WELLINGTON ASTRONOMICAL SOCIETY

Crow's Nest Observatory. Photo © Roland Idaczyk.

MONTHLY MEETING: Crows Nest Observatory and Exoplanet Transit Research by Roland Idaczyk.
7.30pm Wednesday 5th November 2008
Science House,
Turnbull Street,
Thorndon

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Crows Nest Observatory and Exoplanet-Transit Research by Roland Idaczyk.

Abstract

In the first part of this talk the Crows Nest Observatory (CNO) is introduced and the experience of its planning and construction shared. With the main research activity planned being the monitoring of exo-planetary transits, there will be an overview of existing exo-planet search techniques with special emphasis on the significance of transits. Subsequently the challenges to achieve the required accuracy of photometry are discussed. Subject to the availability of suitable data, an example will be presented outlining the complete process of data reduction and analysis.

John Field Steps Down as WAS President

John Field has stepped down as President of Wellington Astronomical Society and relinquished all roles within the society. The Council wishes to thank John for all his work as President especially his willingness to attend and organise star parties at schools and elsewhere, and his devotion to the monthly star parties at Pauatahanui. Vicki Irons will be chairing the AGM until a new president can be appointed.

Notice of AGM

The November meeting is our Annual General Meeting (AGM) at which the Finances of the Society for the previous financial year are presented, a new council is elected, any resolutions that have been submitted are voted on, an auditor appointed and any other business that is applicable is transacted. The positions in Council for election are: President, Vice-President, General Secretary, Treasurer, Editor, Membership Secretary, Convenor of Meetings, Activities Co-ordinator, Astronomical Programs Officer, and Observatory Director. Any financial member can stand for any position on the Council and if more than one member wishes to stand for the same position a vote will be held on the night. For more information on the roles of the various council positions they are available on the WAS website at: http://www.was.org.nz/01documents.html. The auditor's report is attached separately.

Pauatahanui Observing sessions

The resignation of John Field has left a vacancy for people to run the Pauatahanui observing sessions. There will be no observing session during November. The observatory is located on "Willow Bank Farm" off Murphy's Road. The observatory holds a 12-inch Meade SCT on an equatorial wedge. The Council and members of WAS wish to thank John Field for faithfully running the Pauatahanui star parties for many years. Anyone wishing to join a roster to maximise the chance of a monthly observing session please let the new council know.

No Gifford Star Party in November

There will be no star party at the Gifford in November.

Editorial Disclaimer

Views expressed in this newsletter are not necessarily those of the Society as a whole

Farewell to Duncan Hall

Duncan Hall has been appointed to a position in the Square Kilometre Array Project Development Office located in the University of Manchester's Jodrell Bank Centre for Astrophysics.

His official title is "Domain Specialist in Computing and Software". He will interact with organisations around the world, coordinating and contributing to design and development work for the computing and software aspects of the Square Kilometre Array, a proposed Euro 1.5 billion array of radio telescopes currently being designed and developed.

Duncan has been involved in astronomy for over 40 years. The following has been taken from the IYA 2009 site:

> "Duncan Hall became an amateur astronomer when as a five year old he noticed that the moon followed him as he looked up at it while walking underneath trees. He built his first telescopes while at primary school and has been a member of the Royal Astronomical Society of New Zealand (RASNZ) since 1974. As a student at Wellington College Duncan was joint Director of the Gifford Observatory in 1974 and 1975. He is a former Chairman and is now the Treasurer of the Gifford Observatory Trust which restored and operates the Gifford Observatory for all young astronomers in the Wellington region. While completing his masters degree in electrical engineering in 1980 Duncan studied astronomy at the University of Canterbury. He built the first photodiode detector array system for the now retired échelle spectrograph at Mt. John Observatory.
>
> He was a foundation member of the Wellington Astronomical Society and served as its Chairman from 1981 to 1982. He was Vice President and Observatory Director during 2003-2004. Duncan was appointed to the Carter Observatory Board in 2007 and is now its Chair. Duncan has been a Members´ Councillor of the RASNZ since 2004. In various voluntary capacities Duncan has been involved in supporting scientific, technological and engineering activities for secondary and tertiary students."
>
> Duncan is also a:
>
> Fellow of the Institution of Professional Engineers New Zealand
>
> Chartered Professional Engineer and International Professional Engineer

- Senior Member of the Institute of Electrical and Electronics Engineers
- Professional Member of the Association for Computing Machinery

Duncan has been running the WAS star parties at the Gifford Observatory for a number of years. He's also maintained the facilities and kept the grounds tidy. The Committee and all the members thank him for all his work and hope all goes well in his new position.

2008 ANYTHING VINTAGE TRANSPORT & MACHINERY FESTIVAL 27th-29th December 2008.

This is being held at MacKay's crossing Entrance, Queen Elizabeth Park, Paekakariki from 27th - 29th December, 2008 10am until 4.30pm. Again Wellington Astronomical Society will be involved at this event. The contact people for the 2008 event are Bill Parkin and Lesley Hughes ph 472-5086 email : **hpwas@hugpar.gen.nz>**This is a great opportunity for us to showcase astronomy in the Wellington region and would be absolutely great if a number of our members were involved..

Themed around transport and machinery from yesteryear 'Anything Vintage' offers a wide variety of entertainment, rides, food, displays, market stalls and outdoor activities catering for all ages. The festival features live music twice a day by top Kapiti bands including 'Black Eyed Suzie' and 'Legal Tender', supported by fun and magic from 'Harry the Clown' and 'Zippity Zoo' for the kids. A variety of novelty rides will include vintage trams, vintage buses, other transport from the past, plus pony rides by 'Stables on the Park. To complete the vintage transport experience Tranz Metro run their restored 1954 English Electric Suburban Unit from Wellington to Paraparaumu three times a day where passengers can ride vintage buses to and from the festival. (Trains depart Wellington at 9:00am, 12:00pm & 3:00pm and depart Paraparaumu at 10:05am, 1:05pm & 4:05pm.)

What's In the Sky In November: Information Provided by Alan Gilmore

Venus and **Jupiter** make a pair of 'evening stars' in the western sky at dusk. Venus is by far the brighter of the two. For most of the month Venus is below and left of Jupiter but they draw closer as Jupiter slips down the sky. At the end of November Jupiter moves past and below Venus. Binoculars and small telescopes will show Jupiter's brightest moons above-right and below-left of the planet. Jupiter is 840 million km away from us now. Though bright, Venus is not a great sight in a telescope. It looks like a tiny moon between first quarter and full. It is around 165 million km away.

Scorpius is below and left of Venus, with its tail pointed up toward the zenith. The tail is 'the fish-hook of Maui' in Maori star lore. **Antares**, the heart of the Scorpion, is a 'red giant' star cooler than the sun. Antares is bigger than Earth's orbit but it is mostly very thin gas around a hot dense core. The **Milky Way** is low in the sky, visible around the horizon from the northwest, through south into the eastern sky. The broadest, brightest part is in **Sagittarius** around Venus. The Milky Way is our edgewise view of the galaxy, the pancake of billions of stars of which the sun is just one. The thick hub of the galaxy, 30 000 light years* away, is in Sagittarius. A scan along the Milky Way with binoculars will show many clusters of stars and a few glowing gas clouds. Low in the south are the Pointers, Beta and **Alpha Centauri**, and **Crux** the Southern Cross. In some Maori star lore the bright southern Milky Way makes the canoe of Maui with Crux being the canoe's anchor hanging off the side. In this picture the Scorpion's tail can be the canoe's prow and the Clouds of Magellan are the sails.

The Clouds of Magellan, (**LMC** and **SMC**), high in the in the southern sky, are two small galaxies about 160 000 and 200 000 light years away, respectively. They are easily seen by eye on a dark moonless night. The larger cloud is about 1/20th the mass of the Milky Way galaxy, the smaller cloud

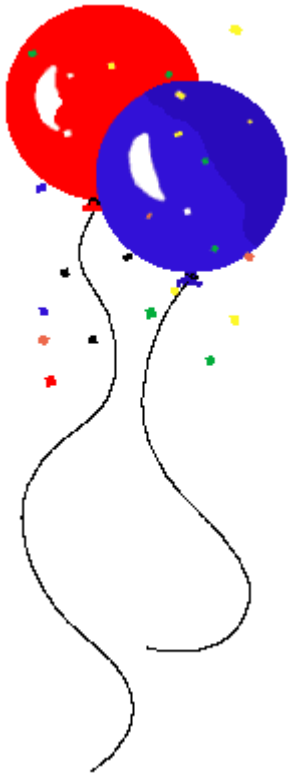
1/30th. That's still many billions of stars in each. The Magellanic Clouds probably orbit our galaxy. The globular star cluster 47 Tucanae appears near the SMC but is 'only' 16 000 light years away. Globular clusters are spherical clouds of stars many billions of years old.**Canopus**, in the southeast, is the second brightest star in the sky. It moves eastward and upward during the night as the stars appear to circle clockwise around the south celestial pole, **SCP**. Canopus is a white star, hotter than the sun, 300 light years away. Seen up close it would be 13,000 times brighter than the sun.**Sirius** rises in the east. It is the brightest star both because it is relatively close, nine light years away, and 23 times brighter than the sun. When low in the sky it is shining through a lot of air. Warm and cool layers in the air break its white light into colours, so Sirius twinkles like a diamond. Left of Sirius is the constellation of **Orion**, with 'The Pot' at its centre. **Rigel**, a bluish supergiant star, is directly above the line of three stars; **Betelgeuse** a red-giant star is straight below. Left again is a triangular group making the upside down face of **Taurus** the bull. Still further left is the **Pleiades**/ **Matariki** cluster, also called the Seven Sisters, impressive in binoculars. Very low in the north is the **Andromeda Galaxy**, easily seen in binoculars on a dark night and faintly visible to the eye. It appears as a spindle of light. It is similar in shape to our galaxy but a little bigger. At three million light years distance it is the closest galaxy that is comparable to our Milky Way galaxy. It is best located by starting with the Great Square of Pegasus.

*A **light year** (**l.y**.)is the distance that light travels in one year: nearly 10 million million km. Sunlight takes eight minutes to get here; moonlight about one second. Sunlight reaches Neptune, the outermost major planet, in four hours. It takes four years to reach the nearest star, Alpha Centauri.

Ions in Action taken from the NASA Space Place website and © to Colleen Barboza.

DISCLAIMER: ***all personal and professional opinions presented herein are my own and does not, in any way, represent the opinion or policy of JPL/NASA.***

Make pieces of paper fly through the air and stick onto a balloon.



Materials:
A balloon
A sheet of paper
A hole punch

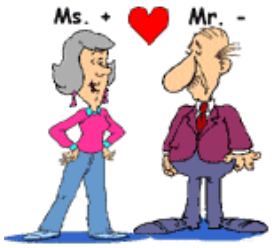
Instructions:
Inflate the balloon to a size that fits easily in your hand.
Tie a knot in the end of the balloon.
Use the hole punch to cut several small circles from the sheet of paper.
Rub the balloon back and forth gently on your hair about 10 times. Don't press too hard. Your hair should be clean, dry, and oil-free.
Hold the balloon close to, but not touching, the paper circles.
Watch what happens.

Don't forget to take off your hat before you rub the balloon on your hair!

So, Dr. Marc, why does the balloon pick up the confetti?

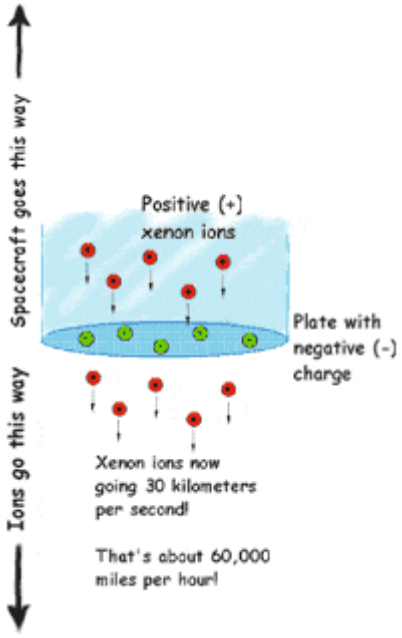
Atoms are the teeny tiny particles that make up all matter. Atoms have even teenier pieces, called **electrons**, that they wear like coats. Sometimes the atom wears all its coats, sometimes it takes off one or more.

When you rub the balloon on your hair, some of the electrons rub off and stick to the balloon. The electrons have a negative (-) electric charge, so the balloon has a negative charge. When atoms are missing electrons (they've taken off a coat or two), we say they have a positive (+) charge. The confetti you made has a few electrons missing, so has a slight positive charge. Negative and positive charges **attract** each other. So, the confetti sticks to the balloon!



Atoms that have either a negative or positive charge we call **ions**. The Deep Space 1 spacecraft uses an **ion engine** to propel itself through space!

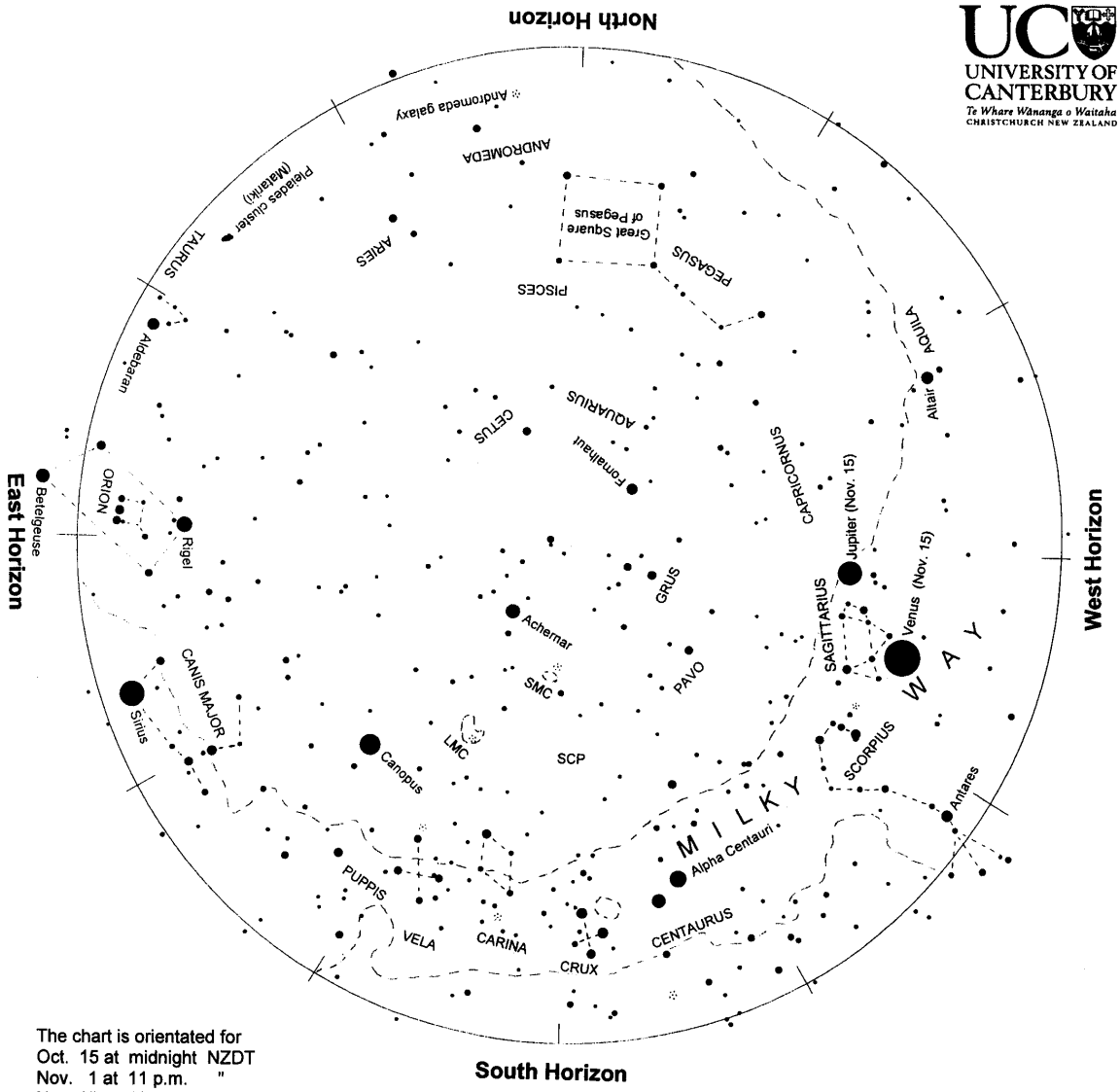
The ion engine contains a gas called **xenon** (pronounced ZEE-non). The xenon is given a charge, just as the confetti has a charge. Another part of the ion engine is a thin sheet of metal with many little holes in it (sort of like a window screen). This metal screen also has a charge, like the balloon. So the metal screen attracts the xenon ions like the balloon attracts the confetti.



The charged metal screen makes the xenon ions move very fast, so they zoom right through the holes and out the other side of the screen. As they shoot out (the **action**), they push back against the spacecraft (the **reaction**). This engine uses the same law of nature that makes a regular fuel-burning rocket work. (See how to **build a pop-rocket**.)

The forces of attraction are very strong in ion propulsion. The ions actually move much faster than does the hot gas coming out of a regular rocket engine. So the ion propulsion system works even better!

Read the story of **Professor Starr's Dream Trip**, made possible by the ion engine.



The chart is orientated for
Oct. 15 at midnight NZDT
Nov. 1 at 11 p.m. "
Nov. 15 at 10 p.m. "

Evening sky in November 2008

To use the chart, hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge. As the earth turns the sky appears to rotate clockwise around the south celestial pole (SCP on the chart). Stars rise in the east and set in the west, just like the sun. The sky makes a small extra clockwise rotation each night as we orbit the sun.

Venus and Jupiter are midway down the western sky at dusk. Venus is the brightest 'star' in the sky, silver white in colour. Jupiter has a golden tint. They set in the southwest about midnight. The Milky Way is wrapped around the horizon. It is low in the west and south sky early in the night. As the western portion sets the eastern part comes into view. Along with it rise Sirius, the brightest star (but much fainter than Venus), twinkling like a diamond, Orion (containing 'The Pot'), Taurus and the Pleiades/Matariki. The Pointers and Crux, the Southern Cross, are low in the south. The north sky is empty except for the Great Square of Pegasus.

Chart produced by Guide 8 software; www.projectpluto.com. Labels and text added by Alan Gilmore, Mt John Observatory of the University of Canterbury, P.O. Box 56, Lake Tekapo 7945, New Zealand.
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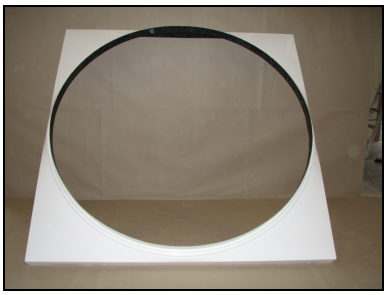
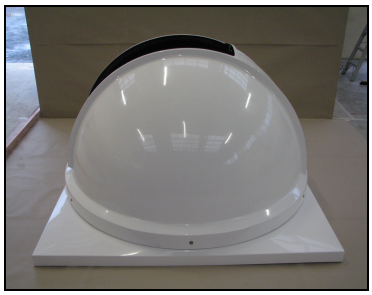


roof/ring system



fitted dome

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