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Don't Miss our special Zoom event!!
“Night Sky Live” Wednesday 23rd, Friday 25th,
3D Moon presentation Saturday 26th September

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Chairman’s Comments

During the virus epidemic and the associated lockdown, I began generating a monthly sky guide in the form of a half hour-long video planetarium show, published on YouTube. Here is latest which gives a guide to the night sky for August is the fifth month now. Please see https://youtu.be/1VpdleNe21E

It has become a habit that I hope to continue, and I have created all the tools necessary to use the Stellarium program to help me with this using my skills in computer programming!

I hope that these are useful, and please let me have any feedback.

Now that we are into September, and with Comet Neowise now a faint shadow of its glorious best, having faded now below naked-eye visibility, we are on to looking at other things this month.

Firstly we have a parade of planets - they are lined up across the sky staring with Jupiter, followed closely by Saturn both almost due south at midnight and in the constellation of Sagittarius. Next in line lies Neptune on the border between Aquarius and Pisces. Mars, in Pisces, rises just before midnight, but will make a fine sight if you stay up into the small hours. Next we have Uranus in Aries and then in the dawn twilight Venus rises at about 2:30 am in Taurus and will be extremely bright. Lastly Mercury is in Gemini and just peeps above the horizon at 4:30 am an hour before the Sun comes up - so it is just possible to do the grand tour in one night at the moment.

See my photo-montage of the planets of the solar system (page 3) all imaged from my back garden observatory here in Over in order along the top - Mercury, Venus and Mars - the inner planets and then on the bottom row, Jupiter, Saturn, Uranus and Neptune.

On the night of the 11th &12th we had the annual Perseid meteor shower, which is often the best show of the year. These meteors start coming at the beginning of August, but peak on the nights of 11th and 12th as the Earth passes through the debris left behind by comet Swift-Tuttle as it sweeps through the inner solar system on its 133 Year orbit around the Sun. We won’t see the comet, the last approach was in 1992 so we have to wait over 100 years for the next one in 2126 when it will pass by the Earth at a distance of 14 million miles.

The meteor shower is caused by the Earth crossing through the previous path taken by the comet, and the meteors are little fragments of the comet that have been left behind by it, which the Earth sweeps up as the orbits intersect. Of course this does reveal that one day we might find the whole comet at the cross-over point when the Earth gets there - and there has been concern that it might collide with us on the 14th August of 2126. Orbits of comets are somewhat difficult to be exact about, because of the effect that the solar wind from the Sun has on them, pushing them off course in unpredictable ways. Observations of the 1992 pass helped astronomers lead by Brian Marsden at the IAU Minor Planet Center, showed that it was going to miss. His team have shown that we are safe for at least 2,000 years from this threat, but as the nucleus of Swift-Tuttle is a ball of rocky debris and ices packed together into a dirty snowball that is around 26km across this we will be keeping a close eye on it.

The Cambridge Astronomical Association organised a "virtual planet and meteor party" for the 11th and 12th which was cast onto the web via Zoom live from my observatory. We had talks about comets and meteors, and live imaging of the planets using a webcam plugged directly into the 14-inch telescope. We were joined by other observing stations run by other members of the CAA who were targeting other objects. We encouraged people to join in by watching for meteors and counting how many are seen and reporting them.

Details of all the forthcoming CAA events are at http://www.caa-cya.org/events.php?who=caa

Looking further ahead we of course hope to get back to normal at some stage, but at the moment the big question of when is anyone's guess - in the meantime, do keep in touch and join us on our many and varied Zoom-based virtual meetings.

Paul
Member’s Contribution

A procession of planets taken at Over, Cambridgeshire by our Chairman Paul Fellows MA FIET FRAS

Mercury, Venus and Mars - the inner planets and then on the bottom row, Jupiter, Saturn, Uranus and Neptune.

Observed from the Garden Observatory in Over Cambridgeshire by Paul Fellows MA FIET FRAS

In addition to using my iPhone I also deployed my Canon EOS DSLR camera with a 200mm lens and was able to get a more magnified image using this longer focal length. I created the final image by "stacking" 25 separate 2-second exposures together to build up the one good result which is seen here.

Any longer than that for each frame and motion-blur would become a problem - but by keeping each frame short and adding them together you get the effect of 50 seconds of photon capture time without the troubles of the turning of the Earth.

The comet was also a terrific sight in binoculars, which were able to frame it nicely and reveal lots of nice detail in the dust tail, and also just a hint of the blue ion tail - but that was only visible at the point of maximum sky darkness, at about 1am.

Comet NEOWISE See page 5 for more interesting photos
Observing the Planets

Now is a good time to be observing and imaging the planets. Jupiter and Saturn are bright objects in the south around 10 pm, but both are very low at around 15° altitude. Jupiter is around 45 arcsec in diameter — that is 40 times smaller in angular diameter than the Moon. The disc of Saturn is 18 arcsec in diameter, 2.5 times smaller than Jupiter, but the rings bring the apparent size of the planet system up to almost the angular size of Jupiter.

Here, for example, is a picture of the crater Tyco on the Moon and the planets Jupiter, Saturn and Mars to scale, for comparison.

The crater Tyco, in the centre of the image, is 49 arc seconds across.

Pluto is close by but is a very challenging mag 14 dot just 0.1 arcsec across.

Neptune is rising in the southeast and reaches 33° altitude in the south around 2 am. It is just 2.5 arcsec across, however, and presents a very challenging imaging target.

Mars is rising in the southeast after midnight, and by 2 am is around 34° altitude. Mars is an unmistakable bright red object at mag -1, but it is just 18 arcsec in diameter, presenting an angular disc about the same size as Saturn.

Uranus appears slightly larger than Neptune at 3.5 arcsec across.

Successful imaging of the planets requires a telescope and camera combination with very small image scales. By that, I mean that each pixel of the camera needs to subtend a very small angular field of view, around 0.1 arcsec. This requires a telescope with a long focal length and a camera with fairly small pixels, say around 3µm.

The tool of choice of many planetary imagers is the Celestron C14, a 14" aperture Schmitt-Cassegrain telescope (SCT). It has a large aperture to provide resolution of small detail and a long focal length of 3.9m. Many planetary imagers will extend the focal length by using a Barlow lens up to x3 magnification, extending the telescope focal ratio to F/33 and the focal length to 11.5m.

Using such a telescope requires a heavy, stable mount with exquisite pointing accuracy and smooth tracking. From my own experiences, finding the planet in the field of view of the camera and focusing it is a challenge in itself.

Therefore, when you see the superb work of our planetary imagers, give a thought to the care and skill needed to obtain the images.
Messier 15 NGC 7078 is a bright and beautiful globular cluster in the constellation of Pegasus. It was discovered by the French astronomer Jean-Dominique Maraldi on 7th September 1746 and he reported it as a bright nebulous star composed of many stars. Messier observed it on 3rd June 1764 and added it to his list of 'not a comet' objects with the remark that it appeared as a round nebula, without a star. Other early observers included William and John Herschel and they commented on its brightness and unusual beauty.

I captured this image during the short darkness of 28th July as part of testing the imaging software N.I.N.A. It comprises just 10 x two-minute subs of red, green and blue sub-frames. The short exposures have ensured that the core is not over-exposed and the planetary nebula Pease1 can be discerned just north of the centre.

Equipment:
Telescope: 8-Ritchey-Chretien with x0.7 reducer
Camera: QSI 683
Mount: Skywatcher EQ8
Location: Cambridge, UK

A TIF file can be downloaded from here. https://www.dropbox.com/s/jrgzf4z91rf4l8d/M15.tif?dl=0
Member’s Contributions
Comet Neowise and Perseid Meteor Shower
Pictures from Paul Fellows, Darren Hall and Mick Jenkins

Comet Neowise by Darren Hall taken on 16th July 2020
at the Radio Astronomy Site

This picture of Neowise was taken by Paul Fellows using just his I-phone 6 Plus with an app called “NightCap” which is great at extending the capabilities of a standard mobile phone camera into the realm of astro-imaging

A Perseid Fireball taken by Michael Jenkins on the All Sky Camera 11th August at 10:30pm

The Comet C/2020 F3 Neowise shining through Noctilucent Clouds. Taken by Pete Williamson from his front room window
Member’s Contribution

NGC 3372 The Carina Nebula
Story and picture by Kevin Offley

The image shows the Carina Nebula, in the southern hemisphere. It is centred on RA 10h 45m 08.5s Dec -59° 52’ 04”. The estimated distance of 2300 parsecs (7500 light years).

The nebula is one of the largest diffuse nebulae in our skies. Although it is four times as large and even brighter than the Orion Nebula, the Carina Nebula is much less well known due to its location in the southern sky. It was discovered by Nicolas-Louis de Lacaille in 1752 from the Cape of Good Hope. It has an apparent magnitude of 6.2.

The radius is approximately 70 parsecs (230 light-years) giving an angular diameter of 120 arcmin. The FOV of the image is 43.2 arcmin. The nebula (not all of which are within the image boundaries) has within its boundaries the large Carina OB1 association and several related open clusters, including numerous O-type stars and several Wolf-Rayet stars. Carina OB1 encompasses the star clusters Trumpler 14 and Trumpler 16. Trumpler 14 is one of the youngest known star clusters at half a million years old. Trumpler 16 is the home of WR 25, currently the most luminous star known in our Milky Way Galaxy, together with the less luminous but more massive and famous Eta Carinae star system and the O2 supergiant HD 93129A. Trumpler 15, Collinder 228, Collinder 232, NGC 3324 and NGC 3293 are also considered members of the association. NGC 3293 is the oldest and furthest from Trumpler 14, indicating sequential and ongoing star formation.

Kevin captured this image remotely using a Planewave CDK 431 mm Telescope based at Siding Springs Observatory in Australia. It comprises of subs taken on the 10th, 11th and 12th of February 2019. The full technical specification can be found at http://support.itelescope.net/support/solutions/articles/231919-telescope-32.

Calibrated subs were used as opposed to applying the provided dark, bias and flat frames to the uncalibrated images. The final image consists of the following subs 15 x 300s luminance, 3 x 300s red, 3 x 300s blue, 3 x 300s green, 3 x 300s Ha, 3 x 300s OIII, 16 x 60s red, 16 x 60s green, 16 x 60s blue.

This gives a total exposure time of 3.3 hours.

The image was processed in PixInsight using the workflow Star Alignment, Image Integration, Automatic Background Extraction, which now seems to work better in the latest version of PixInsight, Channel Combination, Background Neutralisation, RGB Colour Calibration, PixelMath – to incorporate the Ha and OIII images, Multiscale Linear Transform, Histogram Transformation, LRGB Combination, TGV Denoise, HDR Multiscale Transform, Curves Transformation, Dark Structure Enhance, Exponential Transformation, Crop. Then the black point was changed to 17 using PhotoShop CC 2019.
Member’s Contribution

NGC2244

Pictures by Pete Williamson

NGC2244 Cluster “The Rosette Nebula”

NGC 2244 Cluster & The Rosette Nebula. Location: Monoceros, Telescope: Takahashi 106mm f5 CCD: FLI - 4008 by 2672 pixels: 9.0µ by 9.0µ pixel size, 9x300 second Exposure Sii, Ha, OXYIII. Processed in Pixinsight 1.8

NGC 7635 Bubble Nebula, Distance: 11,000 Light Years

Messier 45: The Pleiades: Seven Sisters, Distance: 440 Light Years

Faulkes Telescope Project
NSO Liverpool Telescope
Telescope: 2 Metre (78.7) Ritchey–Chrétien
CCD: Spectral
12 x 90 second Exposure R:V:B : Ha
Processed in Pixinsight 1.8:

Telescope: Takahashi 150mm f7.3
Total Integration Time: 60 mins
Processed in Pixinsight 1.8

All these images were taken and processed by Pete Williamson
Published on our CAA-CYA FaceBook Page.
CAA-CYA Events

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<td>19:15</td>
<td>CYA 11+</td>
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<td>16:00</td>
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<td>Friday 16th October 2020</td>
<td>20:00</td>
<td>Speaker Meeting</td>
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Catch-up with any lectures you missed by the CAA. Current latest list here Just click on the address in the next line. Type http://www.caa-cya.org/catchup.php in your browser for the latest full historical list (60 entries).

If you are reading the PDF file now, just click on any presentation address in grey to go directly to that lecture.

New lectures

September Planetarium Show, 30/8/20 https://youtu.be/1VpdleNe21E
Protostars, 30/8/20 https://youtu.be/XqXeXJB4nks
Steam Powered Astronomy, 22/8/20 https://youtu.be/nLKdrZJwntk
Hubble's Galaxies, 08/8/20 https://youtu.be/tOzZDYjLnBo
A Brief History of Mars, 01/8/20 https://youtu.be/ak9Uz2DE-zQ
Interstellar Travel, 18/7/20 https://youtu.be/ylWmXBMtnudw
Quark Stars and Strangelets, 25/7/20 https://youtu.be/TZ9Bs WuT_uw
Are we dust or nuclear waste - Robin Catchpole, 18/7/20 https://youtu.be/E8ye--_5TXHY
Capturing the Sky with a Digital Camera, 16/7/20 https://youtu.be/ApESEMY0ZU4
Using your Camera with a telescope, 1 https://youtu.be/GDMUJB_IDeU
Imaging the Moon and Planets with a Webcam, 23/7/20 https://youtu.be/suKy4jDpgI0
Brown Dwarfs, 11/7/20 https://youtu.be/j5BxEpxUK88
Rogue Planets, 01/7/20 https://youtu.be/5buhIg15h9s
Interstellar Visitors, 11/7/20 https://youtu.be/dqDaPx5-yCs
Snake Oil and Other Hoaxes, 05/7/20 https://youtu.be/4nXoC8Tq_d0
Cosmic Dawn, 2 https://youtu.be/nt7RGYDVCVM
The First Three Minutes, 20/6/20 https://youtu.be/iLLjchVBTHw

See Apr–May and Jul–Aug Capella Newsletters for the previous individual Zoom Lectures.
Cambridge Astronomical Association
& Cambridge Young Astronomers

CYA Events coming up

List of catch up lectures continuing from previous page. See http://www.caa-cya.org/catchup.php

Our Events are also usually held at the Institute of Astronomy (IoA), coach trips will start from the IoA carpark. We often have a Star Party in September/October and will organise other events to coincide with any unusual astronomical occurrence, such as an eclipse or a bright comet.

Catchup Service: We have a number of videos that have been recorded from our on-line talks. So in case you missed them or perhaps would just like to review them click here to view the list of titles. Clicking through will play the recording via YouTube.

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Chairman : Paul Fellows
Vice Chairman : Brian Lister
Treasurer & Membership Secretary: Mickey Pallett
Secretary: John Hodson
Events Secretary: Jonathan Clough

Capella Editor and DTP Setter: Richard White jazzyrjw@gmail.com
Members should send stories for inclusion where possible by email to Richard or send them to Brian Lister Tel: 01223 420954 (evenings) or email btlister@btinternet.com
Please make sure that article text contributions are sent as standard Word files and images as .jpg’s wherever possible.

President: Professor Max Pettini
Vice President: Carolin Crawford
Committee: Dave Allen, Kevin Black, Paul Drake, Barry Warman, Richard White, Brenda Field, Jonathan Clough
Cambridge Young Astronomers: (both groups): Brian Lister Tel: (evenings) 01223 420954 or email btlister@btinternet.com
Telescopes for hire to members: Mickey Pallett Tel: 01480 493045 or book on line.
Loan Telescope maintenance: Dave Allen, email day vidé@hotmail.co.uk
Library: Kevin Black Tel: 01223 473121
Webmaster: Paul Fellows: email paul.fellows@gmail.com

Website: www.caa-cya.org