macarthur astronomical society

prime focus

monthly journal of the M.A.S.

Volume 16, Issue 4 May 2011

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President's Report: Trevor Rhodes

Welcome to the May Edition of Prime Focus.

Last month we held our Annual General Meeting. Firstly, I would like to congratulate the new committee. We have one new addition this year in Chris Malikoff. Chris has been our Webmaster now for a few years and so is no stranger to the running of the society. I look forward to working with him over the coming months. Also congratulations and a big thank you to the existing members, Roger Powell, Tony Law, Lloyd Wright, Stewart Grainger and Carol McVeigh for continuing to give generously of their time and expertise to help make MAS what it is today. An even bigger thank you to Carol McVeigh for taking on the extra job of 'Refreshments Technician'.

I can not go any further without making special mention of our outgoing President, John Rombi. John is a man full of praise for other people's accomplishments, but forever downplaying his own. It was John who, three years ago, took me under his wing and taught me not only what amateur astronomy is really about, but how to evaluate my needs in a telescope so that I didn't waste my money. We quickly became friends. A year later I became John's Vice President, a position I have held and enjoyed for the last two years. In that time I've gained a lot of respect for his abilities as a leader, amateur astronomer and family man. His are not easy shoes to fill, so I'll admit to a feeling of trepidation when I first heard about John's 'retirement' and was asked to stand for this job, but with his encouragement and support I hope I can be half the President he was over the last four years. I'll now be depending on all the Committee to help me settle in and take MAS successfully through the next year.

Our new Constitution was passed unanimously and once approved by the Dept. of Fair Trading, will come into force on June 1st 2011.

MAS Committee

President
Trevor Rhodes

Vice President
Chris Malikoff

Secretary
Roger Powell

Treasurer
Tony Law

Merchandising Officer
Stewart Grainger

Webmaster
Chris Malikoff

Committee Members
Lloyd Wright
Stuart Grainger
Carol McVeigh

Patron
Professor Bryan Gaensler (Syd Uni)

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MAS Dates 2011

May	7	Stargard	September	3	Stargard
	28	Stargard		24	The Forest
Jun	4	The Forest			
	25	Stargard	October	22	The Forest
				29	Stargard
July	2	The Forest	November	19	Stargard
	23	Stargard		26	The Forest
	30	The Forest			
			December	17	Stargard
August	27	The Forest		24	The Forest

President's Report: Trevor Rhodes

We also had the privilege to congratulate the following members for having been with the society for:
5 years: Henry Swierk, Stewart Grainger, Davy Jones, Debra Taylor, Chris Malikoff, Stewart Cant, Ivan Fox, Tony Law, Steve Murphy, Graeme Bellamy.
10 years: Bob Monckom, Ned Pastor.
15 years: Noel Sharpe, Roger Powell, Daniel Ross, Phillip Ainsworth, Robert Bee.

Also on the evening, we were honoured to be able to hand over a cheque for $500 to Macquarie Fields High School to help their students attend Space Camp in September this year. Each student was also given a years membership to our society along with a bag of goodies including our Magnitude DVD and other assorted items We wish them well and hope to be able to hear stories about their adventure when they return. The students were lucky enough to be attending our meeting on the same night as a talk was being given by our own Daniel Ross about his trip to Space Camp last year.

Our next Macarthur Astronomy Forum is on May 16th with Guest Speaker, Dr Andrew Hopkins of the AAO. The title of his talk is, **"The Galaxy And Mass Assembly (GAMA) Survey". Please keep an eye on the website for updates regarding room allocation for this night.**

Looking forward to doin' it with you in the dark...

Trevor Rhodes

This month in History

1576: Tycho Brahe given Hveen Island to build Uranienborg Observatory
1933: Karl G. Jansky announced discovery of radio waves from the center of the Galaxy
1949: Neptune's moon Nereid discovered by Gerard P. Kuiper
1961: President John F. Kennedy proposed putting a human on the Moon by the end of the decade
1967: Lunar Orbiter 4 goes into orbit around the Moon
1969: Launch of Apollo 10 to lunar orbit, final full-up test mission before Apollo 11
1971: Mariner 9 launched toward Mars
1973: Skylab One is launched
1990: Hubble Space Telescope Sends First Photographs from Space
1996: STS-77 (Endeavour 11) launches into orbit

Secretary's Column: Roger Powell

My thanks to the members for re-electing me to the Management Committee again. Like all committee members, I am looking forward to another very exciting year of astronomy for MAS.

For those who could not attend the AGM, we now have a new President, Trevor Rhodes. Trevor is only our fourth President in fifteen years and I am sure he will lead the Society along the same steady path of progress that Phil, Noel and John did during their terms.

Trevor takes over a Society which is in great shape. Our financial situation is secure (healthy balance and debt free) and our membership for the last two financial years has reached into the nineties. We have great membership participation rates for all events, we have two (potentially three) good observing sites; and the local press (especially The Chronicle) takes a great interest in our affairs. Not least, we have an exciting Patron of the Society, Professor Bryan Gaensler (Sydney University) who is an icon for astronomy, both in Australia and world -wide.

Our new Constitution was carried at the AGM last month and the Committee thanks all the members who contributed during the process and who voted unanimously to adopt it. I can advise members that the document has now been registered with the Department of Fair Trading and they have agreed to our requirement that the new Constitution be effective from 1st June.

Having adopted a new Constitution, It is worth having a look at the primary Objectives of the Society, which form part of the Constitution (and have not been changed):

1. To foster the science of Astronomy
2. To organise observational field nights for the purpose of carrying out astronomical observation.
3. To assist and give advice regarding astronomical instrumentation.
4. To participate in / co-operate with other scientific societies and groups with a similar scientific interest in astronomy.

These are our principle aims and I believe we fulfil them - but what should our more practical medium term aims be for the next few years? How do members see the Society progressing? How would you like to see it positioning itself? Should we adopt more tangible aims or should we stay just the way we are?

Should we seek to push MAS towards a much larger membership? Should our aims be directed towards the eventual purchase of Society owned instrumentation? If so, should we be looking to lease or purchase property

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Secretary's Column: Roger Powell

to house it? Where would it be – locally to provide easy access to most members or remotely to take advantage of clear skies for those members prepared to travel greater distances to get there? Most importantly, how would it be financed? How would members feel about the Society taking out a mortgage or signing a long term lease? I don't have a clear opinion on most of this yet and neither does the Committee but Trevor and the Committee would like to know your opinion.

Our relationship with UWS may not be quite so solid as it has been in the past, because of their changing personnel and policies but we are working on it. There is good will on both sides and we continue to hold our meetings on campus. It is natural that a community science-based organisation like ours should seek collaboration with a leading public facility like UWS and vice versa. Members have always enjoyed participating in public nights at the Domes in the past, despite the deteriorating light pollution at the site and MAS will continue to request future public nights there.

The Macastro website has become a great asset to MAS since Chris Malikoff took over as webmaster three years ago and has registered over 120,000 hits. The Committee is now in the process of seeking suitable astronomy related clients to advertise on the website. Two organisations have so far registered an interest and the Committee will keep you posted on how this progresses. We do not want to detract from the current look of the site and we aim to generate a small income stream with discreet advertising.

Membership renewals close at the end of May, so outstanding membership renewals will be terminated.

See you at the next meeting!

Coming Full Circle Davy Jones

The Lord set the earth on its foundations; it can never be moved. ***(Psalm 104:5)***

Whilst the subject of this month's article may be familiar to most members, the logic behind the ideas may not be as obvious. Our modern conceit ensures 'we know' how the universe is structured and are confident in our summation because our technology and scientific know-how support our theories beyond a shadow of doubt.

Singh, pp 20, describes how our ancestors studied the sky by night and day to determine changes in weather patterns, measure time, and confirm directions. The ground on which they stood stayed firm under feet, and the heavens passed overhead in an endless and 'fairly predictable' procession; consequently, they assumed the Earth was the centre of the 'known universe', and the heavens revolved around it and them.

Notwithstanding these early, Earth-centred assumptions, there were a few early thinkers who quite accurately proposed a heliocentric (sun-centred) 'universe'. Whilst the idea of our solar system as just a tiny part of the greater universe was still a long way off, these early heliocentric proposals were uncannily correct. Here we can observe yet another perfect example of human knowledge and ideas being built upon – handed down – and developed over several generations. The earliest recognition for presenting a 'true' *heliocentric* model goes to Aristarchus of Samos (310 BC-230 BC); however, it is acknowledged that his proposals were based on the ideas of those who had gone before him.

Philolaus of Croton (approx. 470 BC–385 BC) a pupil of the Pythagorean school, in the fifth century BC, was possibly the first to suggest the Earth orbited the Sun. In the following century, Heraclides of Pontus (approx. 387 BC-312 BC) developed these ideas even further. For his efforts, he was publically ridiculed, labelled crazy, and given the nickname of *Paradoxolog* – 'the maker of paradoxes'.

Whilst there is some disparity about the dates given from various sources, it is clear that Aristarchus was born about the time of Heraclides' passing. Naturally, any of the aforementioned characters are worth further investigation if the reader is so inclined. It goes without saying; their lives were a rich mosaic of mathematical and philosophical thought. *Truly – no man is an island!*

Having established a viable and reasonably accurate model of a heliocentric 'universe' what happened to change that model? Why did this 'accurate proposal' quite plainly disappear for the next fifteen hundred years, until resurrected in the early 1500s by Nicolaus Copernicus – and later, in the face of severe religious persecution, brought to the fore by Galileo Galilei?

Change doesn't occur easily in the human intellect – egocentrism rules – and the majority, especially if supported by religious or mystical factions in society, tends to hold sway against even the most persuasive scientific arguments. It appears our old companion – common sense – was partly to blame initially; the very idea of the Sun being at the centre of the universe just '*seemed ridiculous*' to most people. Add to this, the 'fact' that the heliocentric model did not stand up to rudimentary scientific analysis – and did not appear to reflect reality. Three very specific criticisms appear to have been lev-

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Coming Full Circle

Davy Jones

elled:

- The Greeks reasoned that if the Earth moved rapidly through space – they would feel a great continuous wind pressure blowing against them. The Earth, they concluded must be motionless! This decision was obviously taken on a windless day! However, far be it for me to interject.
- The Greeks inability to appreciate the effects of gravity in the sense that – to them – everything naturally moved towards the centre of the universe. Apples fell from trees – stars were seen to 'fall' from the sky – and so – as everything 'fell to earth' – then Earth *MUST* be the centre of the universe. If the Sun were at the centre of the universe – it was fairly obvious to the ancient Greeks – that everything would 'fly up' and off in the direction of the Sun.
- The third reason given is more understandable in that a lack of instrumentation or technology rather hindered the Greek ability to identify any shift in the positions of the stars. The *stellar parallax* – as it is more familiarly now understood - indeed could not be detected with the naked eye, simply because of the vast distances involved.

(See: http://onlinedictionary.datasegment.com/word/stellar+parallax)

There were however, five celestial bodies that seemed to defy the observations at point 3 above – and these, as we now know, were the five known planets: Mercury, Venus, Mars, Jupiter and Saturn. For those who love trivia - the word '*planet'* – originated from the Greek – *planetes*- – meaning, 'wanderer'. These five non-compliant bodies would present problems that would eventually be overcome by sheer human resourcefulness – or determination to appear correct at any price! Quite simply, one of the core issues in the heliocentric debate was – if the heavens orbit in circles around the Sun – then it followed that there would be an obvious predictability in the patterns produced in the cosmos. The patterns did not appear to concur with the hypothesis.

Over the course of several centuries many astronomers and mathematicians contemplated this conundrum! Slowly but surely, a complex answer began to evolve. The final solution to this problem became associated with the astronomer, Claudius Ptolemy (AD 90-c. AD 168). Ptolemy's, astronomical paper on the intricate movements of the stars and planetary paths – the Almagest – is known as one of the most significant scientific documents in human history. So powerful was Ptolemy's argument, it held sway from its origins in Hellenistic Alexandria, into the Byzantine and Islamic cultures and on into Western Europe through the Middle-Ages and early Renaissance up until the time of Copernicus!

One glance at a model of the Ptolemaic system reveals a system so complex as to be almost unbelievable. Part of the problem that had to be overcome was *caused* by Mars and the outer planets – which, to observers on Earth, appeared to move sometimes ahead – at other times stop completely – and yet again at other times – to move backwards. This apparent anomaly was simply a result of Earth's position within the solar system and our respective orbits around the Sun. However, to make the '*mathematical facts*' fit the geocentric model; Ptolemy devised a complex, but workable solution, known as the *epicycle*! (See: http://www.thefreedictionary.com/epicycle)

The analogy provided for this model compares to a wild fairground waltzer ride, in which the passenger is locked into a cradle joined to a long arm. Whilst the cradled passenger follows a small 'circular orbit' – the longer arm at the same time describes its own much larger 'orbit'. This complex arrangement complied with the demands created by the Earth-centred model and satisfied both science and religion at that time.

Of course, such blatant manipulation of *reality* is not the sole province of the ancients; in more modern times, Einstein's *cosmological constant* was an equally blatant *mathematical mirage* designed to suit the 'required populist truth'. Luckily for Einstein, he got to make amends for his moment of weakness in his rush to comply with the wishes of the ill-informed majority.

As for the Ptolemaic system, the only tweak required to commit it to the garbage bin of magnificent human mirages was a slight adjustment to orbital physics. The most basic mistake made in the first place by those who anticipated the heliocentric model, was to base their assumptions on perfect 360° 'divine circles'. In doing this, those heavenly bodies that wandered the night skies – and should have had predictable orbits – were not where they were supposed to be at the appointed season! In fact, if the orbits are based upon the true elliptical paths taken by the planets in our solar system, then we know with certainty, that those objects will unfailingly appear at the predicted times; but more of that next month.

Refs:

Encyclopedia, W. T. F. (2011, March 1). *Almagest*. Retrieved April 4, 2011, from Wikipedia: http://en.wikipedia.org/wiki/Almagest.

Encyclopedia, W. T. F. (2011). *Aristarchus of samos*. Retrieved April 5, 2011, from Wikipedia: http://en.wikipedia.org/wiki/Aristarchus_of_Samos.

Encyclopedia, W. T. F. (2011, March 1). *Ptolomy*. Retrieved April 4, 2011, from Wikipedia: http://en.wikipedia.org/wiki/Ptolemy.

Singh, S. (2005). *Big bang*. London: Harper Perennial.

Stamatellos, G. (1997). *Philolaus of croton*. Retrieved April 5, 2011, from philosophy.gr: http://www.philosophy.gr/presocratics/philolaus.htm.

MAS MONTHLY FINANCIAL REPORT

Tony Law, Treasurer

Monthly financial summary:
Term deposit: $7,000.00
Cash account: $3,996.65*
PayPal account: $2.56
Refreshment float: $40.00
Merchandise float: $100.00
TOTAL CASH ASSETS: $11,139.21

Prime Focus
Article Submission

Deadline for article submissions for the next edition of Prime Focus is

Monday 13th June 2011

All articles can be submitted via email to editor@macastro.org.au