Clydesdale astronomical society

Orion

Issue 146
Jan 2021

Email: clydesdaleastro@hotmail.co.uk
Web: www.clydesdaleastro.org.uk

The Committee:

Alice-Amanda Kay - (Chairman/Meetings/PR)
Allison Dunlop (Librarian)
Robert McFetridge (Secretary)
Gordon McKay (Observing)
Lyn Smith (Newsletter)
Dave Stephens (Treasurer)
Janice Stephens

Picture Left

Southern constellation Vela, supernova remnant, 50 light years across and about 800 light years distant

From the Chairman/Society News

I hope you all had a lovely Christmas Day, and I would like to wish everyone a Happy New Year.
Our Zoom meetings have lifted spirits during this pandemic and our membership has risen due to having our meetings online. Our ranks have been swelled by associate members from further afield as travel is no longer a barrier and so I would like to give them a special welcome. Our next Zoom webinar is on the 11th of January, "Astronomy Fun Quiz and Virtual Party". Then, on the 25th of January, we have Dr Steve Barrett, from Liverpool University, whose presentation is entitled, "Legacy of the Hubble Space Telescope".
Keep safe and well.

Next Meeting

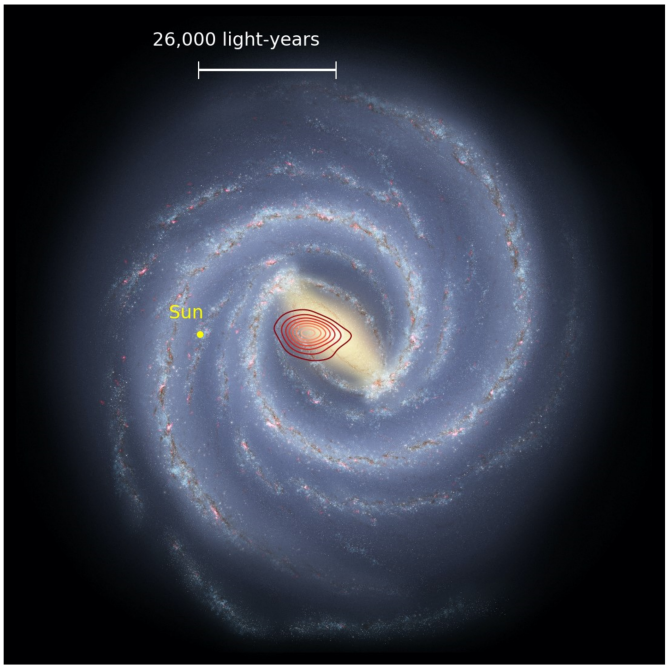
Monday 11th January 2021 at 7.30 pm

CAS Zoom Webinar + Q & A Session

"Astronomy Fun Quiz & Virtual Party"

ESA Exo-Planet Mission

ARIEL (Atmospheric Remote-sensing Infrared Exoplanet Large-survey) mission is planned for launch in 2029 to examine the chemistry of exo-planet atmospheres.
The mission will have a duration of 4 years and operate in the visible and near infrared wavelengths. Payload mass will be 330 kg (660 lbs).



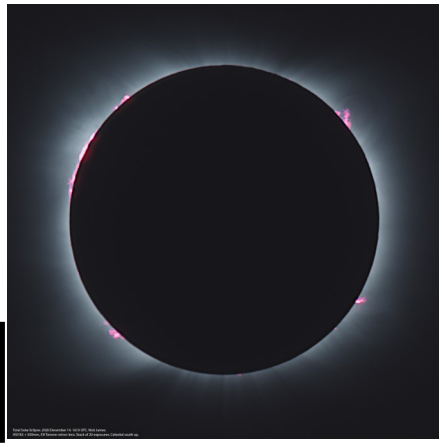
"Fossil Galaxy" Found

Data from the Sloan Digital Sky Surveys' Apache Point Observatory has revealed a "fossil galaxy" hidden in the depths of our own galaxy, the Milky Way. This remnant is what is left of another galaxy that may have collided with the Milky Way 10 billion years ago, when our galaxy was still young. This remnant accounts for about one-third of the Milky Way's spherical halo. This analysis has only recently been possible as many stars are hidden to us by dust but APOGEE can pierce the dust lanes and see deeper into the heart of our galaxy.

Artists Impression (left) Danny Horta-Darrington (Liverpool John Moores University), NASA/JPL-Caltech, and SDSS

The Night Sky—January

The Sun is waking up as solar cycle 25 gets into gear so don't forget to do some solar observing and see sunspot groups rotate across the disc. Don't forget to always project the solar image or use a solar filter on your telescope/binoculars and NEVER look directly at the Sun.
The nights of 2nd/3rd and 3rd/4th January will be the best time to see the Quadrantids meteor shower which emanate from a point in the sky between the constellations of Draco, Bootes, Ursa Major and Hercules.
Mercury is close to the setting Sun at the start of the month but after the 7th can be found close to Jupiter and Saturn. Greatest elongation occurs on the 24th. Venus remains a morning object rising 90 minutes before the Sun at the start of the month but only 26 minutes by the end of January. Mars is in the constellations of Pisces and Aries and will be just north of Uranus on the 20th. Best time to view is the 1st at 19.00 UT when it is located at its highest point and due south. Jupiter and Saturn are receding into the sunset at low altitude but still visible for observation. Uranus and Neptune are also visible in the south and south, south-west.



South American total solar eclipse of 2020 December 14th imaged by Nick James , The British Astronomical Association

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Feb 2021

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Picture Left
The Orion B molecular cloud about 1,350 light years away Hubble Space Telescope

From the Chairman/Society News

It was great to see so many of you on our 25th January Zoom meeting for Dr Steve Barrett and his excellent presentation on the Hubble Space Telescope.
Our next Zoom webinar is on the 8th of February when David Ramshaw will talk about Special Relativity, explained for the amateur astronomer, with practical applications in astronomy. Then on the 22nd of February, we have Paul Money, whose presentation is entitled "Why Are There No Green Stars?" Keep safe and well.

Next Meeting

Monday 8th February 2021 at 7.30 pm

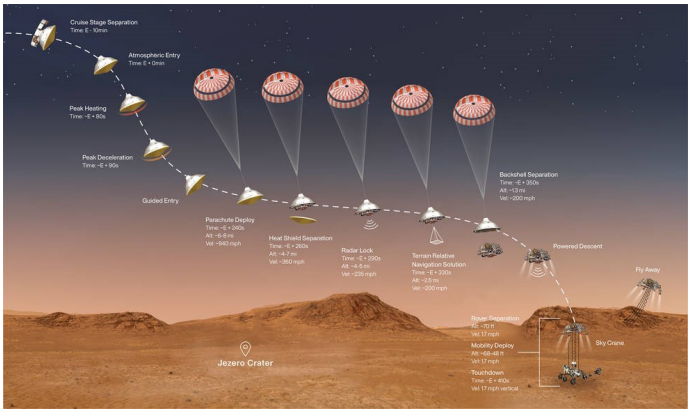
CAS Zoom Webinar + Q & A Session

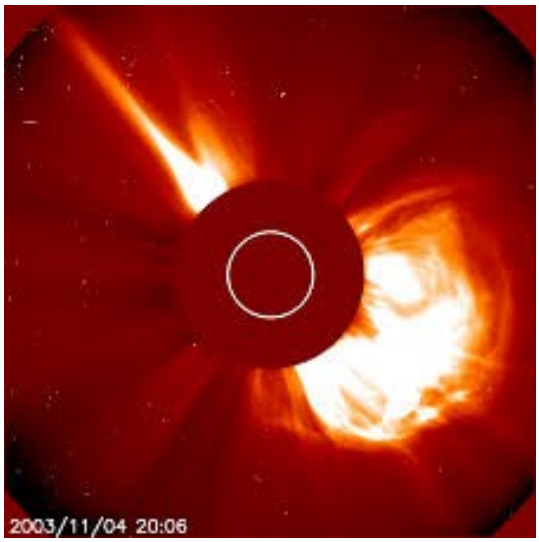
"Special Relativity"

David Ramshaw

NASA Perseverance Rover

The latest NASA rover is due to land on Mars on 18th February. Currently closing on the red planet at 1.6 miles per second (2.5 kms), a heart-stopping 7 minute descent awaits its arrival, depicted in the diagram opposite. This will be the first ever autonomous guided landing on Mars so let's hope it goes well as the red planet has a reputation for mishaps!





Life on Exo-Planets vs Solar Flares

New research has proposed that strong solar flares emitted from active stars may not be prohibitive to life on their planets after all. It has been thought that strong solar flares would strip the atmosphere of any planet within the habitable zone and effectively sterilise it. This new study found such flares did not necessarily destroy the planet's atmosphere but drove it to find a different equilibrium that might still support life. Furthermore, if life were to evolve on such worlds, it would actually be easier to detect as the flares increase the abundance of life-indicating gases such as nitrogen dioxide.

The Night Sky—February

Venus and Saturn and also Venus and Jupiter will be in conjunction during February. On Feb 6th Venus and Saturn will be in the dawn sky, just 23 arcminutes apart with the scene being repeated with Jupiter on the 11th when the two planets will be 31.5 arcminutes apart. However, both conjunctions will be low in the sky as viewed from our viewpoint in Scotland. Brilliant Venus should be easy enough to pick out in the dawn sky but Saturn at mag +0.9 may be more difficult. Even Jupiter at mag –1.8 could be challenging. The events will be visible about 20 mins before sunrise so take care not to catch the rising Sun in your telescope or binoculars.

On the 12th a waxing crescent Moon should be visible as a very thin crescent about 15 mins after sunset just above the west-southwest horizon. The Moon will be only about 1% lit so let's hope for clear skies to view this event. On the 13th it will be 4% lit so a much easier object.

Mars, although receding from us and becoming fainter, will be approaching the Pleiades star cluster and passing just south of it during February/March. The waxing crescent Moon joins the scene on the 18th being 5 degrees below Mars. On the 28th Mars will be just over 3' south of the star cluster, mag +0.9.

Uranus is descending into the southwest sky during February but at the start of the month is still at an elevation of 46 degrees so well worth searching for. Uranus presents a tiny disc of just 3.5 arcseconds but its distinct blue colour makes it an obvious planet.

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Mar 2021

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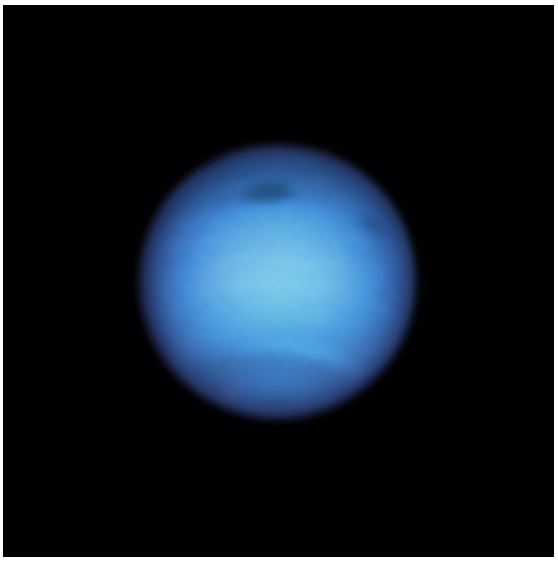

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Picture Left
HST image of Neptune Showing a dark vortex (centre) and smaller storm Image 2020 Jan 07

From the Chairman/Society News

I hope everyone is still keeping safe and well. Our webinars are still very proving popular. If you have missed any of them, head to our YouTube Channel, "Clydesdale Astronomical Society Webinars", to catch up. Some meetings were not recorded at the request of the speaker due to publication rights etc.
Our next Zoom meeting is on the 8th March, when our speaker will be Lyn Smith, whose presentation is entitled, "The Red Sun". I will be emailing the link for this meeting soon. Then on the 22nd March, we have Nicholas Booth, whose presentation is entitled, "Perseverance and Hope - Looking for Life on Mars".

Next Meeting

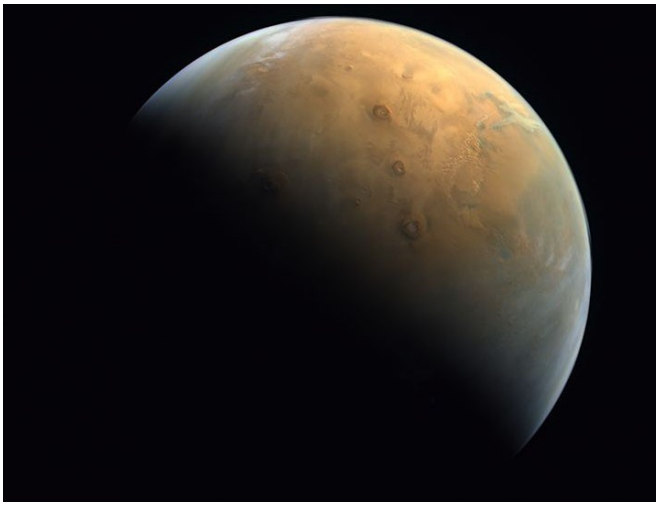
Monday 8th March 2021 at 7.30 pm
CAS Zoom Webinar + Q & A Session

"The Red Sun"

Lyn Smith

UAE "Hope" Satellite

The United Arab Emerates' satellite "Hope" reached Mars on Tuesday 9th February 2021 and took this image the following day. The image shows 3 shield volcanoes, including Olympus Mons, nearest the terminator between night and day.
The image was taken at a distance of 15,350 miles. Hope is on an elliptical orbit that will take it close in to Mars to study how energy moves through the Martian atmosphere from the surface to the very top.

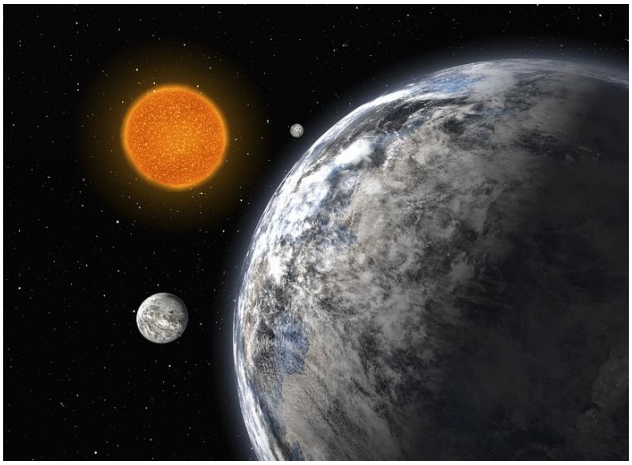


NASA Perseverance Rover

Still on the subject of Mars, NASA's rover "Perseverance" landed safely in the region of the Jezero crater at 2055 GMT on 18th February 2021. The craft landed on a level surface with a tilt of only 1.2° and will explore the 45 km wide crater's multiple rock types. Perseverance will also be the first lander to release a mini helicopter for further exploration; the first flight of its kind on Mars. The image opposite is the first colour image to be sent back by the lander.

TRAPPIST-1 System

In 2017, this system made the headlines as no less than seven small planets were found in orbit around this red dwarf star. Recent studies have found all seven planets contain much the same "stuff"; this could mean they have the same proportion of material that make up most rocky planets and the Earth. Their slightly lower densities could be due to a different distribution of iron or a higher abundance of water. Research continues!



The Night Sky in March

The highlight this month will be the tracking of Mars just to the south of the famous star cluster, the Pleiades or Seven Sisters. Best views will be achieved from the 1st through to the 7th when the Pleiades and Mars should be in the same field of view in binoculars. Jupiter and Saturn are morning objects rising 45 minutes (in the case of Jupiter) before the sunrise, Saturn being less favourable. Uranus is disappearing into the south-west evening sky and will soon be lost for observation as is Neptune.
The asteroid Vesta reaches opposition on the 4th and will shine at mag +5.9 just on the limit for naked eye visibility in a dark sky site. Binoculars should pick it up easily in the constellation of Leo towards the "rear" of the Lion just north of the star Chort and moving towards the fainter star 51 Leonis. Vesta will be brighter than any star in its path so it should be an easy one to spot. If unsure, look the following night and it will have moved.

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Janice Stephens

Picture Left

Messier 33 or NGC 598
the Triangulum galaxy
2.73 million light years away
Picture: Hubble ST

From the Chairman/Society News

I hope everyone is still keeping safe and well and enjoying our webinars. Our next Zoom meeting is on the 12th April, when our speaker will be Richard Miles, whose presentation is entitled, "Fire and Ice – Introducing the two most volcanic bodies in the Solar System". I will be emailing the link for this meeting soon. Then on the 26th April, we have Bob Bower, whose presentation is entitled, "A History of the Telescope". On the 10th of May we have our main event of the Society calendar, the John Braithwaite Memorial Lecture. This year, we are delighted to welcome Professor Axel Hagermann, from Stirling University, whose presentation is entitled "Exploring Blocks of Ice and Rocks – Space and Lab experiments on Asteroids and Comets", so make sure you put this date in your diary.

Next Meeting

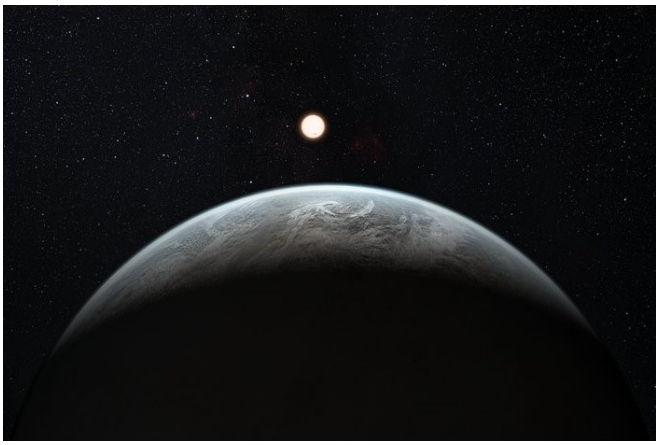
Monday 12th April 2021 at 7.30 pm

CAS Zoom Webinar + Q & A Session

"Fire & Ice"

Dr Richard Miles

Planet 9?



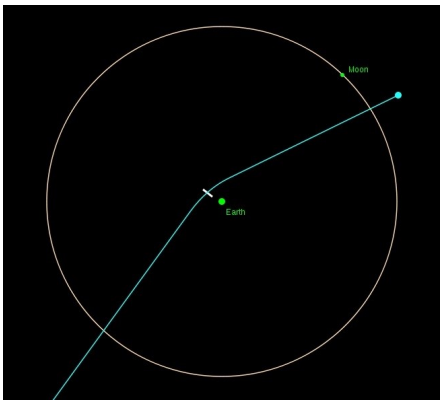
Speculation about a 9th planet beyond the orbit of Pluto has raged for many years. However, cold water is now being poured on the idea as the clustering of trans-Neptunian objects (or TNO's) thought to indicate the existence of planet 9, could just be an anomaly in observations. The apparent clustering is where telescopes are most sensitive and therefore TNO's are more likely to be detected. The argument will continue until more sensitive telescopic data can be achieved.

Andromeda Collision

We know that the Andromeda galaxy will collide with our own Milky Way galaxy in about 4.5 billion years when our own Sun will be on the verge of its red giant phase. Simulations show that this merging process will last billions of years with several close passes and an eventual merger about 10 billion years from now. The two galaxies will form a large elliptical galaxy from the two spirals that they now form. Sadly, the Sun will have faded away before it can take its place in this new galaxy.

Apophis - Near Miss

Talking of collision events, astronomers have calculated that the asteroid Apophis will not collide with Earth in April 2029. In fact the close encounter with Earth will cause perturbations in Apophis' orbit and so the predicted impact in 2036 or 2068 will not happen either. However, this asteroid remains a threat although the next 100 years looks to be safe from this particular impact event. The fly past in 2029 will be close and this 335 metre wide rock will miss Earth by just 31,643 km (19,662 miles) well within the orbit of our Moon.



The Night Sky—April

Venus once again is about to grace our evening sky in the west, however the appearance this year will not be as favourable as the 2020 event. Venus will be low to the horizon so look for the waxing Moon as a pointer. The 12th is a date to observe although it will not be easy, May 13th will perhaps prove more favourable and June will be a spectacular sight.
Mercury becomes an evening object towards the end of April although always a tricky planet to detect in the twilight, low in the west. From the 25th onwards, Mercury will be in the vicinity of Venus.
Mars is fading as it recedes from us, presenting a tiny disc and +1.5 magnitude towards the end of April.
Jupiter and Saturn are both morning objects and with British Summer Time in operation, it will mean getting up pretty early. Jupiter is not well placed rising just over an hour before the Sun. Saturn is still low to the horizon rising around 0400 BST (0300 UT) in the constellation of Capricornus. At mag +0.7 it can be seen beneath a waning crescent Moon on the 6th. Uranus and Neptune are not visible this month.

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May 2021

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Picture Left
Barred spiral galaxy NGC 986 in Fornax 36 million light years distant

From the Chairman/Society News

Welcome to the 150th edition of our newsletter, the first edition going out in November 2006! Our thanks must go to Lyn for a fine job putting this newsletter together all these years. I hope everyone is still keeping safe and well. Our webinars are still proving popular with good attendances. Our next Zoom meeting is on the 10th of May, our principal event in the form of the John Braithwaite Memorial Lecture. This year, we are delighted to welcome Professor Axel Hagermann, from Stirling University, whose presentation is entitled, 'Exploring Blocks of Ice and Rocks – Space and Lab experiments on Asteroids and Comets.' On the 24th of May, we have Dr Steve Barrett, whose two 30 minute presentations are entitled, 'Lighter side of Astronomy' and 'Ancient Light', respectively.

Next Meeting

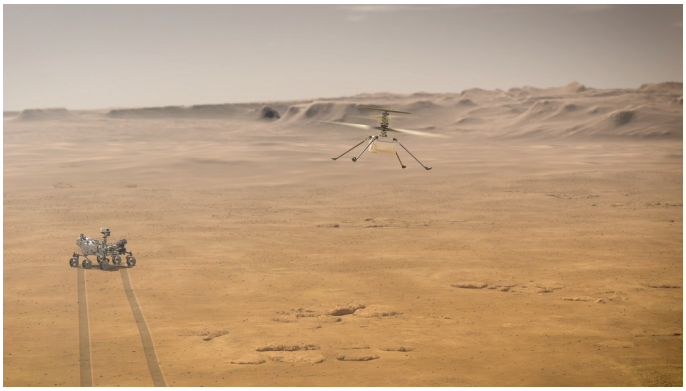
Monday 10th May 2021 at 7.30 pm

CAS Zoom Webinar + Q & A Session

"Exploring Blocks of Ice & Rocks"
Prof Axel Hagermann

Mars Water Mystery

The question of Mars' water loss continues to intrigue scientists. Recent measurements of deuterium do not bear out current theories of water loss into space. Either the rate of loss has been more rapid than thought or water is trapped underground. The mystery has not yet been resolved.



Old Stars Spin Faster Than Expected

According to a new study by the University of Birmingham, older stars are spinning faster than theory predicts. All stars are born spinning from the momentum of the original collapsing hydrogen cloud that formed them, but as they age they lose some of that momentum and slow down, a process called "magnetic braking".
Scientists used asteroseismology to calculate how a star rotates which enables the scientific team to measure the oscillations caused by sound waves trapped inside the star. Changes in a star's magnetic field could be the cause of this weakened braking mechanism but more research needs to be done in this important area of future study.

Partial Solar Eclipse

An early warning for you of a partial solar eclipse visible from the UK on Thursday 10th June 2021. Maximum eclipse will occur at 1017 UT (Edinburgh) or 1117 BST. The Sun will be at high altitude 51° so ideal for viewing. Don't forget you need a solar filter to view this event as it is NOT total and you may damage your eyesight trying to see this event unless properly prepared.

The Night Sky—May

Both Mercury and Venus are evening planets in the sunset sky this month. Best time to see Mercury is early in the month when it is at its brightest before it fades again mid-month. On the 1st Mercury is mag –1.0 and sets a full 90 minutes after the Sun. Venus is closer to the Sun setting just 50 minutes after our star but this will extend to 1.5 hours by the end of May. On the 12th a thin crescent Moon (less than 1% lit) will be around 2 degrees SW of Venus and Mercury will be just 32 arcminutes separation from Venus. A good photography opportunity!
Mars is getting too small to observe and also disappearing into the evening twilight.
Jupiter is a morning object and by the end of May will have improved visibility rising 3 hours before the Sun. Saturn is also a morning object in the constellation of Capricornus and shines at mag +0.7 A gibbous Moon will be nearby on the 3rd and 4th and the Moon will revisit the scene on the 31st with a 72% lit waning gibbous phase.
Uranus and Neptune are not visible this month.

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Jun 2021

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Picture Left

Blue variable star
AG Carinae within a nebula
5 light years across
Hubble Space Telescope

From the Chairman/Society News

I hope everyone is still keeping safe and well. Our webinars are still proving very popular. I would also like to give members notice of our AGM, which will be held just prior to the last meeting of the session on 14th June 2021. If anyone has any relevant business for the agenda or wishes to stand for Committee, please inform Robert McFetridge, the Society Secretary. This meeting will be via Zoom but the speaker is not yet confirmed. With the ongoing Covid situation and the fact that the Bank Hall is to be refurbished at some point, I can't tell you just now when we will be able to meet in person again. The new session begins on the 13th of September, so I will let everyone know as soon as I know what is happening. If not held at the Bank Hall, it will be held as usual via Zoom.

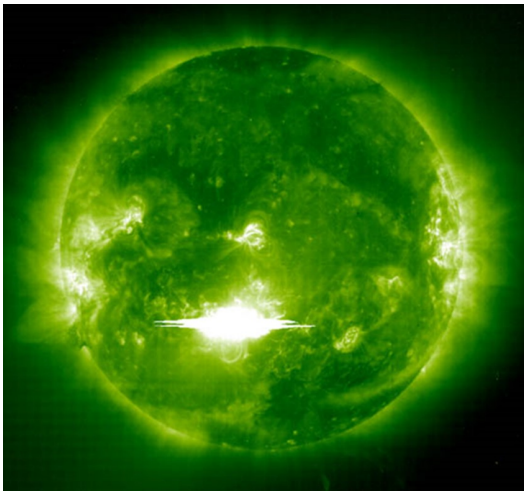
Next Meeting

Monday 14th June 2021 at 7.30 pm

CAS Zoom Webinar + Q & A Session

CAS AGM/Speaker TBA

Proxima Centauri—Massive Flare



The nearest star to the Sun, Proxima Centauri, has produced the largest star flare ever recorded. The flare was estimated to be 100 times more powerful than any solar flare from our own star, the Sun. The flare lasted just 7 seconds on 2019 May 1st and produced a massive amount of ultra-violet light although this did not transfer to visible wave-lengths. The star's planet, Proxima Centauri b, was hit by the radiation. The planet orbits in the star's habitable zone, meaning liquid water could exist there. However, this type of bombardment means that life is unlikely to exist as we know it.

Active Volcanoes on Mars

Evidence of recent volcanic activity shows that eruptions could have taken place on Mars as recently as 50,000 years ago. As most vulcanism occurred on Mars between 3 and 4 billion years ago, this is recent indeed. Satellites orbiting Mars have discovered a new volcanic deposit 8 miles wide around a 20 mile long fissure. Its properties suggest a pyro-clastic eruption of magma.

Solar System Formation

New research suggests that the early Milky Way merged with a satellite galaxy named Gaia-Enceladus, about 10 billion years ago. The existing Milky Way stars ended up in the hub of the galaxy whilst the stars from Gaia-Enceladus made up the outer halo; the stars from the satellite galaxy being slightly younger in age.

The Night Sky—June

As mentioned last month, there will be a partial eclipse of the Sun on the 10th seen between 10.06 and 12.24 mid eclipse at 11.13 BST (10.13 UT). Remember, as this is only a partial eclipse, you will need to protect your eyes so either project the solar disc onto a piece of white card behind the eyepiece of the telescope or use a solar filter over the objective lens.
As the lighter nights are now upon us, it is Noctilucent cloud season once again. Signs of these high clouds in the mesosphere (82 km) are already occurring so look out for the wispy streaks and waves typically 90 to 120 minutes after sunset or before sunrise.
Jupiter and Saturn are both becoming more favourable for observation but of course, may remain tricky during June due to the proximity of the Sun to the horizon. On the 1st the Moon lies close to Jupiter in the early hours and on the 2nd the shadow of Europa passes across Jupiter's disc. On the 5th the shadows of Io and Ganymede can be seen as the planet rises just after 01.30 BST. On the 10th Callisto will transit Jupiter's disc at much the same time remaining visible until 03.20 BST. See if you can map the "dance" of satellites and their shadows as they regularly cross Jupiter's disc month on month.