

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

14th June 2004

Dr Barry Jones – (Open University)

“SETI - The Search for Extraterrestrial Life”

Well, for once in Britain we were blessed with wonderful weather for an astronomical event – the first transit of Venus across the solar disk since 1882. Many of you, I know, saw this, many photographed it, a few even took telescopes or binoculars to their local schools to show future young astronomers this fascinating event, which won't be visible in Britain again in their lifetimes. If you missed it, then there is one more chance in eight years' time, but you'll have to travel half way round the world to see that one!

VENUS TRANSIT PHOTOS



Photo by yours truly [Andrew Ramsey] taken with a hand-held Olympus 'C220-Zoom' digital camera taken down 19mm eyepiece of the society's 6" reflector. This telescope is on loan to members. Please see me (or Bob) if you would like to borrow it over the summer.



The photo to the left is Venus at it departed the Sun's disk. Visually I saw no real sign of the black drop effect. This was confirmed by other members, suggesting that the effect was due to the poorer resolution of observing equipment in the past.

THE NIGHT SKY THIS MONTH

The Planets:

After all the recent excitement over eclipses and transits, the summer months are relatively quiet. The summer solstice occurs on June 21st at 00hrs 57 mins UT and the days then begin to get shorter. On July 5th the Earth is at aphelion, which means it reaches the point in its orbit when it is at its furthest from the Sun. It will be 152 million kilometres from Earth to Sun, as opposed to 147 million kms at its nearest.

Mercury spends late June and July in the evening sky, with greatest eastern elongation on July 27th when the planet will shine at +0.3 mag. It's a reasonable apparition as Mercury will cross Gemini, Cancer and Leo. We will lose it towards the middle of August, inferior conjunction then occurs on 23rd August and it will quickly reappear in the morning sky. This will actually be the best morning apparition of the years but in reality it will not be great. Greatest western elongation is the 9th September as Mercury moves around Leo. If you are up early on the 10th September, Mercury and Regulus will be close together while on the morning of the 13th September the Moon joins the pair to give an interesting grouping.

After the tremendous success of the transit, **Venus** rapidly moves into the morning sky, shining at a very bright -4.2 mag. During the first week of June Venus will be close to Aldebaran, the brightest star in Taurus. Greatest elongation from the Sun occurs in the middle of August at a distance of 46 degrees.

Mars finally gets engulfed by the Sun in September. The planet has been visible in the evening sky for many, many months now. If you want a challenge, Mars and Mercury are only 0.2 degrees apart on 10th July, which will be the closest planetary conjunction of the year. It will be a challenge because they will be very low in the west-north-west in Cancer, and there will be strong twilight. **Saturn** also starts the summer hidden behind the Sun, with conjunction happening on 8th July, then it reappear in the morning towards August. **Jupiter** has a few more weeks on view before it too goes behind the Sun (conjunction is 22nd September)

Meteors:

One of the regular highlights of the summer is the Perseid meteor shower. It is active between July 23rd and August 20th, but the day everyone waits for is August 12th, the night of maximum. This year is very favourable as the Moon will only be a thin crescent in the morning sky. The maximum is predicted to be around 07hr UT on the

morning of the 12th, so the best time to look will be after midnight on the night of the 11th/12th.

Comets:

With luck, comet C/2001 Q4 NEAT will still be easily visible in binoculars throughout the summer as it fades from about 4th mag to about 8th mag. It will be crossing Ursa Major which means it will be circumpolar (ie: visible all night) and if it behaves as expected (hoped?) binoculars should pick it out.

If you are keen on comets there are two others that you may like to try for. Comet C/2002 T7 LINEAR could be visible in the evening sky from June to August, fading to 9th mag as it crosses Sextans, just below Leo. The other comet about is C/2003 K4 LINEAR which could be around 8th magnitude as it moves through Lyra, Hercules, and Bootes.

Throughout the summer, keep an eye on the northern horizon for noctilucent cloud. This is thin, spidery cloud that will be below Capella (the bright star low in the north) long after sunset. All normal cloud will be in darkness, but noctilucent cloud is extremely high and is still in sunlight, even at midnight. It is quite a rare phenomenon so make a note of any dates you see it. It is only visible during summer because the Sun is too far below the horizon at other times of the year.

And don't forget one of the greatest sights of the night sky - the Milky Way. During summer the Milky way stretches right overhead, streaming from north to south. If you only do it once, get away to a dark site, get your eyes dark adapted, and look up - the glowing light from your home galaxy will take your breath away.

MOON PHASES:

Full: 3rd June; Last Qtr: 9th June; New: 17th June;
First Qtr: 25th June; Full: 2nd July; Last Qtr: 9th July; New:
17th July; First Qtr: 25th July; Full: 31st July; Last Qtr: 7th
Aug.; New: 16th Aug.; Last Qtr: 23rd Aug.; Full: 30th Aug.;
Last Qtr: 6th Sept.

If you have any of those jobs around the house that only get done "once in a blue moon", then you're lucky, because on the 31st July this year we have the second full Moon in the month, which is commonly known as a "blue moon".

THIS MONTH'S DEEP SKY OBJECT

"Messier 13"

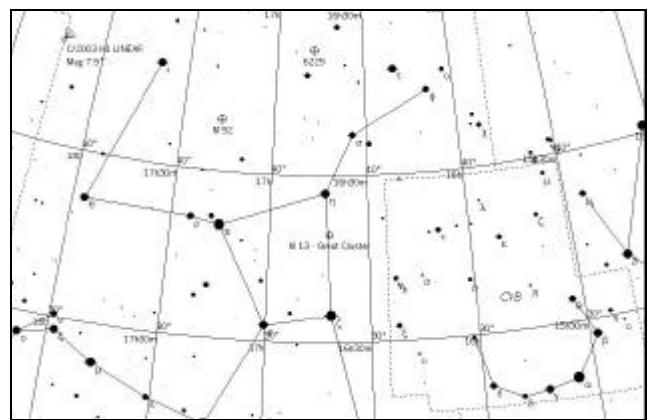
By Paul Warren

Rather than concentrate on one DSO this month, I'm going to take you on a small tour of globular clusters in the constellation of Hercules. The easiest way of locating Hercules is to draw an imaginary line from the bright orange star Arcturus to the bright blue-white star of Vega.

Hercules lies approximately two thirds of the way from Arcturus to Vega. The most prominent feature of Hercules is the grouping of four stars which is commonly called the keystone.

Before we start our tour, let's have a brief recap of what globular clusters are. As their name suggests, they are clusters of stars, but they are very rich in number, ranging from say twenty thousand stars up to more than one million stars. They are typically very old, being as old as the Milky Way galaxy itself.

Our first port of call is NGC 6229. This is not a bright cluster, but it shows up in the telescope as a milky smudge. On a night of good seeing conditions, and a dark enough sky, you might be able to resolve a few of the stars on the periphery of this cluster.



Now, don't just give these clusters a quick glance. Make yourself comfortable and look at them properly. Let your eye wander round the field of view, thus allowing your averted vision to maximise on what there is to offer. Also, if you've seen a particular DSO before, don't use that as an excuse to give it a passing glance. If you do this, then you will miss out on those rare but fantastic nights when there is that little bit of extra detail to see.

Our next stop is M92. This cluster is a very good one indeed, and it would be observed a lot more often if only it wasn't so close to its more famous neighbour M13. This cluster is a lot more impressive than NGC6229, and is a lot easier to resolve stars. It's quite a compact cluster, and this allows you to use high magnification quite successfully on it. Again, don't gloss over it, but take your time in observing it. There's a lot of detail to be seen in this cluster, and some of it can be only too easy to miss.

Our final destination is the "Big Daddy" of globular clusters, namely M13. Not only is it a very impressive DSO, but it must be one of the easiest to find, and from a really dark sky site, it is visible to the naked eye. Although this cluster is big and bright, I find that it doesn't stand up as well to high magnification as does M92, presumably because M13 isn't as condensed as M92. On a good night, try to see if you can spot propeller shaped dust lanes towards the centre of this cluster.

Now, isn't that a marvellous way to work one's way to M13? By working your way up, the idea is that your eyes are better honed for the task in hand, rather than just going straight off to M13. There's a faint galaxy slightly north of M13, which can be seen in the same field of view as M13 when using a low powered eyepiece. I find that this galaxy is easier to spot if I take the NGC6229, M92 and M13 route than if I go to M13 directly.



Photograph of M13 in Hercules.



Ever had a great idea for a new spacecraft propulsion system, or for a new kind of Mars rover? Have you ever wondered how such "dinner napkin sketches" evolve into real hardware flying real missions out in the cold blackness of space?

The road to reality for each idea is a unique story, but NASA has defined some common steps and stages that all fledgling space technologies must go through as they're nursed from infancy to ignition and liftoff.

Suppose, for example, that you've thought of a new way to shield astronauts from harmful radiation during long space missions. In the first stage, you would simply "flesh out" the idea: Write it down, check the physics, and do some quick experiments to test your assumptions.

If the idea still looks good, the next step is to build a "proof of concept." This is the "science fair project" stage, where you put together a nifty demonstration on a low budget-just to show that the idea can work.

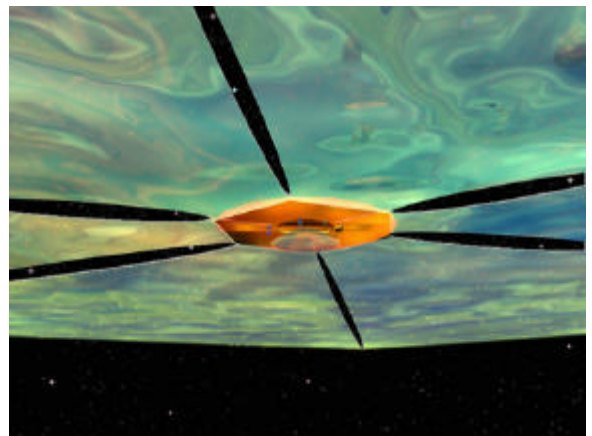
For your radiation-shielding idea, for example, you might show how a Geiger counter inside a miniature mock-up doesn't start clicking when some radioactive cobalt-60 is held nearby. The shielding really works!

Once that hurdle is cleared, development shifts into a higher gear. In this stage, explains Dr. Christopher Stevens of JPL, the challenge isn't just making it work,

but making it work in space. "Some conditions of space flight cannot be adequately simulated here on Earth," Stevens says. Cobalt-60 doesn't truly mimic the diverse mixture of radiation in space, for example, and the true microgravity of orbit is needed to test some technologies, such as the delicate unfolding of a vast, gossamer solar sail. Other technologies, such as artificial intelligence control systems, must be flight tested just because they're so radically new that mission commanders won't trust them based solely on lab tests.

Stevens is the manager of NASA's New Millennium Program (NMP), which does this sort of testing: Sending things to space and seeing if they work. In recent years the NMP has tested ion engines and autonomous navigation on the Deep Space 1 spacecraft, a new "hyperspectral" imager on the Earth Observing 1 satellite, and dozens of other "high risk" technologies.

Thanks to the NMP, lots of dinner napkin sketches have become real, and they're heading for space. You can learn more at the NMP website, nmp.nasa.gov/.



This is just one idea of how a solar sail could be used to power an interstellar probe. A solar sail is one possible type of new technology that NASA's New Millennium Program would test in space before it would be risked on a scientific mission.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

HERSCHEL MUSEUM TRIP

If you still haven't told Bob that you'd like to come along to the Herschel Museum in Bath on Saturday 26th June, then please do so at this meeting. We are arranging a mini bus, leaving from Abingdon, to take members to Bath. Alternatively phone Bob on 01491 201620, or e-mail bobdryden@ntlworld.com.

FURTHER DISCUSSION

The society's e-mailing list is used by members to comment on all things astronomical, as well as other related and not-so-related subjects. The list is also used to publicise "first-clear-night" observing evenings and for alerting members to hot observing news.

The list host has recently changed. Please make sure you are now on the new list hosted by SmartGroups, not the old list hosted by Topica, which is now defunct.

To view the messages on the web go to:
<http://www.smartgroups.com/groups/abastro> .

To subscribe to the list either go to this web page and click on "Join the Group" or send an email to abastro-subscribe@smartgroups.com . You will then receive all e-mails sent to the list. To post e-mails on the list: send an email to abastro@smartgroups.com . To unsubscribe: send an email to abastro-unsubscribe@smartgroups.com

Don't forget the Society's web site:
www.abingdonastro.org.uk

Our webmaster, Chris Holt is always on the look-out for members photographs to put on there. Don't forget you can read back copies of SpaceWatch on the web site too.

DATES FOR YOUR DIARY

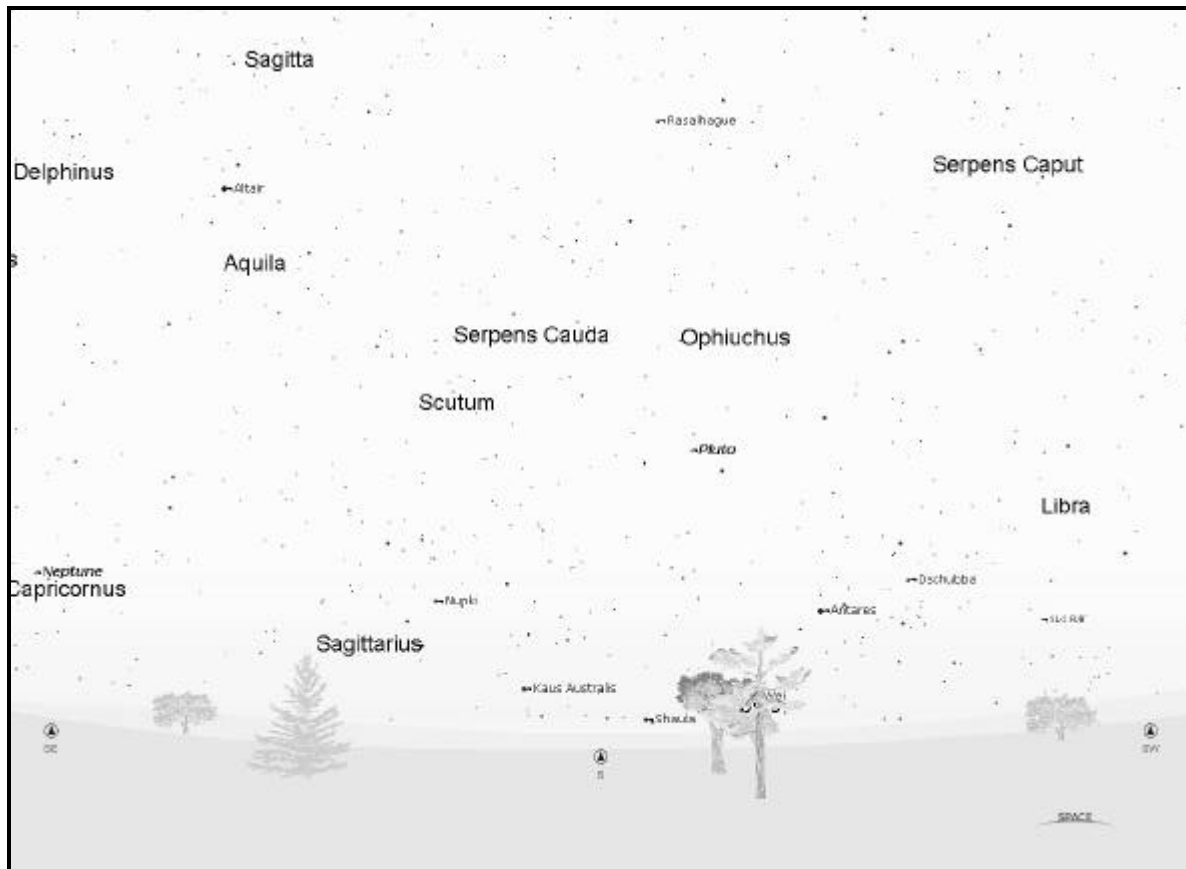
13th Sept.: 8pm. Talk by David Whitehouse (BBC) "Astronomy in the Media".

20th Sept.: 8pm. Beginners' Meeting in the Perry Room.

4th-6th Oct. (FCN*): 8pm Observing Evening at Britwell Salome. [FCN = 'first clear night' – ring Bob to confirm before setting out!]

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your help and contributions. Please send any news, observations, photos, etc. to:
Mail: A.T.Ramsey, 35 Cope Close, OXFORD, OX2 9AJ.
E-mail: AbAstro@ATRamsey.com Phone: 01865 245339

STAR CHART



This is the view looking south next Sunday morning at 1am, which is about as late as you have to wait if you want to see it get dark! Even then it will still officially be twilight as the Sun will still be less than 18 degrees below the northern horizon. Why not use this time of year to start observing the Sun during the day instead? The usual precautions apply – either use projection on to card, or use a solar filter at the large end of your scope and finder.