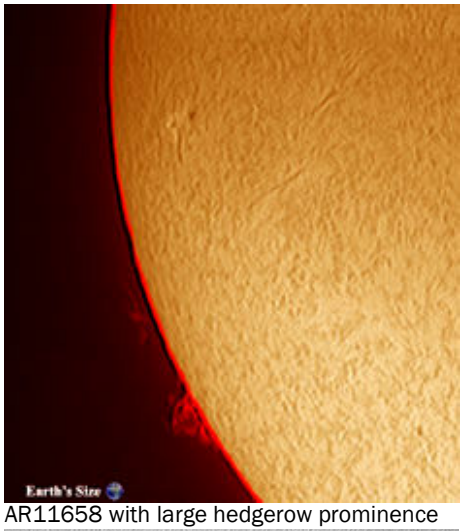


I still couldn't resist trying to image the group with my 5x Barlow, but unfortunately, our roof had started to obstruct the Sun so I was only able to get the bigger section of this group before totally getting obstructed. I also wasn't able to image the Sun in full disk, so I had to borrow a full disk image of the Sun courtesy of SOHO (*above*), to illustrate how big AR11654 was.

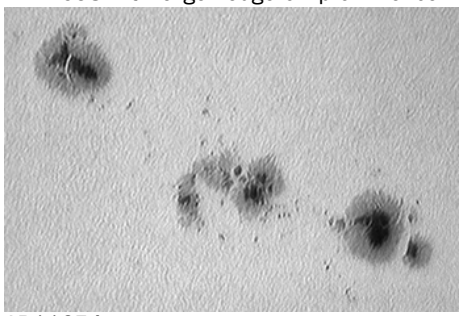
Jan. 14. It was cloudy this morning and I wasn't expecting to do any imaging, but deep inside, the urge to image was there, so I forced myself to set up, and I was able to see the Sun peeking out of the dark clouds once in a while. I had to wait for more than an hour and could see some thinning of the clouds in front of the Sun so I started to turn on my setup. After a while, I could see the Sun's surface in Hα but lots of pesky fast moving clouds continued to pass in front of the Sun!

AR11656, AR11654, AR11652 with huge long dark filament above left

AR11650 and AR11649 with huge hedgerow prominence and long twisting dark filament



AR11658 with large hedgerow prominence



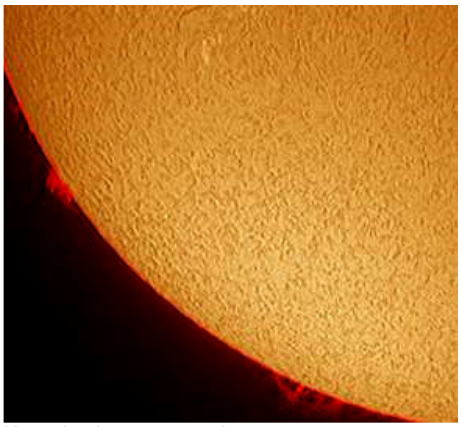
AR11654

I was blessed with a small opening of less than 15 minutes, so I started to fire away at the Sun and was able to see giant AR11654 grow larger in length as it started to come out of Wilson Effect. After taking a quick set of Hα images, I turned to high resolution white light and was able to get an image before I got clouded out again. Nevertheless, I was still happy with the results as I think seeing was slightly better than yesterday.

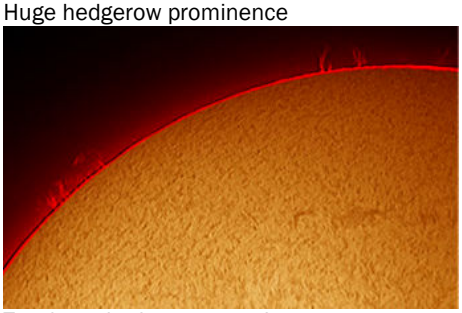
Jan. 15. The sky this morning was very hazy and partly cloudy. Seeing was fair. It was a very hard imaging session today as I had to fight with passing clouds and I was able to do some imaging through. There were numerous huge hedgerow prominences around the Sun. They could be seen in the northeast, southeast and southwest quadrants. AR11654 showed activity with 2 nice large twisting flares with a dark filament between its 2 main core groups.

AR11656, AR11654, and AR11652

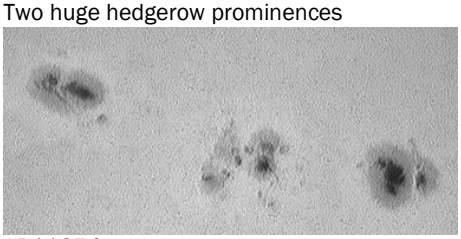
AR11650, AR11649, and AR11655 with huge hedgerow prominence and twisting dark filament



Huge hedgerow prominence



Two huge hedgerow prominences

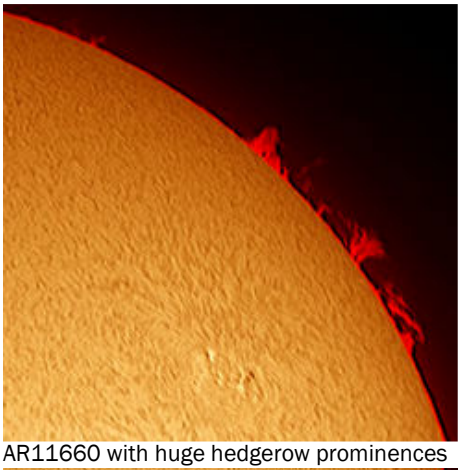


AR11654

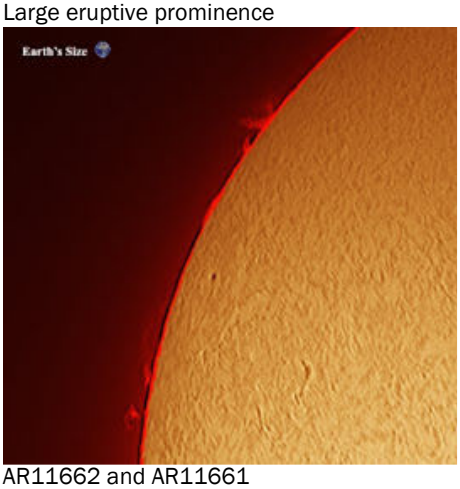
The huge large twisting dark filament in the southwest quadrant near AR11655 was still visible. I tried imaging the full disk but fast passing clouds kept crossing the Sun and even after more than 100 frames, I still couldn't get a good image devoid of clouds. I took a final parting shot of AR11654 through clouds *(⇨ p. 25).*

It had passed the central meridian of the Sun and will start to undergo Wilson Effect as it exits into the western limb. I will miss it exiting the Sun as I had to go for more than a week-long provincial work trip. Thank you AR11654 for a great show.

Jan. 24. The sky this morning was hazy and seeing condition was not that good. Moderate-sized AR11660 was the only interesting large group on the Sun's disk, although there were also several small-sized sunspot groups visible in the northeast and southwest limbs. In Hα, AR11660 was beautifully grouped on the northwest quadrant with a huge group of hedgerow prominences. Another large eruptive prominence was also visible in the southwest limb.


AR11660 with huge hedgerow prominences


Large eruptive prominence



AR11662 and AR11661

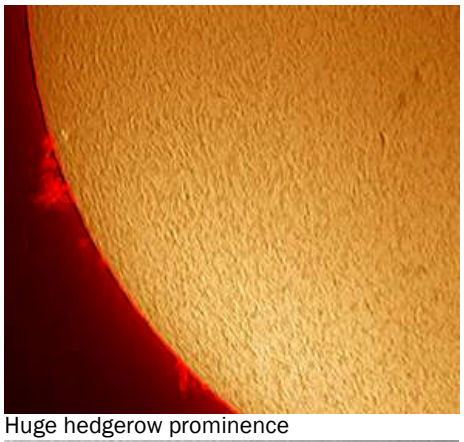

AR11658 and thick, dark filament

Jan. 25. The sky this morning was clear and seeing condition was surprisingly good. I haven't gotten good seeing condition for a long while. Not that perfect, but good enough for me. There were several huge prominences that were visible in all 4 quadrants of the Sun's disk, with one near AR11660 being the tallest and biggest of the visible prominences. It looked like a dragon floating above the Sun's northwest limb. I was also able to image AR11660 and AR11662 close up in white light.


Large eruptive prominence

AR11660 with huge eruptive prominence

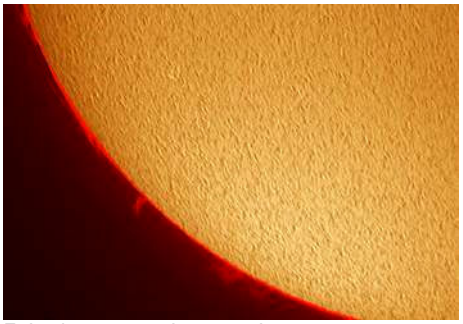
AR11662 and AR11661 with two large eruptive prominences


Huge hedgerow prominence


AR11660

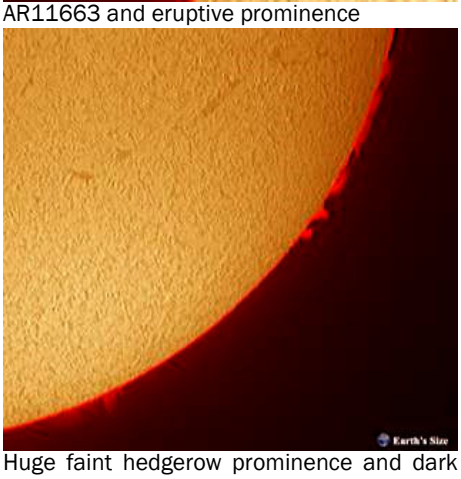
Jan. 27. The sky this morning was clear but seeing condition was fair. With AR11660 gone, there were only 3 sunspot groups visible on the Sun with another possible new active region developing in the northwest limb. There were several huge faint hedgerow prominences. I imaged AR11662 as well as new AR11663 in white light high resolution.


AR11662 and AR11661 and numerous dark filaments

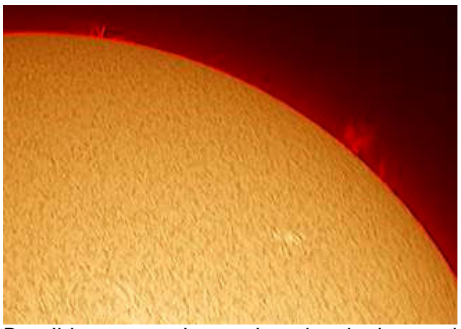

Faint large eruptive prominence

(⇨ p. 26)

AR11663 and eruptive prominence

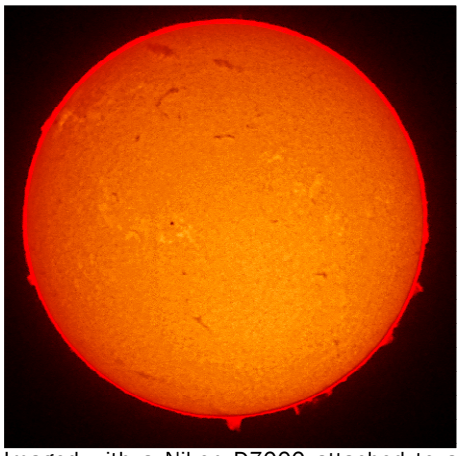


Huge faint hedgerow prominence and dark filament



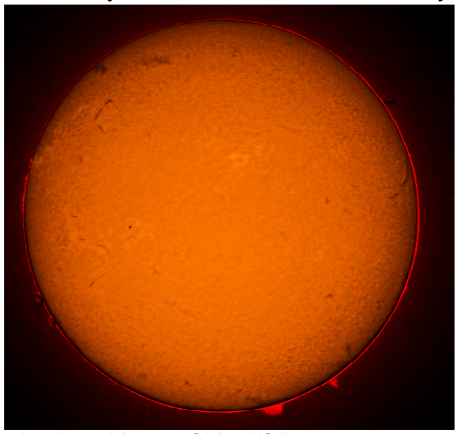
Possible new active region developing and hedgerow prominence
- *James Kevin Ty*

Jan. 19. The weather turned unusually mild and sunny, and allowed me to take some images of the Sun. Seeing wasn't so great though, so there was still some fuzziness in the image. Do note the thick filaments near the limb –these are prominences that appear thick over the sun's disk.



Imaged with a Nikon D7000 attached to a Solar Max 60. Composite of two images, one exposed for the solar disk, and one for the prominences.

Jan. 20. Seeing was even worse on the 20th, but the day was a little cooler than Saturday.



- *Jun Lao, Mason, Ohio, USA*

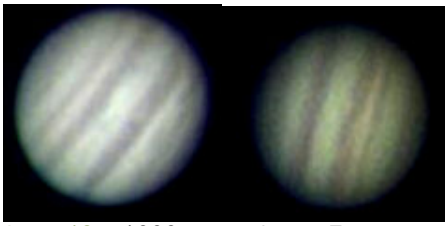
Ceres

The asteroid through cloud holes over almost a week – Jan. 6 and Jan. 12, 2013.

- *Raymund Sarmiento*

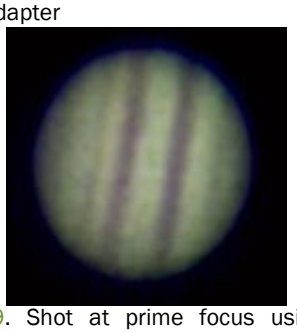
Jupiter

Jan. 17. There was a little improvement in seeing (from 1/5 to 2/5), thus I did a quick capture of Jupiter using the 1000 mm + 20 mm eyepiece on a Toucam webcam (*right, above, at left*).

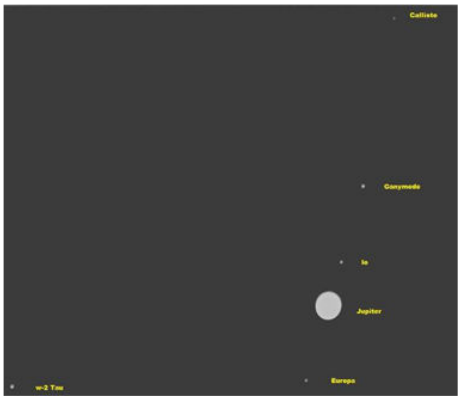


Jan. 19. 1000 mm lens, Toucam on eyepiece projection (*above right*).

Jan. 23. Last night's Jupiter using the Toucam. I missed the Great Red Spot (GRS) by an hour, as I was attempting to finish the mod on the Logitech C615, attaching a mogg adapter



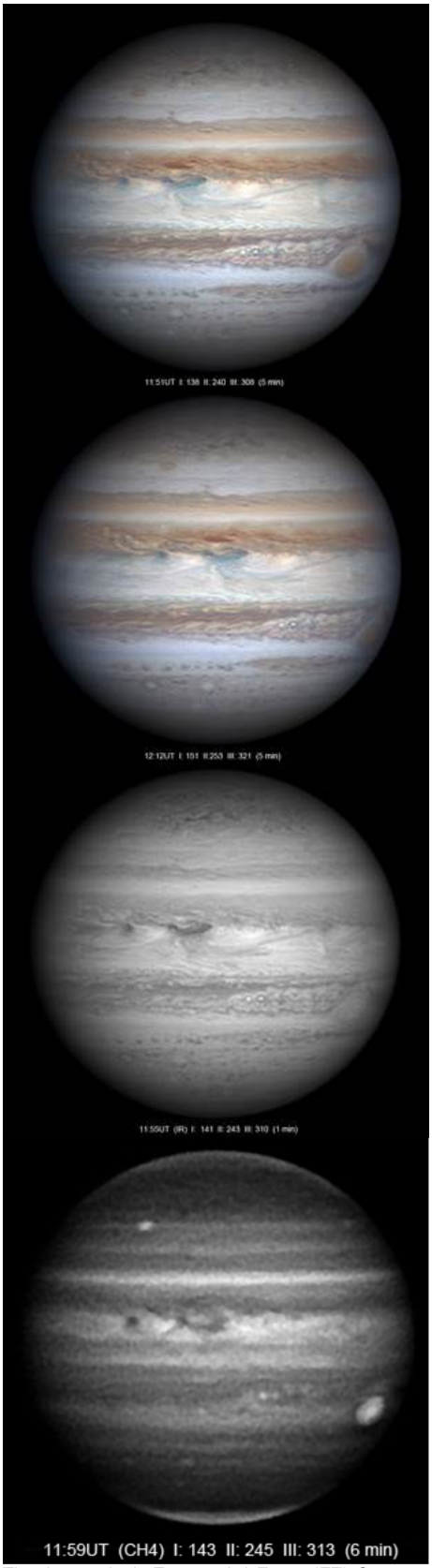
Jan. 29. Shot at prime focus using the Logitech C615 Webcam on an 800mm Mirror-Lens.



- *Raymund Sarmiento*

Jan. 1. Happy New Year!! After over 5 days of suffering a flu, I felt better. Seeing was good this evening, and that was before the clouds rolled in. The GRS was setting. Note the complex wake following the GRS *(⇨ p. 27).*

There were two prominent outbreaks within this wake.



The large dark Equatorial Zone (EZ) festoon seemed to be interacting with the dark barge in the North Equatorial Belt (NEB).

These features were dark in methane band (CH_4). The North-North Temperate Zone Little Red Spot (NNTZ LRS) was also prominent and very bright in CH_4.

Jan. 4. Seeing was okay this evening. Note the 2nd NNTZ LRS. The North Temperate Belt (NTB) was active in this region. Note the small red spot and the bright white spot north of the NTB.

The North Equatorial Belt (NEB) had a lot of complex rifts and outbreaks. The South Equatorial Belt (SEB) was very dark.

Jan. 5. Seeing was variable today, but it improved as Jupiter got higher. Oval BA was pulling away from the GRS. It still had a very strong red color. Note the region north of the Oval BA at the EZs/SEBn area, the South Equatorial Disturbance (SED) was back!

The SED seemed to be interacting with the dark barge and bright area following the barge. Io could be seen close to the GRS.

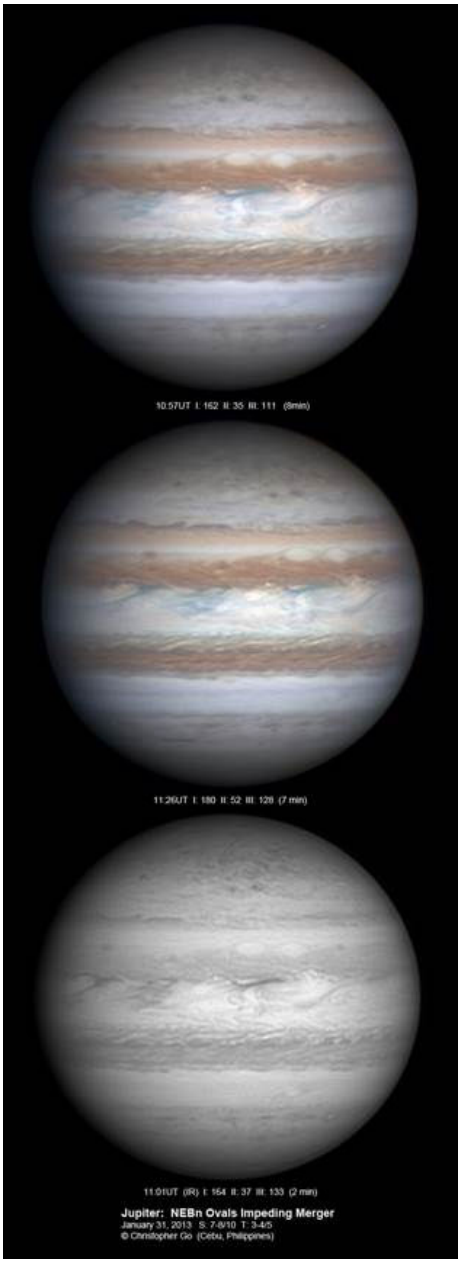
The NEB looked quiet. Some red and white ovals could be seen. The NTB had some activity at its northern edge.

(⇨ p. 28).

Jan. 27. Weather had been terrible during the last two weeks. I was able to get a short clearing today, just enough for one round of imaging (*last image on page 27*). Seeing was unstable because I wasn't able to cool my optical tube assembly (OTA).

Oval BA could be seen at the central meridian (CM) - its color was still very strong. The dark red barge on the SEB was still there, right next to the bright feature it had been following for months now. There seemed to be some rifts on the NEB. The NTBn was dark.

Jan. 31. Conditions were okay this evening. Finally had some decent seeing, despite the variable transparency due to clouds. The two big white ovals on the NEBn should merge in the coming weeks. Note the interaction of the EZ festoon with an NEB outbreak. There were a lot of rift activities in the NEB.



The NTBn looked complex with some white ovals on it. The SEB looked complex, with activity on the SEBn. - *Chris Go, Cebu*

Comet C/2012 K5 LINEAR

Jan. 6. Vixen Polarie - 2 minute exposure with 500 mm lens.

- *Raymund Sarmiento*

Jan. 1. C/2012 K5 Linear is a comet with a hyperbolic orbit that came from outside our solar system and about a week ago made its closest approach to the Sun. It was also making its closest and brightest approach to Earth (roughly between the orbits of Earth and Mars) and was moving very rapidly from above the solar system's orbital plane to below it. It was in the constellation Auriga and heading west southwest towards Taurus. The comet was expected to fade rapidly by the middle of January. Comet C/2012 K5 Linear will then steadily make its way back out to the deep reaches of space and will never be seen again.

The three-minute image was taken with an SBIG ST10XME camera and an Astrophysics 5" f/8 refractor at a focal length of 1,016mm. The 1 minute image was taken with a Nikon D7000 camera at ISO6400 and a Borg 77ED f5.5 refractor at a focal length of 425mm.

Jan. 2. This one-minute exposure (*bottom image at middle bottom*) at 1,016mm focal length captures the rapidly moving nucleus of Comet C/2012 K5 Linear, which was off center in the coma. This could indicate some rotation in the nucleus of the comet.

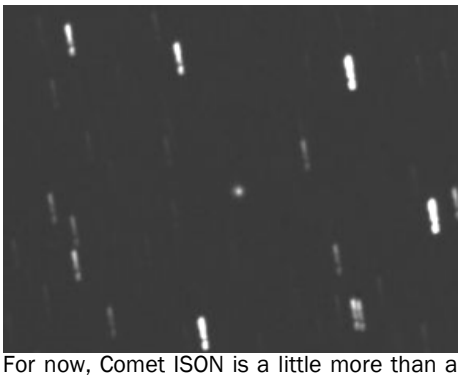
Jan. 5. C/2012 K5 Linear was starting to fade and could no longer be visually seen through 10x50 binoculars like it could five nights ago. Below is a 16 minute exposure of the comet at a focal length of 1,016mm.

Jan. 10. Comet C2012 K5 Linear through a 16-inch scope.

- *John Nassr, Baguio*

Comet ISON

Jan. 8. It may not look like much for now. It is still very far away, but by November and December of 2013 and January 2014, when it makes its extremely close encounter with the Sun, Comet C/2012 S1 ISON is expected to become a great comet so bright it may become visible during day time *(⇨ p. 29).*



For now, Comet ISON is a little more than a small speck of light in this cropped image exposed a total of 20 minutes through a 16-inch telescope. Though no tail was captured, the coma exhibits definite fuzziness.

Comet ISON is presently just inside the orbit of Jupiter at a distant 5.2 AU from the Sun. One Astronomical Unit (AU) is the distance of the Earth from the Sun. Its orbit indicates that this is probably its first time to visit our solar system from the deep reaches of space. Its virgin nucleus has never yet been heated up and depleted by a vaporizing close encounter with a hot star like the Sun. This factor, its intrinsic present brightness, and the fact that it will come to an extremely close 0.01AU at closest approach to the Sun (on November 28, 2013) make it a candidate to become a "great" and exceptionally bright comet.

C/2012 S1 was discovered on September 21, 2012 by the International Scientific Optical Network (ISON) in Russia using a 16 inch f/3 reflector telescope and four 100 second CCD exposures. - *John Nassr, Baguio*

Star Clusters

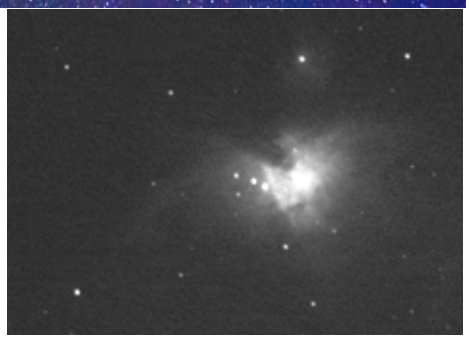
M35 is a beautiful open star cluster in the constellation Gemini (*right, top*). It consists of a loose grouping of dazzling young blue stars. To the lower right is another more distant star cluster, NGC 2158. Its reddish stars are indicative of its older age and its denser arrangement is almost like a globular cluster. - *John Nassr, Baguio*

Pleiades. Imaged with a 300 mm f/5.6 lens, 70 secs at ISO 800 using the Vixen Polarie. - *Raymund Sarmiento*

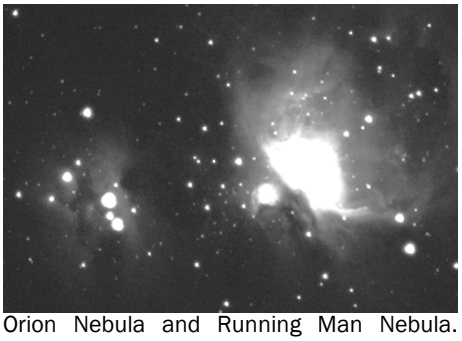
Nebulae

Nebulae in Orion, including Barnard's Loop and the Rosette Nebula (*above*). Single 303-second exposure at ISO 1600, taken with a Pentax Kx and a 50mm lens at f/2.8 on a Vixen Polarie mount. Taken on January 5, 2013. – *Oliver Abrigo de Guzman*

Oxygen III filter first light (*right*). Single Frame at ISO6400, 60 seconds exposure using Canon 600D and 800 mm f/8 mirror-lens on a BRIGHT moonlit sky, tracked using the Polarie. – *Raymund Sarmiento*

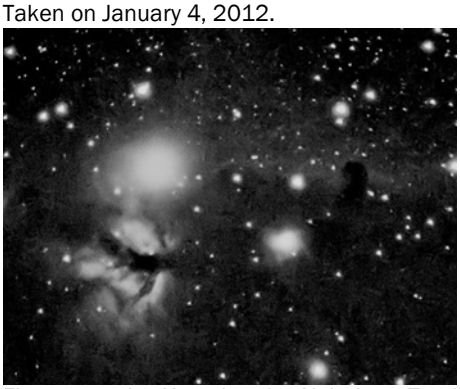


Great Orion Nebula. First time taking my HEQ5 Pro outside for a test run in Trece Martires, Cavite. Imaged with a Canon 550D on Explore Scientific DAR102 telescope. 3 min. exposure at ISO 400. - *Arnel Campos*

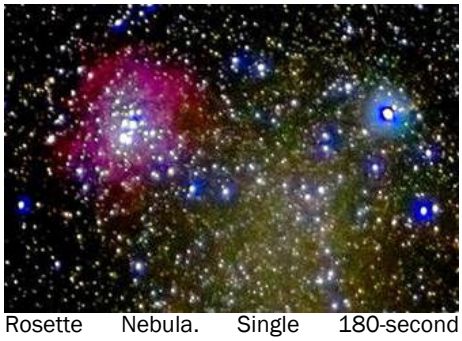


Orion Nebula and Running Man Nebula. Total exposure of 13 minutes and 57 seconds, taken with a Pentax Kx on Orion ST80 on a Synta EQ2 mount.

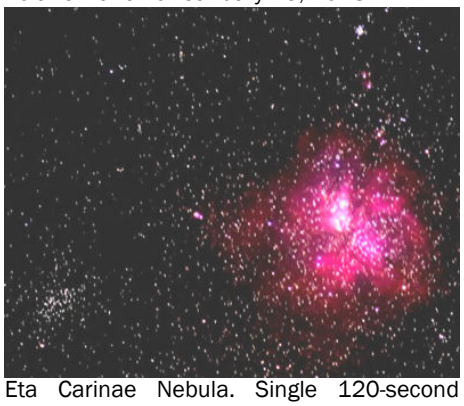
Orion's Belt with the Flame and Horsehead nebulae. Single 121-second exposure at ISO 1600, taken with a Pentax Kx and 200mm f/4 lens on a Vixen Polarie mount. Taken on January 4, 2012.



Flame and Horsehead Nebula. Total exposure of 10 minutes and 30 seconds. Taken with a Pentax Kx and Orion ST80 on a Synta EQ2 mount. Taken on December 15, 2012.



Rosette Nebula. Single 180-second exposure at ISO 1600, taken with a Pentax Kx and a 135mm f/2.8 lens on a Vixen Polarie. Taken on January 15, 2013.



Eta Carinae Nebula. Single 120-second exposure at ISO 1600, taken with a Pentax Kx and 200mm f/4 lens on a Vixen Polarie. - *Oliver Abrigo de Guzman*

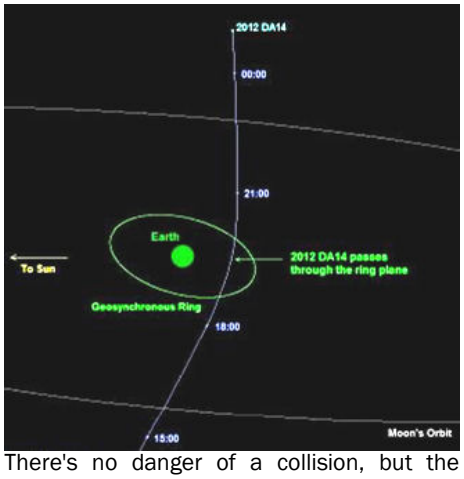
Rosette Nebula. The dense molecular clouds of the Rosette Nebula offer a wealth of close-up targets with intriguing dark shapes, shadows, and star forming Bok Globules. This image captures the northern part of NGC 2244, richly punctuated with such denizens.

It was captured in bright moonlight through a narrow band hydrogen alpha filter. Imaged with a 16" f/5.2 Newtonian with a focal length of 2,100mm, ST10XME camera, Astrodon 3nm Hα filter, and 3.1 hours exposure. - *John Nassr, Baguio*

The Sky

Asteroid Flyby

On Feb. 15th, an asteroid about half the size of a football field will fly past Earth only 27,200 kms. above our planet's surface.



There's no danger of a collision, but the space rock, designated 2012 DA14, has NASA's attention. 2012 DA14 is a fairly typical near-Earth asteroid. It measures some 50 meters wide, neither very large nor very small, and is probably made of stone, as opposed to metal or ice. Don Yeomans estimates that an asteroid like 2012 DA14 flies past Earth, on average, every 40 years, yet actually strikes our planet only every 1200 years or so.

"2012 DA14 will definitely not hit Earth," emphasizes Yeomans. "The orbit of the asteroid is known well enough to rule out an impact." Even so, it will come interestingly close. NASA radars will be monitoring the space rock as it approaches Earth closer than many man-made satellites.

Yeomans says the asteroid will thread the gap between low-Earth orbit, where the ISS and many Earth observation satellites are located, and the higher belt of geosynchronous satellites, which provide weather data and telecommunications.

Comet Lemmon

2013 is gearing up nicely to be a superb year for bright comets. Already we have two comets that promise to be spectacular this year - Comet PanSTARRS (C/2011 L4) should peak at magnitude -1 in March and then later in the year comet ISON (C/2012 S1) may even reach the dizzy heights of magnitude -15 in November.

There is another comet that is currently brightening faster than expected, although it will probably not be bright as the above-mentioned comets. It may prove to be the surprise package of the year. Its name is Comet Lemmon (C/2012 F6). Alex Gibbs of the Mount Lemmon Survey discovered the comet on March 23, 2012. The Mount Lemmon Survey is part of the Catalina Sky Survey (CSS), a Near-Earth objects searching project, specifically aimed at finding potentially hazardous asteroids (PHAs) that may pose a threat of impact to Earth *(⇨ p. 31).*

Currently, there are a number of telescopes participating in the survey, each of the order of 1-meter in aperture, located at various astronomical sites. The project is producing superb results with the Mount Lemmon telescope, currently the most prolific telescope in the world for discovering Near-Earth Objects.

Comet Lemmon was only magnitude 20.7 when found. At the moment, Comet Lemmon can be seen best in the southern hemisphere. It heads north through Tucana, Phoenix, Sculptor, Cetus, and Pisces, where on April 19, Comet Lemmon crosses the celestial equator and moves into the northern section of the sky. Although now fainter, the comet is still predicted to be a naked eye object brighter than magnitude 5 on that date. Great news for comet watchers - Comet Lemmon is currently brightening much faster than expected and it's now believed that it could peak as high as magnitude 2. That could be even brighter than the much hyped, but currently disappointing Comet PanSTARRS (C/2011 L4).

On January 1, 2013, the comet was at magnitude 8.4. Despite no visible tail, the comet displayed a 5 arcminute diffuse coma with a definite bright center. It continued to brighten by about 0.5 magnitudes a week and by the middle of January, Lemmon was up to magnitude 7.3 with a coma of the order of 7 to 8 arc minutes in diameter. On this date, the core had noticeably brightened with better definition. The coma appeared slightly elongated although still no tail. Since Comet Lemmon is brightening at such a nice rate it won't be long before it attains naked eye visibility, and by January 30, it was close to that scenario. With a magnitude of 6.2, the comet moved within easy binocular range. The coma on January 30 was up to 10 arc minutes in diameter with reports of a small tail visible in binoculars. In addition, Lemmon has a green look to it that's especially noticeable when imaged.

Peak magnitude should occur on or around March 21, when hopefully Lemmon will be as bright as magnitude 2.4. Perihelion then follows on March 24, when it will be 0.7313 AU (109.4 million kms) from the Sun.

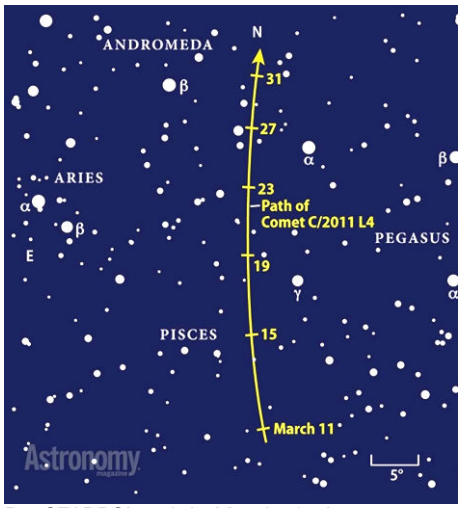
Ephemeris

Date	Right Ascension	Declination	Mag.	Distance from Earth (AU)
18 Mar	00h 09m 34s	-31d 36m 06s	2.6	1.393
19 Mar	00h 09m 39s	-30d 34m 02s	2.5	1.406
20 Mar	00h 09m 45s	-29d 32m 32s	2.5	1.418
21 Mar	00h 09m 49s	-28d 31m 35s	2.4	1.430
22 Mar	00h 09m 54s	-27d 31m 08s	2.5	1.442
23 Mar	00h 09m 58s	-26d 31m 11s	2.5	1.454
24 Mar	00h 10m 02s	-25d 31m 40s	2.6	1.466
25 Mar	00h 10m 05s	-24d 32m 36s	2.6	1.477
26 Mar	00h 10m 09s	-23d 33m 57s	2.6	1.488
27 Mar	00h 10m 13s	-22d 35m 40s	2.7	1.498
28 Mar	00h 10m 17s	-21d 37m 46s	2.7	1.509
29 Mar	00h 10m 21s	-20d 40m 14s	2.8	1.519
30 Mar	00h 10m 26s	-19d 43m 02s	2.9	1.529
31 Mar	00h 10m 31s	-18d 46m 09s	2.9	1.538

Comet PANSTARRS

A dazzling comet can ignite a viewer's passion better than almost any other celestial object. Those flames could burn bright this month for seasoned observers and novices alike — astronomers forecast Comet PANSTARRS (formal designation C/2011 L4) will glow brighter than any comet in the past six years. And for those in the Northern Hemisphere, this could be the brightest easy-to-view comet since the 1990s.

Researchers discovered this comet June 6, 2011, on images taken through the 1.8-meter Panoramic Survey Telescope and Rapid Response System (Pan-STARRS) on Haleakala in Hawaii. At the time, the object glowed dimly at 19th magnitude, but its time as an inconspicuous visitor from the distant Oort Cloud will soon be over.



PanSTARRS' path in March. © *Astronomy*

If predictions hold true — never a sure thing when it comes to comets making their first trip through the inner solar system — PANSTARRS will become a superb object when viewed through binoculars, and probably an impressive naked-eye sight. It could peak as bright as magnitude 0 during the first half of March, although some estimates now are a more conservative magnitude 3. The comet is a southern object during February, and pushes northward during March, and at midmonth it becomes visible in the evening sky for Northern Hemisphere observers (might be earlier for those of us in the tropics). If it reaches its predicted brightness, it may appear around March 6 or 7, although only a degree above the western horizon 30 minutes after sunset. Each following day, the comet climbs 1° to 2° higher, which dramatically improves its visibility. By the time it reaches perihelion (its closest approach to the Sun) March 9/10, Comet PANSTARRS lies 7° high in the west 30 minutes after sunset and could shine at magnitude 0. As dusk soaks up the Sun's rays and the sky darkens, the comet's ethereal tail may come into view.

From perihelion to the end of March, the comet moves almost due north through Pisces and Andromeda while its brightness drops by about a magnitude every five days. The tail of Comet PANSTARRS swings through 90°, turning from east to north. Depending on how much dust the comet produces, this could create a nice broad dust tail to go along with a finer, straighter gas tail.

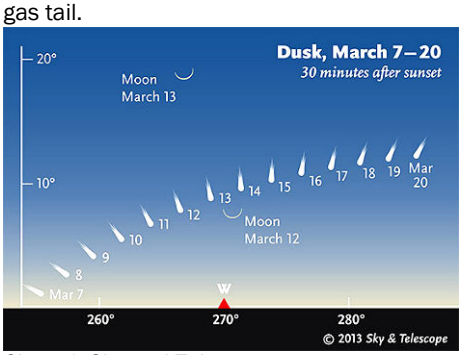


Chart © Sky and Telescope

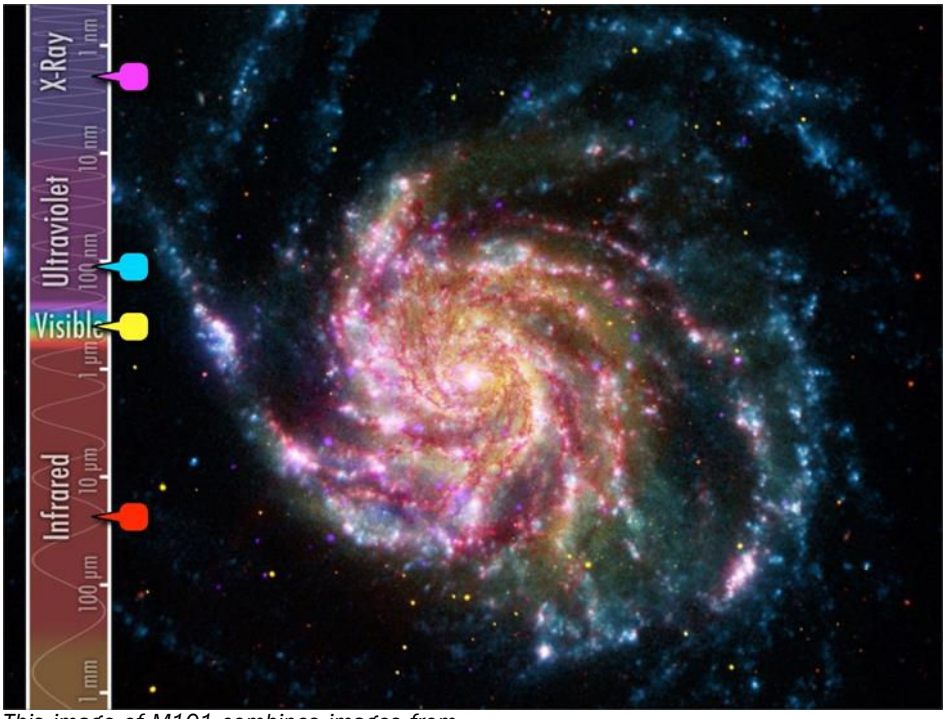
The comet should fade to 4th magnitude by early April, which would make the extended object visible only through binoculars or a telescope. It passes 2.5° west of the Andromeda Galaxy (M31) on the 3rd, then crosses into Cassiopeia on the 9th. - Richard Talcott, ASTRONOMY magazine

Using recent brightness estimates now coming from Southern Hemisphere observers, Seiichi Yoshida, editor of Weekly Information about Bright Comets, has changed his magnitude formula for Comet PanSTARRS. His new predicted light curve has the comet peaking at only magnitude +3 in early March. The slightly hyperbolic orbit of PanSTARRS indicates that it's a fresh comet from the outer Oort Cloud being warmed by the Sun for the first time. Such comets have quite a history of brightening early with the promise of great things to come, and then weakening after a thin, virgin coating of volatiles on the nucleus evaporates off.

The Art of Space Imagery

- Diane K. Fisher

When you see spectacular space images taken in infrared light by the Spitzer Space Telescope and other non-visible-light telescopes, you may wonder where those beautiful colors came from. After all, if the telescopes were recording infrared or ultraviolet light, we wouldn't see anything at all. So are the images "colorized" or "false colored"?



This image of M101 combines images from four different telescopes, each detecting a different part of the spectrum. Red indicates infrared information from Spitzer's 24-micron detector, and shows the cool dust in the galaxy. Yellow shows the visible starlight from the Hubble telescope. Cyan is ultraviolet light from the Galaxy Evolution Explorer space telescope, which shows the hottest and youngest stars. And magenta is X-ray energy detected by the Chandra X-ray Observatory, indicating incredibly hot activity, like accretion around black holes.

No, not really. The colors are translated. Just as a foreign language can be translated into our native language, an image made with light that falls outside the range of our seeing can be "translated" into colors we can see.

Scientists process these images so they can not only see them, but they can also tease out all sorts of information the light can reveal. For example, wisely done color translation can reveal relative temperatures of stars, dust, and gas in the images, and show fine structural details of galaxies and nebulae.

Spitzer's Infrared Array Camera (IRAC), for example, is a four-channel camera, meaning that it has four different detector arrays, each measuring light at one particular wavelength. Each image from each detector array resembles a grayscale image, because the entire detector array is responding to only one wavelength of light. However, the relative brightness will vary across the array.

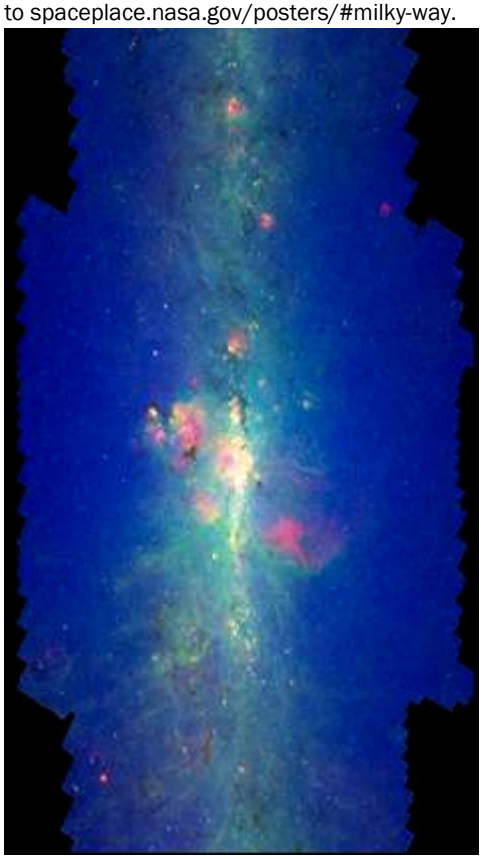
So, starting with one detector array, the first step is to determine what is the brightest thing and the darkest thing in the image. Software is used to pick out this dynamic range and to re-compute the value of each pixel. This process produces a grey-scale image. At the end of this process, for Spitzer, we will have four grayscale images, one for each for the four IRAC detectors.

Matter of different temperatures emit different wavelengths of light. A cool object emits longer wavelengths (lower energies) of light than a warmer object. So, for each scene, we will see four grayscale images, each of them different.

Normally, the three primary colors are assigned to these gray-scale images based on the order they appear in the spectrum, with blue assigned to the shortest wavelength, and red to the longest.

In the case of Spitzer, with four wavelengths to represent, a secondary color is chosen, such as yellow. So images that combine all four of the IRAC's infrared detectors are remapped into red, yellow, green, and blue wavelengths in the visible part of the spectrum.

Download a new Spitzer poster of the center of the Milky Way (*see below*). On the back is a more complete and colorfully-illustrated explanation of the "art of space imagery." Go to spaceplace.nasa.gov/posters/#milky-way.



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