SPACEWATCH

the newsletter of the Abingdon Astronomical Society

13th February 2005

Dr Tanya Lim (RAL):

"SPIRE – A New Space Instrument to Measure the Cool Universe"

Make the most of these long winter nights, as it won't be long before it starts to get darker later and later and Spring will be in full swing. Orion is already high in the south after the Sun has set. I always take the position of Orion in the sky as a measure of how far through winter we are.

THE NIGHT SKY THIS MONTH

by Bob Dryden

Planets:

Mercury: As this session starts, Mercury is having its best evening appearance of the year. It reaches greatest eastern elongation on 24th February when it is 18 degrees from the Sun, after which it starts to move Sunward again, reaching inferior conjunction on 12th March.

So the best period to see the planet is roughly from the middle to the end of February. Look low towards the west, shortly after sunset and the bright 'star' is Mercury. If you need a guide, on the evening of 1st March the crescent Moon will be above and to the right of the planet.

Mercury makes a very close approach to Uranus on 14th February when they will be a mere 9 arc minutes apart. Unfortunately, while you may be able to see Mercury, Uranus will be too faint. The pair will be just 5 degrees above the horizon half an hour after sunset and by the time it gets dark enough they will have set.

Venus: Venus is now on view in the morning sky but it remains very low in the south east. Fortunately, at magnitude -4.5, you can easily see it if you have a clear horizon. It is actually at its best for this apparition about now even though it goes on until about October.

The phase is still a very nice crescent, becoming a 'fat' crescent by mid March.

Mars: The red planet is still with us in the evening sky and during the second half of February passes just below the Pleiades. While much fainter (about +1 mag) and smaller (about 6 or 7 arc seconds) than it was last year, on, or around, 19th February try and have a look at it in a telescope. On that date Mars reaches eastern quadrature which means from our viewpoint, Mars is only 89% illuminated. The result is instead of us seeing a complete disc, the planet has a gibbous phase (or looks like a ¾ Moon in shape).

Saturn: This is probably the star of the show this session as it is on view at a convenient time in the evening now. Still in Cancer, shining at 0 magnitude, it is easy to find towards the east after sunset. The ring tilt is 20 degrees which is the best for this year. The rings are gradually closing now and the northern part of the planets disc is now visible again above them. Also, look for the shadow of the disc on the rings themselves as the angles are right for us to see this at the moment.

Jupiter: While very bright at magnitude -2.1, Jupiter is in Libra and so only on view in the morning sky at the moment.

Occultations: There is an easy occultation to see on the evening of 14th February at 20.51 UT. The 4.7 magnitude star, chi Leo, reappears from behind the Moon. The Moon will be about 15 degrees high in the east at the time.

Comets: There is only one comet of any note on view at the moment. Comet E2 2005 McNaught is about 10th magnitude, crossing Pisces in the evening sky. Obviously, you will need a telescope and finder chart to see it, but as it is the only one available, comet buffs will give it a go.

MOON PHASES:

First Qtr: 5th Feb.; Full: 13th Feb.; Last Qtr: 21st Feb.; New: 28th Feb.; First Qtr: 6th Mar.; Full: 14th Mar.

SNOWSTORM ON PLUTO

by Dr Tony Phillips

There's a nip in the air. Outside it's beginning to snow, the first fall of winter. A few delicate flakes tumble from the sky, innocently enough, but this is no mere flurry.

Soon the air is choked with snow, falling so fast and hard it seems to pull the sky down with it. Indeed, that's what happens. Weeks later when the storm finally ends the entire atmosphere is gone. Every molecule of air on your planet has frozen and fallen to the ground.

That was a snowstorm—on Pluto.

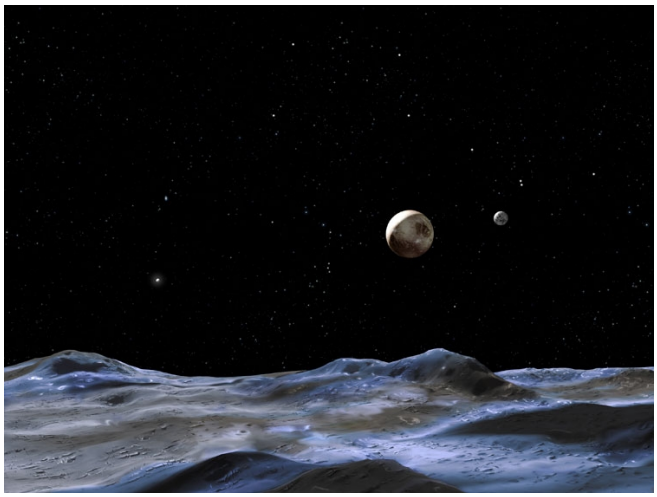
Once every year on Pluto (1 Pluto-year = 248 Earth-years), around the beginning of winter, it gets so cold that the atmosphere freezes. Air on Pluto is made mainly of nitrogen with a smattering of methane and other compounds. When the temperature dips to about 32 K (-240 C), these molecules crystallize and the atmosphere comes down.

"The collapse can happen quite suddenly," says Alan Stern of the Southwest Research Institute. "Snow begins to fall, the surface reflects more sunlight, forcing quicker cooling, accelerating the snowfall. It can all be over in a few weeks or months."

Researchers believe this will happen sometime during the next 10 to 20 years. Pluto is receding from the warmth of the Sun, carried outward by its 25% elliptical orbit. Winter is coming.

So is New Horizons. Stern is lead scientist for the robotic probe, which left Earth in January bound for Pluto. In 2015 New Horizons will become the first spacecraft to visit that distant planet. The question is, will it arrive before the snowstorm?

"We hope so," says Stern. The spacecraft is bristling with instruments designed to study Pluto's atmosphere and surface. "But we can't study the atmosphere if it's not there." Furthermore, a layer of snow on the ground ("probably a few centimeters deep," estimates Stern) could hide the underlying surface from New Horizon's remote sensors.



This artist's rendering shows how Pluto and two of its possible three moons might look from the surface of the third moon. Credit: NASA/ESA and G. Bacon (STSci)

Stern isn't too concerned: "Pluto's atmosphere was discovered in 1988 when astronomers watched the planet pass in front of a distant star—a stellar occultation." The star, instead of vanishing abruptly at Pluto's solid edge, faded slowly. Pluto was "fuzzy;" it had air. "Similar occultations observed since then (most recently in 2002) reveal no sign of [impending] collapse," says Stern. On the contrary, the atmosphere appears to be expanding, puffed up by lingering heat from Pluto's waning summer.

Nevertheless, it's a good thing New Horizons is fast, hurtling toward Pluto at 30,000 mph. Winter. New Horizons. Only one can be first. The race is on….

Find out more about the New Horizons mission at http://pluto.jhuapl.edu . Kids can learn amazing facts about Pluto at http://spaceplace.nasa.gov/en/kids/Pluto .

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

THE CANOE & SAIL OF TAINUI

by former member Deborah Hambly
in New Zealand

Having lived in New Zealand for nearly a year, and highlighted the best clusters, nebulae and galaxies, it is time to widen the field of view and share some Maori constellations with you. I trust you will enjoy this new perspective of the stars which you will be able to see from the Northern Hemisphere in your winter as you look south.

Since both countries are surrounded by water, it is no surprise that seafaring and navigation feature highly in the history of both New Zealand and the United Kingdom. Therefore, it is only natural that many of the Maori constellations relate to either water or to voyages by boat, or in the case of New Zealand, a canoe or 'Waka'.

Start at the Pleiades (known by the Maoris as Matariki) which marks the bow of the canoe. Head east in the direction of Taurus. The sail of the canoe surrounds the perfectly shaped 'V' of Taurus, marked by the bright red star Aldeberan, the eye of the bull. Continue your journey into Orion, where the boat arcs up (or down from the North Hemisphere) between another bright red star Betelgeuse and Bellatrix. The belt of Orion forms the stern of the canoe, and the sword containing the Orion nebula is the prow rising above the canoe like an ancient figurehead).

Now you have the basic canoe shape it is time to add an oar. The blade is marked by Betelgeuse and the handle by Bellatrix. The constellation - which now stretches across most of my northern sky - is connected by a line stretching across to the Southern Cross to Alpha & Beta Centauri (Alpha being one of the closest stars to the Sun) and then on to the canoe's anchor which is formed by what we call the Southern Cross.

The next time you are outside admiring Orion see if you can see the canoe, albeit 'upside down, or grab a reclining deck chair, face north, lean your head back and admire our shared vista of the heavens from a Southern Hemisphere perspective! [Ed: You'll get an even better view of this from Spain, Greece or the Canaries.]

LUX

by your local CfDS rep, David Birkett

Pax et Lux adorned the front of the library in the town of my child hood. At that time Lux was a soap powder and I did not quite understand its connection with books.

Lux is now the way we measure light levels. I have referred to it in the last few notes but not what it means. Normal home living lux levels vary from about 40 up to say 500. The highest being for precision work say sewing or model making where one may use a daylight lamp. 40 lux is for outside lighting.

The scale starts with 1 lux, which is the lowest form of natural light off the sun, which is moonlight. The scale describes 1 lux as full moonlight on a bright night. However as this in my opinion varies it would seem an odd starting place. The moonlight of the last full moon seems to fit this criteria, as it has been at its highest in the sky. It is assumed therefore the differences between bright and dull full moons must exist, it would be interesting to discover how varied the reflection is. So far I can find no references anywhere to this likelihood.

On the war front a new case turned up this week from a fraught parish council who have been fighting a source of light pollution for 11 years with a district council unable to justify the cost of tackling the perpetrator.

The present situation has reached a point where it will reach the district council's committees in about two months. It appears that neither side were fully aware of the new legislation covering the statutory nuisance of light pollution. A quick passing of the papers to Bob Mizon seems to likely to provide the parish council with a new and powerful ally through his office.

The passing of the papers is a result of them including a lot of consultative work by experts and barristers to name but two, and not on more local social grounds, as was Radley, where a quick chat seems to have had some, if not a complete effect. Getting involved in the detail of complaints is difficult in a voluntary capacity due to time constraints.

Until the next news I bid farewell.

FURTHER DISCUSSION

The Society's web site is www.abingdonastro.org.uk . Our webmaster, Andrew Ramsey, 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. Also on the web site is the item "Space News", astronomy news which changes every day, brought to you courtesy of "Universe Today".

You can also find details of our e-mailing list there.

DATES FOR YOUR DIARY

20th – 22nd February (FCN*) 8pm. Observing Evening at Britwell Salome. Contact Ian Smith on 01491 824266 for details.

27th February 8pm. Beginners' Meeting in the Perry Room.

13th March 8pm. *Stan Cocking Memorial Lecture:* Richard Fleet: "Glows, Bows and Haloes".

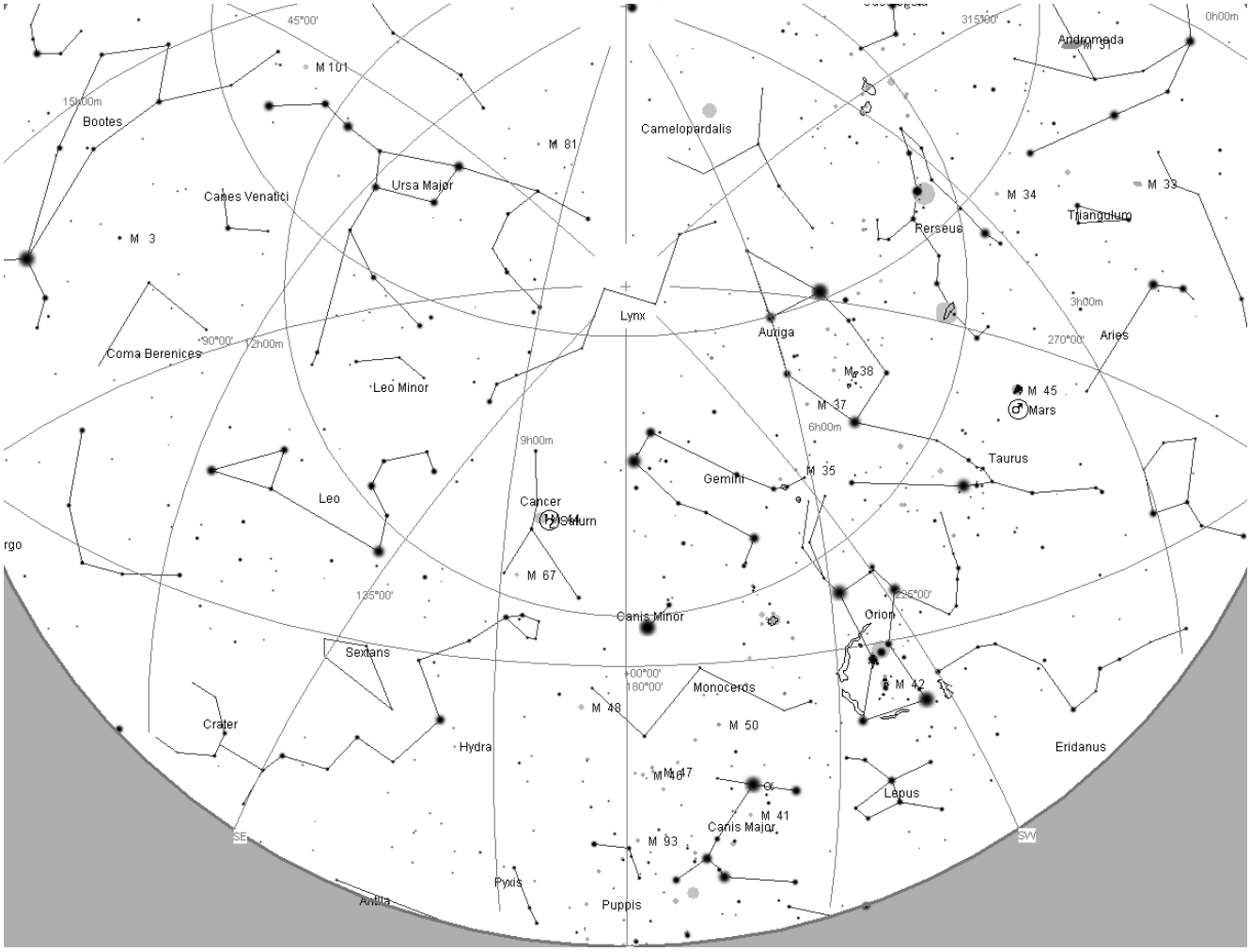
The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your help and contributions. Please send any news, observations, photos, etc. to:

Mail:A.T.Ramsey, 35 Cope Close, OXFORD,OX2 9AJ

E-mail: AbAstro@ATRamsey.com

Phone: 01865 245339

STAR CHART



Looking south at 10pm next Saturday (18th February)

Orion, and Mars to its west are moving westward now. Up and to the left is Gemini, with its twin stars Castor and Pollux. Saturn is to the left, very close to the Beehive Cluster (M44) in Cancer. Following close behind is Leo, the Lion, with its bright star Regulus, directly below the Plough. The Milky Way sweeps through from the 'W' of Cassiopeia, through Perseus and Auriga, north of Orion and through Canis Major, with its bright star, Sirius, the brightest star in the night sky.

This chart was produced using the freeware program Cartes du Ciel. The curved southern horizon is at bottom. The zenith is shown by the small cross in Lynx.