

TAURANGA ASTRONOMICAL SOCIETY NEWSLETTER

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Polynesian Star Compass at Sulphur Point, Mt. Maunganui

Jack Thatcher on Navigation

Imagine sailing across the Pacific Ocean with only the Sun, the Moon, the stars, and the Earth's environment to help you.

Imagine the world without the technology we now have.

Imagine using your senses and very being to accomplish a journey which many people of today take for granted.

The voyaging canoes Hokule'a and Hawai'iloa sailed through the ancient routes of Polynesia without the navigational instruments we are now familiar with. In 1985, Hokule'a was part of the Voyage of Rediscovery to Aotearoa, and arrived when the pohutukawa was in bloom.

Jack Thatcher was the speaker for our October meeting, and treated us to another cultural view of how the stars were used. He gave a great visual presentation and explained the many facets of getting from A to B using Polynesian navigation skills.

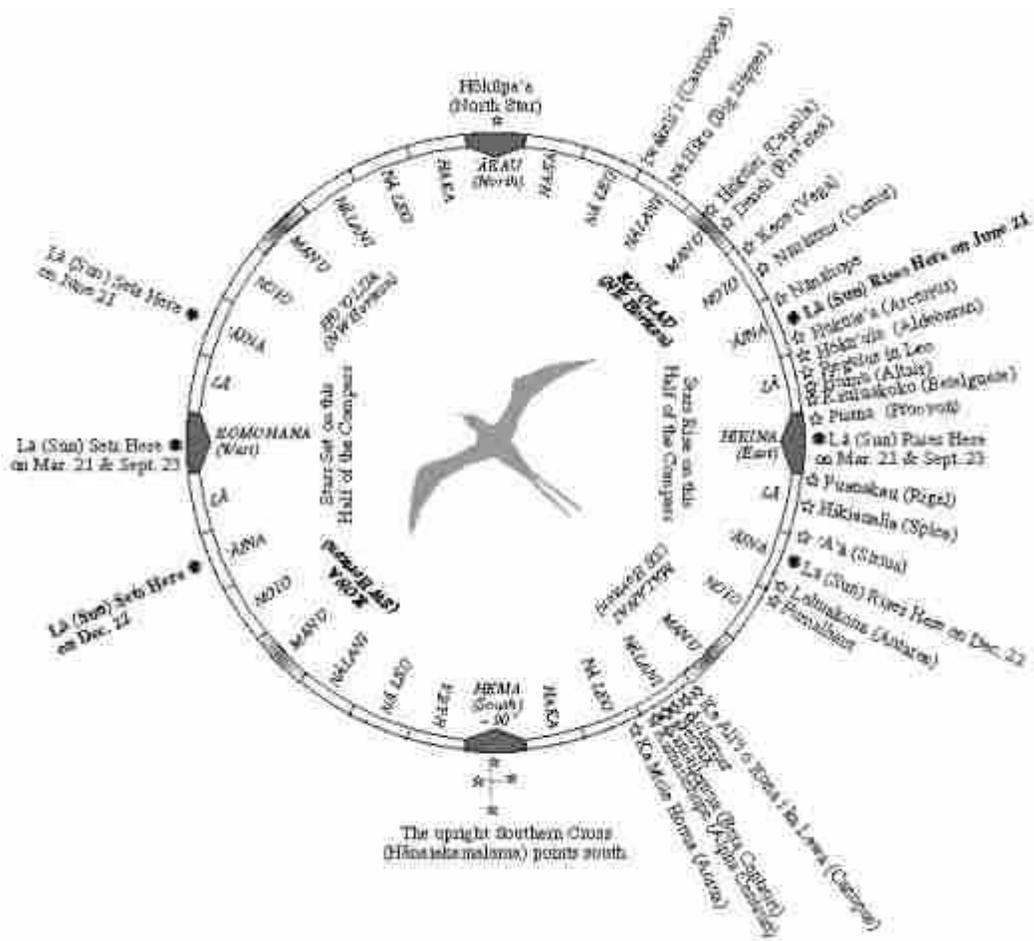
Jack has constructed a star compass out at Sulphur Point – and it is well worth going to have a look. Using Sky Map Pro Jack also showed us some guide points with star positions – for example, the Southern Cross, in May, is its own distance above the horizon for an observer in Hawaii. Basic knowledge such as the moon following the path of the Sun across the sky, and fixing the point of the sun's rising and setting every day, as well as knowing which star is where at certain times of the year are all facts which everyone can attune to.



A good project to try is to look out for the moon every day. If you stand at the same point, and look at the same time, note just where in the sky it is, relevant to other objects, ie. the horizon during the day, and star positions at night, and what

phase the moon is actually in. Do the same with the Sun. Watch its position over a year. Get the children to construct a simple sundial. You'll get some sense of what we are able to achieve ourselves just by observing what goes on in the vast environment we are part of.

To get to a point with amateur observing where one can go out on a clear night and know exactly what is in the sky at any particular time is surely a great achievement, and listening to Jack's talk will hopefully inspire some towards that.



There are a number of sites to be found on the Internet – I thought this one was very informative -

<http://www.celestialnavigation.net/wayfinding.html>

This article was also found via Wikipedia – by Bill Thoen – he tells us of the Origins of the Compass Rose.....

The compass rose has appeared on charts and maps since the 1300's when the portolan charts first made their appearance. The term "rose" comes from the figure's compass points resembling the petals of the well-known flower.

Originally, this device was used to indicate the directions of the winds (and it was then known as a wind rose, but the 32 points of the compass rose come from the directions of the eight major winds, the eight half-winds

and the sixteen quarter-winds.

In the Middle Ages, the names of the winds were commonly known throughout the Mediterranean countries as *tramontana* (N), *greco* (NE), *levante* (E), *siroco* (SE), *ostro* (S), *libeccio* (SW), *ponente* (W) and *maestro* (NW). On portolan charts you can see the initials of these winds labeled around the edge as T, G, L, S, O, L, P, and M.

The 32 points are therefore simple bisections of the directions of the four winds (but the Chinese divided the compass into 12 major directions based on the signs of the Zodiac). For western apprentice seamen, one of the first things they had to know were the names of the points. Naming them all off perfectly was known as "boxing the compass".

Andrew Walker on "Telescopemaking"

Andrew Walker was our speaker for the September public meeting, and he enlightened us as to the mysteries of building our own telescopes. Andrew brought his own 'scope to show us, along with mirror making tools for those who thought they would like to have a try at this fine art.

The talk was very well executed and covered many aspects of telescope making including history, types of 'scope, materials and skills required. Historically speaking, the first telescopes appeared in the 17th century; Hans Lipoche by accident, and Galileo by design. Two-inch refractors were the first to appear, which were prone to chromatic aberration due to the shortness of the instruments combined with the effects of the electro-magnetic spectrum. A longer focal length negates because the light doesn't bend as much, however, a scope of 200ft in focal length was rather cumbersome.

James Gregory came up with the reflector scope in 1663, which was free from chromatic aberration and used two concave mirrors which are identified now as the cassegrain model, and in 1668 Isaac Newton perfected this method.

Andrew's knowledge of the optics was particularly good – he makes his own – and he informed us of the different shapes such as hyperbolic, parabolic and elliptical mirrors, and that speculum metal used to be used in the 17th century. This tarnished easily and needed frequent cleaning.

Andrew uses silicon carbide and carborundum for grinding the glass. The grinding tool is home-made, using a plaster cast set with epoxy resin and tiles, and all this equipment was on show for people to get an idea of what the process involves. Aluminising the mirror is a separate process, and there are various people in New Zealand who will do this.

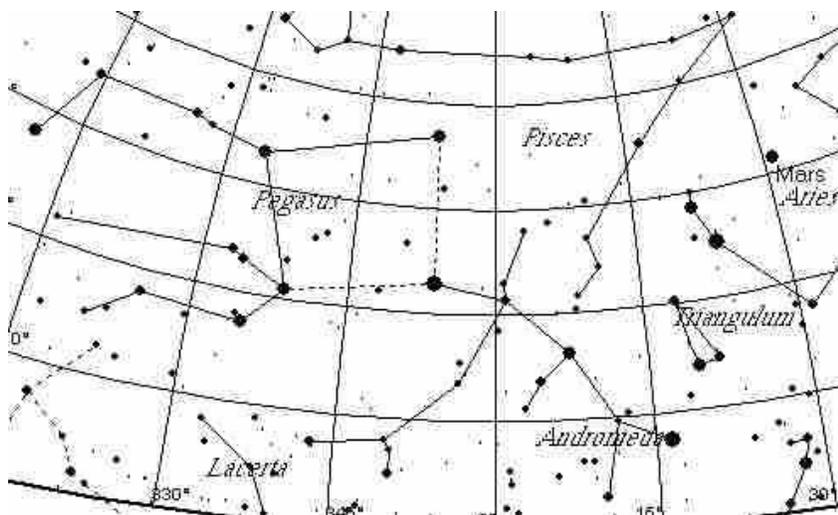
Both Tony Dodson and Gary Nankivell were well known in New Zealand for their skills in telescope making. Sadly they are now passed away, but Tony's book is a must to read if you are embarking on your own telescope making project.

Graeme Loftus is another great telescope maker, and can construct a pretty large dobsonian in a short space of time, mirror and all.

The weather after the meeting was not too good so we didn't go outside to observe, however, Andrew is happy enough to help with any questions.

Constellation Roundup

Pegasus – the Winged Horse



This is a huge constellation to the north – it is very well known in the northern hemisphere, and one of the tasks we were given as students was to see how many stars we could find in the square of Pegasus. This also gives an indication of the intensity of light pollution in your local area. Unfortunately I haven't been out to count while in Tauranga, so you'll have to go out and do it yourself. The whole constellation stretches West to East for about 60 degrees – or 3 handspans with an outstretched arm, and at this time of the year at

an altitude of between 20 and 40 degrees. You may find it easier to find Mars first, as this is quite an obvious object at the moment. Pegasus is to the left, or west of Mars – see above.

Historically, the winged horse has been found depicted on ancient stone tablets, and on Greek coins minted in the 4th century B.C. There are a number of deep sky objects which are worth chasing... M15 is a well known northern globular, and quite spectacular through a telescope. It's just off to the left of the map above (oops, sorry!).

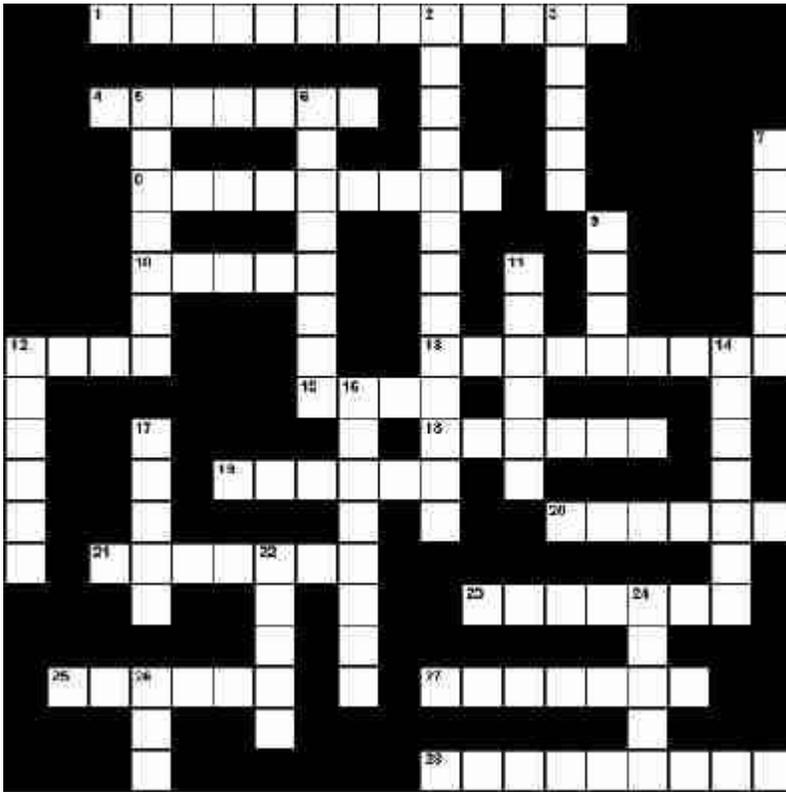
Another interesting group is "Stephan's Quintet", but need at least a 10" scope to see by. It is a faint group, but contains spiral and barred objects.

To get your own sky maps.....

<http://www.skymaps.com/>

Astronomy Crossword

Something to keep you awake after Christmas lunch.....It's *extremely* easy !



Across

- 1. Patterns in the sky created by stars
- 4. This planet appears blue-green through a telescope
- 8. Star distances are measured in _____ (2 words)
- 10. The smallest planet in our solar system
- 12. The number of known planets in our solar system
- 13. Astronomers look through these at the night sky
- 15. U.S. Space Agency
- 18. The first planet discovered using a telescope
- 19. Holes in the moon
- 20. Best known ringed-planet
- 21. Planet featuring the Great Red Spot
- 23. Mercury, Venus, Earth and Mars are the Inner _____
- 25. The halo of gas around the Sun
- 27. This planet has an orbit of 3 months
- 28. A collapsed star may become this (2 words)

Down

- 2. The nearest star to the sun (2 words)
- 3. The path of one body around another in space
- 5. When the Moon moves in front of the Sun, or when the Earth's shadow falls on the Moon
- 6. The main gas in Earth's atmosphere
- 7. Orbiting Space Telescope launched in 1990
- 9. Planet where Sojourner journeyed
- 11. A flashing neutron star
- 12. Large clouds of gas and dust in space
- 14. The north star
- 16. Minor planets; most orbit the sun between Mars and Jupiter
- 17. This planet comes closest to Earth
- 22. Saturn's main moon
- 24. Our planet
- 26. Mars is known as the _____ Planet

From www.surfnetkids.com

Further Society Information

Astronomy in Schools

Previously we have been out to several schools in Tauranga to give Star Parties and small DVD presentations but on December 2nd this year, we gave a larger DVD presentation and lecture on astronomy to Aquinas College with a visit to Otumoetai Primary and Tauranga Intermediate schools on December 12th. with the same presentation. We hope it was a worthwhile experience for the children of those schools as it was a learning experience for us. In the coming year ahead we hope to visit quite a number of other schools in the area and so have it known that we are giving this service - we have known previously of parents hearing about our Star Parties and wanting the same for their school. Roll on 2006.

Jim Barrowclough.

Upcoming Public Meetings of Tauranga Astronomical Society.....

We start again in the New Year !

Many thanks to our committee who have held the reins and given us a great year
- tell all your friends - let's make this a great Society !

TROG.....Tauranga Roaming Observers Group

This is a phone/email list which you can put your name down for if you are interested in 'spur of the moment' observing. This has normally been down at Fergusson Park in Matua, Tauranga, but other sites are being checked out constantly. Contact Ursula or Jim if you are interested in joining the observing group. Andrew Walker has agreed to help man this list too, so you could co-ordinate a time/place with him if you are keen to go out. Andrew's phone number is 573 8550.

NOTE: Public Meeting Visitors;

Casual visitors to public meeting nights will be able to come along free of charge for two public meetings or viewing nights, thereafter a charge of \$5 per meeting or viewing night if the person does not pay the annual subscription.