

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

14th February 2011

John Hardwick (Cobham),
'Rainbows, Glories, etc.'

Our speaker tonight knows all about the sky, astronomy and particle physics. He has even made a living out of making lightning. He is here tonight to talk about those interesting refractive phenomena seen in the sky while waiting for darkness to fall ready to start your observation sessions.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Moon: The Moon as an observational target doesn't get mentioned in these notes very often, but this session offers a chance to see a 'big' Full Moon. The Moon's orbit is not quite circular and as a result the Moon is physically nearer to Earth at certain times, and consequently appears bigger than normal. One such opportunity occurs on 19th February when the Moon reaches orbital perigee (nearest to Earth) at 19.00 UT. Full lunar phase happens on the 18th, so the rising full Moon on the 19th will be 33' 21" in size (as opposed to its 29.5' size at apogee, i.e. furthest point from Earth). However, even though the Moon **will be** larger than normal, you can still hide it behind the tip of your little finger held at arms length. Don't mistake this larger Moon with the known optical illusion of the 'massive' rising Full Moon near the horizon that is often seen throughout the year. Even this type of Moon can still be covered by your little finger at arms length – and if you don't believe me, try it next time you see one of these huge full Moons.

Mercury: Currently ending its morning apparition, Mercury is too close to the Sun to be seen for most of this session. Solar conjunction is 25th February after which the planet reappears in the evening sky. You might be able to see it by the end of the first week of March low in the west. The brighter Jupiter will be just to the left of Mercury by 14th March, and shining at magnitude -1.0, you should be able to see Mercury in binoculars if not with the naked eye, but you will have to look very soon after sunset.

Venus: Venus is slowly moving back towards the Sun, with its elongation decreasing by about 5°, to 40° by mid March. The phase is increasing (to 0.7% by March) and as the planet is moving away from Earth, its apparent size decreases to 15". However, it is so bright at magnitude -4.1 that it is very easy to see low in the south east just before dawn. Venus rises about 2 hours before the Sun (at about 05.30 UT) in February, but this decreases to just an hour by mid March. On the morning of 1st March there will be a nice thin crescent Moon just to the left of Venus, which should be a lovely sight against the morning twilight sky.

Mars: Mars is too close to the Sun to be seen at the moment.

Jupiter: Still on view in the evening sky, Jupiter is now moving towards the twilight sky and getting lower each day. At magnitude -2.1, it is easy to find – it is the bright 'star' low in the south west just after the Sun has set, but the telescopic views are deteriorating because of the planet's low altitude. However, the South Equatorial Belt revival is continuing so point your telescope at Jupiter's disc every chance you get. In February Jupiter sets about 3 hours after the Sun but by mid March this becomes just one hour so this is probably your last chance to make observations of the planet this apparition.

Saturn: Approaching opposition in April, Saturn is moving towards its prime observational period of the year. It rises about 22.00 UT in February, and about 20.00 UT by mid March. The planet is a few degrees above the bright star Spica, in Virgo, and shining at magnitude +0.6, makes it a good rival for the first magnitude star. The rings are at a tilt of approximately 9 or 10 degrees which means any small telescope will reveal them to you. If the air is steady enough, see if you can see the shadow of the rings on the disc of Saturn itself.

Uranus + Neptune: Uranus is low in the twilight shining at magnitude +5.7, just south west of Jupiter in Pisces. While binoculars will reveal the planet, its low altitude means observations will be increasing difficult now.

Neptune is already deep into twilight and is out of view.

Asteroids: With the lack of any decent comets or meteor showers this session, asteroids become an alternative observational target. There are 4 asteroids that are brighter than about 10th magnitude this session.

The first is our old friend **3 Juno**. Close to the Leo/Virgo border, Juno reaches its maximum brightness in mid March of magnitude +8.9, so good binoculars or a small telescope is all you need to see this one.

7 Iris continues to fade from mag. +8.4, reaching mag. +9.3 by March as it moves along the Cancer/Gemini border.

44 Nysa is also past its best now, fading from mag. +8.9, reaching mag. +9.7 by mid March. This one is lurking near the Leo/Cancer border.

A new name to these notes is **20 Massalia**. At magnitude +9.7 in early February, this asteroid reaches its brightest, at magnitude +8.9, by mid March. In fact, it is quite close to Juno on the Leo/Virgo border so if you have a good finder chart you can bag two asteroids in one fell swoop.

Occultations: There are two lunar occultations of note this session.

The first occurs on 11th March when the magnitude +4.3 star, Upsilon Taurus, is hidden at 23.07 UT. The first quarter Moon will be about 19° high in the west at the time.

The more interesting of the two occultations happens on 13th March when the relatively bright magnitude +3.5 star Eta Gemini is occulted at 21.13 UT. At 50° above the horizon, the event will be an easy one to watch in any small telescope (or even steadily held binoculars). In addition to the star disappearing behind the Moon, if you wait until 22.15 UT, you will see the star reappear again on the bright side of the Moon. It is not very often you have the chance to watch both the disappearance and reappearance of a brightish star so make the most of this opportunity if the sky is clear.

MOON PHASES:

Full: 18th Feb.; Last Qtr: 24th Feb.; New: 4th Mar.; First Qtr: 12th Mar.

LAST MONTH'S TALK

by Gwyneth Hueter

January's talk was given by Ian King: "An Introduction to Astrophotography".

As it's such a popular subject, Ian is not the first to talk to us about it, and he won't be the last either. Also, it's refreshing to find that he can still make a case for film cameras (analogue?).

His pros for film are:

- Cameras and their accessories are cheap, even SLR cameras (single lens reflex – your viewfinder is the same as what the camera sees)
- They're simple to use! They're still the best for long exposure wide sky shots, so best for catching meteors or polar star trails.
- They are not good for long exposure photography in light pollution. Ian recommends Kodak E200 or Elite Chrome 200 slide film.

However, digital is the way forward, and the cost of Canon or Nikon (his preferred makes) DSLR (digital single lens reflex) cameras is coming down all the time.

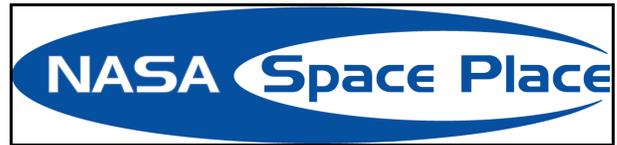
His pros for digital are:

- Far more light sensitivity so far less problematic in light pollution. Five to ten minutes a shot is enough.
- Pollution filters are very good, O-III and H-alpha (656nm wavelength) are recommended.

- That's all without mentioning the obvious advantage of being able to delete poor shots, so no more wasted film.

He didn't spend a lot of time on the more advanced aspects of digital photography, but did give some information on image stacking and off-axis guiding, where a tiny bit of light from the main light path can be fed into a guide camera. Specialist CCD cameras are now being made with a field of view big enough to match up to 35mm film.

Ian runs his own astro-imaging business, Ian King Imaging (www.iankingimaging.com). Full marks to him for not mentioning it!



THANK GOODNESS THE SUN IS SINGLE

by Trudy E. Bell

It's a good thing the Sun is single. According to new research, Sun-like stars in close double-star systems "can be okay for a few billion years—but then they go bad," says Jeremy Drake of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass.

How bad? According to data from NASA's Spitzer Space Telescope, close binary stars can destroy their planets along with any life. Drake and four colleagues reported the results in the September 10, 2010, issue of *The Astrophysical Journal Letters*.

Our Sun, about 864,000 miles across, rotates on its axis once in 24.5 days. "Three billion years ago, roughly when bacteria evolved on Earth, the Sun rotated in only 5 days," explains Drake. Its rotation rate has been gradually slowing because the solar wind gets tangled up in the solar magnetic field, and acts as a brake.

But some sun-like stars occur in close pairs only a few million miles apart. That's only about five times the diameter of each star—so close the stars are gravitationally distorted. They are actually elongated toward each other. They also interact tidally, keeping just one face toward the other, as the Moon does toward Earth.

Such a close binary is "a built-in time bomb," Drake declares. The continuous loss of mass from the two stars via solar wind carries away some of the double-star system's angular momentum, causing the two stars to spiral inward toward each other, orbiting faster and faster as the distance shrinks. When each star's rotation period on its axis is the same as its orbital period around the other, the pair effectively rotates as a single body in just 3 or 4 days.

Then, watch out! Such fast spinning intensifies the magnetic dynamo inside each star. The stars “generate bigger, stronger ‘star spots’ 5 to 10 percent the size of the star—so big they can be detected from Earth,” Drake says. “The stars also interact magnetically very violently, shooting out monster flares.”

Worst of all, the decreasing distance between the two stars “changes the gravitational resonances of the planetary system,” Drake continued, destabilizing the orbits of any planets circling the pair. Planets may so strongly perturbed they are sent into collision paths. As they repeatedly slam into each other, they shatter into red-hot asteroid-sized bodies, killing any life. In as short as a century, the repeated collisions pulverize the planets into a ring of warm dust.

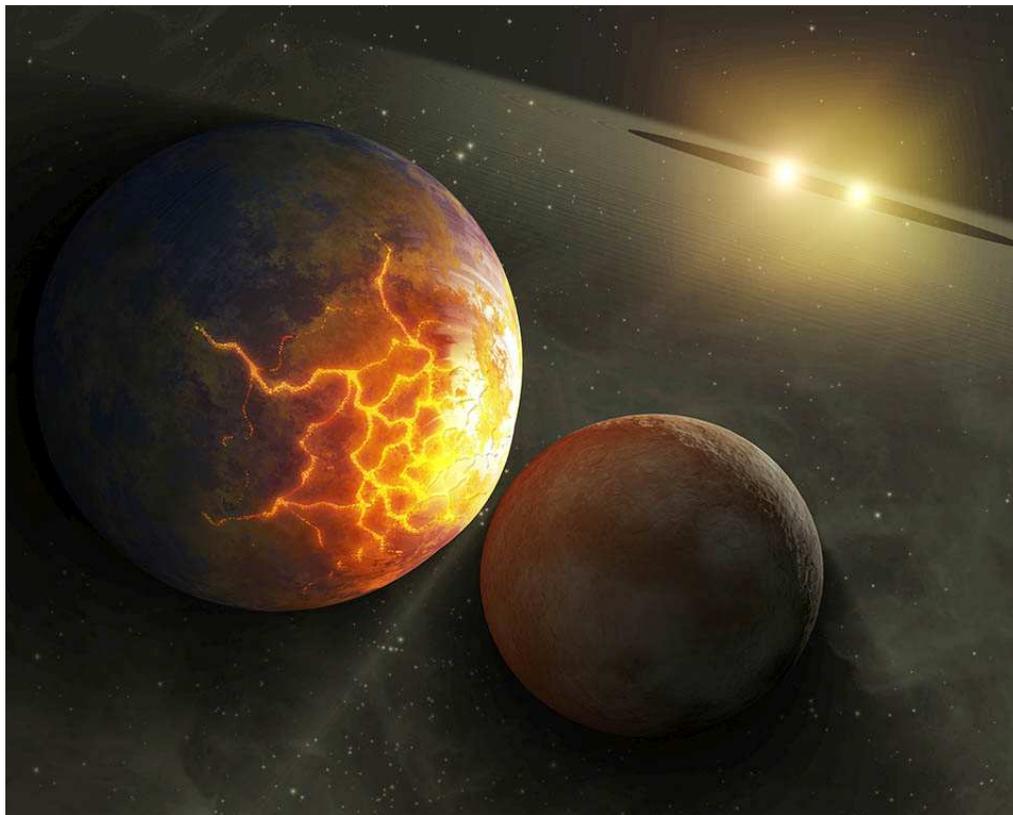
The infrared glow from this pulverized debris is what Spitzer has seen in some self-destructing star systems. Drake and his

colleagues now want to examine a much bigger sample of binaries to see just how bad double star systems really are.

They’re already sure of one thing: “We’re glad the Sun is single!”

Read more about these findings at the NASA Spitzer site at www.spitzer.caltech.edu/news/1182-ssc2010-07-Pulverized-Planet-Dust-May-Lie-Around-Double-Stars . For kids, the Spitzer Concentration game shows a big collection of memorable (if you’re good at the game) images from the Spitzer Space Telescope. Visit spaceplace.nasa.gov/en/kids/spitzer/concentration/.

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



Planetary collisions such as shown in this artist's rendering could be quite common in binary star systems where the stars are very close.

FURTHER DISCUSSION

If you are not already on our internet mailing list, then why not log on to YahooGroups. The list is called 'abingdonas'. Members use the list to alert each other about celestial events and to chat about amateur astronomy. The list is quite active, with several messages most weeks. To read through previous messages click on:

<http://groups.yahoo.com/group/abingdonas/> .

To join the abingdonas list, please go to <http://www.yahooogroups.com> . You can also unsubscribe from the list here.

To post messages to the list, please send them to abingdonas@yahooogroups.com . Please note that you will need to sign up with a YahooID if you do not already have one. You can do this on the above page.

Further information about the mailing list can be found on the abingdonas webpage at : <http://groups.yahoo.com/group/abingdonas/> .

Further discussion on astronomy and many other topics takes place at the Spread Eagle pub in Northcourt Road after the main meetings. You are most welcome to join us.

DATES FOR YOUR DIARY

21st Feb. 8pm Beginners' Meeting in the Perry Room.

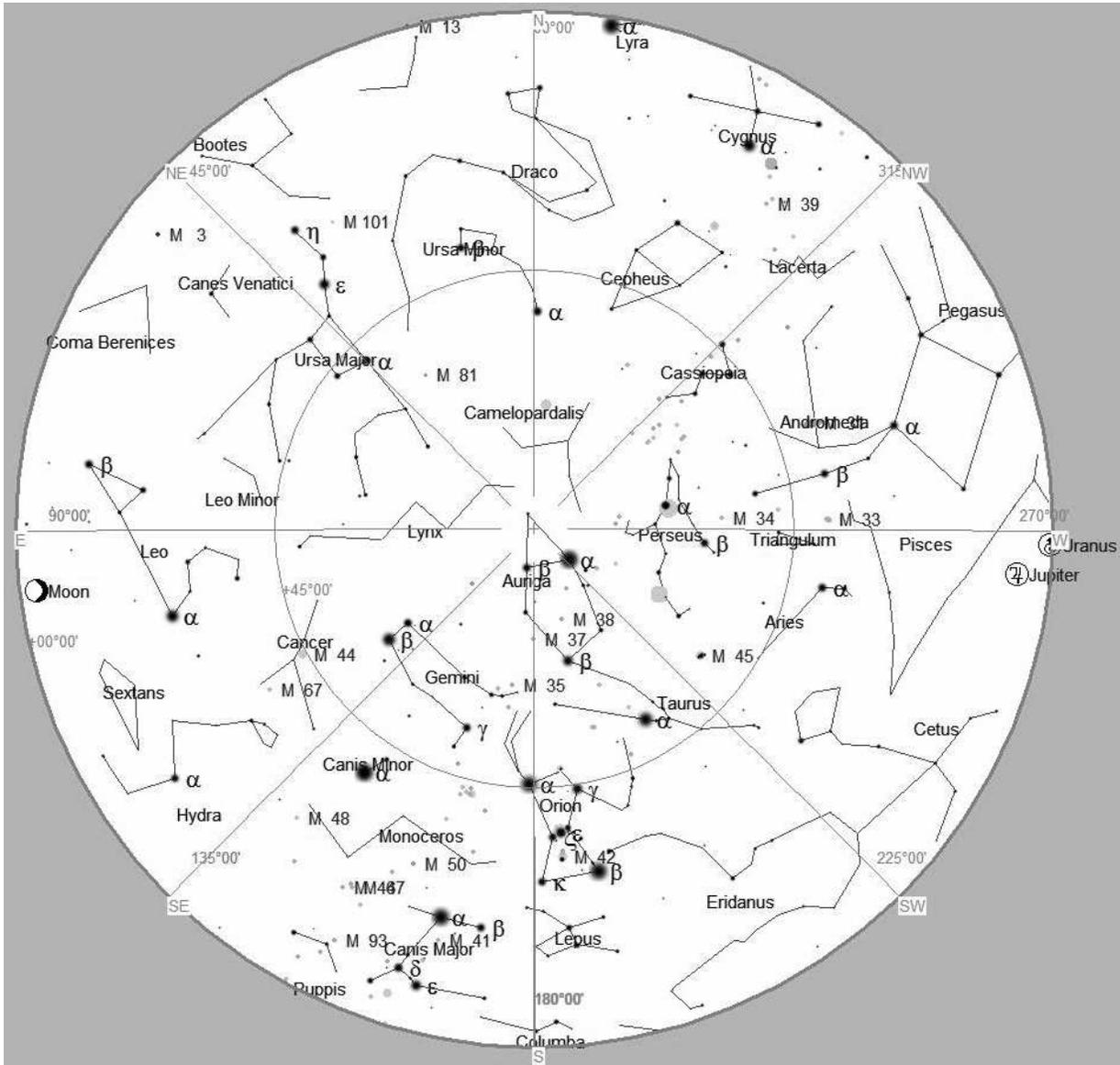
28th Feb. – 2nd Mar. (FCN) 8pm Observing Evening at Uffington. Ring Ian on the night to confirm on 07817 687627. [FCN=first clear night]

14th Mar. 8pm Talk by Mark Radice (Salisbury Plain Observing Group) 'Lunar Observing'

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your stories & contributions. Please send any news, observations, photos, etc. to:

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STAR CHART



The Night Sky at 21:00pm (GMT) next Saturday (19th February)

Orion dominates the southern aspect. Follow Orion's belt up and to the right to find the bright, reddish, Aldebaran, the eye of the Bull, Taurus. Further on are the Pleiades, or Seven Sisters. Above and to the left of Orion are the two main stars of Gemini, the Twins, Castor and Pollux.

The Milky Way runs right overhead from Cygnus in the NNW through Cassiopeia and Perseus then between Orion and Gemini and down to Puppis in the SSE.