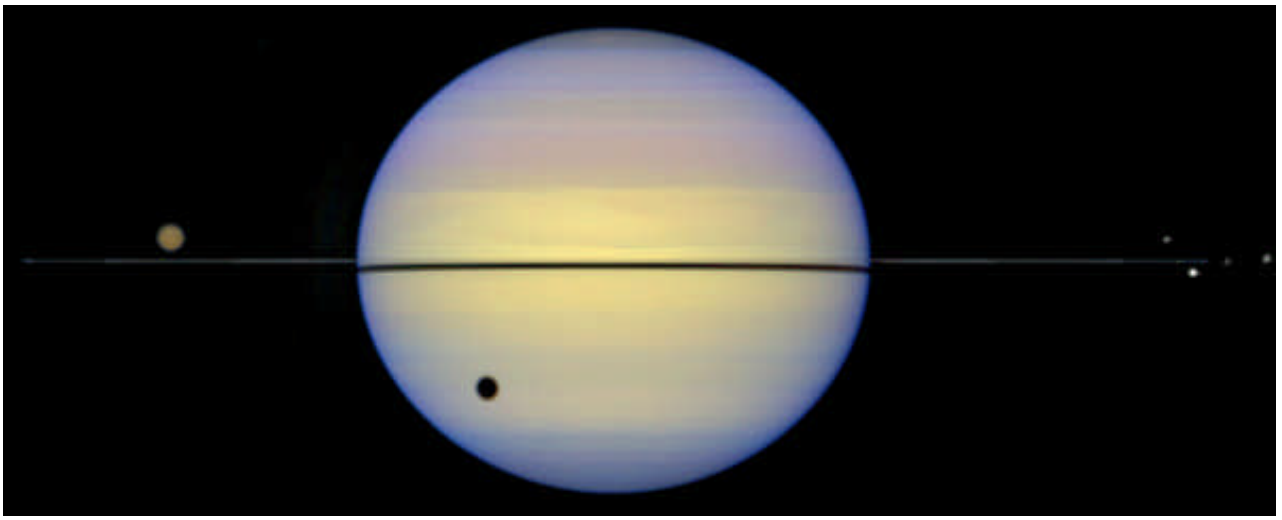
TRANSIT

The Newsletter of

Cleveland & Darlington Astronomical Society

05 January 2009



Hubble caught Saturn with the edge-on rings in 1996.
Image courtesy Eric Karkoschka (UoA)

Front Page Image - Saturn, like the Earth, is tilted on its axis compared to the plane of its orbit, being off vertical by 26.7 degrees. Saturn's rings are aligned with its equator so that means that roughly twice every orbit of Saturn we on Earth see the rings edge on. We pass through the ring plane in September 2009 but at that time Saturn is on the other side of the Sun, so now is the best time to view Saturn in Leo with the almost disappeared rings when they are inclined at 0.8 degrees to our line of sight. The next ring plane crossing is March 2025

Last meeting : 12 December 2008. "The Large Hadron Collider" by Dr Peter Edwards of Durham University. Dr Edwards proved he was a skilled public communicator when he initially launched into a short history of particle physics – we all understood what he was talking about! After then explaining what the LHC was actually looking for and how their massive detectors work he explained the problems caused by the unfortunate accident when firing up the LHC for the first time. The prognosis for future collisions seems to have a varying date but perhaps the 2010 date is the most likely. We wish Dr Edwards and his LHC colleagues the best of luck in achieving an early target date.

Next meeting : 09 January 2009 – Members night. The meeting will start with the **Society 2009 AGM** and follow on with short talks presented by members of the Society.

Please note the venue for the next meeting :-

7.15pm for a 7.30 pm start, Grindon Parish Hall (in Thorpe Thewles, our previous meeting place).

Letter to the Editor

- **To all Society Members,**

From Alex Menarry -

The announcement made at the December, 2008 CaDAS meeting of an **Annual General Meeting (AGM)** on January 9th, 2009, is repeated in this edition of Transit, to ensure the maximum number of members are informed.

Very important issues will be raised and discussed at this meeting, which may affect the future direction and development of the Society.

A revised and updated Constitution will be presented. It is vital that the maximum number of members attend to voice an opinion, take part in the debate and decide what they want.

In my view, this meeting could turn out to be one of the most important AGMs the Society has ever held, since its inception.

As usual in a democracy, members will have expressed a view by not voicing one or by not attending the meeting.

I urge all members to attend and say what they think.

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Dear Editor,

from Rod Cuff -

For a few weeks during late November and early December, the International Space Station made a whole series of passes over the UK round about dusk or early evening, making for easy viewing. I watched it on several consecutive evenings, the first time soon after sunset, when the brilliant spot of white light gradually faded to red and disappeared when half-way across the sky, as the ISS went into its own sunset.

One of the reasons the ISS was particularly bright at that time was that the Shuttle Endeavour was docked with it, giving a larger reflective surface area. They separated on Friday November 28, and at 17:15 the Shuttle was due to fire its engines to take it away from the ISS and into its glide path home. Consulting the Heavens Above website (www.heavens-above.com), I saw that the ISS was due to pass over at about 17:30, and I wondered whether it would be possible to see *two* objects orbiting instead of one.

The skies were clear an hour earlier ... but mist and thin low cloud covered everywhere at 17:25 (surprise!). Gloomily I gazed at the greyness at the predicted transit time -- and a blurred and subdued white light, spread by the mist to about the size of a full moon, appeared out of the murk and moved silently eastwards at about 40 degrees above the horizon. Feeling distinctly chirpy, I turned my binoculars on it -- and there in the same binocular field, about 5 degrees ahead, was a fainter light, moving on the same trajectory at the same speed. Result! I was ridiculously pleased ...

Cheers -- Rod Cuff

"PS -- Did you know you can send a postcard free of charge to the crew of the ISS? See www.nasa.gov/externalflash/postcard

The Goodchild 8” f9 Dobsonian Telescope

From Bob Mullen, Editor

The above hand-crafted Dobsonian telescope was donated to the Society by Mrs Goodchild of Great Broughton in memory of her husband Ray Goodchild who built this telescope using a long focus 8” mirror and tool mirror obtained from Cambridge University. Because of the long focal length Raymond’s interest must have been in planetary observation rather than deep sky observations. Unfortunately no observing records have been discovered as yet to show his intentions. Ray’s books on Cosmology have also been donated to the CaDAS library.

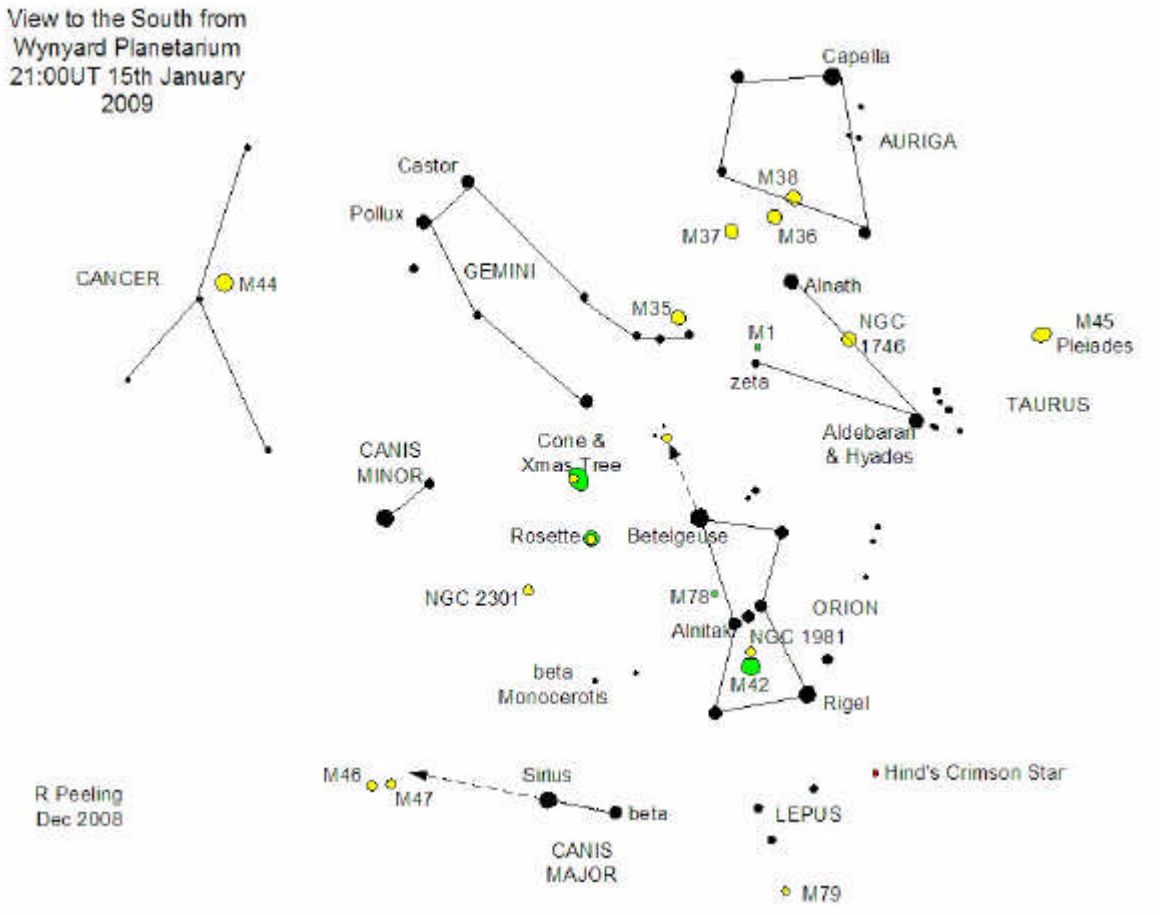
From the construction of the telescope and Mrs Goodchild’s recollection of work undertaken in his superbly equipped back-garden workshop Ray was greatly skilled with his hands. This followed a career as an engineer working in both Tioxide and ICI prior to his retirement.

Raymond was also a Planetarian, he travelled around Durham Schools with his colleague Stuart Shorthouse, presenting Planetarium shows using the Durham LEA inflatable Planetarium

We hope to find out more about his observing interests as Mrs Goodchild searches through his paperwork. If any member has had any contact with Mr Goodchild in the past the Editor would greatly appreciate any information they may offer. Our many thanks from the Society to Mrs Goodchild and her generosity.

Skylights - January 2009

from Rob Peeling

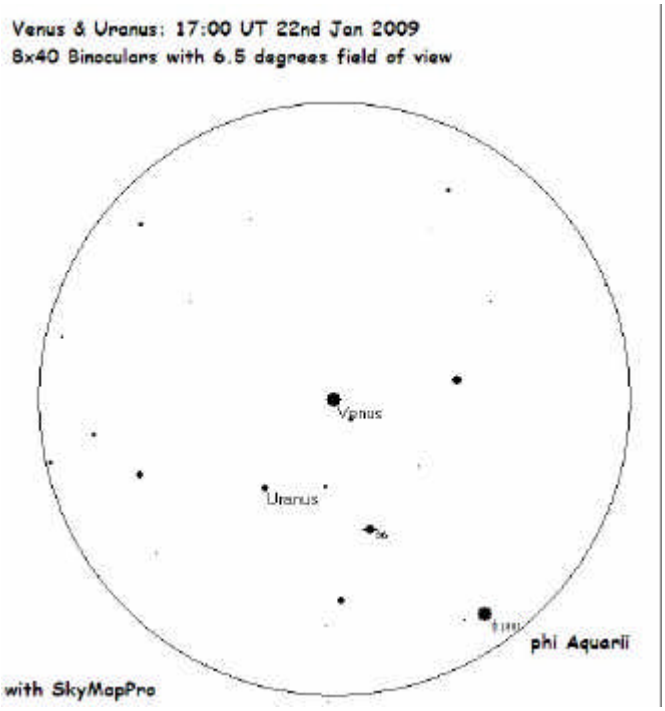


The Moon

04 Jan	11 Jan	18 Jan	26 Jan
First Quarter	Full Moon	Last Quarter	New Moon

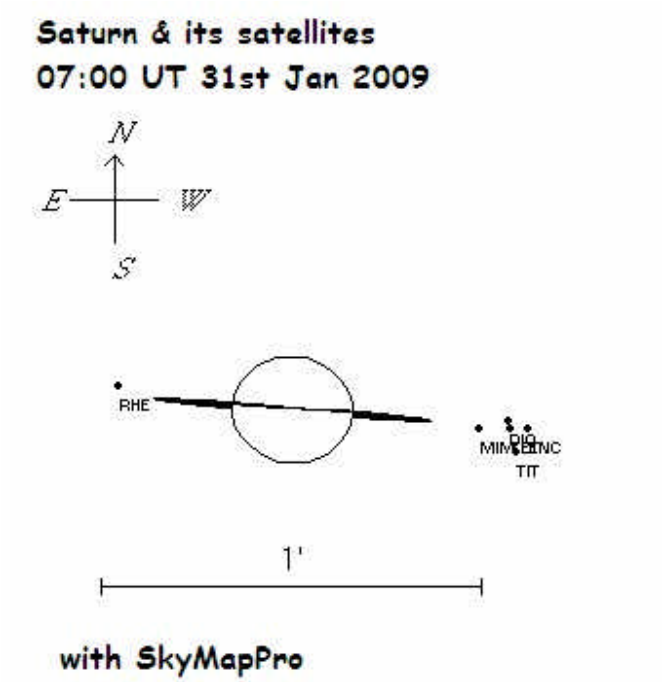
There will be a lunar occultation of the Pleiades on Wednesday, 7th Jan between about 16:00 and 20:00. So the event will have begun as it gets dark. The Moon's glare may make it difficult to see the Pleiades with the naked eye but you should be able to see the brighter stars with binoculars.

Planets



Venus will be very prominent in the evening sky. On the Thursday, 22nd Jan, **Uranus** will be only 1.22° from Venus. If you've not seen Uranus before then it couldn't better marked in the sky for you. Using binoculars or your finder, you will see a row of three stars below Venus. The middle one will be fainter than the other two. The outer star to the east (left in binoculars) is Uranus. Use a telescope with at least X100 power to confirm the planet is a disk not a point.

On the 20th Jan the same group will be to the east (left in binoculars) of Venus and by the 25th Jan it will be below and to the west of Venus. Venus's phase on 22nd is 47%.



Saturn is an early morning object beneath the tail of Leo throughout January. It is worth telescope owners getting up early on Saturday, 31st Jan because the five satellites, Titan, Mimas, Dione, Enceladus, & Tethys will all be in an unusually tight grouping (within 8 arcsec) to the west of the planet with Rhea out on the east. Start watching around 5am to see the satellites bunching up with the tightest grouping reached by around 7am by which means the dawn light may prevent you seeing it at its best.

Meteors

The Quadrantids are the principal shower for January, lasting from 28th Dec to 7th Jan with the maximum on 3rd. According to David Levy this shower yields 40-200 per hour and they tend to be bluish. Expect to see a considerably reduced rate in the light-polluted skies of Stockton but the Moon won't interfere too much.

Deep Sky

Orion occupies centre stage to the south throughout January. From a dark site, like the moors, M42, the Great Orion Nebula can be seen as a fuzzy star with the naked eye. However it is more easily seen with almost any pair of binoculars. Through a telescope M42 is a great testing ground for whatever equipment you have. Try several different powered eyepieces and nebular filters if you have them and see how much detail you can pick out. Can you see all four stars in the Trapezium, θ_1 Orionis. Galileo and Huygens only show three in the earliest known drawings of M42 from 1617 & 1659 respectively. Messier shows four in his drawing published in 1771. The brightest of the four, θ_1 Orionis C is responsible for the majority of the ultra-violet light that causes the gas in M42 to glow so brightly. Can you see the nebula following the line of three stars away from the Trapezium, and the matching arc heading off in the opposite direction?

With a low power lens, look for the faint splodge around a single bright star away from the Trapezium. This is de Mairan's Nebula or M43. It is prominent in good observing conditions from all locations. Above and to the north of M42 is an open star cluster NGC 1981 which should be clearly visible with just binoculars. If you have a larger telescope (8"+) and nebula filters then it is worth trying for the nebula NGC 1973,75,79 around the stars lying between NGC 1981 and M42. Imagers should attempt to obtain a clear image of the "running man". Also look at the bright star, iota Orionis below M42 in the sky. On a good night it is possible to see a faint arc of nebulosity stretching all the way from M42 down to this star. Incidentally, this star is believed to have originally been part of the same star system as the "runaway" stars AU Aurigae and mu Columbae before these two were violently ejected leaving iota Orionis behind at their mutual place of formation.

Staying within Orion, have a look for the emission nebula, M78. Look about a quarter of the way along the line from Alnitak (the leftmost star in Orion's belt) and Betelgeuse. M78 lies about 1 degree (about a field width with low power) to the east of this imaginary line. It is not particularly bright, but can be found with a small telescope from a moderately light polluted site. It is the pair of stars like eyes in the nebula that makes it distinctive.

Also in Orion, is a small, bright open cluster, which I recommend viewing. NGC 2169 completes a triangle with and below xi and nu Orionis lying way out along Orion's up stretched arm to the north-east of Betelgeuse. Douglas Adams told

us in Hitch Hikers' Guide to the Galaxy that the answer to life, the universe and everything was 42. NGC 2169 suggests that he was out by five. The correct answer as written in the stars of this cluster is "37". Have a look if you don't believe me!

Don't forget the well-known Messier open clusters in Auriga (M36,M37 and M38), Gemini (M35) and Cancer (M44). All are easy to see with binoculars, but can you see M44 with the naked eye? It is obvious from a dark site in the moors but I was surprised to be able to just pick it out from my own garden too. If you view M35 with a telescope, see if you can find the little, close-by, open cluster NGC 2158. This cluster is actually similar in physical size to M35. It looks so small because it is six times further away.

Use Sirius and beta Canis Majoris to its right as pointers to sweep eastwards (left) with binoculars or your finder to find first M47 and then M46 lying within 2 degrees of each other in the constellation of Puppis. Both are open clusters. M46 is a personal favourite because lying within the cluster is a planetary nebula, NGC 2438. Since the cluster is low in the sky from Stockton you will almost certainly need a nebula or OIII filter to find this planetary for the first time. The planetary nebula is probably *not* associated with M46 itself but it is not yet clear whether it is lies in front of or behind M46. The problem is the lack of an accurate method of measuring the distance to a planetary nebula.

Beneath Orion's feet lies the constellation of Lepus. Two objects are worthy of attention. R Leporis or Hind's Crimson Star is one of the deepest coloured carbon stars known. I always have a bit of bother finding it because being low in the sky the marker stars I use to find it are often missing in the murkiness reaching up from the horizon. If you are a fan of coloured stars though, it is worth persevering until you find it (and find W Orionis also). The other object is the globular cluster M79 which is included here to provide a mild challenge for small telescopes. It won't show itself without some determination from you!

Now move over to the constellation of Monoceros. Beta monocerotis is a lovely triple of white stars (use high power). To the north-east of beta lie the Rosette (NGC 2239) and Cone (NGC 2264) nebulae. These are worth a look to see the associated open clusters irrespective of whether you are at a dark enough site or have the filters to see the nebulae themselves. The star 15 Monocerotis marks the base of the Christmas Tree cluster. Where the fairy should be on the top of the tree is the tip of the eponymous Cone nebula. You will need some sort of star atlas to help you navigate in this region of sky. If you are up for a bit of a hunt, then try the open cluster NGC 2301 further to the east. This is a lovely bright little cluster. Steve O'Meara has given it the nickname, "Hagrid's Dragon".

To find M1, the Crab Nebula, locate the star zeta Tauri in your finder and sweep north about half a field's width with a low power eyepiece. M1 is surprisingly faint given its fame and any haze in the sky will probably prevent you seeing it. Once

you find this fuzzy blob think about how its light is due to the radiation emitted by the tortured matter in the pulsar at its centre, which is undetectable except, by imaging. Also in Taurus, I recommend the binocular open cluster NGC 1746, two-thirds of the way from Aldebaran to beta Tauri (Alnath).

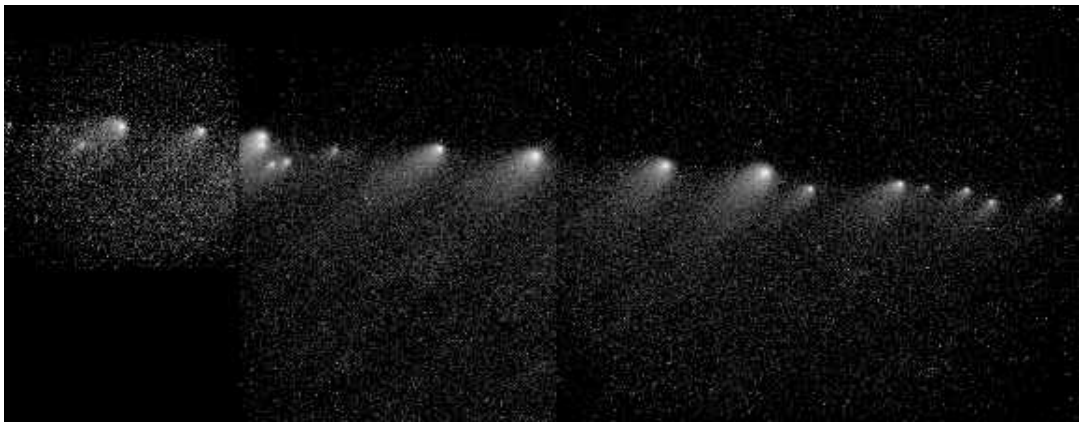
Occultations - 2009

For anyone interested in Occultations in 2009 Keith Johnson recommends the following website :-

http://asa.hmnao.com/AsAtest/SecA/2009/olist09.html

The Transit Quiz

Where in the Universe? A pictorial challenge. Of what, where and when was this image taken?



Q1. Here are some satellites that are or were in Earth orbit, each known by an acronym. What do the letters stand for, and what are/were the missions?
(a) IBEX
(b) INTEGRAL
(c) IRAS

Q2. What first (of many) was found on 1 January 1801? When and what was the next?

Q3. What's this sequence of dates all about? Can you fill in the missing entry?
July 20, November 19, ???, February 5, July 30, April 20, December 11

Q4. Viewing other Solar System planets from Earth, what is:
(a) an inferior conjunction?
(b) a superior conjunction?
(c) opposition?
(d) a syzygy?

Q5. For most CaDAS members, what do the members of each set of constellations have in common?
(a) Cassiopeia, Cepheus and Draco?
(b) Centaurus, Carina and Tucana?
(c) Carina, Puppis and Vela [for a reason different from that of (b)]?

Q6. What are these, and where would you find them?
(a) A Crab?
(b) A horse's head?
(c) An Owl?
(d) Tiger stripes?

The Planet That Wasn't!

from Neil Haggath

This year marks the 150th anniversary of one of the more bizarre episodes in the history of astronomy – the "discovery" of a nonexistent planet! The story involves an unlikely combination of characters – one of the most prominent astronomers and mathematicians of the era, and an obscure amateur astronomer, whose enthusiasm, shall we say, far exceeded his competence.
First, a little background. The planets out to Saturn have been known since ancient times - though of course, it wasn't until the 17th Century, and the invention of the telescope, that anyone realised that the "wandering stars" were worlds like our own. The first planet to be discovered in recorded history was Uranus, found by pure chance by Sir William Herschel in 1781.

By the 1840's, it was clear that Uranus wasn't behaving quite as it should; its position in the sky deviated from that predicted by the calculations of its orbit. Two mathematicians independently concluded that its orbital motion was being perturbed by another planet, even further from the Sun, and as yet unseen. They even predicted where in the sky the new planet would be.

One of these was a young Englishman, John Couch Adams. He sent his calculations to the Astronomer Royal, Sir George Airy – but inexplicably, no-one thought to follow up the matter and initiate a search, until it was too late.

The other was a French aristocrat, Urbain Jean Joseph le Verrier (1811-77), who would later become Director of the Paris Observatory. Using his

calculations, a number of people across Europe searched for the hypothetical planet; in 1846, Johann Galle and Heinrich d'Arrest, at Berlin Observatory, found it, in almost the exact position predicted by le Verrier. It was, of course, the planet which we now call Neptune; le Verrier's prediction was hailed as a great triumph for Newtonian physics.

Le Verrier is the first of the two central characters in our story. While he was highly respected as a mathematician and astronomer, his qualities as a person were less admirable. He was arrogant, irritable and bad-tempered, and it was said that he never failed to argue with anyone he met. In fact he was described by one contemporary as the rudest man in all of France! In 1870, he was forced to resign as Director of the Paris Observatory, due to his bullying manner – though he was later reinstated, following the premature death of his successor.

Following his success in predicting the existence of Neptune, le Verrier turned his attention to another problem which was puzzling astronomers, concerning the orbital motion of Mercury. Mercury's orbit is somewhat more eccentric, or elongated, than those of the other planets, and the direction of the long axis of the ellipse rotates, or precesses, over long periods of time. This phenomenon, called perihelion precession, is predicted by classical Newtonian orbital dynamics, but the rate of precession wasn't quite right; the measured rate differed from that predicted by theory, by 43 arc seconds per century.

Perhaps not surprisingly, le Verrier proposed that this discrepancy was due to the presence of another as yet unknown planet, closer to the Sun than Mercury. His prediction was widely publicised; many other astronomers agreed, and initiated searches for this latest hypothetical planet. They even gave it a name – Vulcan, after the Roman god of fire. But for some years, they could find no sign of it.
(We now know that the true cause of the discrepancy is something which le Verrier and his contemporaries couldn't possibly have worked out. It's a consequence of Einstein's General Relativity, which still lay more than 60 years in the future.)

Had Vulcan existed, it would obviously have been near-impossible to see in normal circumstances, as it would have been permanently lost in the Sun's glare. It was proposed that there might be two ways of finding it. One was that it could be seen during total solar eclipses; the other was that it would periodically transit the Sun, as Mercury and Venus do. Transits of Mercury are fairly common, occurring about 13 times per century; those of Venus, as we all know, are much rarer.

Sceptics pointed out that astronomers had been regularly observing the Sun for two centuries, and no such transit had yet been observed. This would suggest that, if Vulcan existed, its transits must be extremely rare – but simple geometry said that they should occur more frequently than those of Mercury, unless the planet was in a highly inclined orbit.

Now enter the second of our central characters. Dr. Edmonde Lescarbault was a modest, unassuming – but somewhat eccentric - country doctor and amateur astronomer, who lived and worked in the village of Orgères-en-Beauce, 70 kilometres south-west of Paris. He wasn't very well off; legend has it that he couldn't afford writing paper, so he wrote his observing notes on a plank of wood, later planing off the surface to use the plank again! He did, however, own a 95-mm refractor – though of what quality, we don't know.

One of Lescarbault's interests was observing the Sun. On 26 March 1859, he observed a small black spot, apparently moving across the face of the Sun. He was familiar with transits of Mercury, having observed one in 1845, but knew that there wasn't one due; he concluded that what he had seen must be le Verrier's predicted planet, Vulcan.

Yet for some reason best known to himself, Lescarbault shied away from informing anyone of his observation for the next several months. But finally, in December, he plucked up the courage to write to le Verrier in Paris.

Despite his conviction that Vulcan existed, le Verrier found it hard to believe that an unknown, modestly-equipped amateur could have succeeded where so many more proficient observers had failed – but instead of dismissing the claim out of hand, he decided to investigate it. He travelled to Orgères-en-Beauce, to interview Lescarbault in person.

When the arrogant, overbearing le Verrier arrived unannounced at the home of the mild-mannered country doctor, what followed has passed into astronomical folklore. It must surely have been one of the strangest meetings in the history of science! Poor Lescarbault probably didn't know what had hit him, as he opened his door to be greeted by the following diatribe:

"It is then you, sir, who pretend to have discovered the intra-Mercurial planet, and who have committed the grave offence of keeping your observation secret for nine months. I warn you that I have come here with the intention of doing justice to your pretensions, and of demonstrating that you have been either dishonest or deceived. Tell me unequivocally what you have seen."

Amazingly, despite such an unpromising beginning, le Verrier actually became convinced that Lescarbault had indeed made the first observation of Vulcan. On 2 January 1860, he announced the "discovery" to a meeting of the French Académie des Sciences. Lescarbault, for his part, was awarded the Légion d'Honneur, and invited to appear before learned societies.

Over the next few years, other observers announced supposed observations of Vulcan, and le Verrier used them to calculate an orbit for his planet; he concluded that it orbited at only a third of Mercury's distance from the Sun.

Others, however, became more and more sceptical. Some examined records of solar observations from the day of Lescarbault's "transit", and found nothing. Careful observations were made during a total solar eclipse in 1878 - a year after le Verrier's death - but there was no sign of Vulcan. By this time, most astronomers had concluded that Vulcan didn't exist after all. But le Verrier refused to budge; until the day he died, he remained convinced that "his planet" was real.

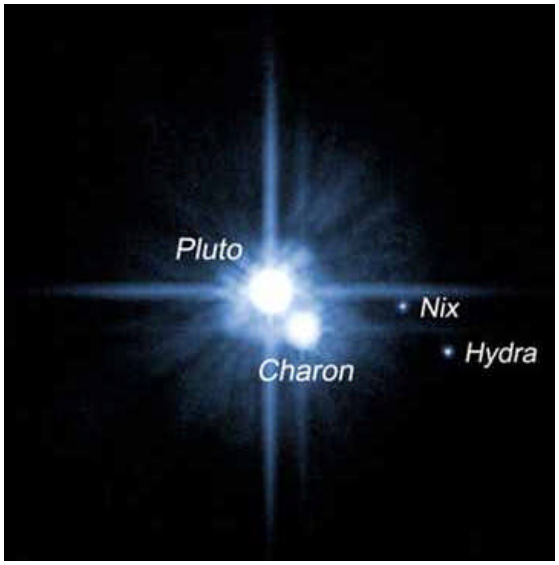
It was Lescarbault himself who finally ended the fiasco, by hammering the final humiliating nail into the coffin of his own credibility. In 1891, he announced to the Académie des Sciences that he had observed a "new star" in Leo – which turned out to be Saturn! The doctor was simply an incompetent observer; his "transit of Vulcan" was probably nothing more than a large sunspot, or perhaps even due to a defect in his telescope!

The real mystery is the question of how such an accomplished scientist as le Verrier came to be fooled. Perhaps his arrogance was his downfall; his unshakeable belief that his own prediction couldn't possibly be wrong, led him to be taken in by Lescarbault's delusion. He really ought to have known better!

Why Pluto IS the Ninth Planet!!!!

from Michael Roe

Pluto has had a hard time recently. In 2006 the International Astronomical Union (IAU) robbed it of its status as the ninth planet. Well, I have always been fond of planet Pluto and thought this decision a bit ridiculous, after all it has been called a planet for 76 years and was only changed due to the IAU making up a few rules to deliberately exclude Pluto from being a planet.



So, what is Pluto really? It is a cold sphere in an elliptical orbit in the outer reaches of our Solar System. 1470 miles in diameter, composed of rock, ice and frozen gases. It has a large satellite named Charon and two recently discovered satellites, it possesses a very thin atmosphere too. Those are the main facts about Pluto, a grey frozen world with just a tinge of yellow.

But is it a planet? What is a planet? It has been accepted by astronomers for centuries that a planet orbits the Sun, it

isn't a satellite of a planet and it isn't a comet or an asteroid. A planet should be fairly large, definitely larger than Ceres, the largest asteroid at 580 miles diameter. Until recently everyone was quite happy with that.!

This gave us the original planets of the solar system as observed by early astronomers – Mercury, Venus, Earth, Mars, Jupiter and Saturn. Later discoveries using telescopes were Uranus, Neptune and finally Pluto, the tiny last planet of our Solar System.

For many years since its discovery by Clyde Tombaugh in 1930, Pluto was believed to be 3,600 miles in diameter but recent measurements brought this down to 1,470 miles, making it the smallest planet.

The IAU then tampered with the planetary rules – a planet's size was to be large enough to be roughly spherical, say in excess of 500 miles diameter but it had to have swept away smaller bodies from the surroundings of it's orbit.
Smaller bodies, known as Kuiper Belt Objects, have been discovered near Pluto but exclude Pluto itself.

But wait, this last rule excludes other planets too! Think of the near Earth asteroids, also the Trojan asteroids orbiting the Sun in Jupiter's orbit. In fact this only leaves Mercury, Uranus and possibly Saturn as true planets according to the IAU. Oh dear! Earth isn't a planet according to their rules!

So, why isn't this fact mentioned, perhaps they like to pick on the smallest planets? By strict definition yes, they are! Because the vote was left to the last day of the IAU General Assembly, when most of the participants had left the venue, not all members voted for this planet abolition decision.

Alright! Its time I sorted out this mess myself or none of us will have a planet to live on anymore, we can't have that!

As a start Pluto must be restored as the Ninth Planet .

I will now re-define what a planet is!

First, it is a roughly spherical body orbiting the Sun (or any other star).
Second, it is not a satellite of these spherical bodies.
Third, size, using Pluto as a benchmark measurement, if it's diameter is greater than 1,470 miles then it is a planet. If it is smaller it is then an asteroid, comet, Kuiper Belt Object etc.

We are now back to nine planets. Well, we will have to include Eris, being larger than Pluto, which makes ten planets! This should please those who like the decimal system.

Of course there are good solid reasons to call Pluto a planet. For years after the discovery of Pluto Clyde Tombaugh searched a wide area of sky above and below the ecliptic for other worlds. He found none down to magnitude +17, much fainter than Pluto's magnitude +14. Also a recent book "Pluto and Charon" never called Pluto anything less than a planet. Would NASA send the New Horizons spacecraft to something less than a planet? Of course not!
I am sure the relatives of Clyde Tombaugh and many astronomers around the world were horrified at Pluto's banishment from planet-hood!

I know that naming anything or defining things is up to humans, with this in mind I have myself downgraded the Pluto-hating IAU members to astrologers!
But why mess up a familiar planet, why did they really do it? They should reverse their decision and just say sorry.

As for a dwarf planet, so its small. What about dwarf galaxies, dwarf stars, even dwarf humans. Isn't a dwarf planet still a planet?

Eris was discovered in 2003 far beyond Pluto, it is over 1500 miles in diameter so why not celebrate it as the long-searched for tenth planet instead of messing up definitions of a planet.

So remember, according to some astronomers, if Pluto isn't a planet neither is Earth!

Observing M31 and M33

From Rob Peeling

We are all familiar with the range of interesting objects that our own Milky Way can offer for us to enjoy with our telescopes; open clusters, globular clusters, bright nebulae, planetary nebulae etc. Surely a similar richness must exist in other galaxies too, and it turns out that the amateur astronomy can see some of this wonderful detail in some of the galaxies near to our own[*].

I personally came on this possibility by chance on 21st October 2008 when observing M33 from Square Corner on the Hawnby road from Osmotherley.

20:51UT M33 with 15mm [with 12", f/5 Dobsonian]. Small knot of nebulosity seen following core of M33 [i.e, to the east of]. Is this an HII region?

I also drew a simple sketch showing the nebulosity's position compared to the core of M33 and four nearby bright stars. Back at home with Sky Map Pro, I was

[*] To any readers living south of the equator: Yes, I have heard of the Tarantula Nebula and the Magellenic Clouds, but I can't see them from Stockton-on-Tees, so for this observer at least I'm afraid they simply don't count!

quickly able to confirm that the object I had spotted was NGC 604, an HII region i.e. a star birth region similar to but much larger than M42. Now I know about NGC 604, I've since been able to see it from my own garden and from the Planetarium. In all, I have seen NGC 604 on five further occasions since the 21st October.

This had me wondering whether there were other similar objects to be seen in either M33 or M31. Uranometria 2000.0 indicated 4 NGC objects in M33 and a single one in M31 (also a collection of NGC objects lying in M101 – they'll have to wait until spring).

During my observing session at Square Corner with Andy and David Fleming (as reported by Andy in December Transit) on 28th October, I thought I possibly spotted two more objects within M33 in addition to NGC 604 but couldn't pin them properly.

M33 clear in finder. Can see NGC 604 with 32mm lens [with 12", f/5 Dobsonian] and 15mm. Clear signs of spiral structure too. Will take 15mm with 2x Barlow also 15mm with UHC filter well. Not certain, but possibly other HII regions to south-west of M33 core? Two maybe.

On 22nd November I was back at Square Corner with a copy of Uranometria 2000.0

20:50UT M33. Careful inspection and sketch of area. NGC 604 is easily visible in 32mm field. Star cloud NGC 592 is found with averted vision using 15mm. Add UHC filter to 15mm lens and NGC 588 is just detectable with averted vision. My first view using 32mm lens and best dark adapted eyes showed signs of spiral structure.

21:03UT M31, M32 and M110 are all very clearly seen in 32mm. With 15 mm, star cloud NGC 206 is just seen without averted vision as a denser area in M31. The star cloud is quite close to the bright star near M32.

I couldn't see NGC 206 the following night from the Planetarium.

I would be interested to hear if other members have found these objects. They all ought to be readily identifiable in any good quality wide-field images of M33 and M31 that anyone has made.

40th Anniversary of the Great Gamble: Apollo 8

written by Nancy Atkinson

Apollo 8's famous Earthrise picture. Credit: NASA

The Apollo 8 mission was a seminal moment not in only the history of spaceflight, but in human history as well. The mission came during a time when the US and the world were divided by war and racial issues. It's been said that Apollo 8 "saved" 1968 from being an otherwise divisive and disheartening year, and because of the success of the mission – in terms of both technical and philosophical matters — the Apollo 8 crew of Frank Borman, Jim Lovell and Bill Anders were named "Men of the Year" by Time Magazine. Apollo 8 was the first human mission to orbit the moon, but it wasn't supposed to be. And the mission was responsible for one of the most iconic images of our time.

Originally the mission was slated to test the lunar lander hardware in Earth orbit. But the lunar lander wasn't ready and then other political issues came into play. NASA was told, incorrectly it turned out, by the CIA that the Soviet Union was preparing its own manned lunar mission and was ready to launch. As NASA wanted to be first to the moon and also fulfill President John Kennedy's call for a US manned lunar landing by the end of the decade, they took a gamble and designated Apollo 8 to go and orbit the moon.

The decision was controversial. NASA giant Saturn V rocket, the only rocket capable of taking humans to the Moon, had been fraught with problems and instrument failures on its two test flights. Also, fresh in everyone's minds was the

fire in 1967 in which killed three astronauts - Gus Grissom, Ed White and Roger Chaffee - during a ground test of an Apollo capsule.

Apollo 8 launch. Credit: NASA

Yes, it was a gamble, but it paid off. The crew launched on December 21, and it was the first manned launch of the Saturn V rocket. It went well, although Anders tells the story how he felt severe vibrations during the first moments of launch, and feeling almost like a bug on top of a car antenna, vibrating back and forth. But the giant rocket, 363 feet tall and weighing 6.25 million pounds performed well and following a rocket burn for trans-lunar injection, the astronauts were on their way to the moon.

Early on Christmas Eve, Apollo 8 reached its destination. The astronauts fired the propulsion system to slow the rocket, putting them into lunar orbit. For its first three obits, the astronauts kept its windows pointing down towards the Moon and frantically filmed the craters and mountains below. One of their main tasks was to do reconnaissance for the future Apollo landings.

It was not until Apollo 8 was on its fourth orbit that Borman decided to roll the craft away from the Moon and to point its windows towards the horizon in order to get a navigational fix. A few minutes later, he spotted a blue-and-white object coming over the horizon. Transcripts of the Apollo 8 mission reveal the astronauts' wonder and amazement at what they were seeing: Earth, from a quarter of million miles away, rising from behind the Moon. "Oh my God! Look at the picture over there. Here's the Earth coming up," Borman shouted.

Apollo 8 crew. Credit: NASA

This was followed by a flurry of exclamations by Anders and Lovell and a scramble to find a camera. Anders found one first and the first image he took was black-and-white, showing Earth just peeping over the horizon. Then Anders found a roll of 70mm color film for the Hasselblad camera, and he took the photograph of Earthrise that became an icon of 20th-century, portraying technological advances and heightening ecological awareness.
This was the way, humans first recorded their home planet from another world. "It was the most beautiful, heart-catching sight of my life," Borman said later, "one that sent a torrent of nostalgia, of sheer homesickness, surging through me. It was

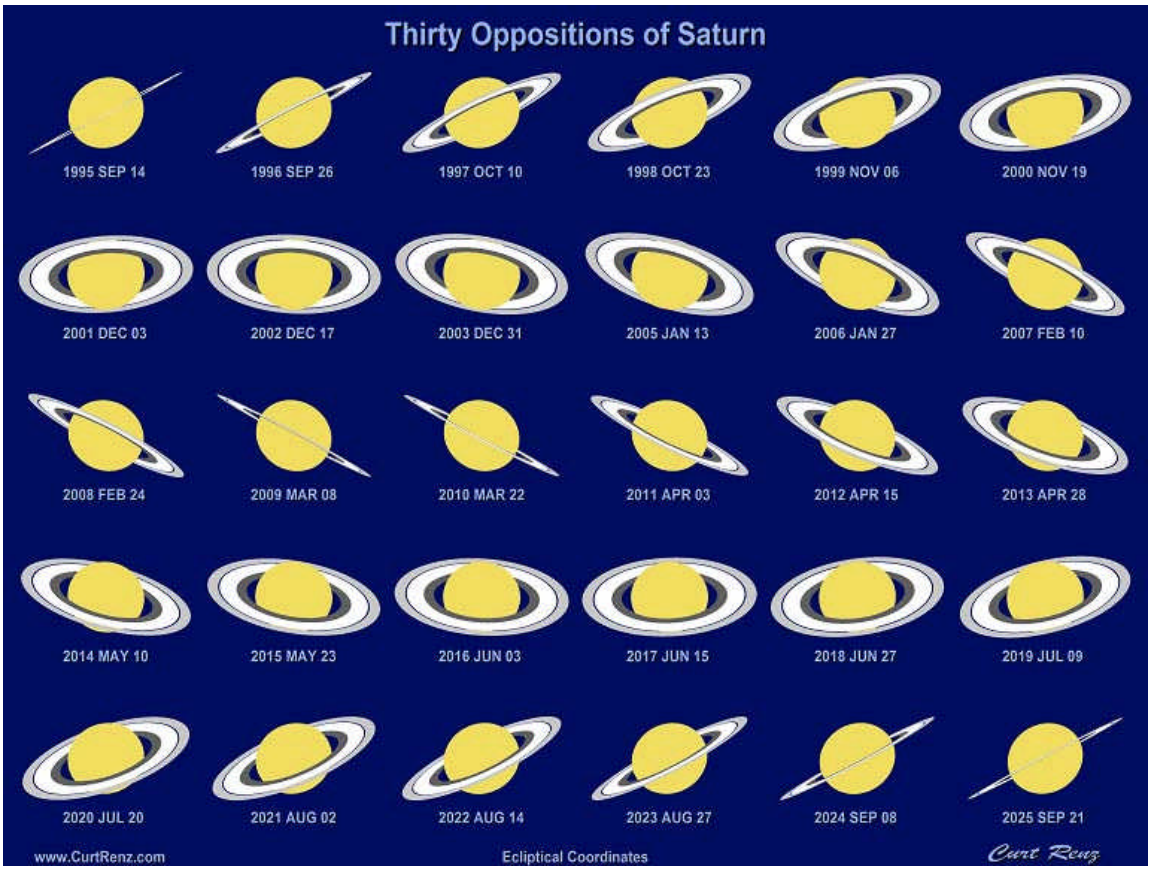
the only thing in space that had any color to it. Everything else was either black or white. But not the Earth."

Jim Lovell said that Earth was "a grand oasis in the vast loneliness of space."

The three astronauts agree the most important thing they brought back from the mission was the photography, not only of the moon, but of Earth.

Saturn's Disappearing Rings

A telescope will show that Saturn's rings have closed to just 1° from edge on. They will reach a minimum of 0.8° at the end of December 2008 and then start opening again before finally closing to exactly edge on September 2009



Answers to the Quiz in December 2008 Transit

from Rod Cuff

[For each answer in this and later quizzes, I'll add one or more websites that will tell you a lot more than the bald answer and will usually include at least one picture as well. Exploring links from these websites is generally worth your time, too! – Rod Cuff, rodcuff@sfep.net]

Photo quiz - Where in the Universe?

Photo answer : . A HiRISE image from the Mars Reconnaissance Orbiter. This is terrain near the north pole on Mars, probably not all that far away from the little Phoenix lander . The bright patch of material is ice, which might have been deposited in the previous winter.

Q 1 *:*
Where and what are:
(a) *Prometheus, Pandora and Pan?*
(b) *Alcyone, Atlas and Asterope?*
(c) *Alnitak, Alnilam and Mintaka?*

A 1:
(a) Satellites of Saturn.
- For Prometheus and Pandora: www.nineplanets.org/pandora.html. See also http://zuserver2.star.ucl.ac.uk/~idh/apod/ap951223.html
- For Pan: www.solarviews.com/eng/pan.htm and www.schoolsobservatory.org.uk/news/arch/pan.shtml

(b) Stars in the Pleiades open cluster (M45): http://tinyurl.com/9xgtph
(c) The stars of Orion's Belt:
www.daviddarling.info/encyclopedia/O/OrionsBelt.html

Q 2:
Who is Hanny van Arkel, and what's her connection with Galaxy Zoo?

A 2 :

She's a Dutch schoolteacher (http://tinyurl.com/7tyuq3), an ordinary member of the public working with the Galaxy Zoo project (www.galaxyzoo.org) to classify pictures of remote galaxies into groups. She queried a peculiar green blob, known ever after as “Hanny's Voorwerp” (http://tinyurl.com/6v4po6), that excited a lot of interest from professionals and gained the attention of the Hubble Space Telescope See also Chris Lintott's blog at http://tinyurl.com/963nl2

Q3 :

Where is: (a) the European Northern Observatory?

(b) the European Southern Observatory?

A 3 :

a) ENO is a grouping of telescopes and supporting resources on Tenerife and La Palma in the Canary Islands (www.iac.es/eno.php?lang=en). There are some nice pictures taken by a visitor at http://tinyurl.com/9vblrt
b) ESO (www.eso.org/public) is spread across three observatories (La Silla, Paranal and Llano de Chajnantor) in Chile, but has its headquarters in Germany – in Garching, near Munich. You can 'visit' major observatories across the world from http://tinyurl.com/882nl2

Q 4:

What country launched the Chandrayaan-1 probe recently, and what's it probing? How will Chandrayaan-2 differ?

A 4 :

This is the Indian Space Research Organization's first mission to the Moon (http://tinyurl.com/64mvvf), launched in November 2008. One part of Chandrayaan-1 will spend the next two years mapping the Moon's topography and chemical characteristics and 3-dimensional topography from orbit; another part, the Moon Impact Probe, smacked into the crater Shackleton [www.nationmaster.com/encyclopedia/Shackleton-(crater)] at the lunar South Pole so that the orbiting part could look for evidence of water ice in the debris thrown up. Chandrayaan-2 (http://tinyurl.com/7tsokk), to be launched in 2011, will carry a rover vehicle that will pootle around the lunar surface for a month and send analytic data back to its orbiting parent vehicle.

Q 5 :

In 1690, John Flamsteed, the first Astronomer Royal, observed a previously unknown object and called it 34 Tauri. What do we call it today?

A 5 :

Uranus! Oops ... but at least three later astronomers took it for a star, too (http://tinyurl.com/9az8lu). More about Flamsteed at http://messier.obspm.fr/xtra/Bios/flamsteed

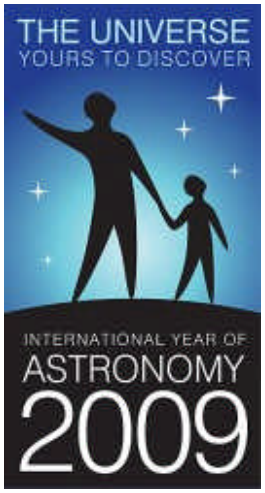
Q 6 :

What are the three stars in:
(a) the Summer Triangle?
(b) the Winter Triangle?

A 6 :

(a) Altair (in the constellation Aquila), Deneb (in Cygnus) and Vega (in Lyra). The picture at http://tinyurl.com/824qyn is absolutely no use for locating it, but looks pretty; http://www.jpl.nasa.gov/images/sim/sim-summer-browse.jpg may be more useful. I've read many times that (now Sir) Patrick Moore invented the term, as a summer counterpart to (b), but a lengthy discussion about the nomenclature at www.space.com/spacewatch/050617_summer_triangle.html doesn't mention him at all. Still, the author is American ...
(b) Betelgeuse (Orion), Sirius (Canis Major) and Procyon (Canis Minor) – see www.bbc.co.uk/dna/h2g2/A32016656 . Less well known (in other words, I didn't know about it until very recently) is the Winter Hexagon – the last two above plus Rigel (also Orion), Aldebaran (Taurus), Capella (Auriga) and Pollux or Castor (Gemini). There's a graphic of these at http://tinyurl.com/8jqezb

The International Year of Astronomy is Almost Here!



January 1 of 2009 brings with it the International Year of Astronomy, a worldwide celebration commemorating Galileo Galilei's first astronomical observation through a telescope. 135 nations are collaborating to promote astronomy and its contribution to society and culture, with events at regional, national, and global levels, to bring the Universe closer to more people on Earth. Events and activities will take place over the coming 365 days and beyond. Here's a list of several IYA activities events taking place during the next year. The International Year of Astronomy 2009 (IYA2009) has been launched by the International Astronomical Union (IAU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). With so many events, the IYA is sure to make "The Universe, yours to discover."

Opening Ceremonies: Many nations are holding their own Opening Ceremonies in January and February, showing their dedication to the Year. The official opening ceremonies take place in France on Jan. 15 and 16, but is not open to the public. Check out this website for opening ceremonies in your country.

Solar Physics. Don't be surprised to see telescopes on the streets on New Year's Day. The IYA2009 Solar Physics Group have been busy planning a grand worldwide campaign, with over 30 countries involved at more than 150 venues, which will see amateur stargazers set up their telescopes on pavements as well as in science centers, letting passers-by observe the Sun using special safety equipment.

The Cosmic Diary is an example of a global activity occurring during 2009, with the release of its official website on New Year's Day. The project concerns the daily lives of full-time astronomers. More than 50 bloggers, professionals from over 35 countries and employed by organisations such as ESO, NASA, ESA and JAXA have already begun producing content, writing about their lives, the work they conduct and the challenges they face. The public can see what being an astronomer is really like, and how ground-breaking research is conducted.
100 Hours of Astronomy: April 2-5, 2009. Includes a wide range of public outreach activities such as live webcasts, observing events and more. One of the key goals of 100 Hours of Astronomy is to have as many people as possible look through a telescope, just as Galileo did for the first time 400 years ago. Check out 100 Hours of Astronomy's website.

From Earth to the Universe. This is exhibition that will bring large-scale astronomical images to a wide public audience in non-traditional venues such as public parks and gardens, art museums, shopping malls and metro stations. Over 30 countries around the world are currently in the development phase of FETTU projects, many with multiple locations. Some 15 countries plan to begin FETTU exhibitions within the first month of 2009, ranging in size from 25 to over 100 images on display. FETTU will be introduced to the global community at the Opening Ceremony at UNESCO headquarters in January 2009. Find out more at their website.

The World at Night. Brings to the public a collection of stunning photographs and time-lapse videos of the world's landmarks with the sky in the background. The World at Night is preparing more than 30 exhibitions and educational events around the world.

Dark Skies Awareness. One of IYA2009's aims is to raise awareness of light pollution, and how the beauty of the night sky is progressively being drowned out, particularly over urban areas. The project Dark Skies Awareness is tackling these issues head-on in a practical, inclusive manner. One way in which it is doing this is by holding star-counting events, where the public are encouraged to see how many stars in a particular area of the sky are actually visible from their location. When compared with data from truly dark sites, the results are often very surprising! The "How Many Stars" event will run from January 2009.
A list of event highlights is available on the official IYA2009 website. From there it is also possible to link to the different country websites, or National Nodes, responsible for organizing local events in the many participating countries. IYA2009 wants to involve the public at many events, and amateur astronomers are organizing events. Known for their enthusiasm, this army of helpers is growing every day, preparing to promote astronomy in a stunning variety of ways. In fact, so many thousands of people across the globe are already involved, they have formed the world's largest ever astronomy network.

Contents – January 2009

Articles : Please send contributions for the newsletter to Bob Mullen, 18 Chandlers Ridge, Nunthorpe, Middlesbrough, TS7 0JL, 01642 324939 (b2mullen@hotmail.com) Copy deadline date is the 20th of each month).