



TRANSIT

The October/November 2011 Newsletter of



NEXT TWO MEETINGS

THURSDAY 13 October 2011, 7.30 pm
Durham University (see p. 12 below)

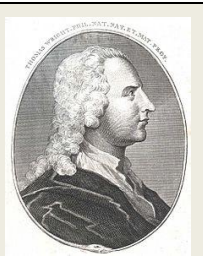
Thomas Wright Trophy competition

o - o - o - o - o

Friday 11 November 2011, 7.15 for 7.30 pm
Wynyard Planetarium

**How to Restore a Telescope, or
Thou Shalt not Covet thy Neighbour's Jacuzzi
Pump Motor**

Martin Dawson, York A.S.



Contents

p.2	Editorial	
p.2	<u>Letter</u> : A new 'local' astronomy kit supplier	<i>Ed Restall</i>
	<i>Observation reports & planning</i>	
p.3	Skylights – October 2011	<i>Rob Peeling</i>
p.5	Some observations in August and September 2011	<i>Rob Peeling</i>
p.8	Comet Garradd (C/200p P1)	<i>Ed Restall</i>
p.9	Recent images of Jupiter	<i>Keith Johnson</i>
	<i>General articles</i>	
p.9	It's Jupiter-fest!	<i>Andy Fleming</i>
p.11	More about that Razor	<i>John Crowther</i>

Notes from the CaDAS committee

- p. 12 Thomas Wright Trophy Competition; *Transit* entries sent by Royal Mail
The Transit quiz
- p. 13 Answers to September's quiz
- p.14 October's quiz

Editorial

Rod Cuff



If it's October, it must be time for the annual three-way Thomas Wright Trophy competition. As we flagged up in last month's *Transit*, this year CaDAS and Durham A.S. teams will travel to ... well, to Durham, but to the University instead of DAS's normal meeting place. Do please come and take the opportunity to urge our team on. There's a map and team information on page 12. And at the risk of boring you, don't forget it's a day earlier than normal: Thursday 13 October rather than Friday 14th.

We warmly welcome new members Robert Ruckley, Kevin Hepplewhite, and Benjamin & Loll Marr – we hope you'll enjoy what CaDAS has to offer and that we'll see a lot of you!

I regret to say that I'll be away from my computer for several weeks from mid-October and won't be able to put a November issue of *Transit* together. Andy Fleming, who guest-edited a while back, is unable to do so this time, so we're skipping a month. The next issue will be the December one, the deadline for which is **Saturday 26 November**.

Rod Cuff, info@cad-as.org.uk, 1 Farndale Drive, Guisborough TS14 8JD (01287 638154)



Letter

A new 'local' astronomy kit supplier

from Ed Restall

Another astronomy supplier has opened up a 'Northern' store, expanding into the frozen wastelands beyond Watford! Green Witch has opened a new branch in Birstall, West Yorkshire, on 1 October 2011. Their announcement describes Birstall as 'an attractive small town to the south of Leeds that is well served by the motorway network'.



The new address is Green Witch, 3 High Street, Birstall WF17 9ES.

Best wishes – Ed

OBSERVATION REPORTS AND PLANNING

Skylights – October 2011

Rob Peeling

The Moon

4 October	12 October	20 October	26 October
First Quarter	Full Moon	Last Quarter	New Moon



The planets

Jupiter is starting to rise early enough for us to enjoy comfortably in the evening sky. It rises at 19:00 at the start of the month and as early as 18:00 by the end of the month.

Neptune is in much the same part of the sky as last month, now moving towards the middle of the 'bow-tie' arrangement of stars I described last month (and shown again below). Use a medium- to high-power lens in your telescope to confirm you've found it.

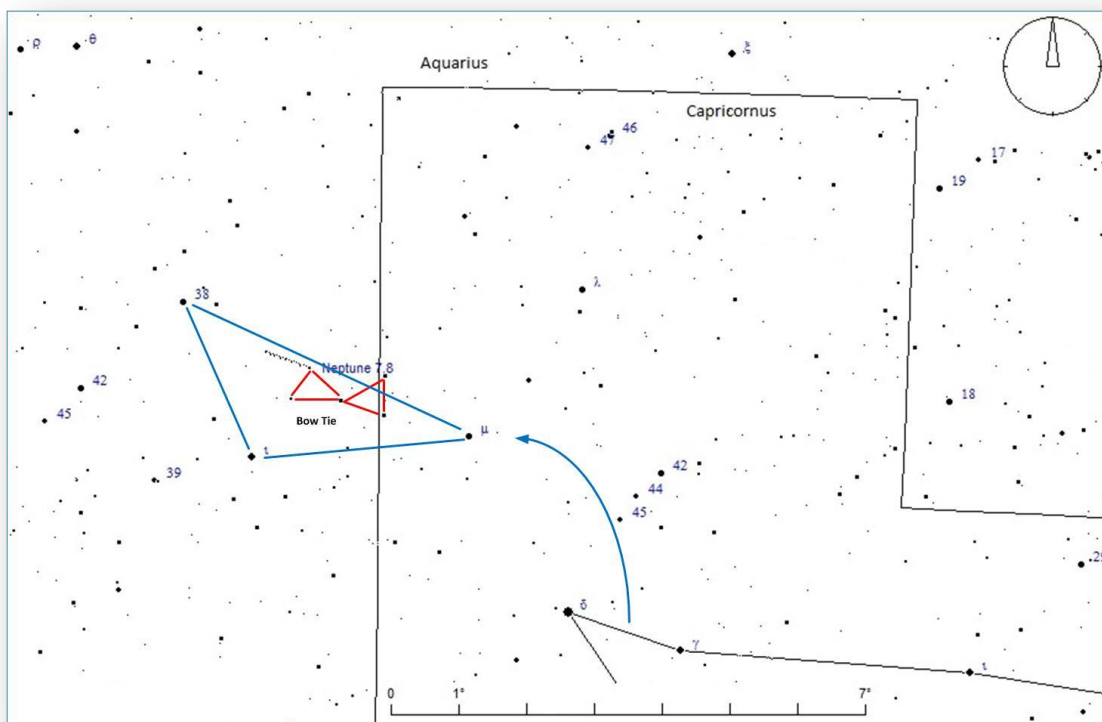


Figure 1. Position of Neptune in September – extrapolate for October! (chart created using Carte du Ciel)

Uranus also is a slow mover across the celestial sphere and can, like Neptune, still be found in much the same place as last month. At magnitude 5.7 it is by far the easier of the two outer planets to locate.

Mars is rising well after midnight. However, if you're willing to get up in the wee small hours, it passes close to M44, the Beehive Cluster in Cancer, in the first week of October. If you do so, you'll also be rewarded with an early-season sight of Orion high in the sky.

Meteors

The **Draconid** shower peaks on 8 October, and there are predictions for high rates of meteors from this shower this year.

The **Orionid** shower peaks on 20/21 October. These meteors are derived from Halley's Comet.

Deep sky

Epsilon Pegasi (Enif) is a double star, with bright Enif at mag. 2.5 and an 8.7 mag. companion 144 arc seconds away – so it is a wide pairing. Select an eyepiece to give a magnification between 60x and 100x while you watch the stars, then gently tap your telescope to make the stars move at right angles to the imaginary line between them. Bright Enif will gently rock back and forth but the fainter companion seems to go berserk. The real berserkers, however, are your mind and eye, because this is of course an optical illusion. Fun, though!

Close to the north-west of Enif is the well-known globular cluster M15. Bright enough to see in a finder or binoculars from a dark site, this globular will resolve into a swarm of stars as you increase eyepiece power.

Next, move to the north of η (eta) Pegasi, which is the next bright star outwards and up from β Pegasi (Scheat) which marks the top-right corner of the square of Pegasus. To the north of η is the bright galaxy NGC 7331 (Caldwell 30), which was featured during August on the [Astronomy Picture of the Day](#) site. This galaxy is larger than our Milky Way, with a diameter of 130,000 light-years. It lies 47 million light-years away.



Figure 2. NGC 7331. Image credit: Ken Crawford ([Rancho Del Sol Obs.](#))

To the south-west of NGC 7331 is a favourite target for imaging, Stephan's Quintet.

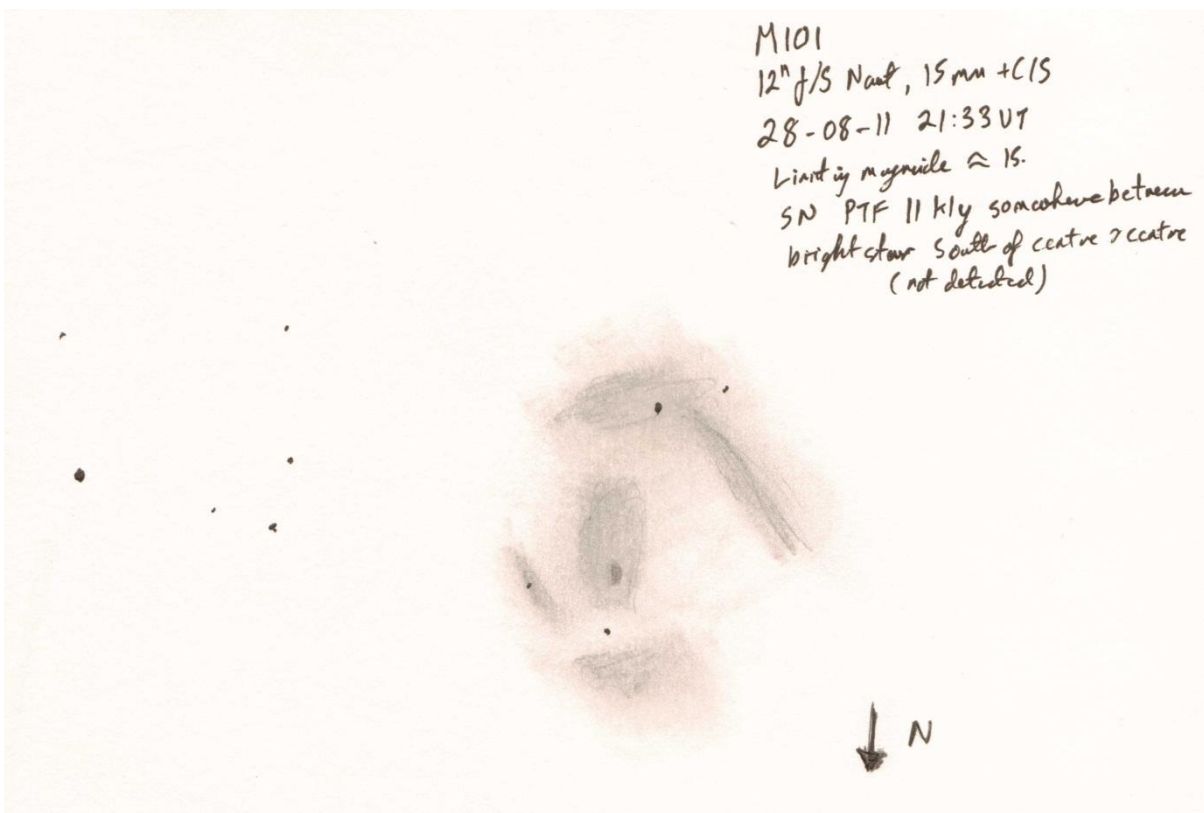
The final target this month is a star. Look for 51 Pegasi, the brightest star just outside the right-hand edge of the Square and almost at the midpoint between α and β Pegasi, which mark the corners on this side of the Square. At magnitude 5.46 there is apparently nothing particularly remarkable about the star, which is of a type similar to our Sun, except that this is the star around which the first definitely confirmed exo-planet was found orbiting – the first representative of a new class of planets, 'hot' Jupiters. Now hundreds of planets are known outside our solar system, but when 51 Peg B was announced by Mayor and Queloz in 1995 the world was stunned.



Some observations in August and September 2011

Rob Peeling

All the following observations were made using a 12" f/5 Dobsonian from my garden at the southern end of the Chilterns.



28 August: Observed M101 from 20:55 to 21:34 UT. The galaxy was initially located using a 15mm lens and CLS filter. M101 was just barely detectable with the 10x50 finder. Much evidence of spiral structure definitely seen. I completed the sketch at 21:34. I was not able to detect type 1A supernova SN 2011fe (= PTF11kly). first discovered about 4 days before. An AAVSO chart was used to provide comparison stars and an indication of the position of the supernova and to establish a visual limiting magnitude of stars detected at ~15.

31 August: Good view of M101 showing much the same detail as sketched on 28/8/11. Fleeting glimpses, using averted vision, of a star in the right place for the current supernova, but not definite. Used 32mm lens and clearer with 15mm lens. Adding the CLS filter improves contrast to show more of the galaxy and more visible stars. Consistently (33% time) seeing a star off-centre from the line made by stars either side of the core and running through the core. From the AAVSO star chart this is a magnitude 14 star to the east of the SN 2011fe, so is NOT the SN. Two mag.-14 comparison stars bracket the position of the supernova and are visible some of the time, but never anything between them. Observed at 21:31 UT.

1 September: With 15mm lens and no filter. Struggling to see as much as I could on 31 August. Sky seems lighter, so there may be some haze around, causing light pollution. I could certainly see the galaxy but not very distinctly and no sign of the comparison stars or the current SN 2011fe. Observed at 21:15 UT.

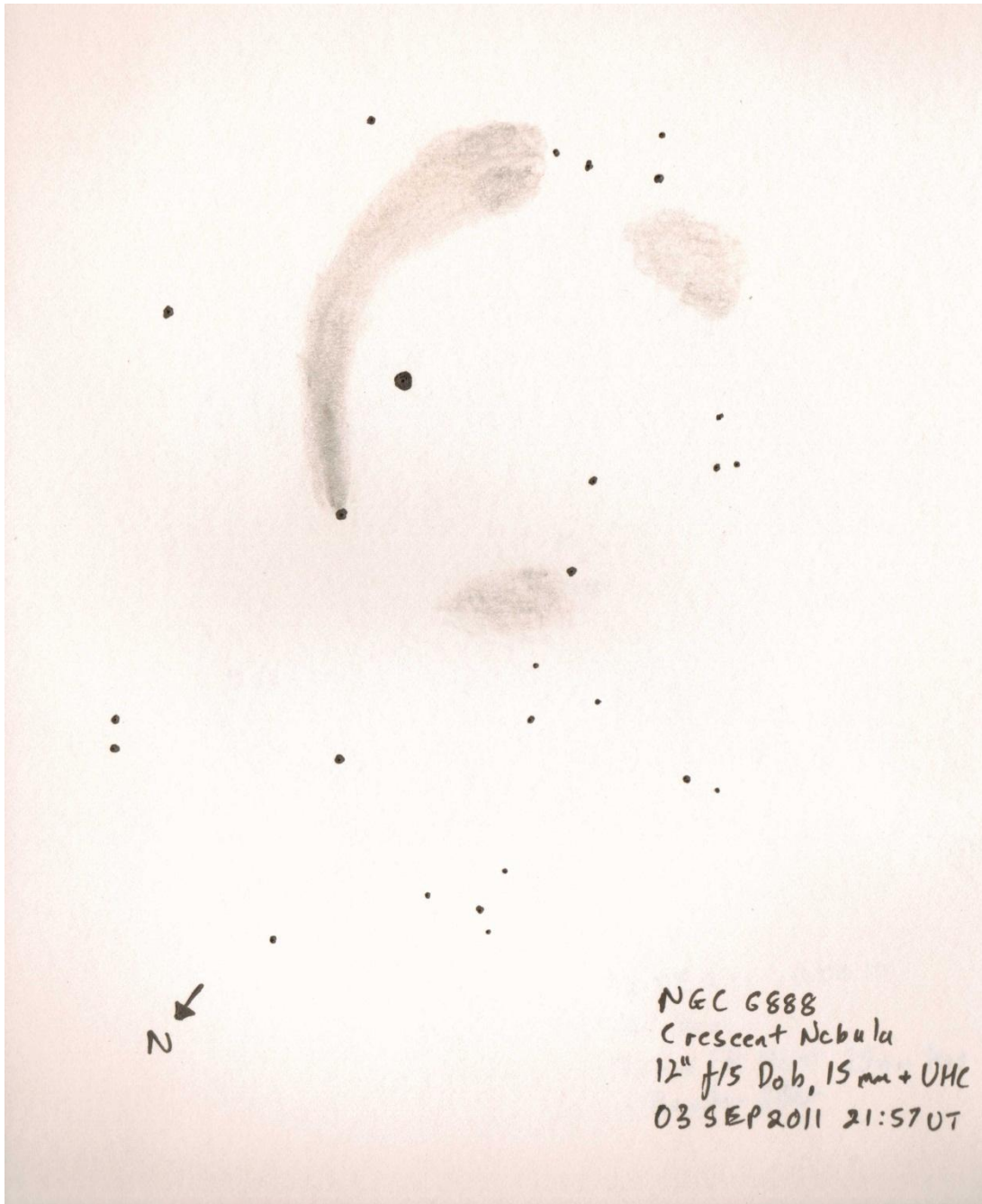
3 September: With 15mm and CLS filter. Seeing was quite variable, with cloud from the west starting to intrude over M101. While I was observing, a satellite passed straight over the galaxy. I had fleeting glimpses of a star in the right place for the SN 2011fe. Stars popping in and out of view to either side suggest that this time I may possibly have glimpsed the supernova itself.



1 September: I found Comet 2009/P1 Garradd close to the Coathanger (Collinder 399). The comet was almost directly south of NGC 6802, which is the open cluster embedded in the end of the Coathanger and on the same declination as the top of the 'hook'. The comet was obvious, with a clear coma and surrounding dust. NGC 6802 was visible also in the same 32mm field. The comet was found by sweeping the area. I knew the comet was near to the Coathanger but didn't have a chart handy. The comet is pretty bright. It was not visible in the finder but very clear in a 32mm lens. The sketch was completed at 20:34 UT. I also picked up M27 while

sweeping, because it was so obvious in the 10x50 finder. M27 was beautifully clear with the 32mm lens.

3 September: At approx. 22:00 UT. Comet 2009/P1 Garradd is now to the south of the western end of the Coathanger and clearly visible in the 10x50 finder. NGC 6802, the open cluster at the eastern end of the Coathanger, is also very clear and extensive. Using 32mm lens.



28 August: At 21:48 UT, NGC 6888 (Crescent Nebula) found with 32mm lens and CLS filter. An apparent jet from a star was clearly seen. With 15mm lens, CLS filter and averted vision, ~50% arc is visible all towards the south from the involved star. The view justifies the name of Crescent as seen here. Switching for a UHC filter shows even more of the nebula with a greater extent eastwards. The nebula was clearly seen as surrounding an area and therefore actually

as a ring emanating from the Wolf-Rayet star itself rather than as a jet from the other nearby bright star. It appears first as a jet from this star because this happens to be the brightest part of the nebula.

3 September: Repeated observation of 28 August and this time sketched the Crescent Nebula, finishing at 21:57 UT.



Comet Garradd (C/2009 P1)

Ed Restall

On 26 September 2011 I captured this image of Comet C/2009 P1 Garradd, moving from Lyra into Hercules, at about magnitude 8.0.

Capture details:

12 subs of 4 min each, and 5 darks at ISO800 using an astro-modded Canon 1000D camera with CLS clip filter on SkyWatcher 80mm PRO & HEQ5 PRO mount.

Autoguided with QHY5 on Celestron 102 using PHD, and aligned & stacked using DeepSkyStacker 3.3.2. Colour balance tweaked & un-sharp mask in PhotoShop CS2.



Figure 3. Comet C/2009 P1 Garradd, 26 Sept. 2011 (Ed Restall)



Recent images of Jupiter

Keith Johnson

I captured several images of Jupiter in late September, using my usual planetary set-up with the trusty ToUcam Pro 2 web camera capturing 90-second video sequences (AVIs) at 10 frames per second, later aligned and stacked in Registax 6. The image below is the best of that bunch, taken on 28 September.



Equipment:

Celestron 9.25" OTA, EQ6 Pro. Mount, infra-red blocking filter, TeleVue 2.5x Powermate.



Figure 4. Jupiter, showing the Great Red Spot, 28 September 2011 (Keith Johnson)

GENERAL ARTICLES

It's Jupiter-fest!

Andy Fleming

Our solar system's largest planet right now is providing some stunning views in the night sky.

It was late evening and as we drove back along the tree-lined country road from an interesting CaDAS meeting at the Wynyard Planetarium, the receding clouds



revealed a stunning, large, bright object on the eastern horizon that seemingly was following the motion of our car through the hedges.

On our ten-minute journey it became very apparent why, to the uninformed observer, an apparition of this celestial object at times bears all the classic features of an unidentified flying object. To those in the 'astronomical know', however, there's no doubt that this is the king of the entourage of our Sun's eight planets – Jupiter. It's the fourth-brightest object in our night sky and there is only one other planet that's even brighter and that's Venus. They can't be confused in the night sky, as Venus (being closer to the Sun than we are) is always in the west near our star at dusk.

Jupiter is magnificent whichever way you view it, whether with the naked eye, binoculars or a telescope. With the naked eye you can tell that it is a planet because it isn't a point source of light and doesn't flicker like even the brightest, closest stars, which are still at gargantuan distances from the Earth. Through binoculars one is stunned to discover that orbiting close to this gas-giant planet there are four tiny points of light.

Repeated observations over the course of one evening reveal, just as Galileo Galilei discovered in the seventeenth century, that these tiny objects are in motion orbiting this huge planet. They are Jupiter's four largest moons: the Galilean satellites, so called after their discoverer. They're all fascinating and strange worlds in their own right, and they suggested to Galileo that the Earth is not at the centre of the heavens, thus laying bare the conceit of geocentricism. Later discoveries revealed that this mini-solar system contains many more moons; new ones are regularly discovered, the present total being sixty-three. Through binoculars it's also apparent that Jupiter is a disk, another clue to it being another world rather than a star.

However you observe it telescopically, Jupiter is a treasure trove, and a small refractor will show the planet's beautiful ever-changing and fast-moving clouds and their bands, a result of immense jet streams in Jupiter's upper atmosphere. A larger refractor or reflector will allow observations of the solar system's largest storm – its Great Red Spot, which is in fact a huge anti-cyclone or area of high pressure that has been observed in the planet's atmosphere for the past four hundred years.

Jupiter has no solid surface, and with the volume of the planet being the equivalent of over 1300 Earths, many scientists regard it as a failed star. It has the right elemental constituents in its atmosphere but has too low a gravity to ignite nuclear fusion. In fact its gravity is still so strong that it is a powerful source of radiation and its ionising effects are felt even as far away as the orbit of Saturn. Jupiter also generates much internal heat. Indeed, if it had been a few times larger it would have qualified as a brown dwarf star. It's a massive ball of hydrogen and helium gas with traces of contaminants such as ammonia and methane at frigid temperatures, these latter two gases being responsible for providing the beautiful colours in its atmosphere. Delve further down in its atmosphere and the immense pressures dictate that these gases liquefy. Delve even deeper down to the planet's core and scientists believe that lurking at the centre is a ball of liquid hydrogen surrounding a rocky core.

I am lucky enough to own two telescopes, an eight-inch custom-built Newtonian reflector and a four-inch Celestron NexStar 102SLT 'go to' refractor. Although more details of Jupiter's atmosphere are available using the better light-gathering capabilities of the larger instrument (which is much better for deep-sky objects), my best views of Jupiter are through the new refractor. Using the same eyepieces, the views are sharper and the clarity is far better. My favourite views are through a 26mm Plössl eyepiece with a double-magnification Barlow lens.

Fancy taking a peek at the fifth planet from the Sun and our solar system's largest? Well, now is a great time, especially for observers in mid-northern latitudes. As I write this in late September, Jupiter is rising in the east at approximately 2100 hrs UT, and looks a fine sight by midnight. Throughout the later months of the year it will continue to rise earlier, providing some stunning early evening views.

Unlike its 2010 apparition, when it barely reached 10 degrees above the southern horizon and observing was difficult owing to the Earth's atmospheric turbulence, it is now high in the sky and really bright at magnitude -2.6 . As an added bonus, unlike in 2010 (when it had disappeared) the south equatorial band is now showing up strongly again.

So get yourself outside and try detecting the bands and the moons with binoculars. With a telescope, try sketching the positions of the four Galilean moons relative to Jupiter. Date and time your sketch and download and use free planetary software such as Stellarium to discover which moon is which. The king of the planets has wonders aplenty to keep you busy for hours.



[More about that Razor](#)

John Crowther

In the July/August issue of *Transit*, Andy Fleming defined Occam's Razor as follows:

Where there are competing explanations for any phenomena, it is the simplest explanation that should be adopted.



Yet perhaps, as with a real razor, caution should be used. I sent some ramblings about that edition to the Editor (including complimentary comments on Andy's views), but alas there wasn't room for them in that issue. Rightly so, since Ray Brown's first-hand experience of the value of Occam's razor in his university research gave us a clear picture of the Razor in action.

However, one thing I wanted to include is worth mentioning now – a newly published book called *Quantum Leap* (ISBN 978 1 85424 972 2). This is a biography of the Revd Dr John Polkinghorne KBE FRS, the former Cambridge particle physicist.¹ In it, unanswerable questions are posed, such as *Has the universe a meaning? Why does it exist?*

We seemed to be close to such questions in our last lecture, by Dr John Stott, when he spoke about the largest parts of the universe: the massive clusters of galaxies. For one of these clusters will apparently be all that can be observed when the universe is almost ended.

However, there'll be plenty of work for any remaining astronomers to do, and Occam's Razor will still be around, making itself useful.

¹ [Dr Polkinghorne – not in holy orders at that time – was one of my lecturers at university, and stood out amongst his peers by being both interesting and witty. Not always easy to do in maths ... – Ed.]

NOTES FROM THE CaDAS COMMITTEE

[Thomas Wright Trophy competition](#)

The Thomas Wright Trophy will be tussled over this year by teams from CaDAS, Durham A.S. and students from the University of Durham A.S. CaDAS are the current holders of the trophy.

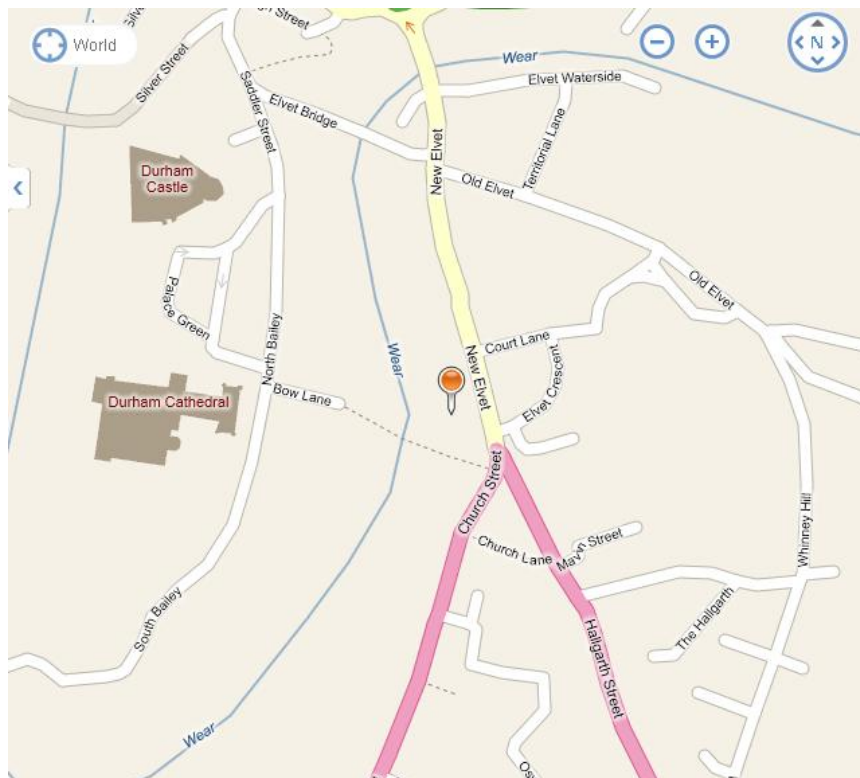
This year's competition will be held on the students' home ground, in the Vane Tempest Room, Students' Union, New Elvet, Durham DH1 3AN, starting at **7:30pm on Thursday 13 October**. A map is shown below, or you can use your faithful satnav if you have one.

CaDAS will be represented by Michael Roe, Rod Cuff and Andy Fleming. The team from Durham A.S. will be George and John Gargett and Keith Johnson (it's quite an astrofamily affair!).

[Transit copies sent by Royal Mail](#)

There are a small number of long-established members who do not have an internet connection and so do not receive their copies of *Transit* by email. We have been printing and despatching copies to them without extra charge, and intend to continue doing that for at least the near future (though we can't extend that privilege, I'm afraid, to new members).

However, the committee recently decided that, for those members who pay a subscription (that is, who are not Honorary Members), we will only print and post copies of *Transit* to them if they are paid-up members – in other words, they have paid their subscription at or before the Annual General Meeting, which is part of our normal February meeting each year.



THE TRANSIT QUIZ

Answers to September's quiz

1. Where and what is Uranus Tholus? **It's a [Martian shield volcano](#).**
2. Plages are bright spots on the Sun; but so are faculae. What's the difference? **Faculae occur in the photosphere (and aren't visible at hydrogen-alpha wavelengths). Plage regions (often above faculae) are in the chromosphere and do radiate in H α , among other wavelengths.**
3. Where is the world's first Dark Sky Island? [Sark](#).
4. A NASA New Frontiers mission to Jupiter was launched on 5 August. What's it called? [Juno](#).
5. A mnemonic has it that if you follow the curve of the handle of the Plough, you can arc to _____ and then spike to _____. Fill in the blanks! **Arcturus and Spica.**
6. The LIGO experimental apparatus in the states of Washington and Louisiana has had no positive results in 10 years of operation. What's it looking for? [Gravitational waves](#).
7. What does it mean when we say that two eyepieces are parfocal? **If an object is in focus with one eyepiece, then it will also be in focus if the other is substituted. This can be achieved with most eyepieces by adding an external *parfocal ring* that is moved along an eyepiece's draw tube and secured so that when it rests against the eyepiece holder, focus achieved with the earlier eyepiece is also achieved in this case.**
8. In 1927, Georges Lemaître first proposed what later became known as the Big Bang theory. What was his occupation when he wasn't being an astronomer? [Catholic priest](#).
9. One of the main components of a hydrogen-alpha solar telescope such as the Coronado PST is an etalon. What's that? **A device that filters specific wavelengths by repeatedly reflecting light between two parallel glass surfaces a very carefully adjusted distance apart.**
10. How many globular clusters have been discovered in our galaxy (as of June 2011)? Is it: (a) 17; (b) 157; (c) 570; or (d) 5700? **(b) – there's a list at <http://spider.seds.org/spider/MWGC/mwgc.html>.**

October's quiz

1. Why will we eventually know a very great deal about Gale Crater?
2. The biggest known reservoir of water vapour in the universe has recently been discovered. What is its unexpected location?
3. The ALMA telescope in Chile is now ready to start observations. What do the initials stand for?
4. We've now had several pictures in *Transit* of Comet Garradd. What's the other bright (mag. ~5–6) comet in the skies at the moment, in Leo?
5. Who is President of the Society for the History of Astronomy?
6. Why was the object designated as 3C 273 a first, and what does the label mean?
7. What is a shepherd moon?
8. If you add a Whirlpool and a Butterfly, what do you get?
9. Most amateur astronomers know about the Hertzsprung–Russell diagram. What were the nationalities of the two men?
10. What are the popular names for the Pointers – the stars α and β Ursae Majoris, which point towards the Pole Star?

