NIAAS Membership

Single Adult (16-65)	£20 per year
Under 16s and over 65	£8 per year
Family membership	£45 per year
Associate membership	£15 per year
Non-members entry per month	£3 adult, £1 under 16 and over 65

Membership is paid at the start of each year, which begins from September.

- Members are entitled to free entry to all NIAAS events for one year including monthly meetings and any public events that are arranged.
- A membership card with membership number is issued to each member.
- Throughout the year members are kept informed via the website, email and post about astronomical events, observing evenings, barbeques, and public events.
- Associate members who cannot attend meetings can choose to be kept updated monthly with the latest astronomical news, astronomy articles and photos via post. Associate Membership can be paid anytime.

About NIAAS

The **Northern Ireland Amateur Astronomy Society** is for people all ages who share an interest in Astronomy and its related subjects.

Everyone is welcome to join us or to attend our meetings, and we meet monthly in the Lecture Theatre at Ballyclare High School

Directions can be found online **at http://www.niaas.co.uk**

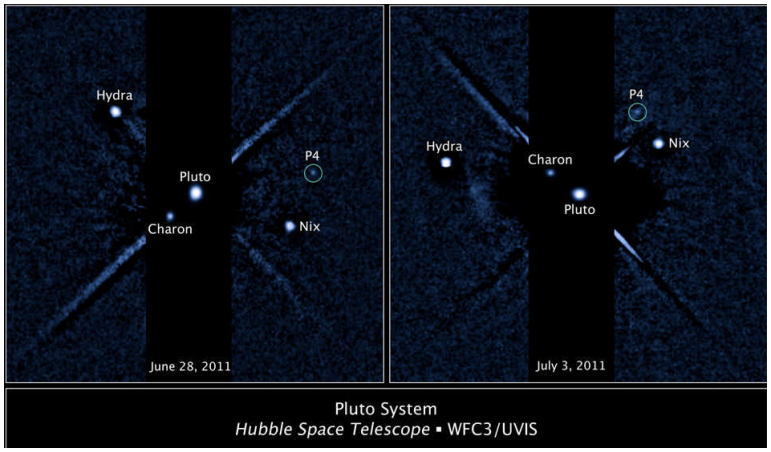
We can be contacted through our website **at http://www.niaas.co.uk** or through our Online Forum at **http://eaas.proboards31.com**

NORTHERN IRELAND AMATEUR ASTRONOMY SOCIETY
Incorporating the EAAS
THE UNIVERSE YOURS TO DISCOVER
INTERNATIONAL YEAR OF ASTRONOMY 2009

AZIMUTH

November 2011
Issue 36

New Moon for the Non-Planet



Astronomers using the Hubble Space Telescope recently discovered a fourth moon orbiting the icy dwarf planet Pluto. The new satellite – temporarily designated P4 -- was uncovered in a Hubble survey searching for rings around the dwarf planet.

The new moon is the smallest discovered around Pluto. It has an estimated diameter of 8 to 21 miles. By comparison, Charon, Pluto's largest moon, is 648 miles across, and the other moons, Nix and Hydra, are in the range of 20 to 70 miles in diameter.

The picture above contains two labelled images of the Pluto system, taken by the Hubble Space Telescope's Wide Field Camera 3 ultraviolet visible instrument with the newly discovered fourth moon P4 circled.

The image on the left was taken on June 28, 2011.

The image of the right was taken on July 3, 2011.

NIAAS November Presentation

'Supernovae'

Speaker: Dr. Rubini Kotak (QUB)

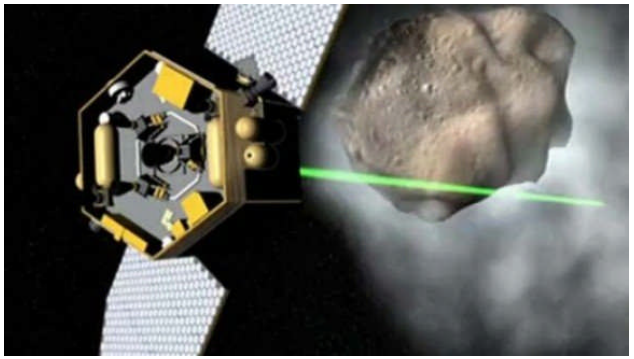
Our speaker for November is Dr.Rubini Kotak from Queens University Belfast, who will be giving a talk on Supernovae.
Rubina Kotak's main interests lie in the area of supernova explosions, of both the thermonuclear and core-collapse varieties.
She is also interested in stellar evolution immediately prior to explosion, in the direct influence of supernovae on their environments, and in the use of supernovae as probes of the distant Universe.
Rubina Kotak did her M.Phys (Astrophysics/French) degree at the University of Kent at Canterbury, and obtained her Ph.D in 2002 from Lund Observatory (Sweden).
Since then, she has held postdoctoral fellowships awarded by the Royal Commission for the Exhibition of 1851, hosted at Imperial College London, and a European Southern Observatory fellowship held at ESO headquarters in Garching, Germany.
She joined the supernova group at Queen's as a staff member in January 2007

The Apollo Camera Case....

Just who owns a camera flown to the moon — the astronaut who saved it as a souvenir or the government that wanted it left on the lunar surface — was heading to be settled in court until recently.
At contention, a 16-millimeter data acquisition camera (DAC) that Apollo 14 astronaut Edgar Mitchell returned to Earth from the Moon in 1971 and then attempted to sell 40 years later.
The mission plan called for the camera to be left in Antares to save weight aboard the command module "Kitty Hawk," the capsule that would return the two moonwalkers and pilot Stu Roosa to Earth.
The lunar module and all its contents would be left to slam back onto the moon just a day later.
The government contended it has no record of the camera being given to Mitchell, who elected to remove it from the lunar module (LM) before parting ways with the spacecraft and returning to earth.
The LM, which Mitchell and Apollo 14 commander Alan Shepard used to land on and launch off the moon, was destroyed after it was allowed to fall back to the lunar surface.
Mitchell's attorney argued that too many years have gone by for the government to pursue the camera as stolen and besides, it was given to the now 80-year-old moonwalker as a gift in line with NASA's then-policies governing spent equipment
Judge Hurley ruled that the statute of limitations as cited in Mitchell's motion did not apply to the federal government's claim
Furthermore, resolving whether the camera was stolen or the subject of a gift or abandonment was "inappropriate" .
In a settlement he reached with the U.S. government, the sixth man to walk on the moon agreed to "relinquish all claims of ownership, legal title, or dominion" over the camera.
Mitchell agreed to allow Bonhams, the New York auction house where he had consigned the camera for sale last June, to release the artifact to the government.
Bonhams had estimated the camera's value at $60,000 to $80,000.

Astronomy News 6

NASA Developing Tractor Beams



If you are a *Star Trek* fan, you will of course be familiar with "tractor beams," those laser-type beams that can grab an object in space and it pull backwards toward the source of the beam. They are another long-running staple of science fiction that is now closer to science reality. NASA is now working on developing just such technology.

A $100,000 study to look at three possible methods has been awarded to NASA's Goddard Space Flight Centre by the NASA Office of the Chief Technologist (OCT). Though a mainstay in science fiction, and *Star Trek* in particular, laser-based trapping isn't fanciful or beyond current technological know-how. The methods being developed can trap and move particles of matter or even single molecules, viruses or cells, using the power of light -maybe not another spacecraft yet, but the principle is the same. NASA has used various methods of sample-retrieving, all with great success, including aerogel on the *Stardust* spacecraft to obtain dust samples from the comet Wild 2 and scoops, brushes and rock abrasion tools on various Mars landers and rovers to retrieve rock and soil samples. On the next Mars rover, Curiosity, which is due to be launched later this month, there will be a scoop as well as a drill.

It will also feature a laser beam to zap rocks so the resulting particles can be analyzed; not quite the same as a tractor beam but still pretty cool.

The first technique being studied is the optical vortex or "optical tweezers" method which uses two counter-propagating beams of light. Particles are confined to the "dark core" of the overlapping beams. Particles can be moved along the ring's centre by alternating the strength or weakness of one of the beams.

The only catch with this method is that it requires an atmosphere to work, ideal for on the surface of Mars or Titan for example, but not for an asteroid or other airless body.

The second technique uses optical solenoid beams, where the intensity peaks spiral around the axis of propagation. Particles can be pulled backwards along the entire length of the beam, and it can operate in a vacuum, no atmosphere necessary.

Both of those techniques have been tested in the laboratory, but the third method, as of yet, has not. It uses what is known as a Bessel beam, which, when projected onto a wall for example, features rings of light surrounding the central dot of light. The effect is similar to looking at ripples surrounding the spot where a pebble has been dropped into a pool of water. Other types of laser beams do not exhibit that however, appearing only as a single point of light. Such a beam could induce electricand magnetic fields in the path of an object, which could then pull the object backwards.

Society News

As the clocks have now gone back, we are into the long nights of late autumn and winter, a time when in theory astronomers should come into their own, get the telescopes ready and get set for long dark evenings of observing.

The current spell of bad weather is still continuing, however, making it difficult to get any observing done, and on some occasions the weather has deteriorated just as the telescopes have been set up and ready to go, one of the most common and frustrating problems we have as observers. Committee member Simon summed it all up:

"Gutted, I'm totally gutted and also at my wits end with our country's weather. I've lost count now as to how many times it clouds over completely just after getting everything set up."

However, On October 25th some members eventually managed to get out and get some observing done.

Chairman Stevie reports:

"Derrick, Peter, Dave and I went up to Killylane last night. Although there was a fair bit of cloud swirling around, we managed to get a fair amount of observing done. The air was very still, with a very slight haze. The light pollution was pretty bad.

We concentrated mainly on the planets, and most observations were of Jupiter. The Great Red Spot was clearly visible in my 10" dob, and was well seen in Peter's 12" dob.

Uranus showed a very clear disk and green colouring, but, try as I might, I could not see any of the moons. even using a 5mm eyepiece (240X). I tried hard using both my own scope and Peter's, but they remained elusive.

Neptune was also seen well in Peter's scope, showing a tiny blue disc.

Apart from planets, the sky was not really good enough to see deep sky objects well, especially galaxies, although I did manage to see both M33 and a very faint M74 during some clearer spells. There was also one superb meteor just after 11pm, not quite a fireball, but very bright, with a long train.

All in all, a good night, and great to be out again after such a long spell of miserable weather."

On the plus side, there have been a considerable number of newcomers onto the NIASS Online Forum over the past couple of months, and some are active observers already getting their eye in, such as Jasonf1 from Ballymoney:

"Got home tonight to find nice clear skies so got the scope straight out.

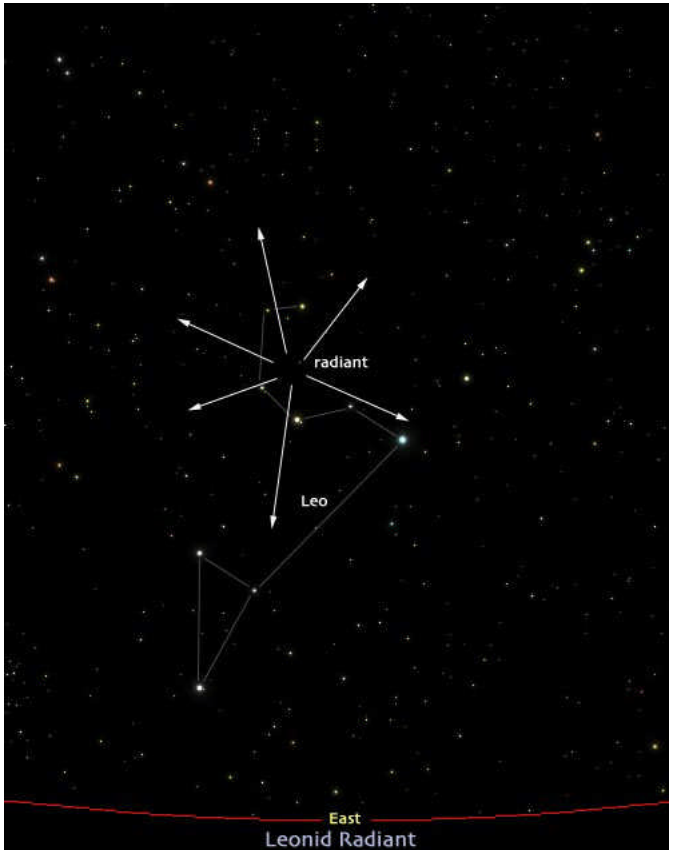
After waiting for some high cloud to move away and faffing around with more problems with focusing, finally got a very nice first sight of Jupiter and three of the moons.

Very pleased with that.

Tried to get some deep space m objects but between the light pollution and my lack of experience with the scope, that wasn't as successful."

So, a big welcome to Gilly, Ronny, Pablomagic , Asanewtonian and, of course, any others I may have missed.

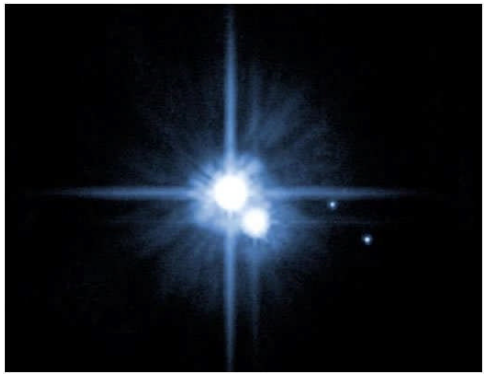
November: The Leonids



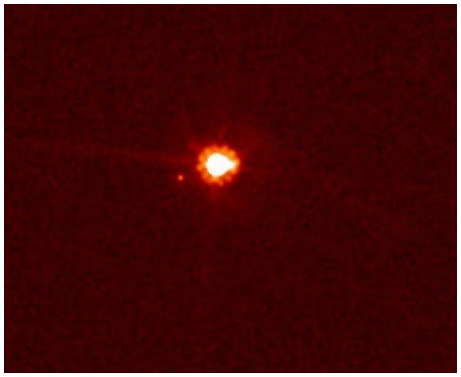
The Leonid meteor shower is famous. Historically, this shower, associated with the comet Tempel-Tuttle, has produced some of the greatest meteor storms in history – at least one in living memory, 1966 – with rates as high as many thousands of meteors per hour.
These storms sometimes recur in cycles of 33 to 34 years.
Most years, though, it seems that the Lion whimpers rather than roars, producing a maximum of perhaps 10-15 meteors per hour.
Like the October Orionids, the Leonids ordinarily pick up steam after midnight and display the greatest meteor numbers just before dawn.
This year, however, the last quarter moon will be shining near the radiant point of the shower in the constellation Leo.
The unwelcome presence of the moon is sure to dampen the 2011 Leonid display.
If you're game, you can try watching from late night November 17 till dawn November 18.

Astronomy News 5

Which is bigger-Pluto or Eris?



Pluto and its moons Charon, Nix and Hydra

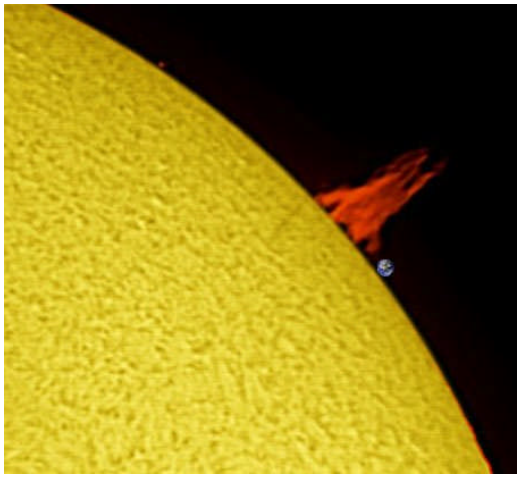


Eris and its moon Dysnomia

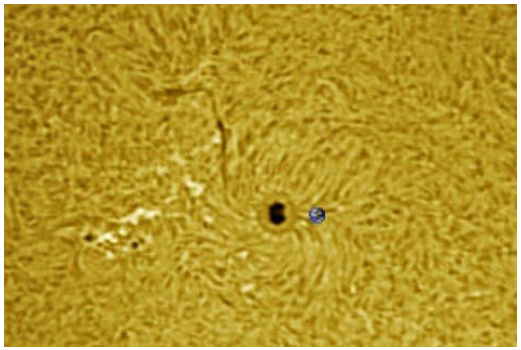
The controversy between Pluto and Eris regarding their status as "largest dwarf planet" continues.
Now new data has been presented that may help settle the debate.
The new findings regarding this size of Eris may be a surprise to some, and to others a confirmation of what was believed to be true.
Using an occultation, Bruno Sicardy of the Paris Observatory and his team were able calculate the diameter of Eris in 2010. The occultation was caused by Eris moving past a background star, which blocked the star's light and cast a small shadow on Earth.
When Sicardy and his team compared the shadow's size at two different sites in Chile, the calculations provided a diameter of 2,326 kilometres for Eris. A previous study by Sicardy in 2009 placed Pluto's diameter to be at least 2,338 kilometres.
However, the first estimates of Eris's size that were made shortly after its discovery put its diameter at 3,000 km, plus or minus 400 km, but a later estimate from observations with the Hubble Space Telescope said Eris might be 2,400 km in diameter, plus or minus 100 km.
If Sicardy's data calculations hold true, this places Pluto and Eris at nearly the exact same diameter. What has continued to not be up for debate, however, is that Eris is far more massive than Pluto. According to Sicardy the increased density of Eris indicates that Eris is mainly composed of rocky material, with a relatively thin ice mantle, and Pluto's density indicates it comprised of about equal parts ice and rock.
The co-discoverer of Eris, noted "Plutokiller" Mike Brown, offers an interesting thought regarding the Pluto / Eris Debate:
"Scientifically, knowing which one is bigger will teach us…. absolutely nothing.
The fact that they are nearly identical in size is scientifically interesting; which one is a few kilometres bigger than the other matters not one bit, but, still, I will admit to having a bit of an emotional attachment to Eris, so, deep down inside, I want to believe it will turn out to be a little bigger."

Astronomy News 4

Sun/Earth Comparison Pictures



The Sun is very big, and comparatively, Earth is a tiny Lilliputian.
We've all seen images comparing the size of Earth to the Sun, but here are two images from October 10, 2011 that really bring home the size-scale of features on the Sun when compared to the size of Earth. Amateur astronomer Ron Cottrell from Oro Valley, Arizona took these images of two different features on the the Sun, overlaying the size of the Earth for reference. Both are viewed in Hydrogen- Alpha light, and the first is a huge prominence from the northwest limb of the Sun.
Below, see a comparison of Earth to a current sunspot



This is sunspot 1312 which has a classic sunspot shape with a core that's larger than the Earth.
Ron used a 40mm Coronado telescope and a webcam to capture the images. He explains the colours of the Sun in Hydrogen-Alpha:
"The red colour of the prominence is very close to the colour collected in the image. The yellow disk is enhanced. I actually capture the disk image in black and white and add the colour. I can choose any colour. The final image is a composite of two separate images. Prominences are, in general, much fainter than the bright disk. Therefore, the prominence image is captured at a slower shutter speed, e.g. 1/25 sec, compared to the disk image captured at 1/100 sec
Speaking of the Sun, activity on our closest star has been ramping up and in the past weeks a series of active regions were lined up one after the other across the upper half of the Sun. Interestingly, the Solar Dynamics Observatory was able to capture how these regions twisted and interacted with each other The magnetically intense active regions sported coils of arcing loops and numerous times these magnetic field lines above them can be seen connecting with the active region next door. Towards the end, a leading active region blasted out a coronal mass ejection, quickly succeeded by a blast from another active region. The disruption of the magnetic field from one likely triggered the second, a phenomenon that has been observed before by SDO.

Neill Mc Keown's November Observing Guide 1

Please note all times are UT and based on an observing location of Belfast.

The Sun

At the start of the month, the Sun rises at 07:25 and sets at 16:50. By month's end, it rises at 08:20 and sets at 16:05.

The Planets

Mercury is not visible this month.

Venus becomes visible in the evening sky by month's end. It sets at 17:35 and is mag -3.9 at month's end in the West after sunset.

Mars is in Leo during the month and rises before midnight by month's end. It rises at 00:05 at the start of the month and at 23:30 by month's end. It brightens from mag +1.1 to mag +0.8 during the month and passes less than 2° to the N of **Regulus (Alpha (α) Leonis, mag +1.4)** on the morning of the 11th.

Jupiter is an evening object this month and can be found in Aries. It rises during daylight hours during the month and sets at 04:55 by month's end. It fades from mag -2.9 to mag -2.8 during the month.

Saturn is a morning object this month and can be found in Virgo. It rises at 05:45 at the start of the month and at 04:10 by month's end. It maintains its brightness at mag +0.7 during the month.

Uranus is an evening object this month. It can be found in Pisces, SE of the Circlet asterism. It can be located half way between **Omega (ω) Piscium (mag +4.0)** and **Iota (ι) Ceti (mag +3.5)**. It rises during daylight hours during the month and sets at 01:55 by month's end. It fades from mag +5.7 to mag +5.8 during the month. Don't expect to see much detail - it will be like a green-blue star.

Neptune is an evening object and can be found in Aquarius, near to **Iota (ι) Aquarii (mag +4.3)**. It is at eastern quadrature on the 18th, rising during daylight hours during the month and sets at 22:40 by month's end. It maintains its brightness at mag +7.9 during the month. You'll see even less detail than on **Uranus**: It will appear like a faint bluish star.

The Moon

The first quarter moon is on the 2nd with the full moon on the 10th. The last quarter moon is on the 18th with the new moon on the 25th.

Neill Mc Keown's November Observing Guide 2

On the evening of the 3rd, the waxing gibbous moon lies 6° to the W of **Neptune** at around 22:00.
On the evening of the 6th, the waxing gibbous moon lies to the NW of **Uranus** at around 23:00.
On the evenings of the 8th and 9th, the waxing gibbous moon lies near to **Jupiter**. On the 8th, it lies to the NW of it and to its NE on the 9th. On both evenings look at around 22:00.
On the evening of the 11th, the waning gibbous moon lies to the S of **M45 – The Pleiades** at around 22:00.
On the evening of the 12th, the waning gibbous moon lies 6° to the NE of **Aldebaran (Alpha (α) Tauri, mag +0.9)** at around 22:00.
On the evening of the 13th, the waning gibbous moon lies to the W of **M35** at around 22:00.
On the morning of the 17th, the waning gibbous moon lies to the W of **M44 – The Beehive Cluster** at around 01:00.
On the morning of the 19th, the waning crescent moon lies to the W of **Mars** and to the S of **Regulus (Alpha (α) Leonis, mag +1.4)** at around 03:00.
On the morning of the 22nd, the waning crescent moon lies to the W of **Saturn** and 6° to the NW of **Spica (Alpha (α) Virginis, mag +1.0)** at around 06:00.
On the evenings of the 26th and 27th, the waxing crescent moon lies near to **Venus**. On the 26th, it lies 6° to the W of it and on the 27th, to the NE of it. On both evenings look at around 17:00. A flat western horizon is needed and BE SURE TO MAKE SURE THE SUN HAS SET BEFORE YOU LOOK.

Meteors
The best time to observe meteor showers is when the moon is below the horizon; otherwise its bright glare limits the number you will see especially the fainter ones. Below is a guide to this month's showers.
The **Taurids** has two peaks during the month. On the 5th, the **Southern Taurids** peak with a ZHR of 10. The radiant becomes visible around 20:00, but a waxing gibbous moon in Pisces spoils the view until it sets around 02:55 on the morning of the 6th.
On the 12th, the **Northern Taurids** peak also with a ZHR of 10. The radiant again becomes visible around 20:00, but a waning gibbous moon in Taurus spoils the view.
The **Leonids** peak around 03:40 on the morning of the 18th with a ZHR of 20. The radiant becomes visible around 02:00 on the morning of the 18th, but again the view is spoilt, this time by a waning gibbous moon in Cancer which rises around 22:45 on the evening of the 17th.

Asteroids
Asteroid (29) Amphitrite is at opposition on the 5th and will be mag +8.7. It can be found in Aries.
Asteroid (15) Eunomia is at opposition on the 29th and will be mag +7.9. It can be found in Perseus.

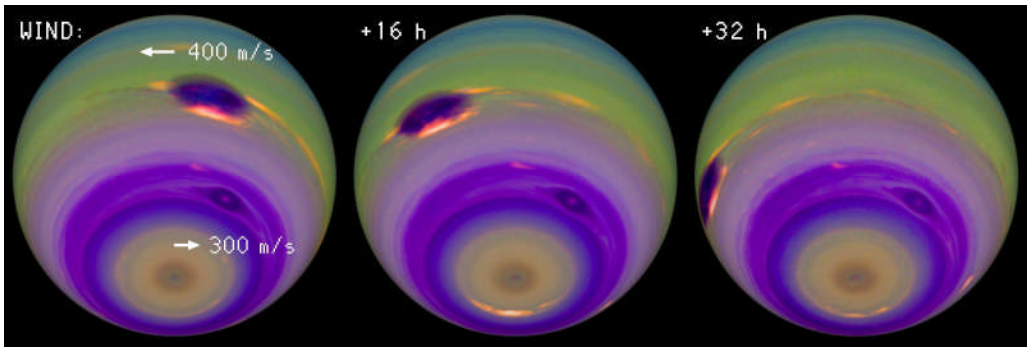
Astronomy News 3

Are Comets Creating Exoplanet Oceans?

Comets have been caught battering an exoplanet for the first time, new observations suggest. If the existence of the planet is confirmed, the finding means that the impacts are bringing water and organic material – the essential ingredients for life – to a world that lies in the habitable zone around its star.
The cometary shower is taking place around a bright star about 60 light years away called Eta Corvi, which is visible to the naked eye.
The Spitzer Space telescope spotted the infrared glow of a band of dust three times as far from Eta Corvi as Earth is from the sun. On analysis its spectrum was found to contain water, organics and rock.
The composition and amounts seen suggest that several small comets, or a single large one, crashed into a rocky world weighing up to a few times the mass of the Earth, creating a trail of debris behind the planet. For example, the dust seems to contain nanodiamonds, which form when organic materials smack into each other at very high speeds, and bits of silica – essentially glass, which forms when rock melts and then quickly re-freezes.
Astronomers already knew that Eta Corvi had a stockpile of comets: a bright ring of cold dust is seen about 150 times as far from the star as Earth is from the sun.
Our solar system has an equivalent band called the Kuiper belt, an icy reservoir of leftover planet pieces where comets are born.
The observations suggest the planet, whose existence has not been confirmed by other methods, is suffering its own version of the solar system's "late heavy bombardment", in which a barrage of comets scarred the inner planets around 4 billion years ago.
It was triggered when Jupiter and Saturn shifted positions, flinging icy bodies from the solar system's frozen fringe inwards. Eta Corvi, a relatively young star, might have a distant Neptune-like planet doing the same.
Some astrobiologists believe that comets carried water and organics – the building blocks of life – to Earth. Life on Earth emerged soon after the late heavy bombardment ended around 3.8 billion years ago, and it wouldn't have taken much water to make the dry planet habitable.
Conveniently, the comet collision appears to be right at the distance from the star where liquid water can exist on a planet's surface.
The researchers also found that the cloud around Eta Corvi matches the composition of the Almahata Sitta meteorite, which astronomers tracked as it fell to Earth in 2008.
The similarity suggests that the meteorite had its origins in the Kuiper belt.

Astronomy News 2

Neptune's Day Length Calculated.



Not long after Neptune completed its first orbit around the sun since its discovery in 1846, scientists have managed to calculate the length of one day on the distant gas giant planet.

Unlike their rocky counterparts, gas giants have long challenged astronomers when it comes to calculating their rotation.

Mercury, Venus, and Mars are essentially solid spinning rock, but huge gas giants move more like spinning liquids, sloshing and swirling around a small rocky core. While features on rocky, terrestrial planets are literally etched in stone, outer planets have features that appear to dance on top of the constantly moving clouds.

But scientists managed to use these features to calculate how long it takes Neptune to rotate on its axis and complete one day: 15 hours, 57 minutes, and 59 seconds.

They examined more than 500 images of Neptune that were taken by the Hubble Space Telescope. Two cloud formations, similar to Jupiter's famous Red Spot, stood out — the South Polar Feature and the South Polar Wave.

After studying the Hubble images, taken over a span of 20 years, they determined that these distinct features appeared precisely on schedule.

They widened their search to a series of more detailed images taken in 1989 by NASA's Voyager spacecraft. In these images, and found six additional features on Neptune that rotated with regularity.

As the Voyager 1 and Voyager 2 spacecraft flew past Saturn, Uranus, and Neptune in the 1980s, they captured radio signals produced by their magnetic fields. But their information, which was originally used to calculate the rotation of the outer planets, was scanty, as Voyager 2 only flew by Neptune, so its measurements are limited.

Hence the analysis of Neptune's visible features. This method will help astronomers understand more than just how often the sun rises and sets on the Neptune.

Refined measurements of the blue giant's rotation will help astronomers gain a better understanding of how its mass is distributed. A faster rotation implies that more of the mass is closer to the centre than previously thought, which could change existing models of the exterior planets.

Neill Mc Keown's November Observing Guide 3

Comets

Comet 45P/Honda-Mrkos-Pajdusakov is a morning comet in Virgo heading E during the month. It is currently mag +8 and having peaked last month, is now expected to fade during the month. Its Eastward motion means it is moving back towards the sun and not readily visible at the start of the month. It is however visible from around 06:00 by month's end.

Comet C/2009 P1 (Garradd) is in Hercules in October, heading SW during the month. It is visible as soon as darkness falls and it is currently around mag +7 with a predicted peak of mag +6 in the new year.

Comet C/2009 P1 (Garradd) is in Hercules in October, heading W during the month. It is visible as soon as darkness falls and it is currently around mag +7 with a predicted peak of mag +6 in the new year.

Deep Sky

On the deep sky front this month, galaxies M81 and M82 can be observed in Ursa Major. In Andromeda, M31 – The Andromeda galaxy can be observed along with its satellite galaxies M32 and M110. In Perseus, there is the open cluster M34 and the excellent Double Cluster – NGC 869 and 884. In Triangulum, there is the galaxy M33. In Auriga there are three open clusters M36, M37 and M38 and also M35 in Gemini. Taurus has the excellent Pleiades – M45, the Hyades and also M1 – The Crab Nebula. Orion returns to our skies with M42 – The Great Orion Nebula and also Cancer with M44 – The Beehive Cluster.

General Notes

Always keep an eye out for **Aurorae**. The autumn equinox is on the 23rd which sees the end of summer and the beginning of autumn. This is the day where the length of day and night is the same and after this the night will take over cumulating with the shortest day of the year on the winter solstice in December.

Other interesting naked eye phenomena to look out for include the **Zodiacal Light** and the **Gegenschein**. Both are caused by sunlight reflecting off dust particles which are present in the solar system. The **Zodiacal Light** can be seen in the West after evening twilight has disappeared or in the East before the morning twilight. The best time of year to see the phenomenon is late-Feb to early-April in the evening sky and September/October in the morning sky - it's then that the ecliptic, along which the cone of the zodiacal light lies, is steepest in our skies. The **Gegenschein** can be seen in the area of the sky opposite the sun. To view either, you must get yourself to a very dark site to cut out the light pollution. When trying to observe either of these phenomena, it is best to do so when the moon is below the horizon.

Clear Skies
Neill McKeown

Neill Mc Keown's November Observing Guide 4

Appendix

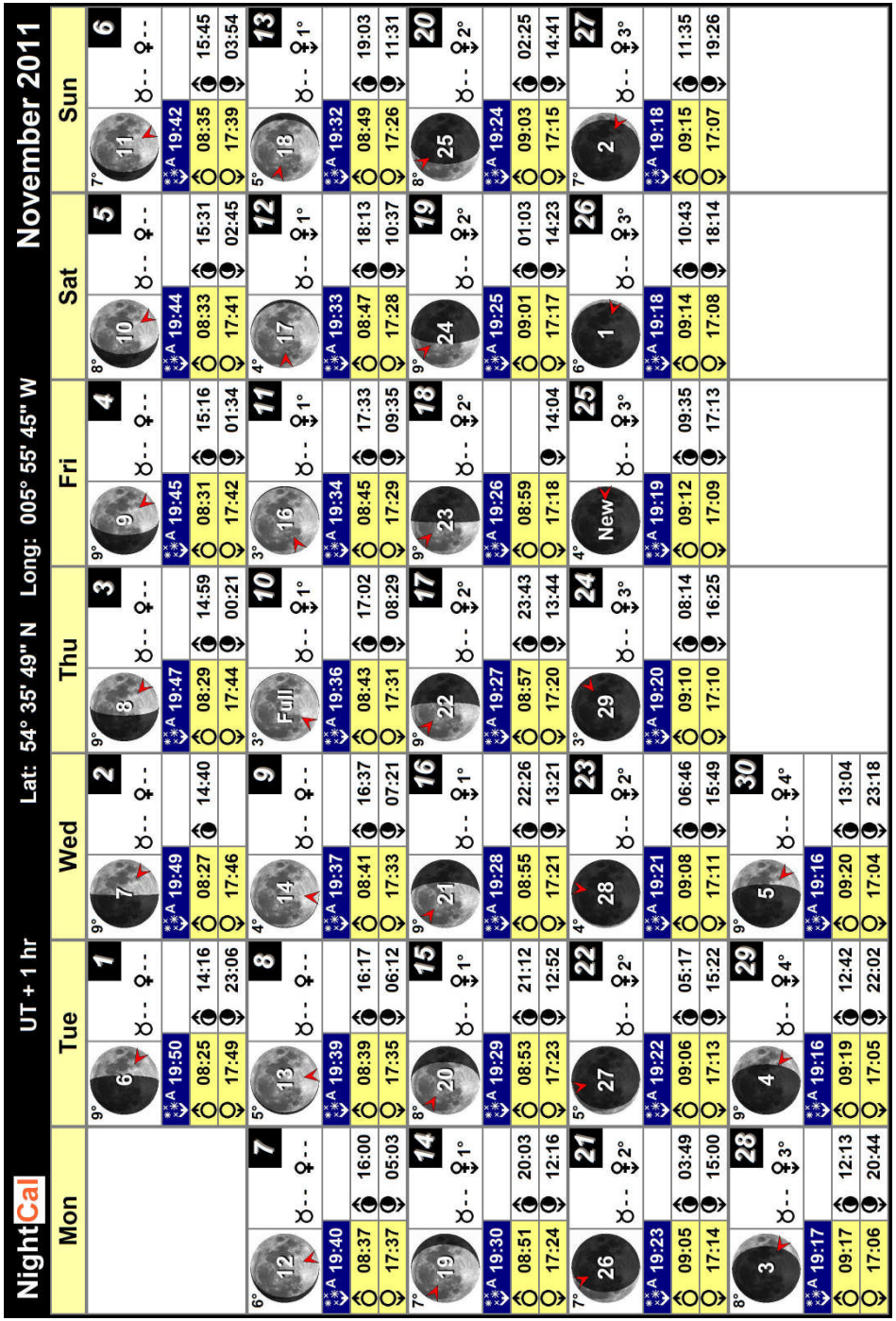
The ZHR or Zenithal Hourly Rate is the number of meteors an observer would see in one hour under a clear, dark sky with a limiting apparent magnitude of 6.5 and if the radiant of the shower were in the zenith. The rate that can effectively be seen is nearly always lower and decreases as the radiant is closer to the horizon. The Zenith is the overhead point in the sky.
The radiant is the point in the sky, from which (to a planetary observer) meteors appear to originate, i.e. the Perseids, for example, are meteors which appear to come from a point within the constellation of Perseus. When the radiant is quoted as "circumpolar", it is never below the horizon and visible all night, otherwise the times quoted are when the constellation in which the radiant lies rises above the horizon in the East.
A fireball is defined by the International Astronomical Union as a meteor brighter than any of the planets, i.e. magnitude -4 or brighter. The International Meteor Organisation defines it as a meteor which would have a magnitude of -3 or brighter at the zenith.
The ° symbol in the guide is that for degrees. A degree is two full moon widths to give an idea for judging any distances quoted in the guide.
An asterism is a collection of stars seen in Earth's sky which form simple patterns which are easy to identify, i.e. the Big Dipper. They can be formed from stars within the same constellation or by stars from more than one constellation. Like the constellations, they are a line of sight phenomenon and the stars, whilst visible in the same general direction, are not physically related and are often at different distances from Earth.
Mag is short for magnitude which is the measure of an object's brightness.
The smaller the number, the brighter the object is. The brightest object in the sky is the Sun at mag -26, the full moon is mag -12 and Venus the brightest planet is mag -4. The brightest stars are mag -1. If there is a 1 mag difference between two objects – there is a difference in brightness of a factor of 2.5 between the two objects. For example the full moon is eight magnitudes brighter than Venus on average which means it is 1,526 times brighter than Venus. Objects down to mag +6 can be seen with the naked eye under very dark skies.
Local time is always quoted in the guide and this means for November – February – Universal time (UT)/GMT is used and for April to September – daylight savings time (DST, = GMT+1).
For the months of March and October when the clocks go forward/back respectively, both times will be used and attention should be paid to any times at the end of these months for that change.
Deep Sky Objects such as galaxies, nebulae and star clusters are classified in catalogues such as the Messier catalogue for objects like M44, M for Messier. Another example would be the New General Catalogue whose objects have a prefix NGC.
The Inner Planets, Mercury and Venus, are best seen when at Greatest Eastern/Western elongation and are not visible when at either Inferior/Superior conjunction.

Astronomy News 1

Asteroid Close Approach to Earth

This week, an asteroid the size of an aircraft carrier will zip by Earth inside the orbit of the moon, marking the closest pass by such a big space rock in 35 years.
The near-Earth asteroid, called 2005 YU55, will make its closest approach at 22.28 GMT on Nov. 8. But astronomers will start their concerted observation campaign even earlier, training a battery of instruments on it from Nov. 4 to learn as much as possible about the asteroid before it recedes into deep space once again.
The asteroid, which was discovered in December 2005, is about 1,300 feet wide, making it about as big as an aircraft carrier. It makes one lap around the sun once every 15 months or so. The last time a rock as big as 2005 YU55 came so close to Earth was back in 1976, though astronomers did not know about that flyby at the time.
The next known close encounter with such a large asteroid won't come until 2028, NASA officials have said.
The rock is not going to slam into Earth on this close pass, or indeed anytime soon, as we have a very good idea about its orbit for the following 100 years, and there is no chance of impact, and new observations allowing researchers to predict the space rock's orbit for centuries into the future.
Researchers say the asteroid will get to within 201,700 miles of our planet, or about 85 percent of the Earth-moon distance, which is on average 238,854 miles from us.
There's also no chance of 2005 YU55 smashing into the moon this week.
This still from a NASA animation by Jon Giorgini of the Jet Propulsion Laboratory shows the trajectory of asteroid 2005 YU55 as it passes between Earth and the moon on Nov. 8, 2011.
There will be no meaningful or measurable effects on Earth, or the moon, at all, scientists say. 2005 YU55 is just too small.
Under dark and clear skies, any scope with an aperture 6 inches or larger should let you pick up 2005 YU55 on the night of Nov. 8.
The asteroid won't be sitting placidly in your eyepiece like a planet or a star, however. It will be streaking across the sky at about 9 degrees per hour. (Your clenched fist held at arm's length measures about 10 degrees.)

Solar and Lunar Data for November 2011



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Greatest Eastern elongation is when the inner planet is at its furthest point east from the sun as seen from Earth and visible in the evening sky in the West after sunset, Western elongation is when its at its furthest point west from the sun as seen from Earth and visible in the morning sky in the East before sunset. Inferior conjunction occurs when the inner planet is between the Sun and the Earth. Superior conjunction occurs when the inner planet is on the other side of the Sun as seen from Earth.

From our Northerly latitudes, the ecliptic, along which the planets move, lies at a very shallow angle to the horizon after sunset in the autumn and before sunrise in spring. This means that any of the planets will be difficult to see when fairly close to the Sun in the evening sky in the autumn or in the morning sky in the spring. In particular, Mercury is more or less invisible from here when at Eastern elongation in the autumn, or at Western elongation in the spring, because it lies so close to the horizon and is never above the horizon except in daylight or bright twilight.

The normal cycle for an inner planet is Superior Conjunction – Greatest Eastern Elongation – Inferior Conjunction – Greatest Western Elongation - Superior Conjunction. After superior conjunction, the planet moves away from the Sun as seen from Earth and becomes visible in the evening sky after a period of time. It then moves past the point of Greatest Eastern Elongation and moves back towards the Sun as seen from Earth until a point when it is not visible and at Inferior Conjunction. After this the planet appears in the morning sky for a time, before again slipping into the Sun's glare as seen from Earth. The duration of this cycle will depend on the planet's closeness to the Sun, e.g. Mercury completes the cycle in 4 months.

The Outer Planets

These are best seen when at opposition and are not visible when at conjunction. Opposition occurs when the earth is between the sun and the outer planet. It is the best time to observe them because the planet is visible all through the night and it is due South and at its highest at about midnight. The planet is also at its closest point in its orbit to Earth – making it appear brighter. Conjunction occurs when the outer planet is on the other side of the Sun as seen from Earth.

If the planet is at or near it furthest point South along the ecliptic, then it won't get very high in the sky even at opposition – just as the Sun never gets high in the sky in midwinter. This happens when opposition occurs near midsummer when the planet is opposite the Sun in the sky and in midsummer the Sun is high, so the planet will be low. The opposite of course applies in winter.

The normal cycle for an outer planet is Conjunction – Western Quadrature – Opposition – Eastern Quadrature - Conjunction. After conjunction, the planet moves away from the Sun as seen from Earth and becomes visible again. The planet from this point on rises earlier and earlier in the morning sky and eventually becomes visible in the evening sky. At Western Quadrature it is at its highest at sunrise and by opposition it is in the same position by midnight. By Eastern Quadrature, it is past its best and is at its highest at sunset, meaning it is rising in daytime and setting earlier and earlier until a point when it sets too close to the Sun as seen from Earth and is no longer visible. The duration of this cycle will depend on the planet's closeness to the Sun, i.e. Jupiter completes the above cycle in around 13-14 months.

The Night Sky
21.00 GMT
Mid-November