



# TRANSIT

The Newsletter of



05 May 2009



The Moon or Mercury?

**Front Page Image** – Its Mercury – an image of the Rembrant impact basin from the Mercury Messenger spacecraft. Courtesy of NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington

**Next meeting** : 08 May 2009 , Professor Tom Hartquist. – “ Cosmic Rays And Shocks”.

**Please note the venue for the next meeting :-**

**7.15pm for a 7.30 pm start, Wynyard Woodland Park Planetarium and Observatory**

**Last meeting** : 17 April 2009 - Neil Haggath, "One Small Step, A Celebration of Apollo

This year is the 40th anniversary of the first Moon landing, Neil reminded the audience. He recalled the space race, the Cold War rivalry between the USA and the Soviet Union, which provided the political will to provide the enormous investment and technical effort required to fulfill President Kennedy's announcement that "the United States will land a man on the Moon within a decade". Tracing the early visits of man in space, Neil showed how the US/Russian rivalry initially favoured the Russians but that the USA gradually overhauled them.

The Apollo Project required \$23 billion, even at 1969 prices. Four major aerospace companies were involved, developing the massive (2900 tonnes) Saturn V rocket and space vehicles. We were reminded of the staggering size of the project as the statistics came out - weights, fuel, thrusts, technical developments. Many of us had probably forgotten the audacity of the whole enterprise, 40 years ago.

There were 17 Apollos, although Apollo 1 did not launch because of the deaths of the astronauts in a capsule fire on the launch pad. Apollo 2 to 6 were unmanned, the first manned flight, Apollo 7, spending 11 days in orbit, practising the techniques required for later missions. Apollo 8, 9 and 10 carried out more tests in Earth and Moon orbit. Apollo 11 was the first Moon lander, with a very short stay on the surface. Missions 12 to 16 spent much longer on the surface, exploring and collecting Moon rocks. In December 1972, the last mission to the Moon, Apollo 17, ended the First Lunar Exploration Programme. The very last Apollo, before the Shuttles, was to the Space Lab.

Neil's enthusiasm, great depth of knowledge and great respect, perhaps reverence, for the achievement shone through his account. The information,

photographs and diagrams he had assembled were very impressive. We all said later that we had been reminded of the sheer scale of the Apollo Project.

**Please note. The Society dues for 2009 were due in January. The cost is only £9.00. If applicable please pay your outstanding dues to our Treasurer, Ian Miles, at the next meeting.**

## **Letter to the Editor**

On the late John Morley, local astronomer and educator. John Morley recently passed away and is remembered by a number of CaDAS members. Here is a letter from John Crowther.

**Dear Editor,**

As we don't get a local paper I didn't hear of John Morley's death until a friend told me at our last meeting in the Parish Hall although appreciations of his life had been published in two local papers.

I got to know John when he lived at Eston where he had a workshop and an observatory above a garage in the center of town. He had to suffer light pollution even in the early seventies..

I don't know for how many years he had telescope making classes but we had about sixteen in the group that I was part of. I think David Bayliss was with us. John helped and provided the parts for our 4<sup>1/2</sup>" reflectors. All we had to do was to take the blanks home with grades of carborundum and grind the mirrors. I found this a slow yet relaxing process with an almost magical result, done in an unlit garage during a cold winter.

John provided the square section tubes from British Steel along with heavy mounts to which the telescope was secured with four wing-nuts. The mirrors were all figured and tested by John in his workshop and even eyepieces were provided although we bought our own higher magnification ones later. With square section tubes an upper and lower corner joint provided a sighting line before a finder was fitted. The total cost was £10!

Even a 2"x2" post was provided, set in a concrete disc. How they got our homes I can't remember. To keep the appearance of the lawn I buried the concrete part. A stupid move as although I painted the post to match the house over the years it rotted under the lawn. The mount, although protected by a plastic bag, also seized up after some years. Luckily the late Ron Shaw whom I used to bring to our meetings gave me his son's telescope so we ended up with two telescopes and one mount.

The reflector is now in Canterbury where I am hopeful that it will be shortly used by one or more of our three grandsons there.

We also went on trips organized by John to Grubb Parsons and to Edinburgh Observatory.

John eventually moved to Swainby - darker skies there than at Eston and we lost touch when I joined CaDAS.

His telescopes live on so, as the Bible tells us, "Their works do follow them". Perhaps John should share in the epitaph of Arthur C. Clarke "I have loved the stars to fondly to be fearful of the night".

### John Crowther

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**Visit our new CaDAS website:** <http://www.cadas-astro.org.uk>

Expertly put together by our webmaster, Don Martin. Our many thanks to him for his hard work getting it up and running so quickly.

*Apologies for wrong link information last month. Ed.*

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An astronomy podcast site recommended by Malcolm Bannister

<http://www.astronomycast.com/>

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Aborigine explanation of a total solar eclipse :-

"Kerosene lamp belong Jesus gone bugger up"

## Skylights – May 2009

From Rob Peeling

With May it is staying light much later and so observing becomes more difficult...

### The Moon

01 May	9 May	17 May	24 May	31 May
First Quarter	Full Moon	Last Quarter	New Moon	First Quarter

Note the impact of the difference between lunar and calendar months in May with the first quarter occurring twice.

At 22:00 UT on 1<sup>st</sup> May the Moon will be close to the open cluster Praesepe or M44. This will happen again on the 28<sup>th</sup> May but by then you will probably need a telescope to spot the cluster at all. These are however not particularly close passes.

The Moon passes by Saturn twice also on 3/4<sup>th</sup> May and 30/31<sup>st</sup> May.

The best nights for going after deep sky objects with the sky as dark as will get in the evening will be from about 11<sup>th</sup> May onwards as the old moon rises later and later.

### Planets

**Mercury** is visible in the evening twilight at the start of the month until about the 2<sup>nd</sup> week. It will be a tricky object to find. Once you have the location, low in the west with binoculars you ought to be able to spot it naked eye.

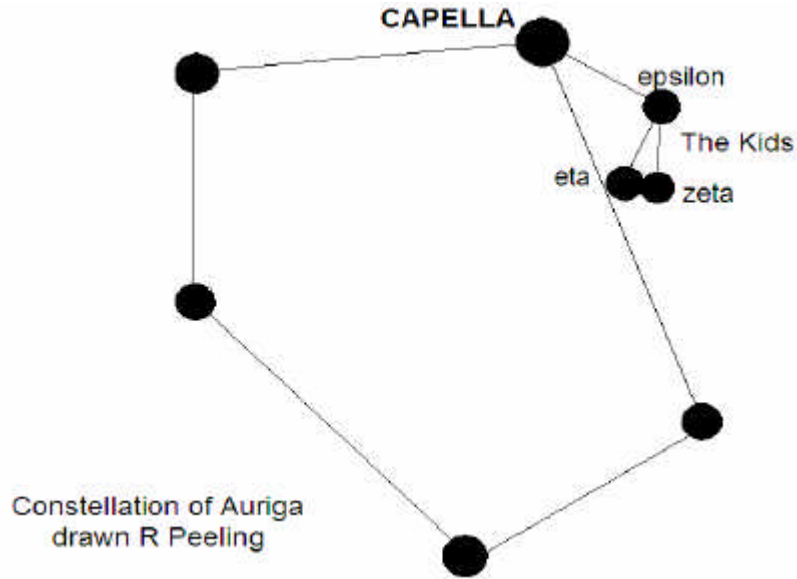
**Saturn** remains prominent to the south in the evening beneath the constellation of Leo. On nights with good seeing the dark gap between the rings and the planet (not the Cassini division) can still be seen. The rings will be fully edge on in August.

**Jupiter** can be seen before dawn in the later half of the month but you won't get long before the growing daylight beats you.

### Comets & Meteors

No bright comets are expected but there are two three around that could be targets for CCD imaging.

## Deep Sky

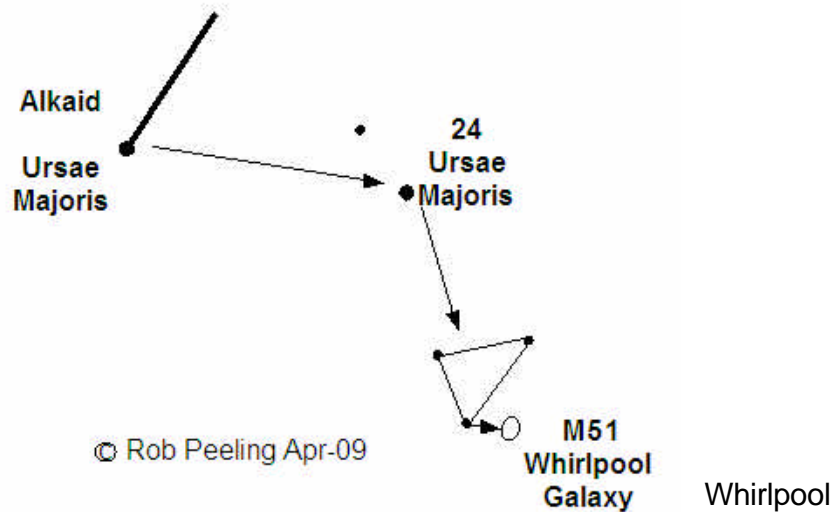


Early evening in early May will be the last chance to see the three stars in the Haedi (Kids) at their “normal” brightness before epsilon (lower left star in the triangle made up by this asterism) goes into eclipse. Note the relative brightnesses of the three stars and next compare in the autumn to see how much epsilon has faded.

## Objects in Ursa Major, Canes Venatici and Bootes

The constellations Ursa Major, Canes Venatici are more or less overhead in May with Bootes well placed also as marked by bright Arcturus. This area of sky is rich in Messier objects.

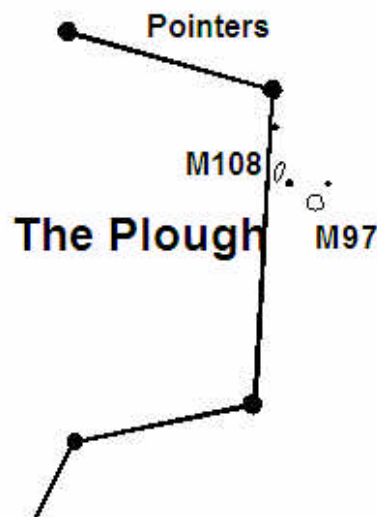
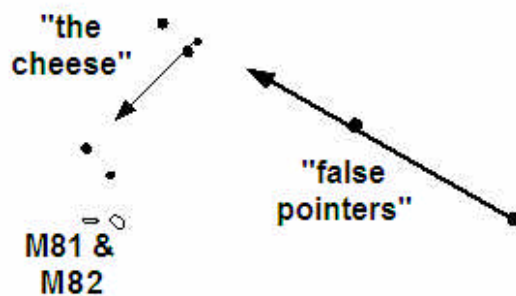
M101 ○



The

galaxy M51 and its interacting companion NGC 5195 are a “must see” pair. M51 is visible in binoculars from dark sites. From elsewhere it is easy to track down by star-hopping from Alkaid, the last star in the tail of the Big Dipper. I can usually see it in the finder. This galaxy was the first to be described as a spiral by Lord Rosse around 1850 using the 6 foot Leviathan of Parsonstown, the largest telescope in the world at the time.

Also near to Alkaid is M101 which a face on spiral galaxy. It is actually better found, I think, by star-hopping from Mizar rather than Alkaid. Only go after it if you like a challenge. It has low surface brightness which makes it **very** elusive with any kind of light pollution. I have detected it from home but I have only ever seen it well from the North Yorks Moors.



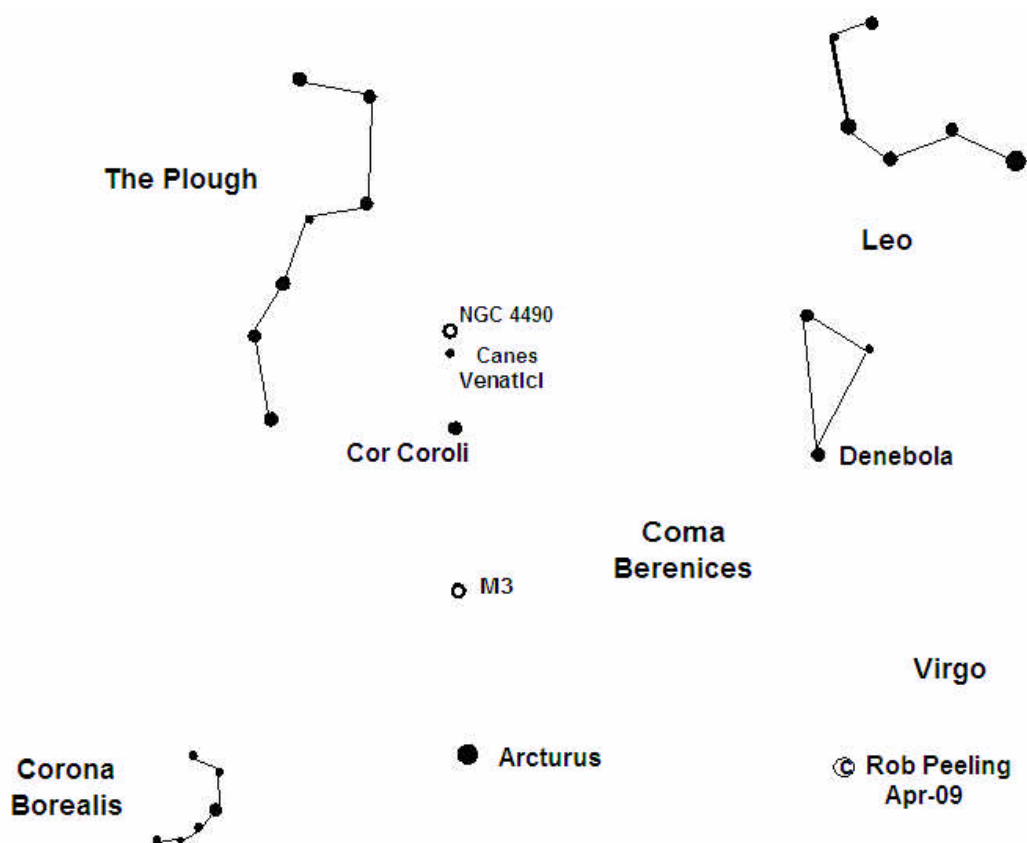
© Rob Peeling Mar-08

With them overhead it is probably the best time to see maximum detail in those old favourites, M81 and M82. Especially the dark lanes in M82. While in the area, try to find NGC 3077 about 1 degree to the east and very slightly south of

M81 which is actually a bright galaxy in its own right but eclipsed by the Messier pair. It is part of the same system.

Also try for M97, the Owl Nebula, which I think is the most elusive of the 4 planetary nebulae in Messier's List. It lies close to Merak, the lower of the pointers in the Big Dipper. Close by is the edge on galaxy M108 which is fairly easy to spot.

Last of the Messier List for now is M3, the globular cluster in Canes Venatici. Find this by tracking with your finder roughly half the way along the line from Arcturus to Cor Coroli. It should show up as a fuzzy blob. Use high power to see this cluster resolve into thousands of stars. There is another globular nearby to the east in the Herschel 400 list, NGC 5466. I haven't seen it yet but Dave Blenkinsop has put it on my target list for me.



My final suggestion for the month is the interacting pair of galaxies, NGC 4490 and NGC 4485. These lie just west of beta Canes Venaticorum (Chara). NGC 4490, the Cocoon galaxy, is fairly easy to pick up. Its companion NGC 4485 is shy but will be seen in good conditions.



## Observing Report for April 2009

Mostly I have been out looking for galaxies since I last wrote. Since the 20<sup>th</sup> March I have logged viewings of 68 different galaxies. Mostly in Leo, Virgo, Coma Berenices and Canes Venatici. When out on the moors with Mike Smith we were both stunned to at one point have six galaxies in the field of view at the same time (around M84 and M86). It just shows how much difference a dark sky makes.

I was also pleased to finally locate NGC 5053 which is a ridiculously faint globular cluster near to the much brighter (and better!) globular, M53 near alpha Comae Berenices.

Finally, on 19<sup>th</sup> April, I tracked down Mercury with binoculars and naked eye. I last saw this planet in May 2007.

## Transit quiz questions for the May 2009 issue

From Rod Cuff



**Where in the Universe?** A pictorial challenge. Of what, where and when was this image taken (a clue – it is not a TESCO Cornish Pasty!)

Q 1. Who discovered these?:

- (a) Uranus
- (b) Neptune
- (c) Pluto
- (d) M100

(e) Comet C/2006 P1

Q 2. What's the brightest star in the northern celestial hemisphere? What are the three stars brighter than that in the southern celestial hemisphere?

Q 3. What are these?

- (a) a red giant
- (b) a red dwarf
- (c) the Red Planet
- (d) redshift

Q 4. What constellation is each set of objects in?

- (a) the Pointers to the Southern Cross, Rigel Kent and our galaxy's biggest globular cluster
- (b) the Rosette Nebula, Hubble's variable nebula and the Cone Nebula
- (c) Algol, the Little Dumbbell Nebula and the California Nebula
- (d) the Lagoon Nebula, the Trifid Nebula and the centre of our galaxy

Q 5. On which solar system bodies would you find the following?

- (a) Caloria Planitia
- (b) Ishtar Terra
- (c) D'Alembert Montes
- (d) Elysium Fossae

Q 6. There are a lot of big telescopes in existence or planned. Can you expand these acronyms, and place the telescopes?

- (a) ELT
- (b) JWST
- (c) SALT
- (d) SOAR
- (e) VLA

## Deep Solar Minimum

from NASA

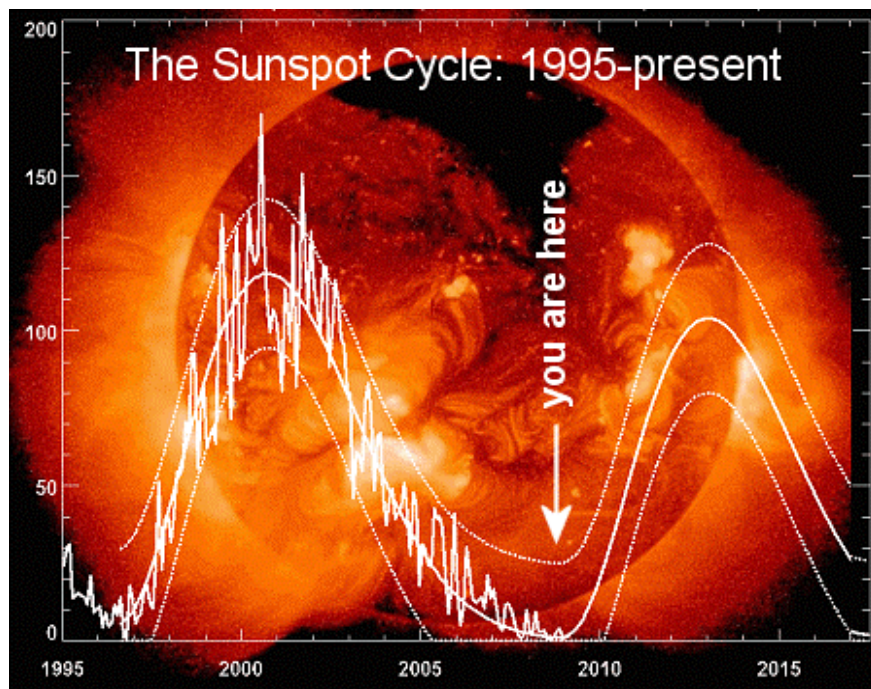
The sunspot cycle is behaving a little like the stock market. Just when you think it has hit bottom, it goes even lower.

2008 was a bear. There were no sunspots observed on 266 of the year's 366 days (73%). To find a year with more blank suns, you have to go all the way back to 1913, which had 311 spotless days. Prompted by these numbers, some observers suggested that the solar cycle had hit bottom in 2008.

Maybe not. Sunspot counts for 2009 have dropped even lower. As of March 31st, there were no sunspots on 78 of the year's 90 days (87%).

It adds up to one inescapable conclusion: "We're experiencing a very deep solar minimum," says solar physicist Dean Pesnell of the Goddard Space Flight Center.

"This is the quietest sun we've seen in almost a century," agrees sunspot expert David Hathaway of the Marshall Space Flight Center.



**Above:** *The sunspot cycle from 1995 to the present. The jagged curve traces actual sunspot counts. Smooth curves are fits to the data and one forecaster's predictions of future activity. Credit: David Hathaway, NASA/MSFC.*

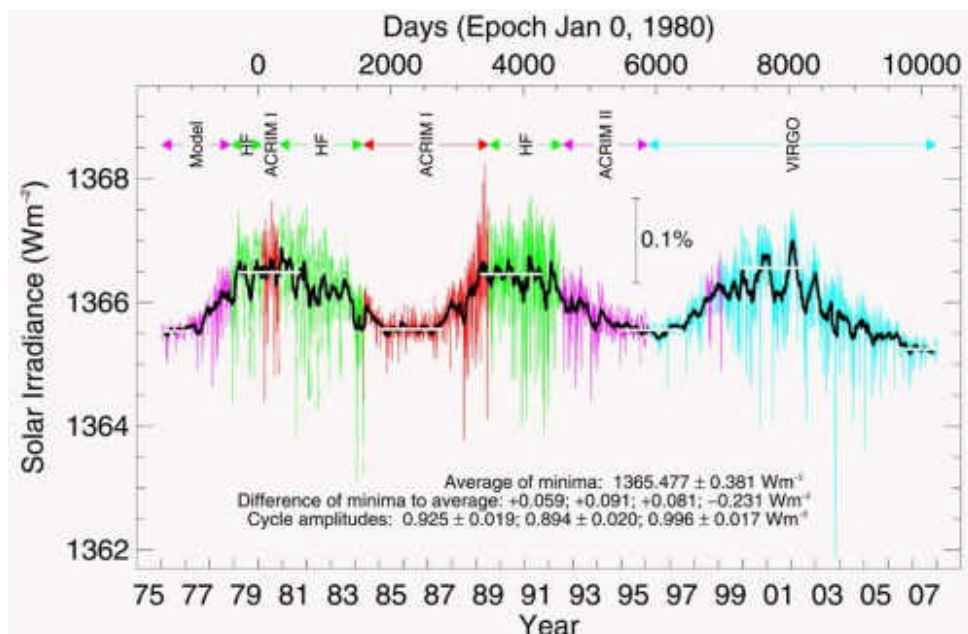
Quiet suns come along every 11 years or so. It's a natural part of the sunspot cycle, discovered by German astronomer Heinrich Schwabe in the mid-1800s. Sunspots are planet-sized islands of magnetism on the surface of the sun; they are sources of solar flares, coronal mass ejections and intense UV radiation. Plotting sunspot counts, Schwabe saw that peaks of solar activity were always followed by valleys of relative calm—a clockwork pattern that has held true for more than 200 years:

The current solar minimum is part of that pattern. In fact, it's right on time. "We're due for a bit of quiet—and here it is," says Pesnell.

But is it supposed to be *this* quiet? In 2008, the sun set the following records:

**A 50-year low in solar wind pressure:** Measurements by the Ulysses spacecraft reveal a 20% drop in solar wind pressure since the mid-1990s—the lowest point since such measurements began in the 1960s. The solar wind helps keep galactic cosmic rays out of the inner solar system. With the solar wind flagging, more cosmic rays are permitted to enter, resulting in increased health hazards for astronauts. Weaker solar wind also means fewer geomagnetic storms and auroras on Earth.

**A 12-year low in solar "irradiance":** Careful measurements by several NASA spacecraft show that the sun's brightness has dropped by 0.02% at visible wavelengths and a whopping 6% at extreme UV wavelengths since the solar minimum of 1996. These changes are not enough to reverse the course of global warming, but there are some other, noticeable side-effects: Earth's upper atmosphere is heated less by the sun and it is therefore less "puffed up." Satellites in low Earth orbit experience less atmospheric drag, extending their operational lifetimes. That's the good news. Unfortunately, space junk also remains longer in Earth orbit, increasing hazards to spacecraft and satellites.



**Above:** Space-age measurements of the total solar irradiance (brightness summed across all wavelengths). This plot, which comes from researcher C. Fröhlich, was shown by Dean Pesnell at the Fall 2008 AGU meeting during a lecture entitled "What is Solar Minimum and Why Should We Care?"

**A 55-year low in solar radio emissions:** After World War II, astronomers began keeping records of the sun's brightness at radio wavelengths. Records of 10.7 cm flux extend back all the way to the early 1950s. Radio telescopes are now recording the dimmest "radio sun" since 1955: Some researchers believe that the

lessening of radio emissions is an indication of weakness in the sun's global magnetic field. No one is certain, however, because the source of these long-monitored radio emissions is not fully understood.

All these lows have sparked a debate about whether the ongoing minimum is "weird", "extreme" or just an overdue "market correction" following a string of unusually intense solar maxima.

"Since the Space Age began in the 1950s, solar activity has been generally high," notes Hathaway. "Five of the ten most intense solar cycles on record have occurred in the last 50 years. We're just not used to this kind of deep calm."

Deep calm was fairly common a hundred years ago. The solar minima of 1901 and 1913, for instance, were even longer than the one we're experiencing now. To match those minima in terms of depth and longevity, the current minimum will have to last at least another year.

In a way, the calm is exciting, says Pesnell. "For the first time in history, we're getting to see what a deep solar minimum is really like." A fleet of spacecraft including the Solar and Heliospheric Observatory (SOHO), the twin STEREO probes, the five THEMIS probes, ACE, Wind, TRACE, AIM, TIMED, Geotail and others are studying the sun and its effects on Earth 24/7 using technology that didn't exist 100 years ago. Their measurements of solar wind, cosmic rays, irradiance and magnetic fields show that solar minimum is much more interesting and profound than anyone expected.



**Above:** *An artist's concept of NASA's Solar Dynamics Observatory. Bristling with advanced sensors, "SDO" is slated to launch later this year--perfect timing to study the ongoing solar minimum.*

Modern technology cannot, however, predict what comes next. Competing models by dozens of top solar physicists disagree, sometimes sharply, on when this solar minimum will end and how big the next solar maximum will be. Pesnell has surveyed the scientific literature and prepared a "piano plot" showing the range of predictions. The great uncertainty stems from one simple fact: No one fully understands the underlying physics of the sunspot cycle.

Pesnell believes sunspot counts will pick up again soon, "possibly by the end of the year," to be followed by a solar maximum of below-average intensity in 2012 or 2013.

## It's Official: Hubble Mission to Launch May 11

written by Nancy Atkinson

After today's Flight Readiness Review for space shuttle Atlantis' STS-125 mission to the Hubble Space [Telescope](#), mission managers unanimously agreed to set May 11 at 2:01 p.m. EDT as the launch date. This long awaited flight will repair and upgrade Hubble, likely the most significant satellite ever launched. And, for the space shuttle, it's a final visit to a dear, old friend.

During the 11-day mission's five spacewalks, astronauts will install two new instruments, repair two inactive ones and perform the component replacements that will keep the telescope functioning into at least 2014.

In addition to the originally scheduled work, Atlantis also will carry a replacement Science Instrument Command and Data Handling Unit for Hubble. Astronauts will install the unit on the telescope, removing the one that stopped working on Sept. 27, 2008, delaying this servicing mission until the replacement was ready. Veteran astronaut Scott Altman will command the final space shuttle mission to service NASA's Hubble Space Telescope, and retired Navy Capt. Gregory C. Johnson will serve as pilot. Mission specialists rounding out the crew are: veteran spacewalkers John Grunsfeld and Mike Massimino, and first-time space fliers Andrew Feustel, Michael Good and Megan McArthur.

## Answers for the quiz questions from the April 2009 issue

from Rod Cuff



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

**Answer** - SN 1987A. Taken by....Hubble. Twenty years ago, astronomers witnessed one of the brightest stellar explosions in more than 400 years. The titanic supernova, called SN 1987A, blazed with the power of 100 million suns for several months following its discovery on Feb. 23, 1987.

- Q 1. What constellation is each set of objects in?
- Sadalmelik, the Saturn Nebula and the Helix Nebula
  - Spica, the Sombrero Hat Galaxy and ten other Messier galaxies
  - Al Nath, the Crab Nebula and the Hyades
  - Rasalgethi and the brightest globular cluster in the northern hemisphere, but no first-magnitude stars.
- A 1. (a) Aquarius. See [www.astro.illinois.edu/~jkaler/sow/sadalmelik.html](http://www.astro.illinois.edu/~jkaler/sow/sadalmelik.html), [www.daviddarling.info/encyclopedia/S/Saturn\\_Nebula.html](http://www.daviddarling.info/encyclopedia/S/Saturn_Nebula.html) and <http://tinyurl.com/c5vdg6>.
- (b) Virgo. See [www.glyphweb.com/esky/stars/spica.html](http://www.glyphweb.com/esky/stars/spica.html), <http://tinyurl.com/dmy8bs> and <http://messier.obspm.fr/map/Vir.html>.
- (c) Taurus. See [www.alcyone.de/SIT/mainstars/SIT000764.htm](http://www.alcyone.de/SIT/mainstars/SIT000764.htm), <http://tinyurl.com/dyll9z> and <http://allthesky.com/clusters/hyades.html>.
- (d) Hercules. The globular is the magnificent M13. See [www.constellationsofwords.com/stars/RasAlgethi.html](http://www.constellationsofwords.com/stars/RasAlgethi.html), [www.concentric.net/~richmann/m13w.htm](http://www.concentric.net/~richmann/m13w.htm) and [http://seds.org/Maps/Stars\\_en/Fig/hercules.html](http://seds.org/Maps/Stars_en/Fig/hercules.html).
- Q 2. All of these have been discovered since the year 2000. What are they?
- Nix and Hydra (*not* the constellation)
  - 2008 TC3
  - B1938+666 (predicted by General Relativity)
  - Ontario Lacus (a long way from Canada!)
- A 2. (a) Small satellite moons of Pluto – see [www.jhuapl.edu/newscenter/pressreleases/2006/060622.asp](http://www.jhuapl.edu/newscenter/pressreleases/2006/060622.asp).
- (b) The first meteoroid to be observed and tracked before hitting Earth – see [www.astronomy.com/asy/default.aspx?c=a&id=7468](http://www.astronomy.com/asy/default.aspx?c=a&id=7468).
- (c) The first observed complete Einstein ring – see [http://wapedia.mobi/en/Einstein\\_ring](http://wapedia.mobi/en/Einstein_ring).
- (d) A lake of methane on Saturn's moon Titan – the first body of liquid found outside the Earth. See [www.space.com/scienceastronomy/080730-titan-lake.html](http://www.space.com/scienceastronomy/080730-titan-lake.html).
- Q 3. What are the following things, and who are they named after?
- a Kreutz Sungrazer
  - Brocchi's Cluster
  - a Hartmann mask
  - Hawking radiation
- A 3. (a) A kind of comet that gets very close to the Sun – see [www.esa.int/esaCP/SEM00AJZBQE\\_index\\_0.html](http://www.esa.int/esaCP/SEM00AJZBQE_index_0.html).
- (b) An open cluster, also known as the Coathanger or Collinder 399, in

Vulpecula – see

[www.danlessmann.com/AstroPages/BrocchisCluster\\_2006-07-18.htm](http://www.danlessmann.com/AstroPages/BrocchisCluster_2006-07-18.htm).

- (c) An easy-to-make aid to achieving sharp focus with your telescope – see <http://lonewolf-online.net/astronomy/tutorials/hartmann-mask>.
- (d) The only radiation thought to be possible from a black hole, though so far not directly observed – see <http://math.ucr.edu/home/baez/physics/Relativity/BlackHoles/hawking.html>

Q 4. What are or were these?

- (a) the Great Bear
- (b) the Great Attractor
- (c) the Great Observatories
- (d) the Great Red Spot
- (e) the Great Debate

A 4. (a) The constellation of Ursa Major (Latin for ... um ... Great Bear) – see <http://tinyurl.com/dxvmd4>.

- (b) A vast as-yet-unseen mass or collection of masses theorised to be in the general direction of Centaurus, that appears to be pulling our galaxy strongly towards it – see <http://tinyurl.com/deklu4>.
- (c) NASA's four orbiting telescopes observing at visual (Hubble), gamma-ray (Compton), X-ray (Chandra) and infrared (Spitzer) wavelengths – see <http://tinyurl.com/2ko98n>.
- (d) The most prominent 'spot' on Jupiter – huge (as big as three Earths) and long-lasting (it's been observed for at least 400 years). See <http://tinyurl.com/cfl8gb>.
- (e) An enormously influential debate in 1920 between the astronomers Harlow Shapley and Heber Curtis about the nature of spiral nebulae (were they fairly local, or separate galaxies like our own?) and the size of the universe. You can find the text and much more at [http://antwrp.gsfc.nasa.gov/diamond\\_jubilee/debate\\_1920.html](http://antwrp.gsfc.nasa.gov/diamond_jubilee/debate_1920.html).

Q 5. Here's a follow-up to Answer 3(c) from last month's quiz, which mentioned that the First Point of Aries is the point on the celestial sphere where the Sun can be found at the spring equinox. There is a companion point where the Sun is at the autumnal equinox – the First Point of ... what? And what constellation has precession taken it into now?

A 5. Libra – and it's now slipped into the constellation of Virgo. See [www.encyclopedia.com/doc/1O80-firstpointofLibra.html](http://www.encyclopedia.com/doc/1O80-firstpointofLibra.html).

Q 6. Which solar system bodies have the following spacecraft visited?

- (a) Magellan
- (b) Messenger
- (c) Clementine

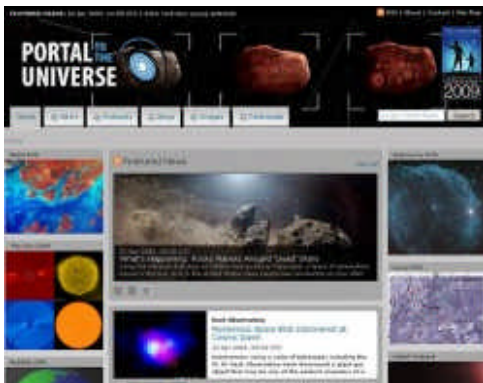


- (d) Viking
- (e) Giotto

- A 6. (a) Venus – see [www2.jpl.nasa.gov/magellan](http://www2.jpl.nasa.gov/magellan).  
(b) Mercury – see <http://messenger.jhuapl.edu>.  
(c) The Moon – see [www.lpi.usra.edu/expmoon/clementine/clementine.html](http://www.lpi.usra.edu/expmoon/clementine/clementine.html).  
(d) Mars – see [www.nasa.gov/mission\\_pages/viking](http://www.nasa.gov/mission_pages/viking).  
(e) Halley's Comet – see <http://sci.esa.int/science-e/www/object/index.cfm?fobjectid=38922>

## Portal to the Universe Now Open

From Universe Today



Screenshot of PTTU.

If you like RSS feeds, readers or other news aggregators, there's a new website available that focuses on astronomy and space news. Called [Portal to the Universe](http://www.portaltotheuniverse.com), it is the latest Cornerstone project of the International Year of Astronomy 2009 (IYA2009). Universe Today is one of the sites featured, and PTTU includes other news sites, blogs, video podcasts, audio podcasts, images, videos, and more. Don't worry: PTTU isn't trying to replace Universe Today or any other sites or blogs. The goal of this new site is to get the word out on what is being featured on all the different space and astronomy sites and push more readers their way. It's all about community.

PTTU also includes Web 2.0 collaborative tools, such as the ranking of different services according to popularity, and a range of "widgets" to tap into all sorts of existing "live data", such as near-live pictures of [the Sun](http://www.portaltotheuniverse.com), live positions of spacecraft or live observations from [telescopes](http://www.portaltotheuniverse.com).

From PTTU's press release:

Portal to the Universe will help the user to sift constructively through the wealth of information available and will promote interactions within the astronomy multimedia community. A The vision for the Portal is to enable real-time access to content by aggregating (pulling) from providers of dynamic content like blogs, images, news, etc., and distributing (pushing) to users, as well as indexing and archiving, collecting and maintaining a central repository of useful information. RSS feeds and standardized metadata make it possible to tie all the suppliers of astronomy information together with a single, semi-automatically updating portal. The result is a technologically advanced site that brings together strands of astronomy content from across the worldwide web.

Project Manager Lars Lindberg Christensen says: "The project will develop with, and around, the community's needs and lots of new features are planned, including adding resources such as educational materials, addresses for all astronomy stakeholders such as amateur clubs, planetariums and observatories."

## **JACOBITE ASTRONOMICAL MEMORIALS**

From Mike Gregory

About twelve months ago the Highlands Astronomical Society opened an observatory adjacent to the National Trust for Scotland's Culloden Battlefield Site in Inverness-shire. As the NTS endeavour to keep the site as natural and as light pollution free as possible this makes an ideal situation for an observatory but has the site any other astronomical links?

I think most people will have heard of 'Bonnie Prince Charlie' and his disastrous attempt to regain the throne of Great Britain for the ill-fated Stuarts... But what has this to do with astronomy I hear people ask? Well, indirectly, quite a bit as the bonnie prince, who was probably never really bonnie and certainly never a 'Charlie', had a second cousin whom the Aurora Borealis is named after, whilst two of his great grandfathers had, respectively, a beautiful double star, and a constellation named after them. Now, whose Family Tree can boast of this!

### **Cor Caroli Regis Martyris**

Charles 1<sup>st</sup>, King of Scotland and England, was the 2<sup>nd</sup> son of James 5<sup>th</sup> & 1<sup>st</sup> and Anne of Denmark, but his marriage to Henrietta Maria, a daughter of Henry 4<sup>th</sup> of Navarre, King of France, caused great unease as Henrietta's marriage articles allowed her to practise her Catholic faith. Additionally Charles was soon warring with his brother-in-law and became unpopular with his lords and barons due to

his tax demands. This led to Civil War in England and, finally, Charles' trial, and execution in 1649, followed by the Cromwellian Interregnum.

Within two years, the martyred king's son, Charles 2<sup>nd</sup>, was crowned at Scone, Scotland, and bolstered by several Scottish clan regiments he marched down to Worcester where Cromwell soundly defeated him. However, Cromwell wore himself out as Lord Protector and he died in 1658, to be followed by his son, Richard Cromwell. But Richard did not possess his father's zest and the Army, led by General Monk, soon easily deposed him. This led to Charles 2<sup>nd</sup> being invited back to take his place on the throne and he entered London on May 29<sup>th</sup> 1660. Sir Charles Scarborough, the new king's physician, claimed on that night that the brightest star in the constellation of Canes Venatici appeared to be shining much brighter than normally. Sir Charles suggested that it was the heart of the martyred Charles 1<sup>st</sup> swelling with pride now that his son had regained the throne and ever since that time alpha Canes Venatici has also been known as Cor Caroli Regis Martyris (the Heart of the Martyred King Charles). Of course, we now know that alpha Canes Venatici is not a variable star and almost certainly was no brighter on the night of May 29<sup>th</sup> 1660 than any other night.

Cor Caroli Regis Martyris is an easy double star for the small telescope (even good binoculars mounted solidly) and nestles beneath the handle of the Big Dipper on spring evenings. Both components are predominantly white though the secondary has a yellowish tinge and when seen in really clear dark skies, this secondary can appear to have an ashen purple tinge.

Charles 2<sup>nd</sup> married Catharine of Braganza, the sister of the King of Portugal, but she was unable to bear any surviving heirs. However, Charles had countless affairs outside of his marriage and one with the actress Moll Davis produced a daughter, Lady Mary Tudor, who was to become the mother of James Radcliffe, Bonnie Derwentwater of the 1715 Rising.

### **Lord Derwentwater's Lights**

The Radcliffes (spelt Ratcliffe in Jacobite literature), who originated from Lancashire, succeeded to the manor of Dilston, near Hexham, Northumberland, in the early 16<sup>th</sup> century when Edward Radcliffe of Derwentwater in Cumberland, married the Dilston heiress, Anne Cartington. Their son, Sir Francis Radcliffe, a noted Catholic recusant, was arrested on suspicion of complicity in the Gunpowder Plot. His son, Edward, the 2<sup>nd</sup> Baronet, was a distinguished Royalist who, during the Civil War, managed to lose his estates.

His son, Francis, 3<sup>rd</sup> Baronet, was the most ambitious of the Radcliffes. He managed to retrieve his family estates and, in 1688, was created 1<sup>st</sup> Earl of Derwentwater by James 2<sup>nd</sup> following the marriage of his son, Edward, to Lady Mary Tudor, a natural daughter of King Charles 2<sup>nd</sup> by the actress, Moll Davis. This prestigious alliance with the ill-fated Stuart dynasty was to prove the

downfall of the Radcliffe family who, for a brief period, became one of the wealthiest and most powerful Jacobite families in the north of England.

Sir Edward and Lady Radcliffe had two sons of interest to this article. James, the eldest son, was born in 1689 and Charles in 1692. At the age of thirteen, James was sent to France to be a companion to the similarly aged James Edward Stuart (The Old Pretender) who, though just one year older was also a generation older (he was Lady Mary Tudor Radcliffe's cousin-german), and to share his education, James Edward being the son of James 2<sup>nd</sup> & 7<sup>th</sup> and his second wife, Queen Mary d'Este (of Modena). It was Queen Mary herself who had requested that James Radcliffe should join her son. In Jacobite eyes at least, as well as that of Paris & Rome, the young James Edward Stuart was looked upon as the rightful heir to the throne of Great Britain!

Sir Edward Radcliffe, the 2<sup>nd</sup> Earl, died in 1705 but his eldest son, James did not return to Dilston until 1709 when he was aged 20 years. Almost at once he laid down plans to have Dilston rebuilt in the French style as the finest mansion in the north with landscaped gardens leading down to the Devil's Water, the tributary that ran into the River Tyne not far away.

In 1712 James married Anna Maria Webb, who he had met in France, and went to live with his new wife and her parents, who had estates at Great Canford in Dorset and Hathersrop in Gloucestershire, whilst Dilston was being rebuilt, the Webb's being staunch supporters of Rome and the Stuart dynasty. But when news came of an intended rising taking place in Scotland, James and Anna returned to Dilston with their infant son. James, known locally as 'Bonnie Derwentwater', was a key player in the rising but few of the leading players had much military experience and Derwentwater's army consisted mostly of local gentlemen and their, probably unwilling, retainers. In fact, it was said that James himself was wary of becoming involved and that his wife was the driving force. As James was aware, his army consisted of little more than 300 men, and he must have been further aware that, as he and his brother were maternal grandsons of Charles 2<sup>nd</sup>, to finish on the losing side would almost certainly lead to their execution.

John Erskine (Bobbing John), the Earl of Mar, raised James Edward Stuart's standard at Braemar in the Highlands in September 1715. At this time there were basically four Jacobite armies – the Earl of Mar in central Scotland, the border lords such as Nairne, Nithsdale, Carnwath and Kenmure in southwest Scotland, Bonnie Derwentwater's border gentlemen in the Tyne valley, and a group led by Lord Widdrington and Thomas Forster, an MP for Bamburgh, on the East Coast. All the leaders appear to have been staunch Catholics except for Forster, a Protestant, but he thought he could further his own ends by supporting the Jacobites.

Kenmure asked Mar for help and a taskforce under the very able command of Brigadier William Macintosh, a professional soldier, were sent south though Macintosh's orders were that he was to relinquish command south of the border to Thomas Forster as Mar did not think it fit that a Scotsman should command a predominantly English army in England. This was to prove a stunning blunder by Mar as none of the Border lords or gentlemen, most of whom were still in their twenties, had seen much action outside of fox hunting and this was certainly true of William Graham (Viscount Kenmure) and the dangerously inept Forster.

On October 22<sup>nd</sup> Macintosh halted at Kelso, just north of the border, with a cavalry regiment of 600 horse and 1,400 foot soldiers (mainly clansmen) and there met the other leaders. He wished to turn north again with the idea of rejoining Mar but the Borderers would have none of this and urged Macintosh to cross into England. This he reluctantly agreed to do, as he knew his way north with upwards of 4,000 troops would not be easy, but as soon as he conceded command to Thomas Forster, the whole enterprise was doomed!

So the Borderers now headed south, numbering a healthy 4,000 men though it is doubtful if more than 25% really wished to be involved. Reaching Preston, they took the town with little opposition but it was not long before a Hanoverian army approached commanded by General Charles Wills. About the same day that the Earl of Mar's Jacobite army fought an indecisive battle with Archibald Campbell, the Duke of Argyll, at Sheriffmuir near Stirling (probably November 18<sup>th</sup> 1715), the Border army came to action against General Wills. The conflict appears to have been short and swift; in fact Thomas Forster and some others tried to parley with the Hanoverians even before the action started but General Wills sent them back to their own lines and the Borderers had no answer to the professional British cavalry who attacked in a pincer movement. James and Charles Radcliffe, Viscount Kenmure and about 29 other gentlemen were captured, tried and later sentenced to death.

Lady Radcliffe tried to plead for her husband's life but his position was untenable and, as a Lord of the Realm, he was beheaded on Tower Hill on February 24<sup>th</sup> 1716. A true gentleman to the very end, he dressed immaculately for his execution and died with great courage at the same time that Viscount Kenmure also suffered. Most of the other leaders were granted pardons, though security in the Tower was rather lax and both Charles Radcliffe and the feckless Thomas Forster managed to escape to France before being brought to trial.

Charles Radcliffe later married the widowed Countess of Newburgh in Brussels and gained a commission in a Franco-Irish cavalry regiment. But he foolishly supported the '45 and was captured whilst at sea along with his regiment; though he had been something of a vagabond throughout his life, like his brother before him, he displayed immense courage at the time of his execution.

Perhaps the same people who helped Charles escape, also secretly brought James' mortal remains back to the north. As the cortege approached Durham city on the evening of March 6<sup>th</sup> 1716, a brilliant aurora, the brightest that had been seen in living memory, illuminated the night sky, and coloured the Devil's Water crimson. Many locals who witnessed this phenomenon thought of it as a sign from Heaven that the Almighty was showing his dismay at the execution of the gentle earl and that the Jacobites would rise again. Since then auroras in this part of the country have always been known as 'Lord Derwentwater's Lights' and, even to this day, his memory lives on in the upper Tyne valleys!

We can be reasonably sure of the date of the aurora as none other than Edmund Halley (1656-1742), of comet fame, witnessed it. He was aged sixty then and recorded it as the finest aurora he was ever to see!

### **Scutum Sobieski**

So hapless was the Jacobite planning that James Edward Stuart did not arrive in Scotland until almost the end of December when the cause was already hopelessly lost and his childhood companion almost doomed. However, some authorities claim that he went ahead and was crowned at Scone but the Earl of Mar, who had survived the Battle of Sheriffmuir, urged James to retire to the Continent and await a better opportunity. Hence the Jacobite Court in Rome then set about finding a suitable wife of royal rank for the throne-less king!

After various unsuccessful proposals, as no West European families of noble birth wished to become involved in future Jacobite intrigues, James Edward became engaged to Mary (or Maria) Clementina Sobieski, a daughter of James Sobieski and Elizabeth Amelia of Newburg. Clementina had all the right attributes – she was wealthy, Catholic, and of royal birth, being a paternal granddaughter of John Sobieski, the late warrior king of Poland. The Jacobite court sent Colonel Hay to the Sobieski home at Ollau in Silesia to escort Clementina to Italy but the British Government were determined to stop this marriage taking place and put pressure on the Emperor of Austria to arrest Clementina. She was held in Innsbruck Castle for seven months but thanks to a Franco-Irishman by the name of Colonel Wogan, and the undoubted bravery of her maid, Clementina arrived safely at Bologna where she was married by proxy to James Edward in May 1719. However, James Edward did not even meet Clementina for the first time until August and they were married on September 1<sup>st</sup> 1719. Some fifteen months later Prince Charles Edward Stuart was born in Rome and with the birth of an heir to the royal line, Jacobite hopes and activities were both revived!

Clementina's paternal grandfather was John (Jan) Sobieski (1629-1696) who was born of noble, though not royal, blood and married a French widow, Maria de la Grange d'Arquien. A professional soldier of great skill, he rose to command the Polish armies and drove the Turks out of Poland and Austria. At this time the king of Poland, Michael, had no heirs, so he suggested that on his own death, John

Sobieski would succeed him as King John 3<sup>rd</sup> of Poland. This a grateful nation happily acquiesced too!

During John Sobieski's lifetime, the Polish astronomer, Johannes Hevelius, who predeceased him by some nine years, suggested that the south-east corner of the constellation known as Aquila, should be renamed Scutum Sobieski (Sobieski's Shield) as a memorial from a grateful nation. Hevelius said that a group of stars in this area of Aquila resembled the pattern of stars on the shield that John Sobieski had carried with him in many fierce battles. Slowly, over the years, Johannes suggestion was accepted and internationally so by the year 1900.

About 1930 the International Astronomical Union met to agree to clear demarcations between the constellations and, at the same time, decided that no constellation would bear a personal name. Henceforth, Scutum Sobieski (Sobieski's Shield) became simply Scutum (The Shield) but still a fine memorial to Poland's warrior king!

Finally, as to our part in all this, I was born at Dilston Hall in 1942 and my brother in 1945!

### **Wynyard Woodland Park Public Planetarium Shows:**

*Public shows last for about 1 ½ hours in total.*

- Friday 3<sup>rd</sup> April 2009, 7:30p.m. : "What's Up?"
- Friday 17<sup>th</sup> April 2009, 7:30p.m. : "Powers of Ten: *Size of the Universe*"
- Friday 1<sup>st</sup> May 2009, 7:30p.m. : "Wonders of the Universe"
- Friday 22<sup>nd</sup> May 2009, 7:30p.m. : "Wonders of the Universe"
- Friday 5<sup>th</sup> June 2009, 7:30p.m. : "Wonders of the Universe"
- Friday 19<sup>th</sup> June 2009, 7:30p.m. : "Wonders of the Universe"
- Friday 3<sup>rd</sup> July 2009, 3:00p.m. : "The Stars from Down Under"
- Friday 17<sup>th</sup> July 2009, 7:30p.m. : "Wonders of the Universe"
- Friday 7<sup>th</sup> August 2009, 7:30p.m. : "Wonders of the Universe"
- Sunday 30<sup>th</sup> August 2009, 3:00p.m. : "Secrets of the Sun"
- Friday 4<sup>th</sup> September 2009, 7:30p.m. : "What's Up?"
- Friday 18<sup>th</sup> September 2009, 7:30p.m. : "Dark Matter & Dark Energy"

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**Articles** : Please send contributions for the newsletter to The Editor, Bob Mullen, 18 Chandlers Ridge, Nunthorpe, Middlesbrough, TS7 0JL, 01642 324939 ([b2mullen@hotmail.com](mailto:b2mullen@hotmail.com)) Copy deadline date is the 25<sup>th</sup> of each month).