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Total Lunar Eclipse, Aug 2007, Himatangi Beach

NEWSLETTER

February

2011

Foxton Beach Astronomical Society
List of Officers 2010-2011

President:	Stephen Chadwick	Ph 329-9458
Vice President:	Ian Cooper	Ph 329-7829
Secretary:	Tina Hills	Ph 368-6926
Treasurer:	Simon Hills	Ph 368-6926

We welcome contributions from any members - observing reports, photos, news, links to interesting websites, just about anything astronomical will be considered. Please have your contributions in by the 21st of the month. Address any newsletter contributions to Stephen Chadwick at stevechads@hotmail.com or post to 628 Himatangi Beach Road, RD11 Foxton.

NEXT MEETING

Ian Cooper

The Construction of the Sluggish Creek Observatory

THURSDAY February 3rd 2011 at 8.00 pm

at the Foxton Beach School staff rooms, Carthew Terrace, Foxton Beach.

Tea, coffee and biscuits are now available at all meetings at a nominal charge of 50c

We are a Registered Charity. All donations over $5.00 can be used to claim a Tax refund.

Minutes of the General Meeting held on 2nd December 2010 from 8.00pm

Present: Members 14 **Guests:** 0
Apologies: 0

Minutes were read and agreed to be accurate - moved Steve, seconded Simon, Carried

Matters arising from previous meeting

- Almanacs to be handed out at Christmas meal
- Palmerston North Observatory – Sluggish Creak still being completed now looking at opening on the last weekend of January – note will be sent out on email group inviting members. Map can be provided if needed.
- Allen Little mentioned that you would not be able to edit items on Google group from January 2011. Discussion clarified that this will in fact only affect the front page.

Correspondence

The following newsletters have been received and are now available to loan from the library

- Aurora & solar section no242, December 2010,
- Te Patiki – Novemeber 2010,
- Astronomy South December 2010,
- Complementary Almanac 2010
- Horowhenua Camera Club in Foxton made contact regarding viewing for viewing in the New Year, 1st or 3rd Wednesday preferred. Our

President to make contact with their Secretary. Contact details given to Steve.

General Business

- Reminder that this year's Christmas meal confirmed for the RSA on 4th at 6:30pm
- Brenden expressed interest in starting up regular public viewing events at the observatory.
- Medieval Market reminder for helpers to man our stall, contact Steve or committee member.
- Almanacs will be available at the Christmas meal see Ian Cooper.
- Allen Little advised members to look out for the DVD - The Universe (4 DVD book set) priced at $30 is being sold by the book clubs that sell at work places.
- Discussion about NASA's biological discovery which is being announced on Friday 3rd December at 8am

Meeting closed 8:20pm

Members then enjoyed mince pies and coffee before listening to the last talk of the year which was "A year at the Sand Dune Observatory" by Ian and Steve. This was a very enjoyable way of ending the year.

Stardate 2011

(January 6th-11th 2011)

The annual gathering of astronomers from all over New Zealand took place in early January and again FBAS were well represented. We had seven members attend. After last year's wash-out fingers were crossed that we wouldn't experience this again. And sure enough we weren't disappointed.

The FBAS Caravan Park

Those that arrived on the Thursday were treated to a beautiful nights viewing. The Saturday was great. Lots of scopes on the go from small to the weird to the large.

Memerable moments were the Tarantula and 47 Tuc through Dave Moorhouse' 16inch binoculars (for the sale by the way for $10000 if anyone would like to make a charitable donation to the club ☺)

Rocky exoplanet milestone in hunt for Earth-like worlds

Astronomers have discovered the smallest planet outside our Solar System, and the first that is undoubtedly rocky like Earth.

Measurements of unprecedented precision have shown that the planet, Kepler 10b, has a diameter 1.4 times that of Earth, and a mass 4.6 times higher. However, because it orbits its host star so closely, the planet could not harbour life.

The discovery has been hailed as "among the most profound in human history". The Kepler space telescope, designed to look for the signs of far-flung planets, first spotted the planet 560 light years away, alongside hundreds of other candidate planets.

Kepler relies on the "transiting" technique, which looks for planets that pass between their host star and Earth. A tiny fraction of the star's light is blocked periodically, giving a hint that the star has a planet orbiting it. The radius of the planet correlates to exactly how much light is blocked when it passes.

Follow-up measurements by a telescope at the Keck observatory in Hawaii confirmed the find of Kepler 10b by measuring how the planet pulls to and fro on its parent star as it orbits. These measurements also bore out the fact that the parent star was about eight billion years old - a grandfather among stars of its type.

Crucially, this meant that the star was free of the optical and magnetic activity that have introduced some uncertainty into the measurements of previous candidates for rocky exoplanets.

This cosmic dance causes tiny changes in the colour of the starlight that is measured by telescopes.

However, what completed the suite of measurements for the Kepler team was the use of asteroseismology - a study of distant stars that is akin to the study of earthquakes on the Earth.

The oscillations that occur within a star - as within the Earth - affect the frequencies of the light that the star emits in a telltale sign of the star's size.

With the size of the host star, the details of the planet's and star's mutual dance, and the planet's radius, the density of the planet can be calculated.

"All of our very best capabilities have converged on this one result and they all converge to form a picture of this planet," said Natalie Batalha, a San Jose State University professor of astrophysics who helps lead the Kepler science mission for Nasa.

Professor Batalha told BBC News that the result was unique in an ever-expanding field of exoplanet discoveries, with smaller and smaller exoplanets discovered as experimental methods improve.

"We're always pushing down toward smaller and less massive, so it's natural that we're arriving there," she said.

"But perhaps what's not so natural is that we've pinned down the properties of this planet with such fantastic accuracy that we're able to say without a doubt that this is a rocky world, something that you could actually stand on."

One could, that is, if it were not so close to its host star that its daytime temperature exceeds 1,300C - so Kepler 10b is not a sensible candidate to host life. However, as Professor Batalha explained, it is a significant step in Kepler's mission.

"We want to know if we're alone in the galaxy, simply put - and this is one link in the chain toward getting to that objective.

"First we need to know if planets that could potentially harbour life are common, and we don't know if that's true - that's what Kepler is aiming to do."

A pioneer of the hunt for exoplanets, Geoffrey Marcy, from the University of California Berkeley, said that Kepler 10b represented "a planetary missing link, a bridge between the gas giant planets we've been finding and the Earth itself, a transition... between what we've been finding and what we're hoping to find".

"This report... will be marked as among the most profound scientific discoveries in human history," he said.

(Jason Palmer, BBC)

Massive Black Hole Discovered in Nearby Galaxy

Astronomers have discovered a huge black hole, a million times the mass of the sun, in a nearby galaxy -- a finding that could help better understand the origins of the universe.

The announcement by the American Astronomical Society said the surprise discovery in a so-called "dwarf" galaxy offers evidence that black holes -- regions of space where not even light can escape -- formed before the build-up of galaxies.

"This galaxy gives us important clues about a very early phase of galaxy evolution that has not been observed before," said Amy Reines, a researcher at the University of Virginia who presented the findings to the AAS annual meeting.

The galaxy, called Henize 2-10, is 30 million light-years from Earth, has been studied for years, and is forming stars very rapidly. It resembles what scientists think were some of the first galaxies to form in the early universe. Reines observed Henize 2-10 with the National Science Foundation's Very Large Array radio telescope and with the Hubble Space Telescope.

They found a region near the centre of the galaxy that strongly emits radio waves with characteristics of those emitted by super-fast "jets" of material spewed outward from areas close to a black hole.

They then searched images from the Chandra X-Ray Observatory that showed this same, radio-bright region to be strongly emitting energetic X-rays. This combination, they said, indicates an active, black-hole-powered, galactic nucleus.

"Not many dwarf galaxies are known to have massive black holes," Sivakoff said. While black holes of roughly the same mass as the one in Henize 2-10 have been found in other galaxies, those galaxies all have much more regular shapes.

"This galaxy probably resembles those in the very young universe, when galaxies were just starting to form and were colliding frequently. All its properties, including the supermassive black hole, are giving us important new clues about how these black holes and galaxies formed at that time," Johnson said.

(Washinton AFP)

Pondering the moon…!

I'm often challenged by sceptics who argue that man never landed on the moon.... Their argument claims its impossible to do so. I had such a conversation at the Horowhenua AP&I Show whilst manning the **Levin Stargazers** stand…. I recalled hearing news reports back on 20th July 1969 and seeing grainy black and white images of Neil Armstrong climbing from the Lunar Module and stepping out on the surface of the Moon some 407 000 Km's from earth. His sound bite **"That's one small step for man, a giant leap for mankind"** is enshrined in the annuls of modern history. This far on from the reality of 20/07/69, sceptics advance the argument that it was all an American con built on Hollywood technique rather than Science etc… I believe Marama is the only celestial body on which human kind has landed. The Soviet Union's Luna programme was the first to reach the her with unmanned spacecraft in 1959 and the US Apollo programme undertook the only manned mission to date, which began with the first manned Lunar orbiting mission of Apollo 8 in 1968 and six subsequent manned landings between 1969 and 1972. The first being Apollo 11 in 1969.

To the sceptics I ask: were the six subsequent landings a falsehood? The missions which according to sceptics did not take place returned over 380 kg of lunar rocks, which have since been used to develop an understanding of Marama's geological makeup revealing a history of some 4.5 billion years.

"Marama" is Earth's only natural satellite and the fifth largest in the Solar System. She is the largest natural satellite in the Solar System relative to the size of its planet, a quarter the diameter of Earth and 1/81 its mass. Marama is the second densest satellite after Io . It is in synchronous rotation with Earth, always showing the same face; the near side is marked with dark volcanic regions and ancient crustal highlands amidst prominent impact craters. She is the brightest object in the sky after the Sun> The moons surface is said to be very dark, with a similar reflectance to coal.

Amongst the ancients the moon took on a certain mythological mystique. Its prominence in the sky with its regular cycle of phases made the Moon an important cultural influence on language, the calendar, art and belief. The Moon's gravitational influence produces the ocean tides and the minute lengthening of the day. The Moon's current orbital distance, about thirty times the diameter of the Earth, causes it to appear almost the same size in the sky as the Sun, allowing it to cover the Sun nearly precisely in total solar eclipses.

Dr Brian Ventrudo, publisher, of the excellent **'One-Minute Astronomer'** says …"Of the thousands of sights in the night sky, none is easier to see than our own Moon. The Earth's only natural satellite covers a patch of sky smaller than your thumbnail, yet it reveals hundreds of fascinating surface features to a casual stargazer with even the smallest telescope. But after hundreds of years of study, the Moon, in many ways, remains a mystery.

• No other terrestrial planet in our solar system has such a large natural satellite. In fact, our Moon is larger relative to its host planet than any other in the solar system. How did our planet come to have such a large moon?
• Even a casual glance at the Moon reveals dark areas called maria, or "seas". What distinguishes these seas from the brighter areas on the Moon? And what can they tell us about the history of the early solar system?

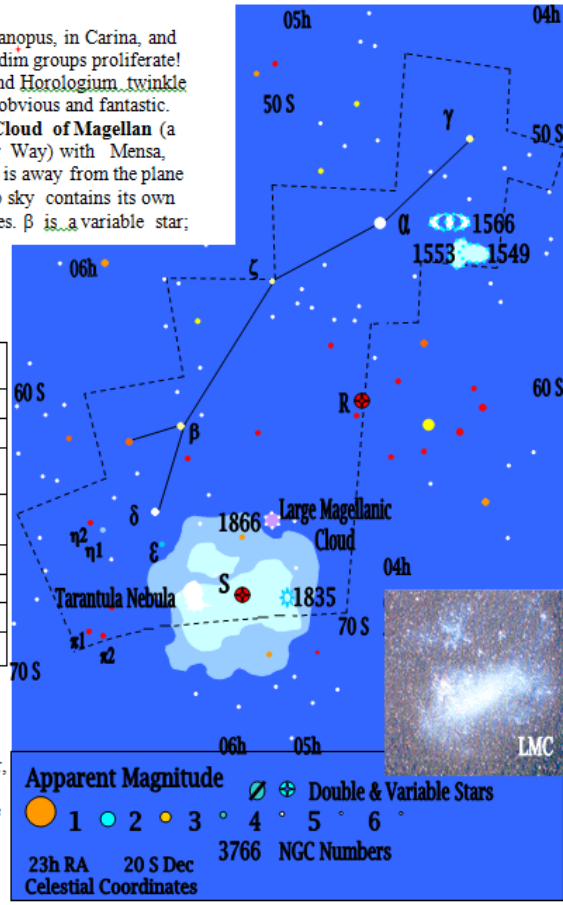
• While the Moon has no water or atmosphere like Earth, and so experiences no erosion, is it really an unchanging and dead world? Or is it possible to see and understand subtle changes on the Moon's surface caused by its unguarded exposure to the harsh environment of interplanetary space? …"

(By Allen Little)

Dorado

The Swordfish

Between the brilliant stars Canopus, in Carina, and Achernar, in Eridanus, tiny, dim groups proliferate! Pictor, Dorado, Reticulum and Horologium twinkle quietly. But one fuzzy bit is obvious and fantastic. Dorado shares the **Large Cloud of Magellan** (a satellite galaxy of the Milky Way) with Mensa, but apart from this, Dorado is away from the plane of the Milky way, so its deep sky contains its own group of more distant galaxies. β is a variable star; η is a wide contrasty double: red and blue!



Stellar Table

Bayer	Mag	Spec	Dist (ly)
α	3.5	A0	181
β var	3.80	F5	372
R var	4.8 – 6.6	M8	long Per.
S var in LMC	8 – 11	SDOR[1]	Bin.
γ	4.4	F5	54
δ	4.50	A5	121
η* *	4.9, 5.8	M0,B1	362
π* *	5.6,5.4	K5,G5	466

Deep Sky Notes

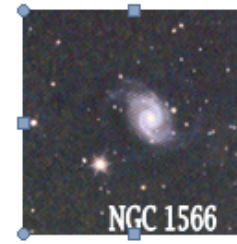
For the Clouds of Magellan – *Officially* Nebeculars Major and Minor, with, of course, only the Major partly in Dorado) use an RFT, binoculars or just your eyes. The LMC is 163,000 ly away, and still stretches over 11° of sky! It is a **barred spiral galaxy**, but is somewhat irregular in shape. (see galaxy section.).

The LMC is 50,000 light years in diameter and contains 30 billion stars, with all of the sights we have in our galaxy plus a few surprises – such as S-Dor above. The huge emission nebula, called the Tarantula, **NGC2070**, is larger (by a long way) than any other observed in the *universe*!

The LMC shines even in full Moonlight and is the most spectacular binocular target in the sky.

Deep Sky Table

NGC	Mag	Type	Dist(ly) & note
1549	9.9	EG	Dorado gp.
1553	9.5	EG	Dorado gp.
1566	9.4	SG	Seyfert.
1835	9.9	GC	163,000 (in LMC)
1850	8.4	OC	2' wide
1866	8.9	OC	163,000 (in LMC) blue globular.



Apart from the LMC, the Dorado Group of Galaxies are quite bright – seen in 7x50 binoculars or a 3" refractor as fuzzy patches, and resolved in an RFT to spirals and ellipticals.

NGC 1549 and 1553 are interacting with each other, and repay study.

NGC 1566 is a beautiful spiral. It is an active Seyfert galaxy and its brilliant nucleus is obvious. Look straight at it for some time and then away slightly. The "fluff" spiral around it stands out in larger aperture scopes.

Cultural Perspectives

S-Doradus can be seen with 7x50 night glasses from my backyard. It is a single star 163,000 ly away in another galaxy, yet it twinkles away like alpha Centauri and Sirius; only the exacting measurements of hard-working scientists and my own research into their writings convinces me it is different. It is a million times more luminous than our Sun!

The **Tarantula Nebula** is so huge that if it was placed as close as the Orion Nebula it would cover thirty degrees of sky! It is the biggest such object in the known universe.

Astronomy can be a marvellous subject, full of surprises. Who would expect, in a small, dim constellation like **Dorado**, (the very name being misunderstood and *mistranslated* by top writers because – let's face it! – it doesn't seem important!), who would expect such wonders?

Only astronomers…

(Diagrams and text by Douglas Jackson)

The View from the Sand Dune Observatory

NGC 300

This is a spiral galaxy in the constellation of Sculptor. Although previously thought to be a member of the Sculptor group of galaxies, recent measurements have shown that it is actually much closer to us and is therefore gravitationally unassociated with the Sculptor group. It is actually a mere 6.1 million light years away from us.

In this image you can see that the arms are peppered with dense star forming regions. The bright stars are actually in the foreground.

(Image and text by Stephen Chadwick)

Calendar of Events

February 3rd: General Meeting
Ian Cooper: The building of the Sluggish Creek Observatory

February 12th Medieval Market
Levin

March 3rd: General Meeting
TBA

If undelivered please return to:

Foxton Beach Astronomical Society
c/o 6A York Street, Levin 5510

Nelson Bartlett Observatory *(Photo by W Marshall)*

THE FOXTON BEACH ASTRONOMICAL SOCIETY
NELSON BARTLETT OBSERVATORY
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