# MACARTHUR ASTRONOMICAL SOCIETY Inc.

Journal



# PRIME FOCUS

Volume 7 Issue 3

PRESIDENT NOEL SHARPE VICE PRESIDENT JOHN ROMBI SECRETARY IAN COOK TREASURER JOHN KOSTER EDITOR BOB BEE Ph 46 251623

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MAS : Postal Address PO Box 17 MINTO 2566 Phone 46271424

# President's Report

Tonight brings about our 3rd meeting of the year and I wish to extend a warm welcome to all members, guests and fellow Astronomers.

# Last Month

Peter Druery worked overtime last month and kept us up to date with a heap of stuff, from Hubbles deep field of galaxies, the latest comet discoveries and even how to create a black hole on your office desk. Like many of us Peter has a real passion for astronomy and we thank him for sharing this with us. Saturday night the 16th of March was our planned observing night at International House in the Belanglo Forest and hopefully we can share our adventures with you tonight.

# Tonight

We are trying something a bit different tonight and holding some discussion groups. This will be a great way to network with other members and share your common astronomical interests. The groups are as follows:

Finding Constellations and Basic Observing Techniques: leader is Ian Cook Cosmology and accepted theories: leader is John Casey Astro-computing, using computers and a telescope: leader is Daniel Ross Basic telescope information: leader is Noel Sharpe.

Tonight will be on a casual and fun basis and will no doubt contain a small amount of Chaos Theory. After Time is called courtesy of our timekeeper John Rombi, we will assemble back into one main group to hear any announcements and general business matters.

### Very Important

Membership fees are due tonight and must be paid either at the end of tonights meeting or no later than next month. You can mail your renewal if you wish to our PO Box if this is more convenient.

# **Annual General Meeting**

Our AGM will be held next month in this very room. The date is the 15th of April and as a result nominations will now be sought for all Office Bearing and Committee positions. The nomination forms are on the table near the attendance book. For the record positions to be elected are as follows.

President Vice President Treasurer Secretary 3 Committee Members The current Secretary Ian Cook must receive your nominations either tonight or no later than the 2nd of April. Again posting it by the deadline to our PO Box is acceptable. No nominations will be accepted after that date.

Next Saturday night the 23rd is our first Public Observatory session. Please contribute to the night and help make it a big success. It should be all right to get there around 6.00pm with a start time around dusk.

# Next Month

The AGM will be held as you know and afterwards Dr Ragbir Bhathal will be our Special Guest Speaker. His subject of choice will be Mathematics in Astronomy which should be fascinating. It looks like we're back at the Airfield on the 13th April and again on the 20<sup>th</sup> April. Please check the "Bunch of Dates" timetable elsewhere in P.F for a more complete run down of events.

Anyway that's about it for now so I wish everyone clear skies and plain sailing.

#### Kind Regards

Noel Sharpe President

# Mobile Nos. to contact on Star Nights re weather etc.

Noel Sharpe: 0410445041 Ian Cook: 0415915771

# **Black Holes Not Black**

The words 'Black Hole' conjure up in the popular mind some kind of monster lurking unseen waiting to gobble up all unwary matter that just happens to be drifting through space like little Red-Riding-Hood tripping through the woods. This is not true! Neither is it true that black holes cannot be seen, nor that nothing escapes from black holes.

Black holes are neither 'black' nor 'holes'. When is a 'black hole' not a black hole? Apparently when it's a dull red singularity. Depending on size black holes glow a very dull red or a blazing white in the X-ray spectrum. Nor are they holes like a cavity cut into space but full of matter compressed into a deep warp and finally into a theoretical point.

Most astronomers and physicists do not believe the distortion of space-time inside a black hole connects to another space region like so called 'wormholes'. The singularity is an accumulation of what it contains. Its power does not increase disproportionate to its contents. It maintains the same gravitational attraction on distant objects, it rotates and moves through space at the same speed, and it has the same positive and negative electric properties it did before. It does not 'hunt' or search for matter

Four or five different types of black holes have been discovered; one has been measured for mass and size. Some black holes are actually asleep, some evaporate and disappear by themselves, and others wander around galaxies with friends like tourists!

#### Stellar Black Holes are

created in the natural evolution of massive stars. A star of 5 – 100 solar masses at the end of its life span will explode and collapse to form a black hole. Material within the gravitational influence of the new object will be drawn in, heated to millions of degrees and radiate X-rays when passing over the event horizon. X-ray detectors can 'see' a black hole but only while it is consuming matter.

Black holes avoid indigestion. They only consume a small volume of matter at a time. A 10 solar mass star has a diameter of 20-30 million kms and a gravitational pull reaching out much further than that, but the event horizon of a 10 solar mass black hole is only 16 earth kms from its centre. Material that has been gravitationally attracted may spend many years orbiting outside the event horizon waiting to be drawn in. The radius of the event horizon will only increase by about 3 km for every solar mass swallowed.

A black hole becomes dormant when it has consumed all the material available to it at any given time. More distant material is kept out of its clutches by rotating at speed outside the event horizon. Consumption is stopped, growth is stopped, and X ray emission is stopped, hiding the black hole from detection. However, dormant black holes can be deduced by observing the behaviour and motions of material surrounding them.

Ian Cook

# Intoduction to "Discovery of a Concept"

Back in March 2001, MAS member Robert Zindler shared his personal theory on cosmology and the Big Bang and Cruncher. Robert is very passionate about his theory and puts great energy into researching it. His presentation was controversial to say the least, with followers of the more conventional cosmology models pointing out that his 'Third Dimension of Gravity' theory is not supported by any empirical evidence. But that doesn't deter Robert, who has kindly provided the following article which explains where his concepts have originated.

# Discovery of a Concept

#### **By Robert Zindler**

I studied physics as well as chemistry and qualified and worked in industrial organic chemistry in Holland, the U.K. and in Australia. I also studied, qualified and worked for 23 years in the health profession in Australia, and now being semi-retired, I am researching and authoring a number of publications in that area.

#### The First Inspiration:

Being widely read, including astronomy and cosmology, and having a basic understanding of quantum theory, I had a sudden flash of inspiration when reading the special issue of May 1998 of the Scientific American entitled 'The Magnificent Cosmos.'

The inspiration was the recognition of the relationship between the big cruncher – the primordial black hole – the big bang, and dark matter.

This lead directly to the following realisations:

• The big bang is the final phase of the primordial black hole, or big cruncher.

• The big bang exploded into, and collided with, already existing clouds of dark matter which were flowing into the erstwhile big cruncher.

• The resulting luminous matter expanded spherically outwards from the singularity which was at the geophysical centre of the big bang and thus of the cosmos.

• This resulted in the generation of luminous matter which is observable even today.

• Gravity slows down this luminous matter, which for

several other reasons loses its velocity from its initial speed of light at the big bang, to zero near a hypothetical cosmic boundary.

• The totality of cosmic gravity pulls this matter back towards the newly forming big cruncher at the cosmic centre. On its return journey this matter speeds up again, but only to a fraction of the speed of light when approaching this next big cruncher.

• Due to the Law of Entropy, this matter also dissipates its energy and cools and slows down throughout its outward and return journeys and becomes the ubiquitous dark matter at 2.726° Kelvin

• This dark matter, at a ratio of 10:1 to luminous matter, and consisting essentially of <sup>3</sup>/<sub>4</sub> of hydrogen and <sup>1</sup>/<sub>4</sub> of helium, constitutes the bulk of the mass of the cosmos.

• The newly formed big cruncher eventually explodes again as the next big bang, and restarts this whole process.

#### The Second Inspiration:

It was during the subsequent research to clarify these concepts that I had the sudden idea of the 'third dimension of gravity' which manifests as the spirallity of gravity waves with variable wave lengths.

This led to my awareness that all four natural forces are in fact manifestations of gravity with different wave lengths, and that they manifest spacial characteristics which accumulate volumetrically.

This led to the recognition that the singularity of the big cruncher, and therefore of the big bang, is a misnomer as it manifests cosmologically significant dimensions and should thus be renamed the big bang and big cruncher core.

These insights provided greater understanding of quantum theory and the structures and mechanisms of big cruncher and big bang processes.

### **Result of this recognition:**

Everything fell into place. Then followed a period of acquiring background information, discovering some fundamental principles, challenging some current theories and developing internally consistent concepts and mechanisms for a logical sequence of cosmic events.

During this process I became aware of a number of currently accepted concepts and theories which I found difficult to accommodate from a logical point of view. Others I found to be inconsistent with, to contradict and to violate basic physical laws. These concepts are now being collated into a book. It offers some new concepts, which may assist the sciences of physics, of cosmology and, by extension, of astronomy.

Robert Zindler

# Terry Pratchett's View of Dark Matter

At this point of scientific time, no astronomer or astrophysicist seriously claims to know what Dark Matter consists of.

Except Terry Pratchett who, in his novel 'Thief of Time', puts forward this theory:

"For something to exist, it has to be observed. For something to exist, it has to have a position in time and space. And this explains why ninetenths of the mass of the universe is unaccounted for. Nine-tenths of the universe is the knowledge of the position and direction of everything in the other tenth. Every atom has its biography, every star its file, every chemical exchange its equivalent of the inspector with a clipboard. The nine-tenths of the universe is unaccounted for because it is doing the accounting for the rest of it, and you cannot see the back of your own head (except in very small universes.)

Nine-tenths of the universe, in fact, is the paperwork."

So, now we know.

# A Bunch of Dates

International House Dark Site -Belanglo State Forest

08/6/02; 07/09/02; 07/12/02.

# **Observatory Public Night**

23/03/02; 18/05/02; 15/06/02; 17/08/02; 12/10/02.

#### The Oaks

13/04/02; 20/04/02; 11/05/02; 06/07/02; 13/07/02; 10/08/02; 14/09/02; 05/10/02; 02/11/02; 09/11/02; 14/12/02.

### **General Meetings**

18/03/02; 15/04/02 (AGM); 20/05/02; 17/06/02; 15/07/02; 19/08/02; 16/09/02; 21/10/02; 18/11/02.

#### At a Glance up to June.

18/03/02 General Meeting
23/03/02 Obs. Public Night
13/04/02 The Oaks Airfield
15/04/02 AGM Meeting
20/04/02 The Oaks Airfield
11/05/02 The Oaks Airfield
18/05/02 Obs. Public Night
20/05/02 General Meeting
8/06/02 Dark Site Belanglo
15/06/02 Obs. Public Night
17/06/02 General Meeting

# What IC This Month March 17 – April 14, 2002

# Diary

Venus returns to evening sky; Minor planet Vesta visits Saturn; Moon blots out Saturn and Vesta then Jupiter 2 days later; Autumn Equinox; Four planets lined up in Taurus; Uranus discovery -221 year Anniversary ; The Comet comes to the morning sky.

#### **Did You Know?**

An Italian Giovanni Riccioli was responsible for naming most of the moon features but the first map of the moon surface was made by the Dutchman Michael Florent van Langren in 1645. As part of his attempt to determine longitude at sea by the illumination and darkening of lunar mountains he prepared maps of the full moon and of 30 phases. He was the Spanish Royal Cosmographer and Mathematician so he named lunar features after the Royal family and court officials. By the time of Riccioli these names were considered inappropriate and all were abandoned. However the large crater Langrenus on the eastern rim of the Sea of Fertility honoured Langren himself. Transient Lunar Phenomena have been sighted inside the crater. Mikey may be still trying to set longitude in the mountains after all!

# **Evening Sky Planets**

**Venus** returns as the evening star very close to the sunset but gaining height during April. It will move from Aries into Taurus and lie 6° below a thin crescent moon on 14<sup>th</sup> April.

Mars is also in Aries setting two hours after the Sun. On 18/3 the crescent moon will be 3° above it. It will set 30 minutes after sunset as April advances and move into Taurus

Saturn still in Taurus 4° below Aldebaran. At the beginning of April it will be the only planet in Taurus but will be joined by 3 others as the month progresses. On 19th March the minor planet Vesta will be just a mere 0.1° separated from Saturn with Titan the moon sandwiched between. The following night Vesta will be on the opposite side of the planet from Titan. Also on the 20<sup>th</sup> March a thick crescent Moon will be close below.

**Jupiter** rises in the southern end of Gemini, where it has been loitering along for some weeks now. On 22<sup>nd</sup> March a 1<sup>st</sup> Qtr Moon will be just 2° from it, making a triangle with the open cluster M35. During the early evening in April it will join Venus, Mars and Saturn in a Taurus convention of planets.

At that time Jupiter will be very close to where William Herschel discovered Uranus 221 years ago this month.

### Moon

22<sup>nd</sup> March 1<sup>st</sup> Quarter 29<sup>th</sup> March Full Moon 5rh April Last Quarter 13th April New Moon

**Earth** is at Autumn Equinox on 21<sup>st</sup> March when the Sun will rise and set due east and west and there will be equal hours of daylight and night.

# **Morning Sky**

**Mercury** rising in Capricorn is a late morning object in March. On 7<sup>th</sup> April it will reach superior conjunction behind the Sun from us, and will move to the evening again in Aquarius and Pisces. It will not be visible to us till the end of April

**Uranus** and **Neptune** are both still in Capricorn and lost in the daylight

# Meteors

The **Virginids** will provide several peaks of activity between late January and mid April. Originating near Spica they are best seen after midnight. Only 5 per hour.

# Comets

WM1(Linear) is moving from Sagittarius to Aquila and on to Hercules. On  $26^{th}$  Mar it might be found less than  $1^{\circ}$ from the globular cluster NGC 6760 in Sagittarius. Fading from  $8 - 11^{th}$  mag during March/April this could be your last chance.

# Portraits in the Sky

# Leo – The Lion

The first of Hercules' labours was to kill the Nemean Lion, a giant beast that roamed the streets and hills of Greek villages, devouring everybody it met. The animal's skin was impervious to iron, bronze, and stone. Hercules' arrows harmlessly bounced off the lion; his sword bent in two and his wooden club smashed to pieces. So Hercules wrestled with the beast, finally choking it to death. To honour the great fight the Lion was placed in the sky.

However, even before the Greek stories, the lion was an ancient symbol of power and kings were depicted flanked by rampant lions. Archaeological evidence suggests that the lion replaced an earlier symbol of kingly power, the bull, symbolising fertility of the earth and animals.

This switch from a horned bull, to the lion could have been linked with a changeover from a lunar to a solar-based religion. The bull was identified with the Moon, the lion with the Sun. Kings preferred an animal of strength and power and a heavenly body that ruled the day with an annual cycle, rather than an animal of fertility, and a night-time symbol with a short-term monthly cycle.

The constellation movements supported the ascendancy of the lion. The Lion is seen chasing the Bull over the horizon, announcing the end of winter in the northern hemisphere and the beginning of spring. Thus Leo, slayer of Taurus, dominates the summer skies.

Leo is a compact constellation and readily recognisable with bright stars. Many of the stars are named.

Alpha Leonis - "Regulus" means 'one who regulates the heavens.' Copernicus named Regulus but the star was better known as *Cor Leonis*, the Lion's Heart. Regulus is a multiple binary. Component B is very wide (177") and has its own companion (2.6") a very faint 13 mag dwarf. The orbital period of B and C is about 2000 years.

**Beta Leonis** a white 2.1 mag star called "Denebola" which means the Lion's Tail, and naturally is the star at the end of the triangle forming the hind quarters of the animal.

*Gamma Leonis* - "Algeiba", is Arabic for forehead, but is also named *Juba*, meaning mane. This is a pair of 2/3 mag gold/yellow stars separated by 4.4".

*Iota Leonis* is located halfway down the rear leg of Leo and is a good point to start looking for M65/66. It is a double with a  $6^{th}$  mag companion separated by 1.62" slowly increasing in distance.

*Epsilon Leonis* and *mu Leonis* are in the sickle shape of the head. They are called "Al Ashfar", meaning the evebrows. **Deep Sky Objects in Leo:** Leo has five Messier objects: **M65 and M66** a pair of spiral galaxies in the same field, near Iota Leonis. Both galaxies are elongated northsouth; M65 has a tighter spiral. About a degree north hovering just between M65 and M66, is a wispy patch **NGC 3628**, a faint galaxy seen edge-on. Actually this is larger than either Messier object, but much dimmer because it is seen edge-on.

M95 and M96 form another nice pair, although farther apart. The two are found in a group of galaxies midway between alpha Leonis and theta Leonis, and just slightly to the south. Of the two, M95 is to the west.



This is a curious round object, with a very faint circular bar. M96 is a tight spiral galaxy, much brighter than its neighbour. M105 is a much dimmer galaxy to the north-north-east of M96.

NGC 2903, somehow escaped Messier's telescope, even though it is brighter than any of the above Messier objects, and covering a larger area. It is an elongated multi-armed spiral at visual magnitude 8.9, located 1.5 degrees directly south of *lambda Leonis*,.

Good seeing IC