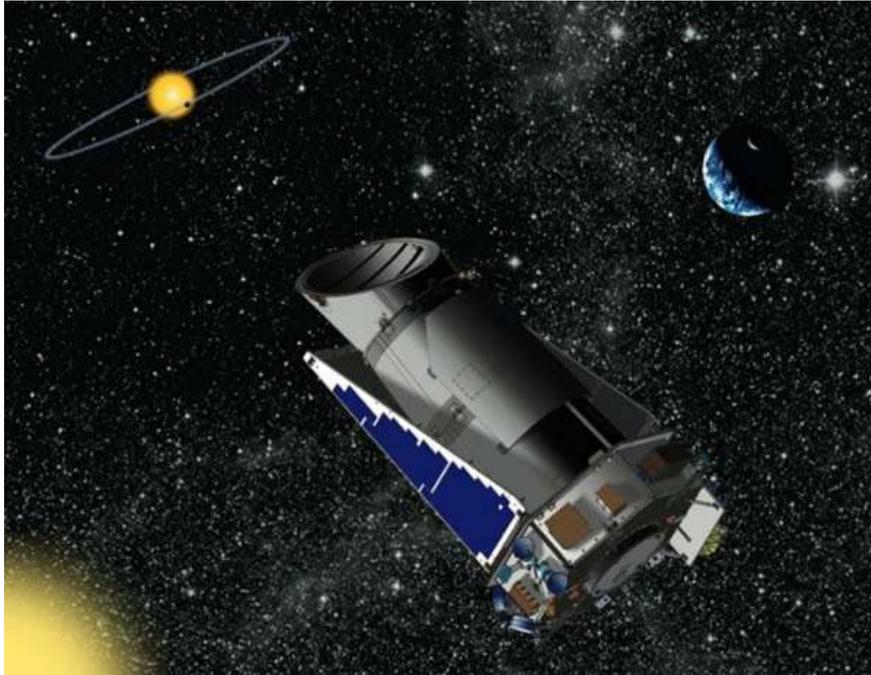


TAURANGA ASTRONOMICAL SOCIETY (INC)

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In March we were fortunate enough to have Dr Grant Christie give a presentation on Extra Solar Planets and the evolving theory on planetary formation. Pictured above is NASA's KEPLER observatory which will monitor over 100,000 stars looking for evidence of planetary systems.

January and February Meetings:

Both January and February meetings were DVD nights.

March Meeting

We were fortunate enough to have the Societies Patron Dr Gant Christie from Auckland present the talk for March. Due in no small part to advertising the event in local papers we had a record attendance for the event.

Grants talk was entitled “**Alien Solar Systems, what they tell us about the formation of planets**” and was a natural extension to last year’s presentation on detecting extra solar planets. His presentation started with a review of historical theory on planetary formation starting with the Solar Nebula Theory first proposed by Emanuel Swedenborg. With this theory it was proposed that planetary systems formed in gas clouds through the coalescing of gas to form the star and the planets forming in eddies within the disk of gas around it. Grant explained that these eddies were believed to form in a similar manner to

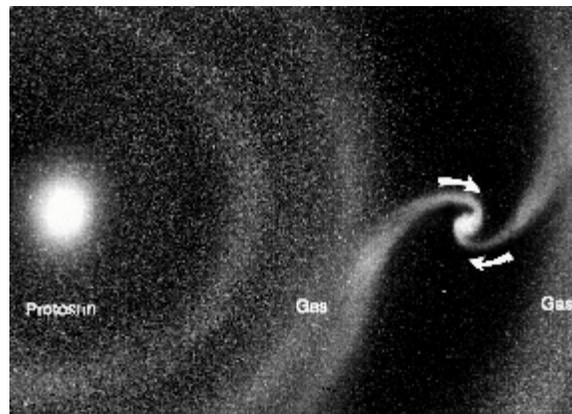
those that we might notice when stirring a pale of paint. This theory had its problems and drawbacks. Not least of which was why most of the angular momentum within the solar system lies with the planets and not the sun which has the most mass.

In 1992 the first extra solar planets were detected (planets outside of our solar system). These were discovered orbiting a pulsar (a rapidly rotating neutron star formed as the aftermath to a super nova).

1995 saw the first planets detected orbiting a “normal” star. The first was detected by an American team led by Geoff Marcy and used the Doppler shift in spectral lines to extrapolate details of the planetary body. These early ones were given the name “Hot Jupiters” as they had rapid orbital periods (the first only 4 days) which meant they must have orbits close to their parent star, and were massive (often many times the mass of Jupiter).

These observations led to changes in the theory of planetary formation. It is now believed that planets form within from interplanetary dust and gas in Nebulae with HII regions within galaxies being particularly fertile ground. It is also believed that dust plays a pivotal role by absorbing energy from hot new stars allowing the gas cloud to collapse further and form stars and planets. Without the dust the gas would be blown away before other stars and planetary systems could form.

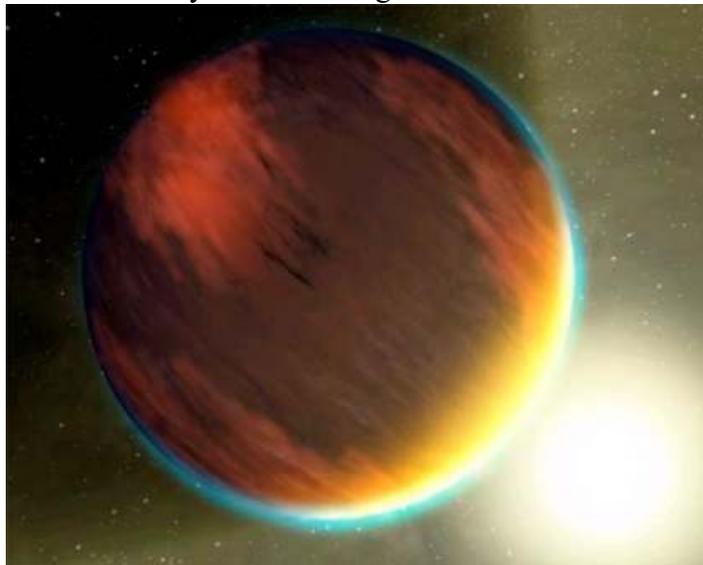
This theory has been backed up by observations using infra red telescopes such as the Spitzer space telescope, which can peer through the gas and allow us to view star formation inside nebulae. Observations show that proto planetary disks may extend to a radius of 200 AU. Interestingly jets have been observed emanating from the stars poles. The first direct images of a planet within a protoplanetary disk were around the bright southern star Fomalhuat.



An important part of current theory which goes to explain the existence of both rocky terrestrial planets and gas and ice giants is that protoplanetary disks are relatively warm out to 4 AU then cooler outside of this mark. Inside this distance water ice can not exist for long and has been dubbed the “snow line”.

It is believed that planets form within these disks through a process of accretion through electrostatic attraction of dust particles to form pebbles up to around 10mm diameter. These then accrete to form asteroids up to 1 km diameter. Through collisions and gravitational attraction these assemble to 1000 km diameter asteroids. There is then a “shake down” period where collisions lead to the formation of a few larger planets. There is a window of around 50 million years for planets to form before the gas and dust which forms the building blocks is all blown away.

Collisions and planetary migration play a big part in the eventual orbits that planetary bodies settle into. A good example of this is the formation of our moon. This was formed by a Mars mass body colliding with a young earth. The rubble and ejected material from the impact coalesced to form our moon. Also had Saturn been slightly larger its orbit would have been perturbed by Jupiter to the point where it would have been flung into the inner solar system wreaking all sorts of havoc.



There are currently two space missions looking to detect transiting exo planets. These are the European Space Agencies (ESA) COROT mission and NASA’s Kepler mission. Both space craft monitor thousands of stars and hope to detect the tell tail dimming of light as an alien world passes in front of its star dimming the light by a tiny yet measurable amount. The Kepler mission will monitor 100,000 stars out to a distance of 3,000 light years and the expectation is that it will detect dozens of earth sized planets.

While there are still problems with current theories around planetary formation this exciting aspect of Astronomy is constantly opening up new planetary systems and images to test our theories against. Currently the tally of extra solar planets stands at over 300 and this figure is set to rapidly rise with the use of new instruments currently launched. It seems like it is only a matter of time until an Earth Analogue is discovered, and who knows, maybe such a world could be directly imaged in the future and the spectral signature of the planet analysed for signs of life.....

It's Finally Here!

By Stuart Murray

Viewing the Universe including our solar system was made more interesting on Monday 30th March. When viewed from one of the latest, spectacularly placed observatories in the South Pacific, it will give Astronomers unique and magnificent sights of the 'Firmament'. The site is of course, the about to be built observatory in Tauranga and was marked on this Monday 30th with the unpacking of its major acquisition - the new 14 inch Meade telescope.

Secretary Jim, Les, Shaun and myself, at Jim's residence, opened the large crate to reveal, in all its glory, the extremely well cushioned instrument. The four of us managed to carefully, ever so carefully, place it on its accompanying tripod, though of course once in the observatory it will be on a fixed column.

If anything was learned that day, it was to read the 75 page A4 sized manual first. Who reads manuals? It would have saved a lot of time in fixing the eye piece remote focus and the other multitudinous number of various coupling units.

At the time of writing the only object viewed through the telescope was a pine needle growing on top of a tree on Matakana Island, or it may even have been on Mayor Island - not quite true, and that was with a basic 26 mm eye piece.

Once set up, the remarkable features of this scope will truly provide wonderful viewing and even research for club members. The easy to use 'Go To', whether with the telescope's onboard computer or a remote desktop, will move, point and track it to any selected object in the sky.



We did accidentally switch to a mode on the onboard computer when, because it was under a metal roof in the garage and this obstructed the GPS to find its location, the

telescope started behaving like a mad dancing robot - continuous declination and right ascension moves. Hopefully by the time it is correctly set up in our observatory, many will have studied the manual and 'tamed' the instrument into letting us see the wonders that abound in the night sky.

Just prior to unpacking the instrument I had a phone call from the Bay Times who were inquiring about meteors many readers had witnessed and could I comment. No, there were no known (to me) meteor showers that the earth is currently going through. I mentioned to the reporter that in 1 to 2 hours we were about to unpack our new treasure. He showed great interest and arrived with a reporter just as we finished setting it up and investigating the telescopes many features. Together they wrote and presented a splendid article in the following night's newspaper that hopefully will raise the society's profile.

Frank Bateson Plaque

Photo by Toby Tobias



Above is a picture of a plaque our Astronomical Society presented to our Patron of many years (Frank Bateson, now deceased) on his retirement from active astronomy at a conference held in Tauranga a few years ago. Frank Bateson was the one who sought out Mt John as the most suitable site for a N.Z. observatory and was Officer in Charge for a number of years (members are encouraged to read his book, we've got lots for sale) but before this there was nothing at Mt John to say what Frank had done.

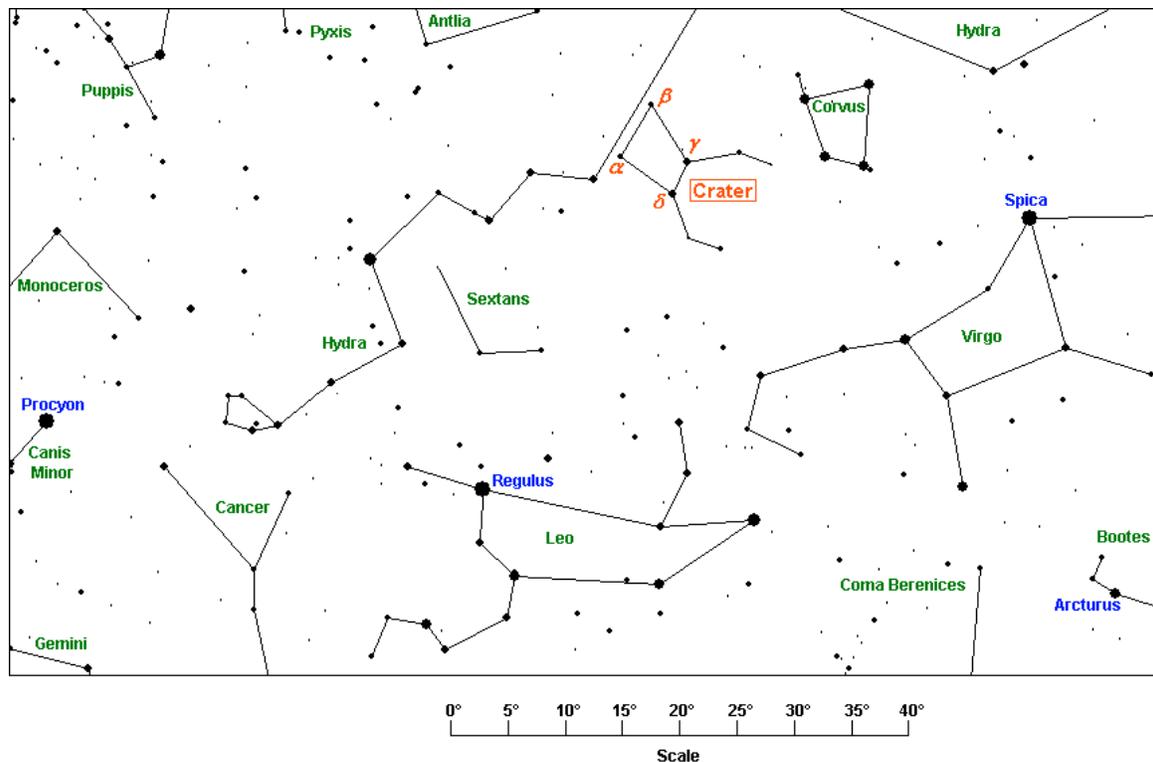
Toby Tobias has recently been down to the South. Island and took some photos at Mt John and as this is the first time this picture has come out it really means something for our Astronomical Society. The photo above the Plaque was put there by Alan Gilmore, officer in charge at Mt. John now, and it shows the young Frank at the time when he set up Mt. John as an observatory for New Zealand.

Constellation up close CRATER, the "Cup"

Crater is an ancient constellation representing the goblet of Apollo, and is a companion to Corvus the Crow on the back of Hydra the Water Snake.

To find Crater look north in the evening to find the bright stars Regulus and Spica. Find the distinctive quadrilateral of Corvus, and look west to find the upside-down cup or sundae dish shape.

Chart showing Crater - as seen high to the north at about 10.00 pm (NZST) mid April.



Details of some of the objects shown in the chart.

α (Alkes) is a magnitude 4.1 yellow giant star 174 light years away.

β Crt is a magnitude 4.5 blue-white star 266 years away

γ Cr is a close double star of magnitudes 4 and 9 with colours of pale yellow, and ashy. They lie about 84 light-years away.

δ Cr is a pale yellow star magnitude 3.55 and about 195 light-years away.

For Sale

Telescope Mirror set. I have for sale the primary and secondary mirrors for a 6inch f 4.7 RFT (Rich Field Telescope). The primary mirror was made by myself and could use re-coating though is still serviceable. They are currently in a telescope so any prospective buyers can view before purchase, I will include the whole scope minus the focuser. This would make a good first scope for someone who does not have a lot of storage space or boot room in the car. Use it as it is or build your own scope around the optics.

Orthoscopic eyepieces. I have for sale brand new, Japanese made Orthoscopic eyepieces for \$80 a piece in 5,6,7,9,12.5 and 18mm focal lengths. These are excellent eyepieces of high quality that will last a life time if cared for. At this price they are cheaper than the wholesale rate from Japan! These are the same eyepieces offered by University Optics in the US.

For more information on any of the above phone Andrew Walker on 07 579-5656 or email andrew32walker@yahoo.com



BACK PAGE

The Tauranga Astronomical Society holds a monthly meeting on the fourth Wednesday of each month at the Otumoetai Soccer Club rooms, Fergusson Park, Tilby Dr, Matua. The meeting begins at 7.30pm and all are welcome.

New comers are invited to attend two meetings free of charge, however, after this a charge of \$5.00 per meeting will apply if membership of the society is not taken up.

Current membership fees are below and may be paid to the treasurer on any club night.

Full Time Student	\$15
Ordinary Membership	\$20
Family	\$30

Meetings consist of a presentation of roughly one hour either by a society member or an invited guest on an astronomical subject. After light refreshments this is followed by viewing through one of the society's telescopes, weather permitting, or the screening of an Astronomical DVD.

The Tauranga Astronomical Society Newsletter is published quarterly each January, April, July and October. The editor welcomes contributions from members provided they are on an Astronomy related subject and are original. Articles for the newsletter may be submitted electronically by email too: andrew32walker@yahoo.com

T.R.O.G (Tauranga Roving Observers Group)

TROG is a list of persons interested in observing from a dark sky site. We have been currently meeting approximately once a month at the editor's home in rural Te Puke. Another location previously used is Bell Road Papamoa and other sites are welcomed.

If interested in observing contact either Ursula Macfarlane 5767283 or Andrew Walker 5738550. The group is informal and no previous experience is required. Just bring along a telescope or binoculars if you have them, any star charts you might need and your enthusiasm.

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