



South Downs Mercury



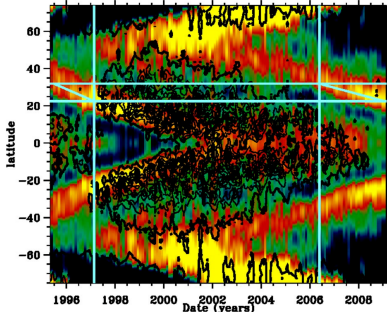
The monthly newsletter of South Downs Astronomical Society
Issue: 420 - August 2009 Editor: John Simper

No meeting this month - the next will be on Friday 4th September.

Competition for space means we usually devote only our front page to current news. This month we hold over our "feature" article for one month, giving some space to catch-up with some of the unreported astronomy news of the last 6 months.

In the News:

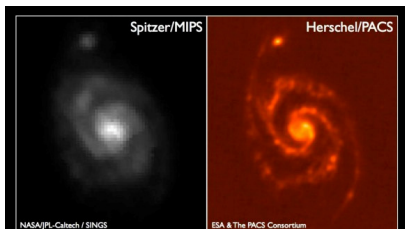
☉ Researchers at the National Solar Observatory in Tucson may have found the reason for the puzzlingly low sunspot activity of the last two years. Using a technique called helioseismology they have tracked a jet stream deep inside the sun and concluded that it is migrating slower than usual through the star's interior. Some 7,000 km below the surface, new jet streams form near the Sun's poles every 11 years and



then migrate towards the equator. When a jet stream reaches 22° latitude a new-cycle of sunspots begin to appear. This is illustrated in this NSO image - the tilted red/yellow bands trace solar jet

streams and black contours denote sunspot activity. Latest measurements indicate that the jet stream associated with the next solar cycle has moved only sluggishly, taking three years to cover a 10° range in latitude compared to only two years for the previous solar cycle. Frank Hill, one of the researchers, said "the jet stream is now, finally, reaching the critical latitude, heralding a return of solar activity in the months and years ahead. It is exciting to see," says Hill, "that just as this sluggish stream reaches the active latitude of 22°, a year late, we finally begin to see new groups of sunspots emerging." More information can be found at: http://science.nasa.gov/headlines/y2009/17jun_jetstream.htm

☉ Following the June newsletter item about the successful launch of the Herschel and Planck telescopes, the first images from Herschel's infrared camera have been published, several weeks ahead of schedule. Shortly after the opening of the protective cover, and before the telescope had fully cooled to its design operating



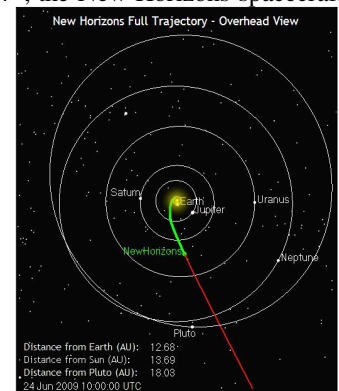
temperature, Herschel took a test image of the Whirlpool galaxy (M51) some 31 million LY distant. To date the best infrared image of M51 had been achieved with the Spitzer telescope - comparison of the images reveals the far greater detail now available from Herschel.

☉ Meade's latest product, the 6" ETX-LS, went on sale in



mid-June. Advertised as the first completely hands-off self-aligning telescope, it uses a range of technologies, including GPS, magnetic sensors and a built-in CCD camera, to automatically determine its own location, date and time, and then find any of more than 100,000 celestial objects. Two versions are available (Advanced Coma-Free or Schmidt-Cassegrain), each with 1524mm focal length (f/10 focal ratio) and a resolving power of 0.76 arcsec, able to view down to mag.14. Scrolling the web indicated UK prices of about £800 for the SC and £1300 for the ACF versions.

☉ At 11:59:00 on July 14th, the New Horizons spacecraft was exactly 6 years from closest approach to its target - the dwarf planet Pluto. Launched in January 2006, the craft crossed the orbit of Saturn in early June last year, about 9.1AU from Earth; its next planet crossing will be with Uranus in March 2011. Interested readers can keep abreast of the mission at: <http://pluto.jhuapl.edu/index.php>



☉ In late April the European Southern Observatory Very Large Telescope (ESO VLT) in Chile detected a faint gamma ray burst (GRB) from the most distant object yet observed in the Universe. Thought to be mostly associated with the explosion of stars that collapse into black holes, GRB's last from less than a second to several minutes, releasing so much energy in such a short time they are one of the most powerful events in the Universe. This particular event is estimated to have occurred more than 13 billion years ago, only about 600 million years after the Big Bang. More information available at: <http://www.eso.org/public/outreach/press-rel/pr-2009/pr-17-09.html>

How to Contact us:

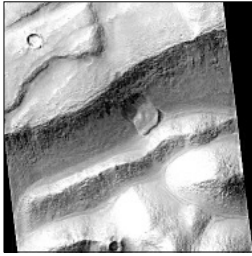
Editor - by email at: sueandjohn88@btinternet.com

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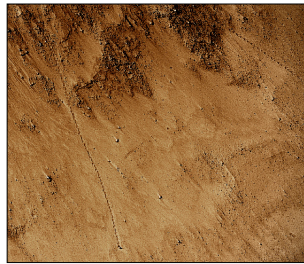
More "In the News":

☉ Many of the images taken by the HiRISE (Mars) orbiter are of purely scientific interest, not immediately grabbing the interest of amateur astronomers. But Stuart Atkinson of the



Cumbrian Sky website was intrigued by a lopsided crater-like feature in the centre of this image of the Aram Chaos. Zooming in, he could see the feature was not an impact crater but was a slump of material that had slid down the side of the ridge. Enhancing the image and adding some colour,

he noticed some "line" features just to the left of the slump. More zoom, and he was rewarded with this detail showing where large boulders had rolled and bounced down a steep slope, leaving visible tracks (running from left top to about middle bottom and a shorter track cutting across the top right corner.)



HiRISE images are available on-line for anyone to study. Go to: <http://global-data.mars.asu.edu/>

☉ In 1962 a new kind of astronomical object was observed. Labelled 3C 273, its redshift of 0.158 indicated it was about 2 billion LY distant, receding at about 47,000 km/s and about 2 trillion (10^{12}) times as luminous as the Sun. To better understand what this extraordinary result meant, researchers delved into the Harvard University collection of photographic plates dating from the 1860s, spotting the object on 600 photographs. Fluctuating in brightness between about mag. 12 and 13.2 on time scales as short as a week, the images indicated it had to be less than a light-week across, the size of the solar system. The finding helped characterize 3C 273 as a new type of object known as a quasar, one of the most powerful energy sources in the universe.

Earlier this year the university started to put 500,000 star plates in the university's collection on-line. Called the Digital Access to a Sky Century at Harvard (DASCH), the aim is to digitize and study old astronomical photographs in hope of doing new science. More information can be found at: <http://hea-www.harvard.edu/DASCH/>

☉ Just started and open 7 days a week is a free-entry exhibition at The Science Museum in London "Cosmos & Culture: how astronomy has shaped our world". From their website



(<http://www.sciencemuseum.org.uk/>), the exhibition explores how astronomy has changed the way we see our universe, tracing the history of people and the stars through stories drawn from around the world. Cosmos & Culture uses a new multimedia display environment that allows visitors to explore objects in depth and find out about key scientific

concepts, seeing how different instruments work and are used, and enjoy beautiful models, illustrations and photographs.

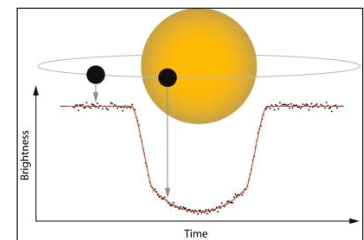
☉ Earth-based telescopes suffer from the blurring effect induced by atmospheric turbulence, producing star twinkling that delights poets but frustrates astronomers.

Adaptive optics techniques to overcome this major drawback are based on real-time adjustments to the collecting mirror, adjustments being computed from images obtained by a camera working at very high speeds. To date, this has involved automatic image analysis several hundred times each second. Now, the latest generation telescopes require corrections more than one thousand times a second, and this is where a new ultra-fast camera able to capture 1500/sec finely exposed images of extremely faint objects is so important.

The OCam and its CCD220 detector has a readout noise only one-tenth that of detectors in current use, making it ideal for the faint light camera systems to be used on the second generation of Very Large Telescope (VLT) instruments at the European Southern Observatory in Chile. "Using this technology, all the new generation instruments of ESO's VLT will be able to produce the best possible images, with an unequalled sharpness," declared Jean-Luc Gach, from Laboratoire d'Astrophysique de Marseille, which led the team that built the camera. More info. is at:

<http://www.eso.org/public/outreach/press-rel/pr-2009/pr-22-09.html>

☉ Staying with cameras and detectors, a team at the University of Hawaii's Institute for Astronomy used a new camera technique to measure the precise size of a planet, measuring the change in brightness of a star as a planet transits (occults) in front of it (see diagram below.) Mounted on the UH 2.2-meter telescope on Mauna Kea, their equipment is so sensitive it can detect the change in brightness as a moth passes in front of a lit window from a distance of 1,000 miles! Studying WASP-10, about



300LY distant, the team determined its planetary body (WASP-10b) was only about 6% larger than Jupiter but more than 3 times as massive, making it one of the densest planet known. The full story can be found at: <http://www.sciencedaily.com/releases/2008/12/081211112223.htm>

☉ The HST is not yet back to full observing status - an anomaly with the Imaging Spectrograph caused it to suspend operations in late June, and attempts to recover the instrument have, so far, been unsuccessful. The Advanced Camera for Surveys, which suspended operations in June, has now been successfully recovered and is progressing through a verification program. Mission controllers have yet to announce when Hubble will return to its full observing programme.

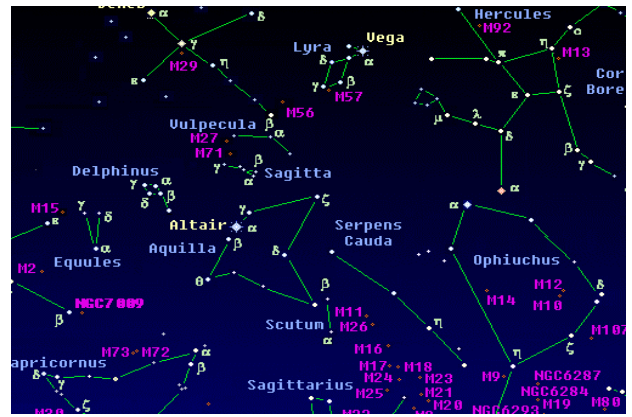
SUMMER OBSERVING

(Contributed by John Whittington)

Summer is an interesting time to view the sky with binoculars/telescope or by naked eye - short nights give little time for observing, but it is at least warm in the garden. Sagittarius, at the centre of our Galaxy, is low on the horizon and the Milky Way extends up through Scutum, Serpens Cauda and Summer Triangle constellations of Aquila, Sagitta and Cygnus. Sweep through the Milky Way and you will find many beautiful knots and twists and stars of different colours side by side.

One fairly easy object to find is just below Vega where you will find M57 "The Ring Nebula". Nebulae result when red giant stars end their lives by blowing off shells of gas and dust and the star ending as a white dwarf. With its distinct oval ring M57 is quite easy to find with a small telescope.

Jupiter will be in a good position during August, particularly at opposition on the 14th - last year's opposition was bright enough to cast shadows! Viewing its moons is always satisfying, with many occultations between the



moons. Even over the course of an evening's viewing its innermost large moon (Io) appears to move.

So when next entertaining friends after that BBQ in the garden and you are all huddled around the chimera, turn your gaze upwards and try some star spotting. And perhaps even see a satellite or two. Your guests will be surprised and amazed at what you can actually see!

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Summer Entertainment

Last summer we offered readers a 64-question summer entertainment quiz. This summer, courtesy of John Letheren, we offer a "word search" summer entertainment.

Buried within the grid are 36 of the answers to last years quiz! The answers are hidden in the jumble of letters, and may be found by reading letters in adjacent squares either from left to right, or right to left, or downwards, or upwards. A letter in any particular square can be used in both an up/down and a left/right answer. There are no gaps between multiple word answers and diagonals are not used.

For those not familiar with this kind of puzzle, one of the answers to last summer's quiz (NUCLEARFUSION) can be found in the top line of the grid.

Straightforward so far? Now for the twist! After finding another 35 answers, the unused letters in the grid will spell out a message when read line by line down the page.

You might be interested to find that hidden message!

Answers and a mystery prize will be announced at our meeting on Friday 4th September.

August 2009 Sky Diary:

Chart for Chichester, mid-month, 9.00 pm.

(Compiled by Peter Littlejohns)

Mercury: still difficult to see even though it is at its greatest elongation of 27° on the 25th

Venus: rises about 3 hours before the Sun at a brilliant mag. -4.0 in Gemini, moving into Cancer by month-end.

Moon: partial penumbral eclipse on the 6th as half the Moon passes through the Earth's penumbral shadow, probably making little difference to the observed brightness.

Mars: apparent diameter of Mars varies between about 4 and 25 arcsec - in the coming month it will be close to its minimum apparent size, at about 5½ arcsec, shining at mag.+1.0 and rising at about 01.00. On the 16th it will be only 2.5° from the crescent Moon.

Jupiter: is now at it's brightest and at opposition (closest to Earth) on the 14th and visible all night. Its disc is an impressive 48" shining at mag.-2.9, the brightest object in Capricornus. Its four closest/largest moons will be clearly visible.

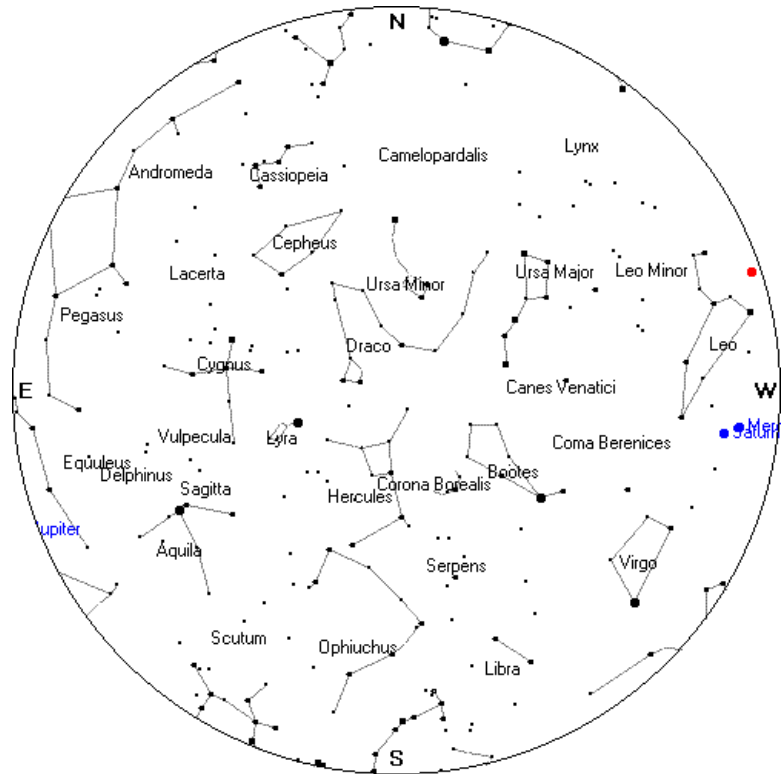
Saturn: unfavourably placed for observation, being close to solar conjunction.

Uranus: still shining at mag. +5.8, on the borders of Aquarius and Pisces in the SE.

Neptune: close to Jupiter and telescopically visible throughout the night at mag.+7.8. At opposition on the 17th.

Meteors: four minor showers during the month: α Capricornids on the 2nd at a rate of about 5/hr; ι (iota) Aquarids on the 6th (night of the full moon) and δ Aquarid on the 7th and 28th all peaking at about 10/hour.

The big event of the month will be the Perseid shower overnight on the 12th/13th as Earth passes through the tail of Comet Swift-Tuttle. These tiny fragments of comet material hit the Earth's atmosphere at over 200,000km/hr and could produce a peak rate of about 80-90/hour. This year the shower is best observed before midnight.



Last Month's (July) Meeting:

☉ Following his **What's Up?** preview of the month ahead, John Whittington reminded us of the **Apollo 11** launch of 40 years ago, taking us through the various stages of launch, journey to the Moon, the landing and exploration, and the safe return to Earth. That first mission was followed by a further five, landing 12 men on our only Moon, returning rock and soil samples from each site as well as setting up various experiments. Thank you John for reminding us what an exciting mission it was.

☉ Ron Arbour has been skywatching and making telescopes for more than half a century, but only started **Desperately Seeking Supernova** in 1976. It took 22 years (!) to find the first but Ron has gone on to discover 19 more

as well as 3 variable stars, 1 galactic nova and an active galaxy. Painstaking attention to detail and determination to capture images of galaxies whenever he can are essential ingredients of a successful search - using his automated LX200 12" Meade and a home-made 16" Newtonian. Ron would typically take more than a thousand images on a good winter night. Analysis of a nights work might yield a few possible candidates, but usually these would all be eliminated when checking against databases of position of satellites, minor planets and variable stars, and eliminating observing artefacts such as hot pixels or cosmic ray impacts on the CCD. But after everything else has been eliminated, that bright spot might just be another supernova! Thank you Ron for an insight into the observing life and technique of a supernova hunter, and continued success in your search.

Planetarium Shows in August:

- Sat. 1st 2.00-5.00 pm. Thomas Harriot exhibition
- Sun 2nd 3.30 pm. Thomas Harriot Lecture
- Tues 4th 3.30 pm. Thomas Harriot Lecture
- Thur. 6th 7:30 pm. Summer Skies, Shooting Stars
- Sun. 9th 3:30 pm. Summer Skies, Shooting Stars
- Tues. 11th 7:30 pm. Summer Skies, Shooting Stars
- Thur. 13th 3:30 pm. Violent Sun - Space Weather
- Sat. 15th 3:30 pm. Britain's last total Solar eclipse, 1999
- Sun 16th 3:30 pm. Through the Eyes of Hubble

- Tues. 18th 3:30 pm. The Northern Lights
- Thur. 20th 7:30 pm. The Stars this Month
- Sun. 23rd 3.30 pm. The Northern Lights
- Tues. 25th 3:30 pm. Prepare for Blast-Off!
- Thur. 27th 7:30 pm. The Stars this Month
- Mon. 31st 3:30 pm. All aboard - A Tour of the Planets

Do remember! SDAS Members can watch planetarium shows at the special, discounted, ticket price of only £5.
 Booking by Telephone: 01243 774 400 or 07818 297 292