

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

6th April 2009

Dr Nick Hewitt
(Northampton Natural History Society),
'Planetary Nebulae'



Members Julian Mole and Bob Dryden setting up the Moon viewing on Saturday 4th April at Sunningwell Village Hall, just one of the society's International Year of Astronomy 2009 events.

2009 is International Year of Astronomy, and Saturday 4th April saw us running two events on the same, together with a market stall in Abingdon to publicise them.

The first was a solar viewing event, outside the Museum of the History of Science in Oxford on Saturday afternoon. The second was a lunar viewing event, preceded by a talk about the Moon, in Sunningwell Village Hall in the evening. Both were well attended. More in next month's Spacewatch.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Mercury: The evening apparition of Mercury will be the highlight of this session, as it is the best apparition of the year. The planet past through inferior conjunction on 31st March and will probably be visible by about the end of the first week of April. It reaches greatest elongation on 26th April when it will be 20° from the Sun. On that date it will set about 2 hours after the Sun. Mercury then starts to head back towards the Sun, but should be visible until the end of the first week of May. If you scan the western horizon after sunset with your binoculars, the 'star' low down will be Mercury. Once a bit darker, Mercury will be quite obvious to the naked eye. If you need a guide, the evening of 26th April provides a good one in the shape of a thin crescent Moon. Mercury, the Moon, and the Pleiades star cluster are all close together and should fit into the field of view of your binoculars that evening.

Venus: Having passed through inferior conjunction, Venus is now on view in the morning sky. Crossing Pisces, Venus remains fairly

low throughout the session, rising about an hour before the Sun. However, as it is a whopping -4.4 magnitude, it still should be quite easy to find. Elongation from the Sun increases from -18° to -42° by mid May while the phase increases to a mere 0.3%. Which means the planet is presenting a very nice crescent phase to those who look. On 22nd April there will be a crescent Moon just west of Venus which will give the morning twilight an added vista.

Mars: Chugging slowly along through Aquarius and Pisces, Mars also remains very low to the horizon. However, while Venus is low and bright, Mars is low and quite faint at +1.2 magnitude. It will still be visible in binoculars, but telescopic views are not recommended at this time because it is not only low, but very small, making it almost impossible to see any detail on the disc. If you like an observing challenge, then between 14th and 18th April, Mars passes close to Uranus. Closest approach is on 16th, and binoculars will definitely be needed for this one.

Jupiter: This is another planet only visible just before dawn. In Capricornus, Jupiter is bright at -2.2 magnitude, but it is still only about 20° high at sunrise by mid May. During May Jupiter closes in on Neptune which provides us with another observing challenge for next session.

Saturn: Saturn is well on view in the evening sky at the moment and is high above the horizon as it goes dark. Still in Leo, Saturn is a bright +0.7 magnitude. The rings have opened up slightly now, going from an angle of 3.6° to 4.1° by mid May and they should be visible in a small telescope. The satellite events of Saturn are continuing, although only a few are visible from the UK. One such event occurs on 22nd April when Rhea transits the disc. The transit is already underway as Saturn rises but you can watch the satellite move off the disc at 21.20UT, and the shadow of Rhea moves off the disc at 22.52UT.

Uranus + Neptune: Both these planets are low in the morning sky at sunrise and are rather difficult to observe at the moment.

Meteors: The meteor season gets off to a start at last with the Lyrids shower. Active from 19th to 25th April, the maximum is on 22nd at 10.00UT. The zenith hourly rate (ZHR) is a rather low 10, but just occasionally the shower gives us a surprise with a substantial increase. This shower is always best after midnight, and on maximum night the thin crescent Moon does not rise until about 04.00UT so will not be a problem. There are two other active showers this session, the Virginids and the Aquarids. Rates are always low for these two from the UK but it is possible you will see a few Aquarids in particular. Active from 24th April to 20th May, the Aquarids peak on 4th May.

Comets: 22P Kopff is slowly brightening, going from +10 to about +9.5 magnitude this session as it crosses from Sagittarius into Capricornus. Obviously, you will need a telescope for this one. Hopefully it will reach about magnitude +8.9 by June.

A more recently discovered comet, C/2008 T2 Cardinal, is also brightening. It crosses Auriga, and enters Gemini, which of course means it is visible in the evening sky. It is also fairly bright (for a comet anyway) as it rises from +9.2 to +8.4 magnitude so most small telescopes should show it.

Our old friend comet 2007 N3 Lulin is still about, now in Gemini (again, in the evening sky). It is fading now of course, reaching +11.8 by mid May so larger telescopes will be needed by then.

Asteroids: Asteroid 1 Ceres continues to be on view in Leo. Still fading, it will still be a binocular object at +8.1 magnitude by May.

MOON PHASES:

Full: 9th Apr.; Last Qtr: 17th Apr.; New: 25th Apr.; First Qtr: 1st May; Full: 9th May.



APOLLO UPGRADE

The flight computer onboard the Lunar Excursion Module, which landed on the Moon during the Apollo program, had a whopping 4 kilobytes of RAM and a 74-kilobyte "hard drive." In places, the craft's outer skin was as thin as two sheets of aluminum foil.

It worked well enough for Apollo. Back then, astronauts needed to stay on the Moon for only a few days at a time. But when NASA once again sends people to the Moon starting around 2020, the plan will be much more ambitious—and the hardware is going to need a major upgrade.

"Doing all the things we want to do using systems from Apollo would be very risky and perhaps not even possible," says Frank Peri, director of NASA's Exploration Technology Development Program.

So the program is designing new, more capable hardware and software to meet the demands of NASA's plan to return humans to the moon. Instead of staying for just a few days, astronauts will be living on the Moon's surface for months on end. Protecting astronauts from harsh radiation at the Moon's surface for such a long time will require much better radiation shielding than just a few layers of foil. And rather than relying on food and water brought from Earth and jettisoning urine and other wastes, new life support systems will be needed that can recycle as much water as possible, scrub carbon dioxide from the air without depending on disposable filters, and perhaps grow a steady supply of food—far more than Apollo life-support systems could handle.



The Chariot Lunar Truck is one idea for a vehicle equal to the lunar terrain. Each of the six wheels pivot in any direction, and two turrets allow the astronauts to rotate 360°.

Next-generation lunar explorers will perform a much wider variety of scientific research, so they'll need vehicles that can carry them farther across the lunar surface. ETDP is building a new lunar rover that outclasses the Apollo-era moon buggy by carrying two astronauts in a pressurized cabin. "This vehicle is like our SUV for the Moon," Peri says.

The Exploration Technology Development Program is also designing robots to help astronauts maintain their lunar outpost and perform science reconnaissance. Making the robots smart enough to take simple verbal orders from the astronauts and carry out their tasks semi-autonomously requires vastly more powerful computer brains than those on Apollo; four kilobytes of RAM just won't cut it.

The list goes on: New rockets to carry a larger lunar lander, spacesuits that can cope with abrasive moon dust, techniques for converting lunar soil into building materials or breathable oxygen. NASA's ambitions for the Moon have been upgraded. By tapping into 21st century technology, this program will ensure that astronauts have the tools they need to turn those ambitions into reality.

Learn more about the Exploration Technology Development Program at:

www.nasa.gov/directorates/esmd/aboutesmd/acd/technology_dev.html. Kids can build their own Moon habitat at spaceplace.nasa.gov/en/kids/exploration/habitat.

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

DUNDEE'S MILLS OBSERVATORY

by Andrew Ramsey

Last month I missed the main meeting because I was up in Scotland on business. I was in Dundee, and last time I was there I picked up a leaflet about the Mills Observatory. This observatory is open to the public on all cloud-free evenings throughout the winter.

The observatory was built using a gift from John Mills (1806–1889), a local linen and tweed manufacturer, and a keen amateur scientist, but it wasn't until 1935 that it actually opened, mainly due to the perseverance of Professor Ralph Allen Samson, the Astronomer Royal for Scotland. It is the only British observatory to have been built with the sole aim of encouraging public understanding of science, and is the UK's only full-time public observatory – and it's free!

So I set off after dark to walk up Balgay Hill and find this elusive observatory, way above the woods. Finally, after almost giving up, I saw a small wooden sign urging me to continue upwards. Surely nothing could be up there beyond the trees in that darkness? But sure enough, after another climb I found it – and it was open. The guy behind the counter told me that the council was given the money after John Mills died, and it sat in a savings account for over 40 years. In those days, savings earned interest! And so there was enough money to build the observatory (from sandstone) and the dome (from papier mâché – one of only two in the world, the other being at the David Dunlap observatory in Toronto). Now, of course, they were saddled with running it, with staff from the museum service running the shop, and astronomy students from Dundee



University operating the telescopes. So of I went up the steps into the dome...

The telescope, a 10-inch refractor, built by Thomas Cooke of York in 1871, was driven by clockwork. It actually had a pendulum, and had to be wound by hand every few minutes.

There a young woman with long blonde curly hair, and with a strong Irish accent was demonstrating the telescope to the small crowd. An astronomy student at Dundee, she told me she did this three evenings a week all winter long. As I arrived she was moving it on by hand to point to Saturn. Of course Saturn's rings are almost edge-on at the moment, but I could clearly see them, like a line drawn through the slightly flattened disk, rather like a London Underground station sign on a map. It was so bright!

Later we looked at mountains on the Moon, and I had the impression I was hang-gliding over them only a few hundred feet up.

There was also a 12" Meade Schmidt-Cassegrain 'scope, fitted with a video camera, which allows images to be projected on the wall downstairs by the shop, to allow disabled people and those who prefer the warmth, to do some observing.

AGM NOTICE

The Annual General Meeting for 2008/09 will take place on **Monday 11 May 2009** at All Saints' Methodist Church Hall, Dorchester Crescent, Abingdon at approximately **8 p.m.**, and will be followed by a talk from Bob Dryden about his recent trip to New Zealand.

AGENDA

- 1 Apologies for absence
- 2 Minutes of the previous Abingdon AS AGM (held 12/5/08)
- 3 Matters arising
- 4 Change to para. 9.2 of the Constitution from
"All cheques drawn on any Society account must bear the signature of the Treasurer or that of the Chairman" to:
"All cheques drawn on any Society account must bear the signatures of two of the following three officers: Treasurer, Chairman and Secretary".
- 5 Presentation of Committee's report
- 6 Presentation of Treasurer's report and Adoption of accounts
- 7 Setting of membership fees for 2009/2010
- 6 Election of officers
 i) Chairman ii) Secretary iii) Treasurer iv) Publicity Officer
- 7 Election of other committee members (between one and six in number)
- 9 Any other business

NOMINATIONS FOR ELECTIONS TO COMMITTEE

Nominations are sought for the posts of Chairman, Secretary, Treasurer, Publicity Officer and between 1 and 6 other committee members.

Under the Constitution of the Society, the "candidates for election shall be proposed and seconded by ordinary members of the Society and the nomination, including the candidate's signature, submitted in writing to the Chairman at least four weeks prior to the Annual General Meeting"(para. 10.3.3). Ordinary members are all those who are not honorary members or affiliated members.

The Constitution goes on to say that, "in the event of there being no candidate for the election of an officer of the Society, or fewer than ten candidates for the election to the Committee, the Chairman may accept nominations given at the meeting" (para. 10.3.4).

Chris Holt, Secretary, Abingdon AS

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 abastro list, please go to <http://www.yahogroups.com> . You can also unsubscribe from the list here. To post messages to the list, please send them to abingdonas@yahogroups.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 meeting. You are most welcome to join us.

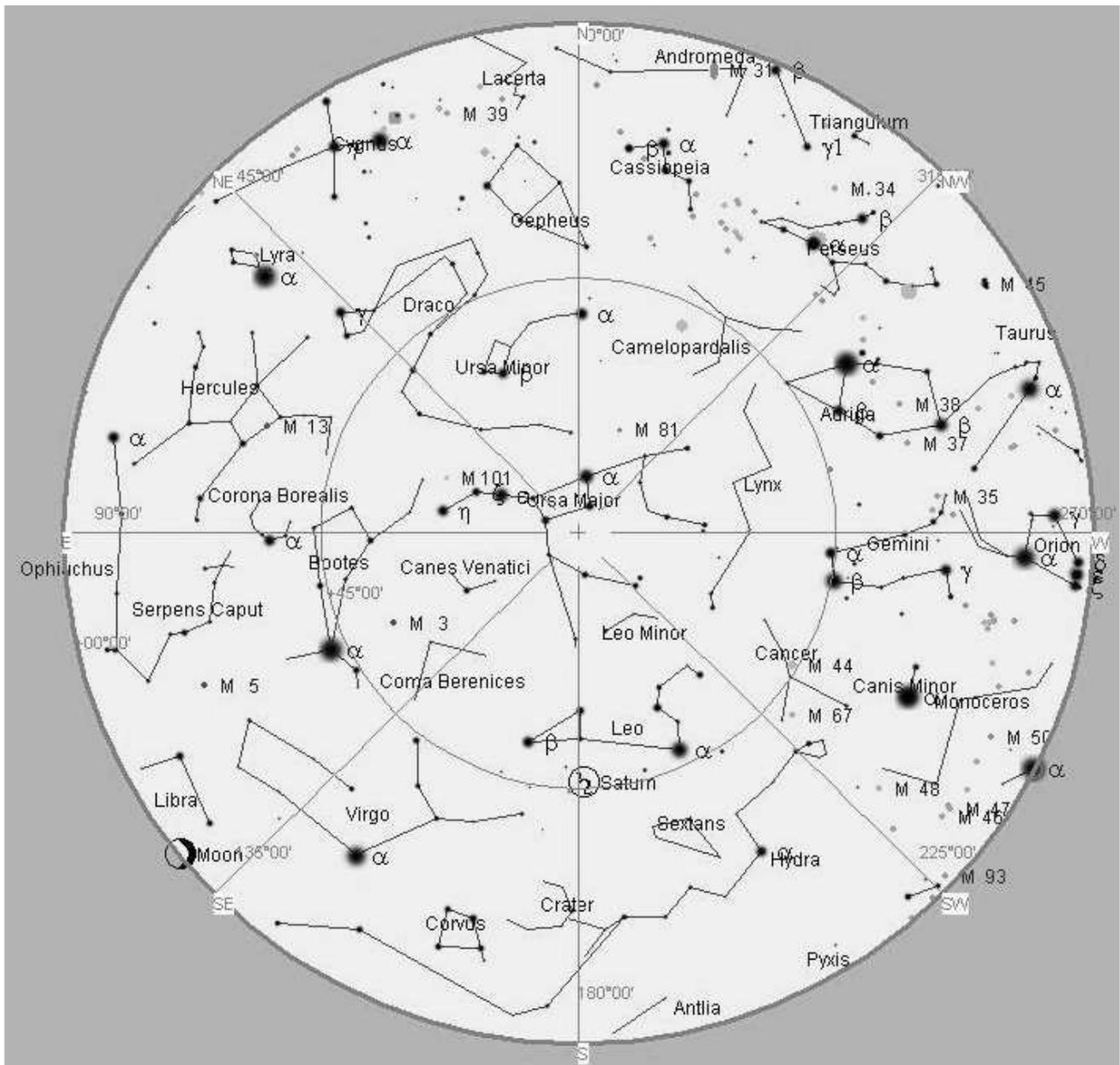
DATES FOR YOUR DIARY

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

11th May 8pm Annual General Meeting, followed by a talk (to be announced).

The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your stories & 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



The Night Sky at 10pm (GMT) next Saturday (11th April)

The Plough in Ursa Major is almost directly overhead at present. Leo, the Lion, dominates the southern aspect. Saturn is just below Leo, while Spica glows red below left. Well above Spica is Arturus in Bootes, the brightest star in the northern hemisphere, which can also be found by following curve of the tail of the Great Bear, Ursa Major (or the handle of the Plough) down and to the left.