

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

10<sup>th</sup> September 2007

## Martin Lunn – Aurora Books: 'The Discovery of Pluto'

Hello everyone, and welcome to the 2007-08 season of Abingdon Astronomical Society. I hope you all had a pleasant summer. Soon the evenings will be getting darker earlier and earlier so there will be plenty of opportunity for observing – clouds permitting of course (which often they don't). For those theorists among you, there are plenty of lectures this season on subjects ranging from observing our nearest star, the Sun, to outbursts in galaxies the other side of the universe. For those of you without a telescope of your own there will be an observing evening every month, where you can try out quite large amateur telescopes. But remember you can always borrow one of the society's scopes – just ask one of the committee members for details.

### THE NIGHT SKY THIS MONTH

by Bob Dryden

**Sun** – We reach the autumn equinox on 23<sup>rd</sup> September at 09hr 51 min (UT) which means that the Sun crosses the celestial equator heading south and the nights become longer than the days again.

**Mercury** – Mercury is going through a very poor evening apparition at the moment. Although it reaches a greatest eastern elongation of 26 degrees on 29<sup>th</sup> September, it will only be a few degrees above the horizon in the south-west and so very difficult to find. If you want a challenge, then the evening of 13<sup>th</sup> September has the crescent Moon just below Mercury. On that night, the Sun sets at about 19.20 BST and Mercury sets at about 19.45 BST so you will not have long to try and find it. The Moon will be two days old, a thin crescent, and quite hard to find, while just above it will be a mag. -0.1 'star' which is Mercury. I said it would be a challenging observation.

**Venus** - On the other hand, a very easy observation will be Venus, which blazes forth in the morning sky now. In mid-September the planet will be about 20 degrees high as the Sun rises but by mid-October this will have increased to 35 degrees. Shining at mag. -4.4 it will be difficult to miss Venus in the east as it crosses Cancer and Leo. In a telescope, or even binoculars if held steady enough, the planet presents a very pleasing thin crescent shape as it moves away from the Sun.

**Mars** – Heading towards a magnificent opposition in December, Mars is now a grand sight in Taurus, rising about 23.00 BST in September, and as early as 22.00 BST by mid-October.

It is presently at mag. +0.2 but this increases to mag. -0.2 by October with the apparent size of the disc reaching 10'' by then so a telescope should start to show you surface detail. Actually, you might have trouble seeing any surface detail at the moment because there is a massive global dust storm presently blowing on Mars that is obscuring the disc. All you will see is a blurry orange disc. Hopefully, the dust will settle by December. On 16<sup>th</sup> and 17<sup>th</sup> September, Mars will be less than one degree north of M1, the Crab Nebula, which means they will both fit in to the field of a low power eyepiece which could be interesting.

**Jupiter** – Jupiter is almost lost now in the evening twilight and because it is so low anyway, any telescopic views will not be very good.

**Saturn** – In Leo, Saturn is slowly moving out from behind the Sun in the morning sky. The rings are now closing quite dramatically with the angle of tilt down to just 8 degrees by October which means they are becoming harder and harder to see. Saturn and Venus are getting closer together throughout this session and by the first week of October they make a nice grouping with the bright star Regulus. On the morning of the 7<sup>th</sup> October the crescent Moon joins the group, which will be a very scenic view.

**Uranus + Neptune** – This is now the best time of the year (in the evening sky anyway) to see these two planets. Uranus is just past opposition, shining at mag. +5.7 in Aquarius while Neptune is still in Capricornus glowing at mag. +7.8. Both can be seen in binoculars and, in fact, Uranus is very close to the brightish star Phi Aquarii (mag. +4.4), which acts as a guide for you.

**Occultations** – There is an interesting occultation on the morning of 7<sup>th</sup> October at 05.20 UT. The bright star Regulus will probably graze the lunar limb. Depending on exactly where you are, it might be a proper occultation but it will only be a short one as the star will reappear probably less than 20 minutes later. If you are lucky enough to be on the graze line then you will be able to watch Regulus skim along the Moon's limb, occasionally disappearing and reappearing as it goes behind any lunar mountains. As Regulus is a bright mag. +1.3, and the Moon will be crescent, the occultation should be easily visible in any telescope or even mounted binoculars. The Moon will be about 30 degrees high in the east at the time.

**Comets** - There is one comet worth mentioning this session and that is comet C/2007 F1 LONEOS. It is currently in Leo and will cross in to Coma Berenices by October, so is an evening object. In mid-September it is a faint 11<sup>th</sup> mag. but it rapidly brightens to about 8.5 by mid-October. It peaks at about 5<sup>th</sup> mag. at the end of October when it will be in Libra.

## MOON PHASES:

Last Qtr: 4<sup>th</sup> Sept.; New: 11<sup>th</sup> Sept.; First Qtr: 19<sup>th</sup> Sept.; Full: 26<sup>th</sup> Sept.; Last Qtr: 3<sup>rd</sup> Oct.; New: 11<sup>th</sup> Oct.

## A WINTER HOLIDAY IN THE CANADIAN SUMMER

by ex-member **Deborah Hambly** in New Zealand

After the RASNZ conference this winter I flew to Canada to see relatives and have a ‘summer’ holiday. I was keen to visit a childhood astronomy icon and take in as many other astronomical activities as possible.

The first adventure was a star party weekend at Gordon’s Park on Manitoulin Island – the world’s largest freshwater island – situated in the great lakes of Ontario. Getting there was a mini adventure – a four-hundred-capacity car ferry for the beautiful two hour crossing – and this was after seven hours of driving from Toronto. The site was basic, (as I discovered are the standard for Canadian campgrounds) but everyone was friendly and the site was very dark. You can read more about the park at: [www.gordonspark.com/](http://www.gordonspark.com/).

I volunteered to fill in for an AWOL after-dinner presenter. Despite having no electricity and the IT being “BYO” I was able to whip together a presentation of the highlights of Astronomy in New Zealand via three laptops, with the audience perched on surrounding picnic tables. Sadly, on the second evening, when the rain had finally stopped, the fireflies were again the only lights in the sky!

At 2am, however, there was a ‘knock’ on the tent, and I was quickly roused. I once again saw the familiar stars of Cassiopeia and the Big Dipper overhead. We pointed our scopes to Comet Linear in Virgo. After panning around the perennial favourites through a selection of telescopes the largest of which was a meagre 6”. We saw Matariki [Ed.: Maori for the Pleiades] rising as the first hint of dawn drew practical observing to a close.

Back in Toronto I headed first to the Ontario Science Centre – a must-do on the annual holiday list when I was little. Sadly all astronomy displays were indefinitely closed. I made the best of the situation and raided the gift shop coming out with a wonderful selection of educational books and glow in the dark T-shirts.

The next stop was York University’s public night. Two domes were perched four stories above the campus and looked almost inconspicuous against the still cloudy and invariably light-polluted background. One dome housed a 40cm SCT, and the other a 60cm equatorially mounted scope. As a result, all that we saw was Jupiter and the view was poorer than that of a good 6” scope in decent conditions! You can read more about York University’s observatory at: [www.astro.ubc.ca/E-Cass/1999-ME/WH-York.html](http://www.astro.ubc.ca/E-Cass/1999-ME/WH-York.html).

Finally, saving the best for last, was the visit to the David Dunlap Observatory, housing a 1.88m Cassegrain telescope, the largest in Canada.

I recalled picnicking in its grounds as a child, and I had a photo of it which I carried with me, but I had never been past the front doors. My NZ contact at the University of Toronto was away unexpectedly and despite e-mailing months before for an evening viewing, found that no such weeknight viewings existed in the remaining time window. I tried every phone number available including one for the scope operator at the prime cage of the telescope – obsolete for several years I later heard. Finally I got through to the director of operations and I was in.



*Deborah at the David Dunlap Observatory, Toronto*

I had a personal tour of all the facilities, right down to the 11m elevator shaft beneath the dome and the adjoining aluminizing room. My Dad said of the 74” scope “Where do you look?” as a 5-foot-long spectrograph sat over the traditional eyepiece. The telescope was the first one with a Pyrex mirror. The scope was dedicated on May 31, 1935. The mirror is one foot thick and weighs two tons. The telescope tube is 30 feet long and the moving parts of the tube and the mount weigh 25 tons. I had never stood under a telescope of this size and I was mesmerised. Better still, Archie Ridder, the expert on site, offered me the chance to move the instrument, and I took the ‘steering wheel’ with slight fear and trepidation. Near to the telescope, was an item I recognised – the identical Argo Navis handset which I use in my observatory (Skydome) at Baylys Beach ([www.skydome.org.nz](http://www.skydome.org.nz)).

You can read more about the David Dunlap Observatory at: [www.astro.utoronto.ca/DDO/](http://www.astro.utoronto.ca/DDO/).

Finally it was time to leave the observatory, and then to fly back to familiar Southern skies. While amateur astronomy in general does not benefit from the aperture fever of New Zealand, the Toronto planetarium has been shut for years and most Ontario residents live in light polluted cities, I was still able to have an ‘astronomical’ holiday.

## LAST MEETING'S TALK

by Gwyneth Hueter

June's talk was given by Dr Andrew Ball, of the Open University. It was entitled: 'Planetary Landers: Exotic spacecraft for exotic places'.

He discussed the advantages and disadvantages of planetary orbiters versus landers. Things have come a long way since the kamikaze missions and early disasters of the fifties and sixties. Russia had the first successful landing, Luna 2 in 1959.

Dr Bell recounted the many attempts to land craft on the Moon (USA, 1967-69), Mars (Russia, 1970-73, which included a complete miss) and Venus (Russia, 1975-6). Remote controlled rovers first succeeded with the Mars Pathfinder/Sojourner mission (USA, 1997).

Kamikaze missions resumed with the Galileo Jupiter mission (USA, 1995)! Since 2003 we have become more adventurous with missions to minor planets, where gravity is so low that spacecraft can hover on the surface without actually landing. The Rosetta comet lander, launched 2004, is hoping to land on a comet in 2014.

Strangely enough, Dr Ball said he was involved in the Cassini-Huygens mission, whose lander gave us our first pictures of Titan's surface, but didn't say too much about it! Instead, he showed us the spectacular video it made as it landed. If you weren't at the talk, you also missed an amazing backwards look at us and our Moon, transiting the Sun, and views of Saturn and the approach to Titan.

The logo for NASA Space Place, featuring the words "NASA" and "Space Place" in white text on a blue oval background.

## COSMIC COCKROACHES

by Dr Tony Phillips

Cockroaches are supposed to be tough, able to survive anything from a good stomping to a nuclear blast. But roaches are wimps compared to a little molecule that has recently caught the eye of biologists and astronomers—the polycyclic aromatic hydrocarbon.

Polycyclic aromatic hydrocarbons (PAHs for short) are ring-shaped molecules made of carbon and hydrogen. "They're all around us," says Achim Tappe of the Harvard Center for Astrophysics. "PAHs are present in mineral oils, coal, tar, tobacco smoke and automobile exhaust." Aromatic, ring-shaped molecules structurally akin to PAHs are found in DNA itself!

That's why Tappe's recent discovery may be so important. "PAHs are so tough, they can survive a supernova."



*Using the IR spectrometer on the Spitzer Space Telescope, scientists found organic molecules in supernova remnant N132D.*

The story begins a few thousand years ago when a massive star in the Large Magellanic Cloud exploded, blasting nearby star systems and interstellar clouds with hot gas and deadly radiation. The expanding shell, still visible from Earth after all these years and catalogued by astronomers as "N132D," spans 80 light years and has swept up some 600 Suns worth of mass.

Last year "we observed N132D using NASA's Spitzer Space Telescope," says Tappe. Spitzer is an infrared (IR) telescope, and it has a spectrometer onboard sensitive to the IR emissions of PAHs. One look at N132D revealed "PAHs all around the supernova's expanding shell. They appear to be swept up by a shock wave of 8 million degree gas. This is causing some damage to the molecules, but many of the PAHs are surviving."

Astronomers have long known that PAHs are abundant not only on Earth but throughout the cosmos—they've been found in comet dust, meteorites and many cold interstellar clouds—but who knew they were so tough? "This is our first evidence that PAHs can withstand a supernova blast," he says.

Their ability to survive may be key to life on Earth. Many astronomers are convinced that a supernova exploded in our corner of the galaxy 4-to-5 billion years ago just as the solar system was coalescing from primitive interstellar gas. In one scenario of life's origins, PAHs survived and made their way to our planet. It turns out that stacks of PAHs can form in water—think, primordial seas—and provide a scaffold for nucleic acids with architectural properties akin to RNA and DNA. PAHs may be just tough enough for genesis.

Cockroaches, eat your hearts out!

Find out about other Spitzer discoveries at [www.spitzer.caltech.edu](http://www.spitzer.caltech.edu).

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

## DATES FOR YOUR DIARY

**24<sup>th</sup> Sept.** 8pm. Beginners' Meeting in the Perry Room.

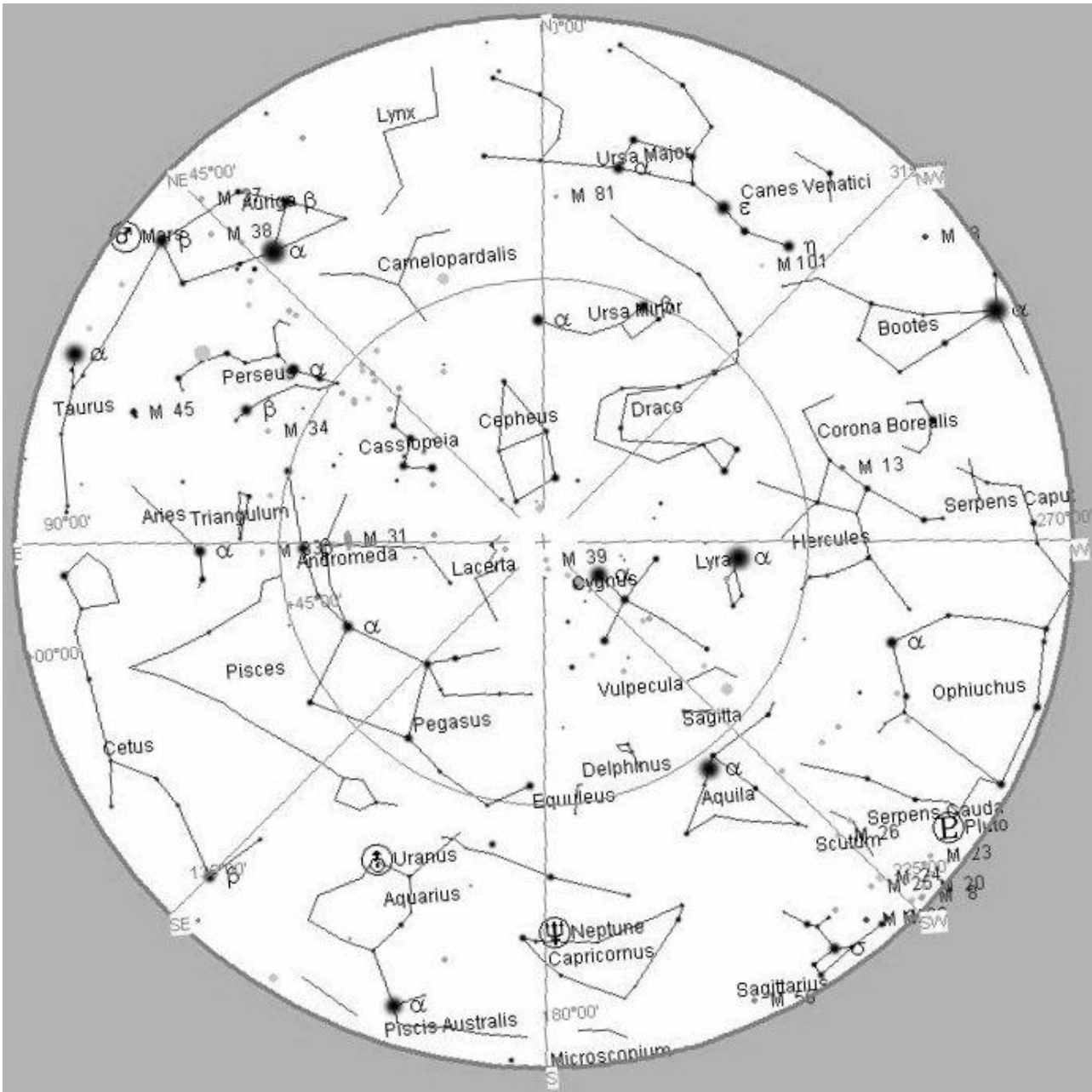
**8<sup>th</sup> Oct.** 8pm Speaker meeting: Dr Andrew Norton (Open University) 'Outbursts, orbits and Oscillations'

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 10pm next Saturday (15<sup>th</sup> September)

The Summer Triangle of Altair, Deneb and Vega is still high in the south-west. The square of Pegasus is high in the south-east. From there, why not search for the nearest galaxy to our own Milky Way, the Great Galaxy in Andromeda, M31. From the top-left of the square, hop two stars left, then two stars up and there you will see a fuzzy blob. Look through a telescope and you will see a larger, brighter fuzzy blob! Point it out to your friends and tell them that the light from there set off 2.2 million years ago. Photographs are required to bring out details in the spiral arms of this galaxy, which is larger than our own, with which it is on a collision course at great speed. But don't worry, it will be a couple of billion years or more before 'impact'.