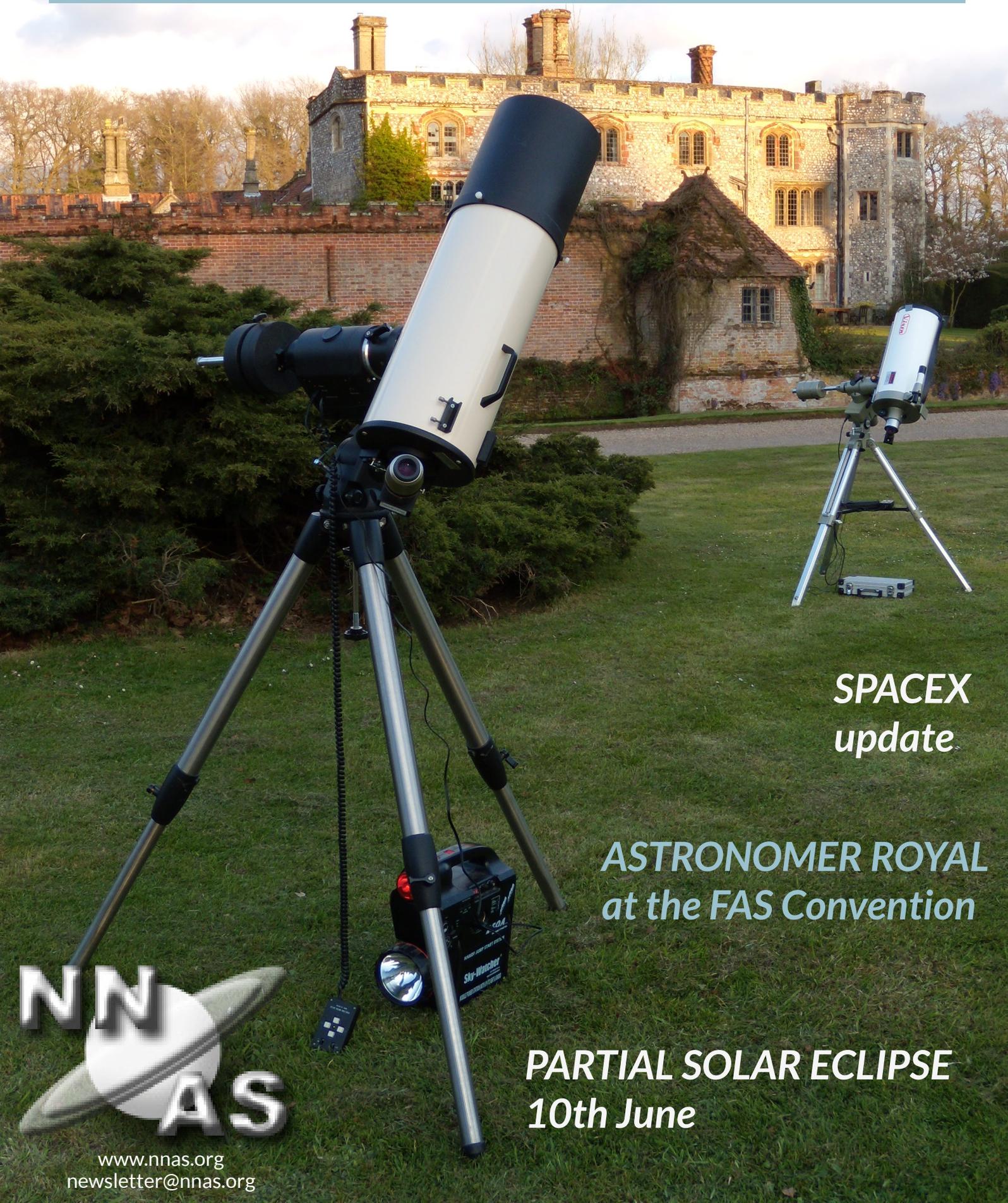


NORTH STAR



*SPACEX
update*

*ASTRONOMER ROYAL
at the FAS Convention*

*PARTIAL SOLAR ECLIPSE
10th June*



Welcome

Are we finally looking at a return to some form of normality? With lockdown progressively easing and a larger society membership we have good reason to be optimistic.

The observatory is now back in action on Friday evenings. It will also be open on the 10th June for the partial solar eclipse; an excellent opportunity to use specialist equipment to view the Sun safely and to see the observatory and meet other members in daylight.

With planned work parties, a 'Welcome Back' social in July and some outreach being discussed for later in the year, events are beginning to re-appear in the online diary. 

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'Earth is the cradle of humanity, but one cannot remain in the cradle forever.'

Konstantin Tsiolkovski, Russian rocket scientist 1895

Cover image: Society telescopes set up and ready for an outreach event at Mannington Hall. April 2019

Things to See

The 1st June heralds the beginning of meteorological summer but astronomical summer does not begin until we reach the 21st June. This is the summer solstice, when our North Pole is at its maximum tilt towards the Sun. Our day has the longest amount of daylight and around this time the sky never gets really dark, a form of twilight persists all night. This is not good news for stargazing as it can be difficult to see the fainter stars and even some constellations.

The Moon



June's full Moon is the 'Strawberry Moon', which occurs on the 24th. In fact it is another supermoon hence 'Super Strawberry Moon'. This follows the full Moons of April and May that were also defined as supermoons and it is quite common, just like buses, for three super moons to come along in a row.

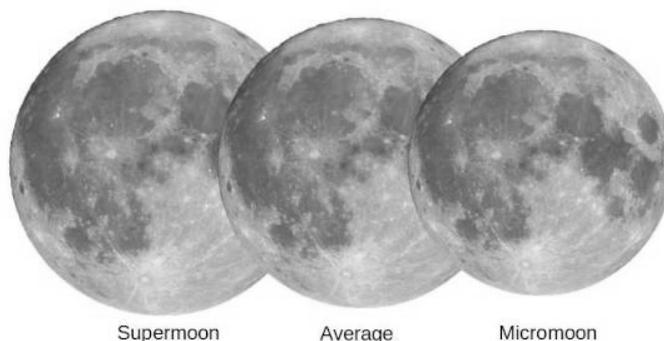
Over the years, different cultures have given names to full Moons that reflect their way of life. Many of the names we use come to us from native North American culture and to those natives; June was the month to harvest strawberries.

Europeans have called it the 'Rose Moon' whilst some cultures mark the beginning of summer heat with the name 'Hot Moon'.

Supermoon is a term used when the full Moon's centre is less than 360,000km (223,704 miles) from the centre of Earth. The point in the Moon's elliptical orbit that is closest to Earth is known as perigee whereas the furthest point is apogee.

There is a lovely term used to describe when our Earth, the Sun and Moon lie in approximately a straight line and that is syzygy. So our supermoon could be described as a perigee syzygy full Moon! [*I think I will stick to supermoon!*]

A full Moon occurring at apogee is called a micromoon. A supermoon will look up to 14% bigger and be 30% brighter than a micro moon.



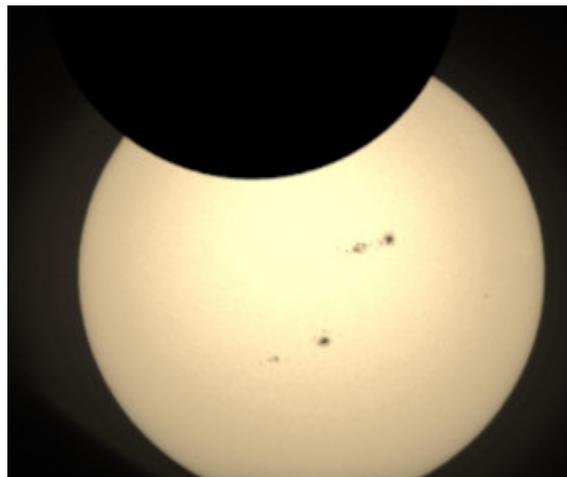
Partial Solar Eclipse

It is purely coincidental, that seen from Earth, the width of the Sun is about 400 times greater than the width of the Moon and the Moon just happens to be 400 times closer to Earth. This means we see the Sun and Moon as roughly the same size in the sky. It also means the Moon can, under certain conditions, completely cover the Sun treating parts of Earth to a total solar eclipse.

As we have seen above, the actual size we see the Moon depends on where it lies on its elliptical orbit. If a solar eclipse occurs when the Moon is further from the Earth, it may not fully cover the Sun leaving a bright ring around the Moon's silhouette. This is an **annular** solar eclipse and one will occur on June 10th.



Annular Solar Eclipse
Image Credit: Smrgeog. CC BY-SA 3.0



*My guess at the partial eclipse we will see.
Image of the Sun by John Consadine NNAS
showing two pairs of sunspots*

Unfortunately, for us, this will only be seen from northeast Canada to eastern Siberia, whereas we will experience a partial solar eclipse with the Moon covering 20% of the Sun at around 11am.

There are only two solar eclipses in 2021, the second occurring on the 4th December over the Southern Ocean so you had better make the most of the partial eclipse on the 10th!

Why not visit the observatory at Green Farm on the 10th where safe viewing will be organised - see Society News.

[NEVER look directly at the Sun, even if wearing sunglasses and especially using a telescope or binoculars. You could be blinded permanently.]

Noctilucent Clouds

Something you can look out for during summer nights are the ghostly, electric-blue apparitions known as noctilucent clouds.

often with interwoven streaks, ripples or waves against a partly lit background sky in the sunlit portion of the Earth's atmosphere.



*NASA - Noctilucent Clouds near Edmonton, Alberta Canada.
Credits: Courtesy of Dave Hughes*

These clouds are the highest in Earth's atmosphere and are located in the mesosphere around 80km (50 miles) up.

They shine at night by reflecting sunlight long after the Sun has set (typically to 6-16 degrees below the horizon). In fact, 'noctilucent' means night shining; they are too faint to be seen in daylight.

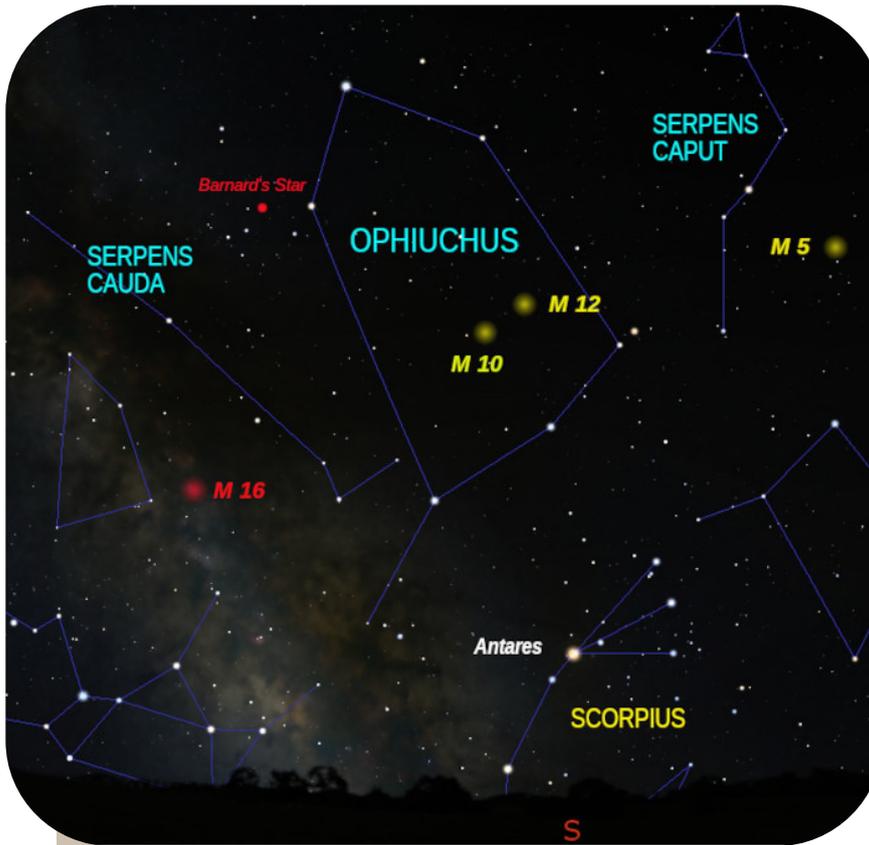
They form over the Earth's poles and are most often seen by those living between latitudes of 50 and 70 degrees north from May to August.

They are made of tiny water-ice crystals frozen onto a dust core. Appearing pearly white or silver-blue

First noticed in 1885, a little after Krakatoa erupted, they may be caused by volcanic dust or from bits of cosmic dust drifting down into our atmosphere.

Noctilucent clouds are only visible during summer nights for around 4 to 6 weeks either side of the solstice. You will need to look towards the north to see any. 

Constellations - Scorpius, Ophiuchus and Serpens



Above Antares is the constellation Ophiuchus (the Serpent Bearer) which covers a large expanse of sky (2.5 hand-spans wide and 3 hand-spans deep) and includes many interesting objects.

Ophiuchus stands on the head of Scorpius and is surrounded by the constellation Serpens (the Serpent).

June and July are also the best times to see the constellation Scorpius but you will need a good view of the southern horizon.

This is another constellation that looks like what it represents but, unfortunately for us, the tail and sting of the scorpion remain below our horizon.

What you can see is the red super giant Antares ('Rival of Mars') which has been described as the heart of the scorpion.

Serpens is the only constellation divided into two parts, separated by Ophiuchus who holds the serpent's head (Serpens Caput) in his left hand and its tail (Serpens Cauda) in his right.

Ophiuchus and Serpens Cauda are often overlooked but each contains an object that gave new insights to the workings of the Universe: Barnard's Star and the Eagle Nebula (with its amazing columns of dust and gas known as the 'Pillars of Creation').

Barnard's Star

In Ophiuchus is a feeble red dwarf star known as Barnard's Star. At 5.9 light-years away it is the nearest star to the Sun after the three components of the Alpha Centauri system.

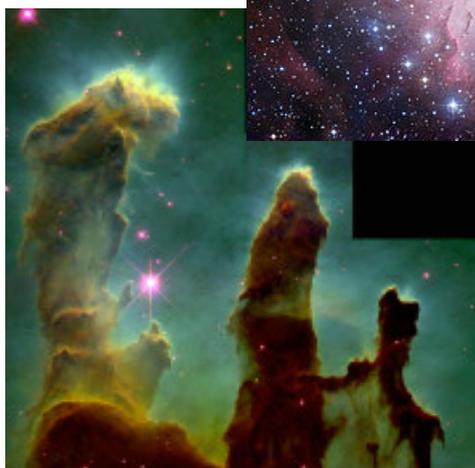
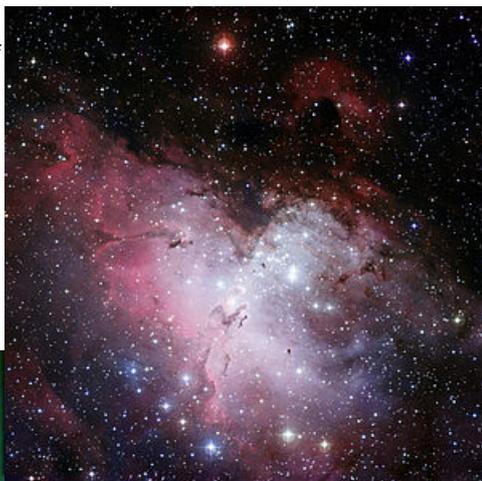
Discovered in 1916 by the American astronomer Edward E Barnard, it is one of the most studied red dwarfs due to its proximity and location.

Barnard measured its movement across the sky and found this star has the greatest 'proper motion' of any known star. In around 190 years, this star will move against its background by a distance equal to the apparent width of the full Moon. At magnitude 9.5, it is invisible to the unaided eye.

The Eagle Nebula (M16)

Three colour composite mosaic of the **Eagle Nebula**.

Image Credit: ESO



Pillars of Creation
Credits: NASA, Jeff Hester and Paul Scowen
Arizona State University

Public Domain

This combination of a nebula and a young open cluster of stars have a dark dust silhouette at the centre giving rise to its name.

This is one of the great star-making areas and was made famous by the spectacular image captured by the Hubble Space Telescope known as the 'Pillar of Creation'. These pillars of gas and dust contain several active star-forming regions.

Lying in Serpens Cauda, some 7,000 light-years away you will need an 8" (200mm) telescope to really appreciate this stunning nebular. Smaller telescopes will present an enjoyable view.

Globular Clusters

Ophiuchus is the 11th - largest constellation and contains a large, empty looking patch of sky. Scanning this with binoculars should reveal several good globular star clusters for example M10 and M12, and open clusters like IC4665, which is a large open cluster of 30 stars or more.

In Serpens Caput, the main star, Alpha Serpentis (Unukalhai) is a red giant 15 times larger than our Sun. here is also a very fine globular cluster, easily viewed with binoculars or a small telescope. M5 is one of the largest and oldest globular clusters known.



M5

Image Credit: ESA/Hubble & NASA

Sitting 24,500 light-years away with a width of some 165 light-years it is believed to contain 100,000 stars.

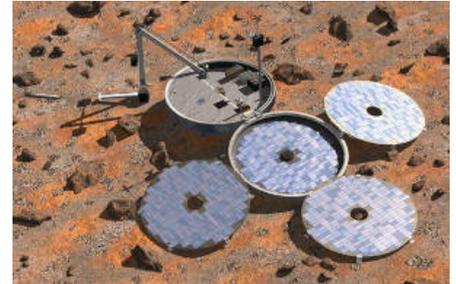


Star Stories

This month in history

On the 3rd June 1965, US astronaut Edward White (1930-1967) left his Gemini 4 spacecraft for 20 minutes to become the first man to 'walk' in space.

On the 3rd June 2003, Beagle 2, the UK's first Mars probe was launched from the Baikonur Cosmodrome. This was part of the European Space Agency's Mars Express programme. The probe was named after the ship in which the naturalist Charles Darwin travelled. Nothing was heard from the probe once it landed on Mars 6 months later. It was designed to bounce on landing and it seems likely it was disabled by hitting the wall of a crater.



Artist's impression of Beagle 2 lander.
Image Credit: ESA/Denman productions

US rocket pioneer Werner von Braun died on the 16th June 1977.



Valentina Tereshkova Credit: NASA

On the 16th June 1963, Valentina Tereshkova (born 1937) took part in the USSR's Vostok 6 mission to become the first woman in space. Two decades later, Sally Ride (born 1951) went into space onboard the space shuttle Challenger to become USA's first female astronaut on the 18th June 1983.

On the 25th June 1967, the first worldwide satellite programme, Our World, was broadcast.

Considerable damage was done to the Russian space station Mir, when a Progress-M ferry being used for a remote piloting test crashed with it on the 25th June 1997.

The 30th June 1954 saw a total eclipse of the Sun visible in North America, Europe and Asia.

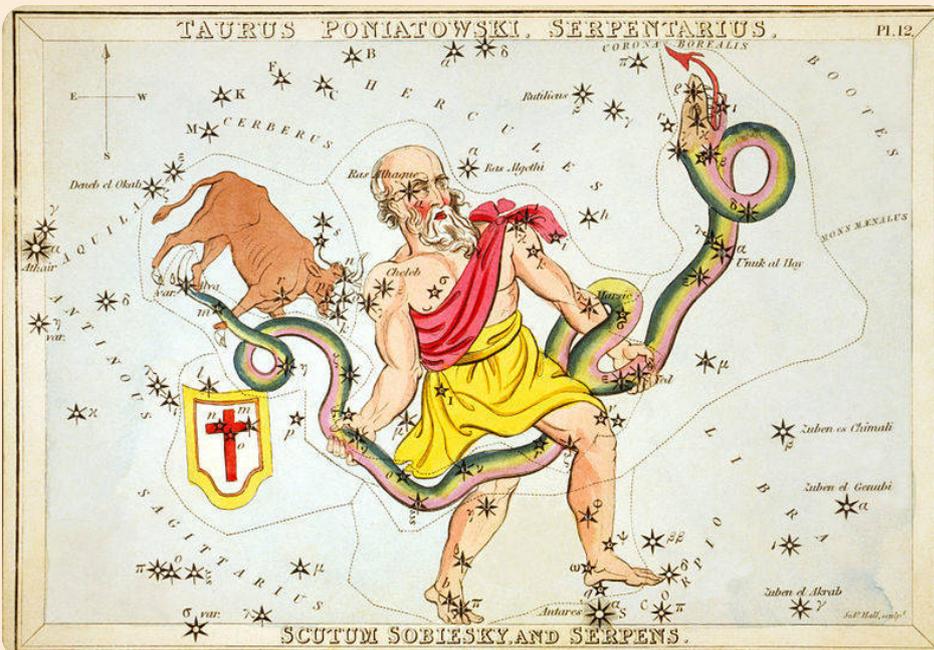
After appearing to land safely on the 30th June 1971, the three crew members of the Soviet space mission Soyuz 11 were found dead following a sudden drop in cabin pressure. This prompted an extensive redesign of the Soyuz spacecraft.



Soyuz 4 and Soyuz 5 docked together.
Card 31 in the series 'The Race Into Space'
issued with Brooke Bond tea 1971

Mythology of Ophiuchus

Ophiuchus is usually identified with Asclepius, the god of medicine.



Urania's Mirror
1825.
Creative
Commons
Attribution 3.0
Public Domain

He was reared by the wise Centaur Cheiron, who taught him the arts of medicine. In time Asclepius had children, including several daughters, who were all associated with aspects of healing.

One was Hygeia who was the personification of health. It has been said that he learnt of the healing powers of plants from a snake. He became such a good healer he could even bring the dead back to life.

This was seen as very bad for business by Hades who ruled the Underworld and the souls of the dead.

Hades complained to his brother Zeus and persuaded him to kill Asclepius, which he duly did with a thunderbolt.

Zeus then placed Asclepius amongst the stars as the constellation we know as Ophiuchus along with Serpens, his snake.

The image above actually shows the constellation known as *Taurus Poniatowski* which was invented in 1777, by a former rector of Vilnius University to honour Stanislaus Poniatowski, King of Poland. The bull feature was part of the family's coat of arms.

It consists of stars now considered part of Ophiuchus and Aquila and is no longer in use. 

FAS convention – Martin Rees - Astronomer Royal



Martin Rees's talk to the FAS convention continued by examining the case for life in the universe. He stated he got numerous letters from people wondering why he didn't believe in aliens. He

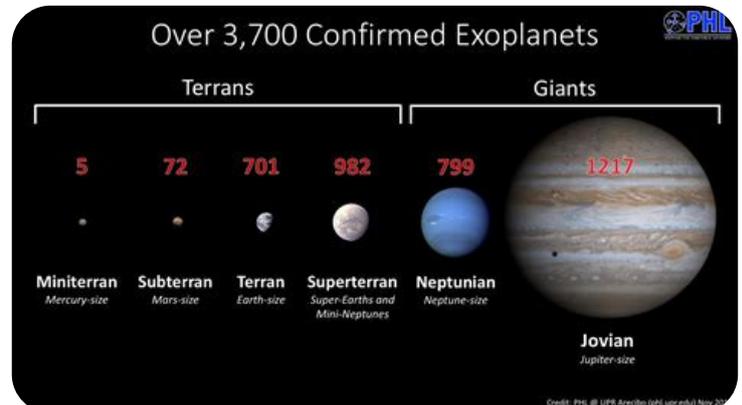
replied that having made a huge effort to traverse interstellar space he wondered why aliens would only meet a few cranks and make some corn circles before going away again. He tells these people to write to each other, not to him.

Nonetheless, the question of life in space is one of the most important in science. Currently missions are looking for evidence on Mars, and in the next few decades will be examining Europa and Enceladus. Both are believed to have liquid water oceans below an icy surface. What has really transformed this scenario in the last twenty five years is the realisation that most of the stars in the sky have orbiting planets. One in six of those is an Earth like planet.

These exoplanets were discovered by observing the small wobble in the parent sun as a large planet orbited round it, and also by the drop in light levels as a planet passed in front. If you were viewing our sun from some distance its brightness would drop by one part in ten thousand when the Earth past in front of it. By these methods you can determine the size of the planet and the length of its year.

Many thousands of planets have been discovered and most by NASA's Kepler mission, which looked at an area of sky about seven degrees across, and measured the brightness of 150 thousand stars, looking for brightness dips.

At the moment we can only view the Exoplanet shadows, but future telescopes such as the European Extremely Large telescope in Chile, and NASA's James Webb Space Telescope, may be able to see actual planets.



If aliens were looking at our solar system from about 50 light years away with a big telescope, then they would see the Earth as a pale blue dot very close to the Sun. But they could learn quite a bit about it. The shade of blue would be slightly different depending on which face of the Earth was towards them, the land mass of Asia or the Pacific ocean. They could determine the length of the day, that there were continents and oceans, and something of the atmosphere. Chlorophyll could be detected indicating vegetation.

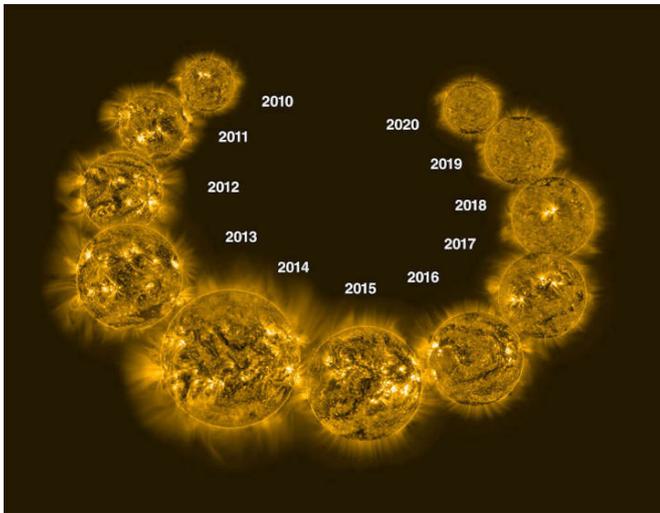
But Martin Rees said that we don't yet understand the origin of life, what makes life burst into existence, and whether it was a fluke here on Earth or might be common everywhere. He showed a close-up picture of a flea and stated that there was more complexity in a flea than in stars and galaxies. Exobiology will become a serious part of astronomy, and a complicated but a fascinating subject.

(Next month: Martin Rees explains the life and death of stars.)



Solar Cycle 25

Our Sun is now well into a new cycle of activity, officially known as Solar Cycle 25.



Credit: Dan Seaton/ESA. Image Collage by NOAA/JPL-Caltech

The image above shows the evolution of the Sun in extreme UV light from 2010 to 2020. The solar activity cycle is an approximate 11-year cycle, which passes from calm, with minimal sunspots, to stormy, with maximum sunspots and back again to calm to mark the start of the next cycle.

The rotation and convection of the charged particles that make up the Sun's hot gases generates a complex magnetic field. It is this field that energises and controls violent outbursts of material and radiation on the Sun, such as solar flares and coronal mass ejections. These increase at the solar maximum and the magnetic fields, radiation and high energy particles ejected from the Sun wash around the Earth. This "space weather" can cause problems for power grids, communications, GPS, satellites, airlines, rockets, astronauts and even migratory birds.

To help reduce the risk to our modern technology, both on Earth and in near space, we need to be able to forecast these events in time to take protective action.

This is currently achieved by using computer modelling to predict when an observed outburst on the Sun will reach Earth. Unfortunately, this approach fails to give us enough time to react.

December 2019 marked a solar minimum and the end of Cycle 24, which proved to be an historic under-performer: the fourth smallest cycle on record and the weakest in 100 years. We are now into Cycle 25, which should reach a maximum of activity in July 2025.

The Solar Cycle 25 Prediction Panel, using solar physics modelling, has predicted cycle 25 will be another weak one as well. But, will it! Some scientists say this cycle will break the trend of decreasing solar activity, suggesting more active future cycles.

ESA's Solar Orbiter is on a 10 year mission to look more closely at the Sun and especially the polar fields from a high orbit which will, hopefully, provide more insight.

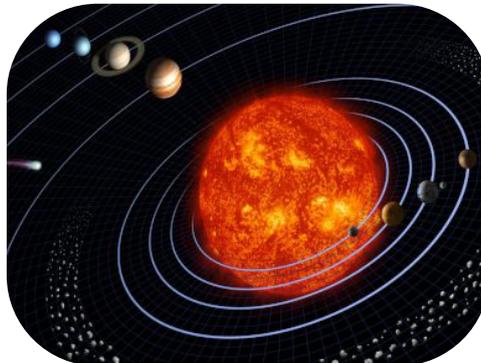
The Solar Orbiter captured a massive eruption on the Sun's surface for the first time on the 19th May 2021 



Artist's impression of the Solar Orbiter observing an eruption on the Sun. Image Credits ESA/AOES

Quiz for the young astronomer - The Solar System

1. Our nearest star is:
 - A Polaris
 - B The Sun
 - C Sirius
2. What is Earth's closest neighbour?
 - A Mars
 - B Venus
 - C The Moon
3. What do we call the event when our Moon hides the Sun?
4. Which planet is closest to the Sun?
 - A Mercury
 - B Venus
 - C Mars
5. Which planet is hottest?
 - A Mercury
 - B Venus
 - C Mars
6. Which planet is smallest?
 - A Earth
 - B Mars
 - C Mercury
7. Which planet is largest?
 - A Neptune
 - B Uranus
 - C Jupiter
8. Where is the largest volcano in the Solar System?
 - A Jupiter
 - B Earth
 - C Mars
9. What is the proper name for a shooting star and what do you call one that lands on Earth?
 - A Asteroid
 - B Meteor
 - C Comet
 - D Meteorite
 - E Asterite
10. How old is the Sun?
 - A Very young
 - B Middle aged
 - C Elderly
11. The surface of the Sun is how many times hotter than boiling water?
 - A 10
 - B 60
 - C 90
12. Which way does a comet's gas tail always point?
13. What colour is Mars and what colour is Neptune?
 - A Blue
 - B Red
 - C Yellow
 - D Green
14. Jupiter is very...
 - A Hot
 - B Small
 - C Stormy
15. Nights on Mercury are...
 - A Bitterly cold
 - B Extremely hot
 - C Very stormy



Solar System illustration courtesy NASA/JPL

Answers

1B, 2C, 3Solar Eclipse, 4A, 5B, 6C, 7C, 8C, 9B and D, 10B, 11B, 12Away from the Sun, 13B and A, 14C, 15A

Voyager 1 still making discoveries



This 40 year old probe is now a staggering 14 billion miles from Earth. It still has 70% of its plutonium energy source and remains in touch although its signals take 20 hours – and it is still allowing discoveries to be made.

In 2013, it officially became the first human-made object to venture into interstellar space by leaving our solar bubble or heliosphere on the 25th August 2012 at a distance of 121 AU (18 billion km or 11 billion miles) from the Sun.

Since 2012, it has been a challenge to distinguish between the ionised gas (plasma) streaming from our Sun and the material ejected by nearby giant stars millions of years ago. However, from late August 2012 Voyager 1 recorded a sharp drop in protons from the Sun from 25 per second to just 2 per second by early October.

In 2017 Voyager 1 first spotted faint, persistent vibrations of plasma as well as the massive annual vibrations from solar flares.

Now, travelling in the sparse collection of atoms that fill interstellar space, it has been able to measure the long-lasting series of waves and scientists can use their frequency of vibration to infer the density of the interstellar medium revealing more about its structure.

Model of Voyager 1
Image Credit: NASA - Public Domain



Heliosphere: a theoretical boundary where the Sun's solar wind no longer has the strength to push away the stellar winds from surrounding stars. This is where the interstellar medium and solar wind pressures balance.

Space X Update

There have been a number of Falcon 9 launches recently. On the 23/4/21 a Falcon 9 put Crew Dragon 2, with four astronauts, in to LEO (Low Earth Orbit) to rendezvous with ISS with a successful docking the following day. Together with Crew 1 this made a total of 11 on board ISS. This was the first time two Crew Dragons had been docked on the station.

On May 2nd the Crew Dragon 1 undocked with the four astronauts who had spent the last 167 day in space. Six hours later they parachuted down into the sea.

NASA astronauts Shannon Walker, left, Victor Glover, Mike Hopkins, and Japan Aerospace Exploration Agency (JAXA) astronaut Soichi Noguchi, right are seen inside the SpaceX Crew Dragon Resilience spacecraft onboard the SpaceX GO Navigator recovery ship shortly after landing in the Gulf of Mexico off the coast of Panama City, Florida, at 2:56 a.m. EDT May 2, 2021.
Credits: NASA/Bill Ingalls



Credits: NASA/Bill Ingalls

A Starlink launch took place on 29th April putting another 60 satellites up with another booster recovery (7th flight for this one) on to the drone ship “Just read the instructions”. This was the 74th successful launch and recovery of a Falcon 9 booster.

There was a further Falcon 9 Starlink launches on 4th May & 10th. On this launch the booster had flown a record 10 times.

There are also Falcon 9 launches scheduled for the May 15th, June 1st, 3rd and 17th.

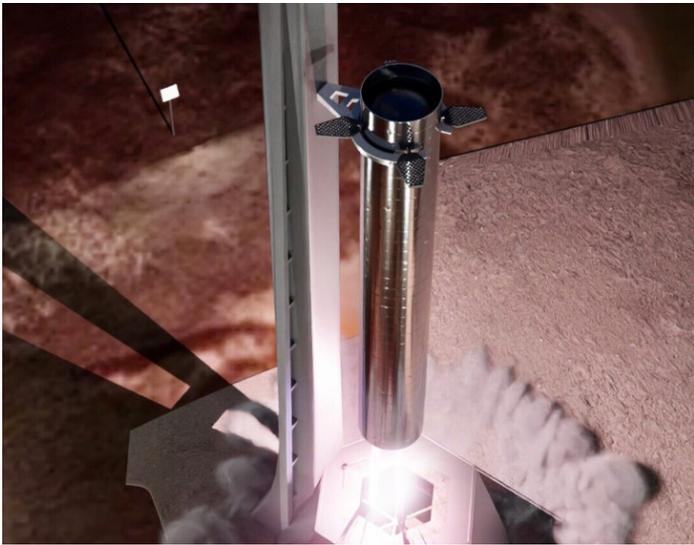
So what is happening at Boca Chita or Starbase as SpaceX are now calling it?

After SpaceX was awarded the contract to provide the Lunar Lander for NASA, the rival companies Blue Orion & Dynetics, have put in a protest basically saying they have put all their eggs in one basket. NASA has 100 days to come to a decision. If you look at Blue Orion & Dynetics proposals they look dated and would not look out of place back in the 1960's!

In the meantime NASA has awarded a \$50 million contract to SpaceX for them to look into the feasibility of in orbit refuelling. That says a lot!

For a few months now “Starbase” has been a building site as SpaceX prepare for the proposed Orbital flight in July. They are creating a new tank farm with eight storage tanks GSE (Ground Support Equipment). These are nine metres in diameter and around 35 metres tall they are made by the same process that is used for Starship.

The tanks will contain LOX (Liquid Oxygen), Liquid Methane, Nitrogen, Helium and Water. There should be enough for two fully stacked launches. Also they are constructing the launch platform and the Orbital Integration Tower; this will be used to stack the Starship onto the Super Heavy Booster. To do this it will need to be around 140m tall, the highest thing for 100's of miles. To cut down the weight on the Super Heavy Booster, SpaceX are planning to not have landing legs. They are going to catch the booster with extended arms on the Integration Tower. Crazy or what?



TeslaRati

On May 5th Starship SN15 was launched from Starbase. It flew to 10km and performed a hover before executing the belly flop manoeuvre. It drifted back down and at about 500m had a two engine burn that put it in vertical which resulted in soft landing. There was a fire after landing but after a while it went out. This was the first 100% successful flight of Starship which is a significant step towards humans returning to the Moon and later travelling to Mars.

The link is a 2 minute video of the launch and landing.

<https://www.bbc.co.uk/news/science-environment-57004604.amp>

SN15 was lifted back on sub orbital launch pad B. Space X are now getting it ready for a landmark second flight. This will demonstrate the reusability of the craft and show the competition what they are up against. SN 17 has now been scrapped along with BN1 and BN2.

The FAA (Federal Aviation Administration) has approved the proposed flight plan for the fully stacked Starship which is scheduled to fly on July 1st.

The launch will be at Starbase with the booster separating about 2 minutes into flight and will soft land about 50 miles down range in the sea to be recovered. Meanwhile the first stage, Starship, will continue up into orbit and travel for about 90 min in LEO before re entry and a soft landing in the sea near Hawaii.

As always with Space X, things move quickly so watch this space. 

Keith Jones

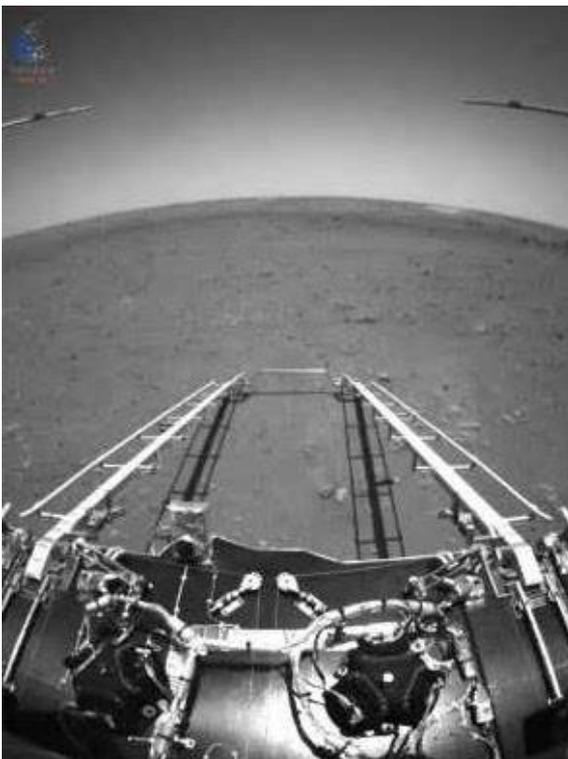
China's Rover Lands

China has become the third country, after the US and Soviet Union, to land a rover on Mars.

The Zhurong Mars rover was in orbit aboard the Tiawen-1 spacecraft since February. It reached the surface on the 14th May protected inside the lander employing a heat shield, parachute and small thrusters

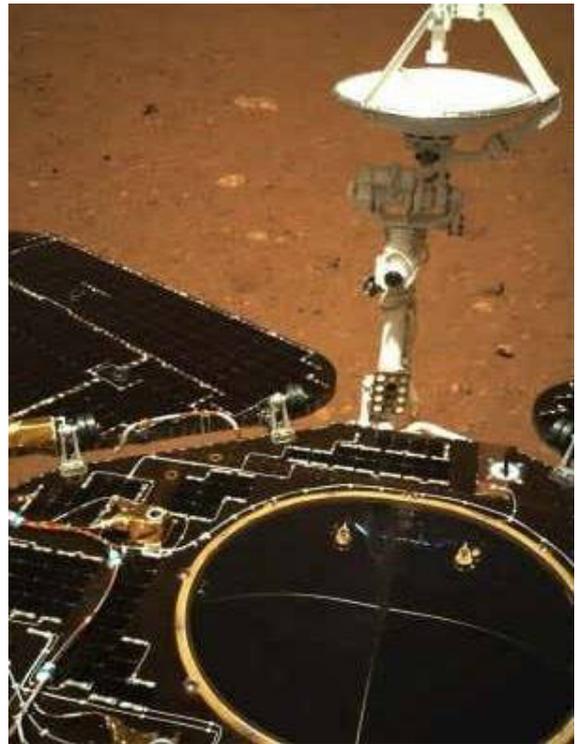
The lander has now extended its ramp down which the rover will rollout.

Landing in the Utopia Planitia region, it will study the geological structure of Mars using cameras, ground-penetrating radar, magnetic field detector, weather station along with chemical analysis of dust and rocks. 



The landing platform

Image Credit: China National Space Administration



The rover

Image Credit: China National Space Administration

Society News

It may not feel like it but summer is here with long days and very short nights, in fact it doesn't get dark until 11pm now.

Soon we will enter the summer twilight period with no dark skies at all.

So its time to service equipment and plan for the return of shorter days in August.

Two years ago we had a donation of an 8inch Orion Schmidt Newtonian telescope (Newtonian telescope with a glass corrector plate at the front) but with no model number on it we weren't sure what it was. However, it is very well built, but the focuser is unusable.

Being old we took it Altair Astro to see if they thought it worth putting a new focuser on. To our surprise they got very excited when they saw it; apparently it is an F4 imaging scope (GPX200) with very good optics (F4 will give a wider field of view). Altair are going to fit a new focuser and service the telescope for us. I'm really looking forward to testing it out when we get it back.

It just goes to show that you can't write-off old equipment and bargains can be found if you are on a tight budget and looking to buy a telescope.

We had another unexpected donation this month of a very nice 5 inch refractor telescope and mount from the Rev Ian Terry. This is a lovely piece of kit and will be available for members to use. We have sent a letter of thanks and an invite for him to visit the observatory.

Committee meeting.

We had the May committee meeting on the 23rd. This was a very positive meeting and we were able to welcome Keith Jones as a new committee member. Andrew Gorton has also returned to the committee. Several future events were discussed and it feels like we are finally looking to some form of normality. Work parties are planned for Sunday mornings at the observatory.

Events

There are two initial events: the partial Solar eclipse on the 10th June and the 'Welcome Back' evening at Binham village hall on the 1st July.

Partial Solar Eclipse.

Viewing of this will take place on Thursday 10th June at the observatory, the eclipse starts at 10am and lasts for 2 hours peaking at 11am. We will have our Solar Scope set up for safe viewing and other members will bring there own equipment. **All members are welcome to attend.**

'Welcome Back' event.

If the covid restrictions are lifted this will take place on Thursday 1st July at Binham Village hall starting at 7.30pm and finishing at 10pm.

All members are welcome to attend and there will be a running presentation showing what the society has been doing during the last year with equipment there to look at and discuss.

It will be great if you can attend - this will be a golden opportunity to meet fellow members. Now that we have a larger membership we want to know if a regular meeting like this would be of interest to you. Refreshments will be available.

Green Farm observatory (GFO)

We are there Friday evenings at 8pm weather permitting; you are welcome to pop along and if clear, viewing will take place.

We have had some of our new family members at the GFO for inductions over the past few weeks, great to have some younger members, hopefully the next generation of astronomers.

Workshops

We have continued with the workshops but have been limited by social distancing rules, hopefully these will be relaxed in June.

There has been interest put forward to have a workshop on photographing nightscapes with DSLR cameras. We will add this to the online list. During the summer months this will be a good subject and we can arrange to meet at given locations to photograph a range of subjects. Please sign up if interested.

Imaging

The main imaging season is over due to the lack of dark skies.

This leaves us with solar system objects until late August.

Hopefully there will be an opportunity to take images of the solar eclipse in June.

Martin Boddy

Members Gallery

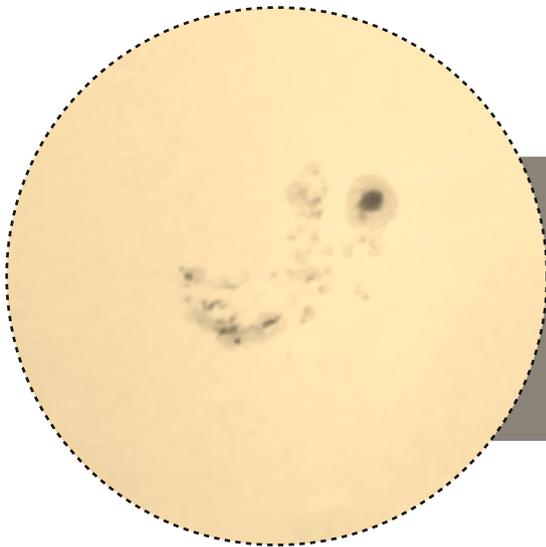
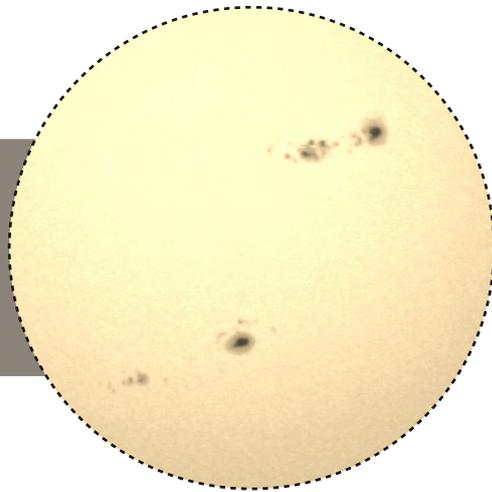


Iris Nebular NGC7023 (Caldwell 4), a bright reflection nebula in Cepheus 1,300 light-years away and 6 light-years wide.

Image: Brian Fry, NNAS taken with an Altair 110ed-r refractor.

Pair of sunspots captured in October 2013

Image: John Consadine, NNAS using a Celestron Nexstar 125 MAK with homemade solar filter made from Baader Solar Film.



Sunspots captured in November 2013

Image: John Consadine, NNAS using a Celestron Nexstar 125 MAK using homemade solar filter made from Baader Solar Film.

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