SPACEWATCH
the newsletter of the Abingdon Astronomical Society

10th January 2011

Ian King (Ian King Imaging), 'An Introduction to Astrophotography'

A Happy New Year to you all. I hope you all had a good Christmas. How many of you braved the freezing nights to get some observing done? And how many of you saw the partial solar eclipse last Tuesday morning? The British weather lived up to its expectations by being cloudy and misty on the day with a beautiful clear sky the following morning.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Mercury: Presently in the middle of a morning apparition, Mercury is visible low in the south east in Sagittarius. While the planet rises just over an hour before the Sun at the moment, this quickly decreases to under an hour by the third week of January, and Mercury will probably be gone by the end of the month. Superior conjunction with the Sun occurs on 25th February.

Venus: While Venus has passed greatest elongation, it is still extremely easy to find blazing away in the south-east before dawn. It crosses Ophiuchus and Sagittarius this session which means it rises a little bit later each day, and also becomes a little bit lower. In mid-January Venus appears above the horizon at about 04.30 UT, and by mid-February that time becomes 05.00 UT. Elongation from the Sun decreases from 47° to 45°, while the phase remains around 50% (or half phase if you prefer). On the morning of 30th January there will be a nice crescent Moon just below Venus.

Mars: Mars is in conjunction with the Sun on 4th February which means it is not visible at the moment.

Jupiter: This is the brightest planet on view in the evening sky. Shining at magnitude -2.2, it is the bright 'star' low down towards the south-west in Pisces. It is getting towards the end of this apparition and this session is probably your last chance to have a look at it in your telescope before it becomes too low for decent views. The planet will be setting about 3 hours after the Sun by mid-February, but by the end of January will almost certainly be too low for a steady telescopic view.

Saturn: Currently in Virgo, Saturn rises later in the evening, appearing by around midnight in January, and around 22.00UT by mid-February. You will have to give it an hour or two after that of course to gain enough height for steady views in a telescope. Once high enough however, your telescope will give you nice views of the rings now as they have opened up to 10°. At magnitude +0.7, Saturn is an easy naked eye object.

Uranus + Neptune: Uranus is the easier of these two planets to find by virtue of the fact it is the brighter. At magnitude +5.7, any pair of binoculars will show it you, and it starts this session very close to the bright planet Jupiter. If you point your binoculars at Jupiter, Uranus is the 'star' just above it. However, Jupiter quickly moves away from Uranus so this trick for finding Uranus will only work for a few days.

Neptune is further west on the Aquarius/Capricornus border. This means Neptune is much lower and closer to the evening twilight so if you want to see it you must look in the next week or so before it gets too low. Binoculars are all you need but Neptune is much fainter than Uranus (magnitude +7.8) so you will also need a good finder chart.

Asteroids: There are three asteroids brighter than 10th magnitude this session.

The first, and brightest, is **7 Iris**. This increases in brightness from +8.1 to +7.9 by the 3rd week of January, before fading to magnitude +8.4 by mid-February. Iris will be crossing Cancer and will be relatively close to the bright star Beta Cancer.

The second asteroid is **3 Juno** which is in Virgo, close to the border with Leo. This one also gets brighter this session, rising from magnitude +9.8 to +9.4 by February (it reaches mag .+8.9 in March).

44 Nysa is the third asteroid on view this session. This one is in Leo, and in mid-January it is close to the first magnitude star Regulus, although it moves north westward quite quickly. Nysa is also gaining in brightness, going from mag. +9.6 to +8.9 in February. This is the brightest it will get this apparition.

Occultations: Lunar occultations of brighter stars are not common so when one happens it is good to try and make an effort to see it.

One such occultation occurs on the morning of 18th January when Eta Gemini is covered by the Moon at 02.14UT. Yes, sorry, but that is 2 o'clock in the morning, so quite a bit of effort is required to watch this one. Shortly after, at 03.07UT, the star reappears from behind the lunar limb which makes the effort worthwhile as a disappearance and reappearance of a bright star in one night is much less common. At the time of the occultation the Moon will be approximately 40° high in the west. By the time eta reappears, the Moon will be 30° above the horizon.

MOON PHASES:

New: 4th Jan.; First Qtr: 12th Jan.; Full: 19th Jan.; Last Qtr: 26th Jan.; New: 3rd Feb.; First Qtr: 11th Feb.

LAST MONTH'S TALK

by Gwyneth Hueter

December's talk was our Stan Cocking Memorial Lecture, given this time by Dr Arfon Smith of Oxford University: 'Galaxy Zoo'

Dr Smith started off with some new technical terms: 'citizen science' and 'crowd sourcing'. Yes, that's what Galaxy Zoo is all about. It was launched in July of 2007 and is an ingenious way of getting a huge archive of galaxy images analysed. Researchers wanted the images to be sorted into elliptical galaxies (especially the blue ellipticals because they would be the star-forming galaxies) versus spiral galaxies. The human brain is far better than any computer at this kind of job, and the best way is to get as many people as possible to compare some of the images and gradually the results come together.

When the website opened it was so popular that it caused server meltdown within two hours. A new server was opened and within two days there were 50,000 people signed up. There are now 350,000 contributors. When you hear that 40 people look at each galaxy and one million galaxies have been classified up to now, you will understand how there are 160 million classifications on record. If it turns out that you are particularly good at classifying them the Galaxy Zoo team are able to detect this and give you an accuracy weighting. The images are from the Sloan Digital Sky Survey (SDSS), which has now covered over a quarter of the northern sky.

Early on, there was also an attempt to determine whether there was a tendency for spiral galaxies to rotate in a certain direction (presumably in the hope of getting more clues about the formation and structure of the universe?) but it appears that our brains are more likely to see them as rotating anticlockwise, so that's come to a dead end.

There is a forum set up so that unusual images can be discussed. For example, the SDSS dismissed some green pea-shaped blobs as stars, but the forums queried them and Hubble pictures identify them as small galaxies undergoing mergers with other galaxies, resulting in extremely high star formation (hence the green, from highly ionised oxygen).

The Galaxy Zoo idea started in Oxford, and plays on the community's motivation to contribute to real research. Because the human eye is so good at recognising patterns it is possible to work while watching TV, when your brain has some capacity to spare; that's what Dr Smith calls 'cognitive surplus'. He also mentions seven other bodies of data which are made available for public analysis and they come under the umbrella of zooniverse.org. They include a Lunar crater survey, Solar storm watch, cometary dust hunting, and galaxy mergers.

NASA Space Place

BLUE RINGS AROUND RED GALAXIES

by Trudy E. Bell and Dr Tony Philips

Beautiful flat rings around the planet Saturn are one thing—but flat rings around entire galaxies?

That is the astonishing discovery that two astronomers, Samir Salim of Indiana University at Bloomington and R. Michael Rich of UCLA described in the May 10, 2010, issue of *The Astrophysical Journal Letters.*

"For most of the twentieth century, astronomers observing at visible wavelengths saw that galaxies looked either 'red and dead' or 'blue and new,'" explained Salim. Reddish galaxies were featureless, shaped mostly like balls or lentils; bluish ones were magnificent spirals or irregular galaxies.

Elliptical galaxies looked red, astronomers reasoned, because they had mostly old red giant stars near the end of their life cycles, and little gas from which new stars could form. Spiral and irregular galaxies looked blue, however, because they were rich in gas and dust that were active nurseries birthing hot, massive, bluish stars.

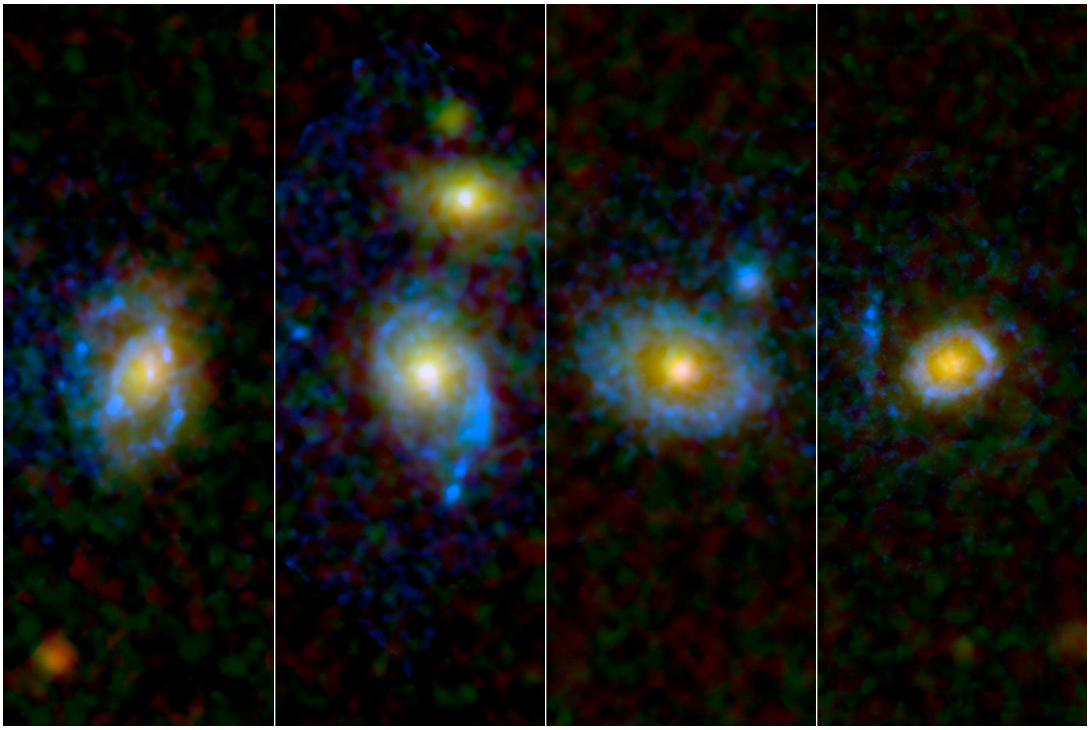
At least, that's how galaxies appear in visible light.

As early as the 1970s, though, the first space-borne telescopes sensitive to ultraviolet radiation (UV) revealed something mysterious: a few red elliptical galaxies emitted "a surprising ultraviolet excess," said Rich. The observations suggested that some old red galaxies might not be as "dead" as previously supposed.

To investigate, Salim and Rich used NASA's Galaxy Evolution Explorer satellite to identify 30 red elliptical galaxies that also emitted the strongest UV. Then they captured a long, detailed picture of each galaxy using the Hubble Space Telescope.

"Hubble revealed the answer," says Salim. The UV radiation was emitted by enormous, flat bluish rings that completely surrounded each reddish galaxy, reminiscent of the rings of Saturn. In some cases, the bluish rings even showed a faint spiral structure!

Because the bluish UV rings looked like star-forming spiral arms and lay mostly beyond the red stars at the centers of the elliptical galaxies "we concluded that the bluish rings must be made of hot *young* stars," Salim continued. "But if new stars are still being formed, that means the red-and-dead galaxies must have acquired some new gas to make them."



The Galaxy Evolution Explorer UV space telescope helped to identify red elliptical galaxies that also emitted the strongest UV. These are detailed, long-exposure Hubble Space Telescope images of four of these galaxies that capture the UV-emitting rings and arcs indicative of new star formation.

How does a galaxy "acquire some gas?" Salim speculates that it was an act of theft. Sometimes galaxies have close encounters. If a gas-rich irregular galaxy passed close to a gas-poor elliptical galaxy, the gravity of the elliptical galaxy could steal some gas.

Further studies by Galaxy Evolution Explorer, Hubble and other telescopes are expected to reveal more about the process. One thing is certain, says Rich: "The evolution of galaxies is even more surprising and beautiful than we imagined."
The press release is available at http://www.galex.caltech.edu/newsroom/glx2010-03f.html.
The full published article is "Star Formation Signatures in Optically Quiescent Early-Type Galaxies" by Samir Salim and R. Michael Rich, *The Astrophysical Journal Letters* 714: L290–L294, 2010 May 10.

Point the kids to the Photon Pile-up Game at http://spaceplace.nasa.gov/en/kids/galex/photon, where they can have fun learning about the particle nature of light.

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

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.yahoogroups.com . You can also unsubscribe from the list here.

To post messages to the list, please send them to abingdonas@yahoogroups.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

17th Jan. 8pm Beginners' Meeting in the Perry Room.

31st Jan. – 2nd Feb. (FCN) 8pm Observing Evening at Britwell Salome. Ring Ian on the night to confirm on 07817 687627. *[FCN=first clear night]*

14th Feb. 8pm Talk by John Hardwick (Cobham) 'Rainbows, Glories, etc.'

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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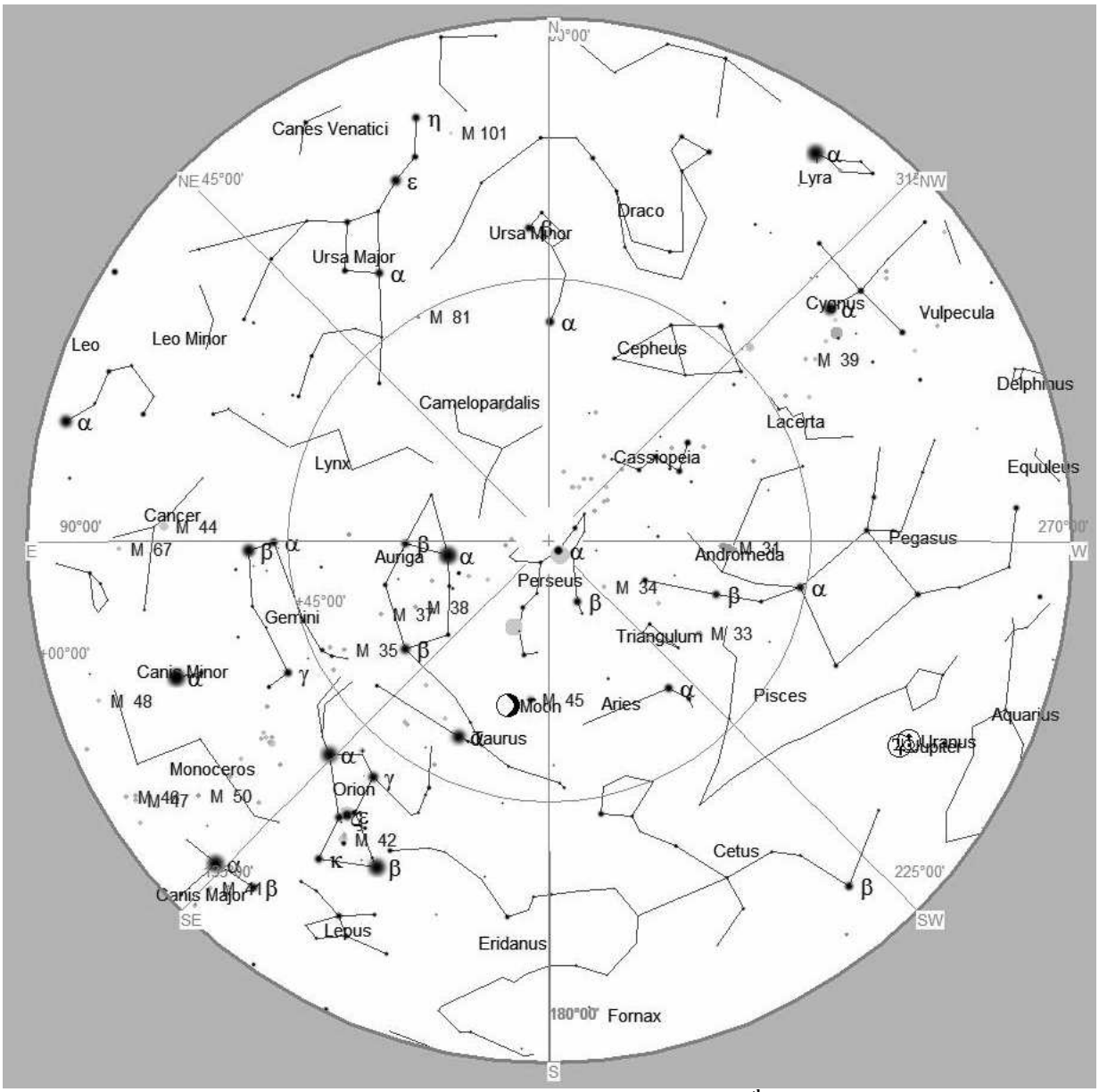
STAR CHART



The Night Sky at 21:00pm (GMT) next Saturday (15th January)

Orion dominates the south-east. 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, very close to the almost full Moon.

Jupiter is very bright in the south-west. Jupiter passed very close by Uranus in the first week of January but is now heading off westwards, leaving Uranus behind. See if you can spot it in your telescope.