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Presidents Report

John Rombi

Welcome to our 2nd meeting of the year, I would like to thank Chris Malikoff (our webmaster) for bringing us up to date on the expansion of our website last month and also being available to answer any questions concerning the operation of the site.

The Domes:

Roger Powell and I meet with representatives of U.W.S last week.

We came away with our objective achieved; that is to have the observatory opened for a monthly Public night at First quarter moon.

Apart from Dr Ragbir Bhathal, Mike Johnston from U.W.S will also be an Official User of the observatory.

Six members will be chosen as "Adjuncts" between U.W.S & M.A.S and will be M.A.S's contribution to the operation of the domes. These people will have been chosen by the time you read this.

The first night is Saturday March 7th. If the weather is unco-operative the event will still go ahead, we will meet (in a still unknown room) set up our scopes there.

The public will then be directed to that location where they can have a discussion with an astronomer (M.A.S) you will be able to show off your set-up and showcase our club.

I'm sure an Info & sales desk will be set up as well.

So please keep this first date clear, as U.W.S will be watching to see if we can deliver, it's all up to YOU.

I would like to thank Roger for all his assistance and hard work in achieving this objective.

The Forest.

Hopefully by the time you read this a solution has been reached. I have been informed by International House that the cost of using the cabin has risen from $8 per person per night, to $110 per weekend.

We would need a bumper crowd, with members staying both nights to be able to achieve this on a monthly basis.
With the weather being very unpredictable the last 18 months, we have had only 3-4 members making the trip each event. With the new pricing structure this would place a very unfair financial burden on the attendees.

I am in communication with their business manager, so I hope a fairer system can be worked out.

I will keep you informed.

Observing Nights

At The Forest have not been up to scratch, Stargard on the other hand has redeemed itself and produced some great clear nights with excellent observing sessions.
It's great to see members with new scopes (for the first time) or as an addition to their arsenal.
For such a small club, we are a very active one; keep it up!!

Committee Members

Daniel Ross (V.P) and Dick Everett (Treasurer) will not be nominating for a committee position at the A.G.M.
I will have more to say about these hard working members in future P.F's.

If you think you would like to take up the challenge of guiding M.A.S into the future, consider nominating for a position.

Forms will be made available at the meetings or from the secretary.

As you can see we are going to be very busy this year, so please make sure that all the vital dates are on your calendar and that you are able to attend as many as possible.
A Quote from ***"The Dish"*** (Cliff Buxton, Director) ***"This is our chance to make science daring"***
So let's take a leaf out of that book!!

Tonight Our speaker will be Ian Cook (member)

Clear Skies, John Rombi

Observing Dates

February
16/02/09 General Meeting
21/02/09 Stargard
28/02/09 The Forest

March
16/03/09 General Meeting
21/03/09 Stargard
28/03/09 The Forest

April
18/04/09 Stargard
20/04/09 AGM
25/04/09 The Forest

May
18/05/09 General Meeting
23/05/09 The Forest

June
15/06/09 General Meeting
20/06/09 The Forest
27/06/09 Stargard

July
18/07/09 Stargard
20/07/09 General Meeting
25/07/09 The Forest

August
15/08/09 Stargard
17/08/09 General Meeting
22/08/09 The Forest

September
12/09/09 Stargard
19/09/09 The Forest
21/09/09 General Meeting

October
10/10/09 Stargard
17/10/09 The Forest
19/10/09 General Meeting

November
14/11/09 The Forest
16/10/09 General Meeting
21/11/09 Stargard

December
12/12/09 Stargard
19/12/09 The Forest

Secretary's Column

Roger Powell

Early last December, we faced the prospect of a maximum of only two scheduled public observing nights at the Rotary Observatory for 2009. Last year we also had only two and both were cancelled due to the weather. This was just not good enough for the *International Year of Astronomy* and a decision was made to stir things up a bit.

Although there were delays due to the holiday break, I was very pleasantly surprised by the depth of the response from UWS to our pleas. Nine public observing nights at the Rotary Observatory between March and November is very exciting news for MAS - and UWS has also indicated a desire to develop a much closer relationship with the Society, which is a fantastic development.

I look forward to a huge turnout of member's telescopes for the first public night on 7th March.

I'll be out there a lot more often than I was in the past. I was going nowhere with my old 4½" equatorial reflector. I could only approximately polar align it; my knowledge of the constellations was inadequate despite a lifetime of interest; and my inclination to use it had diminished because of my difficulty in finding objects and the onset of several bouts of bronchial asthma. The last time I went on an MAS observing night was six or seven years ago.

Last year I bought a Meade 8" LX-90 ACF telescope from Bintel, with GPS, automatic alignment and electronic hand control. I had hesitated to buy it because it would have been a huge waste of money if the urge to observe did not return or if I started getting sick again. However, I was very attracted by the thought of being able to accurately view objects without worrying about where they are, so long as they are above the horizon.

I will always have a genuine respect for all those very experienced members who can manually track down the faintest of objects with their Dobsonians (especially when 'up' is 'down' and 'left' is 'right') but I knew my 'star-hopping' skills were poor. I wanted to observe without spending all evening trying to find one object and I wanted to use my experience with computers to improve my ability with a telescope.

After eight months I can report that this was the best purchase I ever made!

I can now lock onto any object that is visible in an 8" SCT – without having to research it's location - just by pressing a few buttons on the hand controller - and I probably saw more objects in my first full observing night than I had in my entire life. The imperative to learn the constellations off by heart has been eliminated, as has the need for polar alignment and setting up level.

Switch it on and the GPS detects its exact geo-position and the precise time. It determines north and automatically compensates for any deviation in level. It achieves astro-alignment by slewing to two bright stars such as Sirius and Canopus and waiting for me to centre them in the eyepiece. After that I can select any object from it's library to view at the press of a button.

I have now added Bluetooth to cordlessly connect the hand controller to a laptop to control the telescope – a facility that will soon become very useful, as I begin planning a journey into the world of astrophotography.

A few months ago, John described me as a born-again astronomer! I suppose in a way he is right in a way and who knows, maybe I'll even learn a few more constellations!

60

That's the number of satellites now known to be orbiting Saturn. When I started out in Astronomy it was only nine!

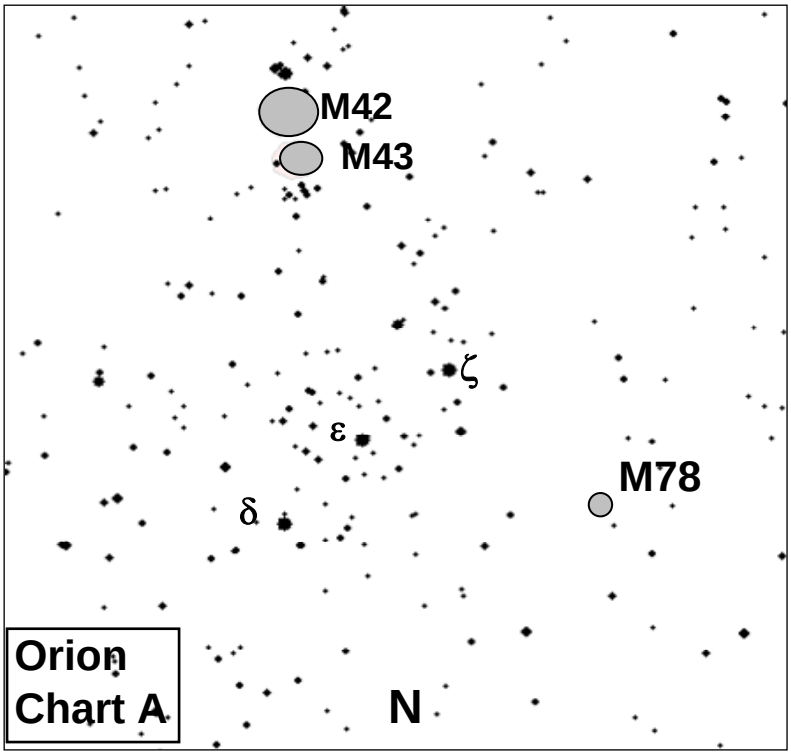
Star Hopping to Messiers #10
Orion (M42, 43 & 78), Monoceros (M50), and Auriga (M36, 37 & 38)

Bob Bee

While these Messiers are still available to the North, let's hop to them.

Orion: M42, M43 & M78.

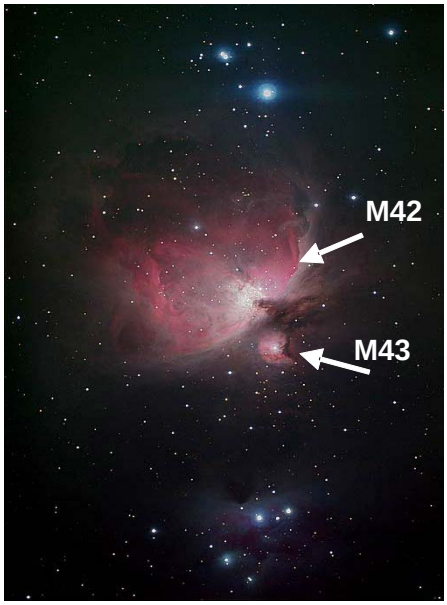
You probably need no help finding M42, the Great Orion Nebula, but just in case, look at 'Orion Chart A' below.



In the centre is Orion's Belt, comprising the three 2nd Mag stars δ, ε and ζ Orionis. These span just 2.75º, a handy fact to remember. The handle of 'the saucepan' is above them (south) and the magnificent M42 (with its imbedded stars) is in the middle of the handle. Place your finder scope there and – bingo! **M43**, actually part of the same nebulous cloud as M42 but optically separated from it and much smaller in size, is just below M42.

Also from Chart A you can also see the general location of M78, on the opposite (northern) side of the Belt towards Betelgeuse.

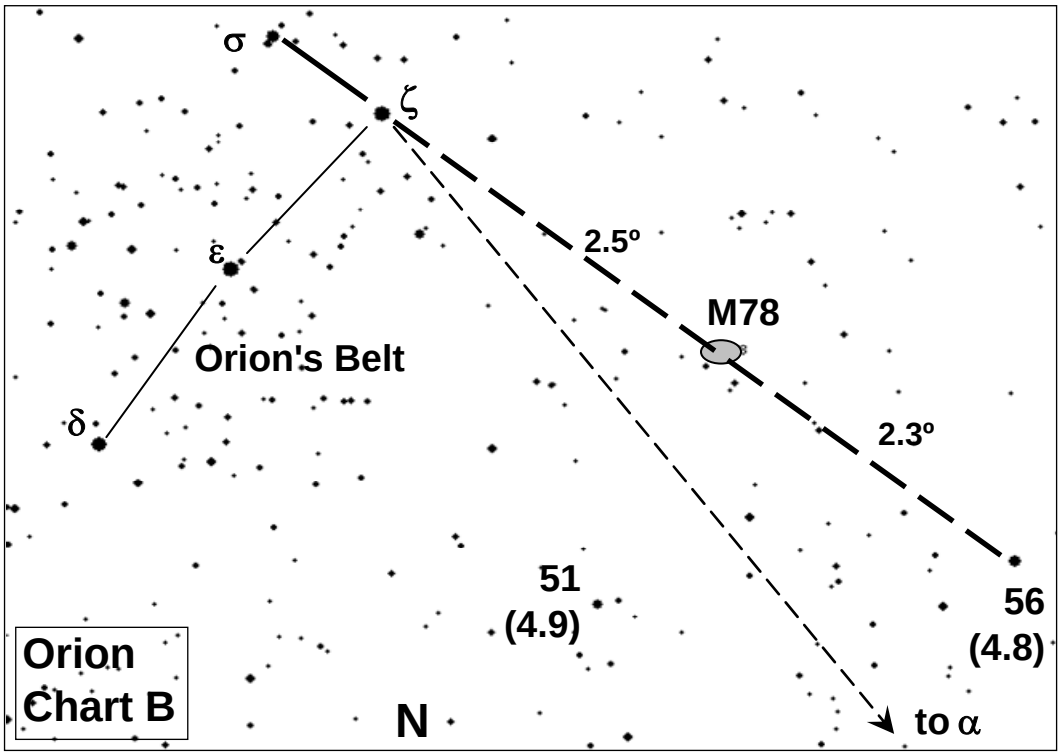
See the image below showing how M42 and M43 look in your eyepiece (without the colour, of course). When you are seeing one, you are actually also seeing the other. You just need to see where M42 ends and M43 starts.



M42 and M43

M78

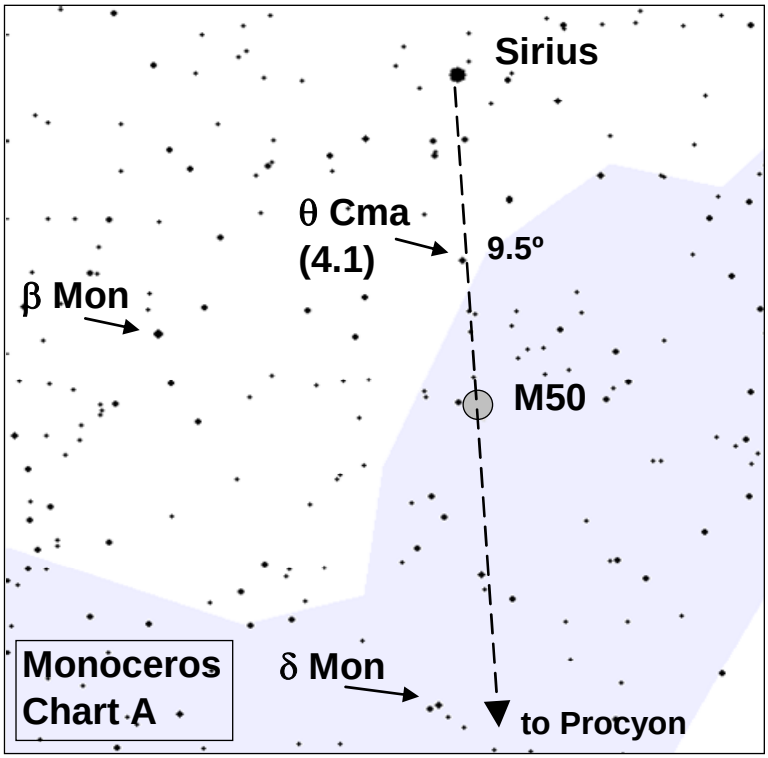
To find M78, a small comet-like elongated reflection nebula, see Chart B below.



You can see the 3 stars in the Belt and the mag 3.8 σ above ζ. There is a mag 4.8 star **56 Ori** only 4.8º below ζ in the general direction of Betelgeuse. In fact there is a direct line from σ through ζ that lands right on 56 Ori. M78 is almost halfway between ζ and 56. So if you put one edge of your f/s FoV on ζ with 56 on the other side, estimate half-way and put the f/s centre on that. Check your main eye-piece. There's **M78**. You may need averted vision to convince yourself.

Monoceros: M50.

Monoceros is located immediately east of Orion. Its stars are maddeningly faint, all mag 3 and fainter. Most of them are located inside the triangle formed by Betelgeuse, Sirius and Procyon. It's best to ignore them. As a rough first guide, **M50** is located on the straight line between Sirius and Procyon, 9.5º from Sirius. See 'Monoceros Chart A' below.

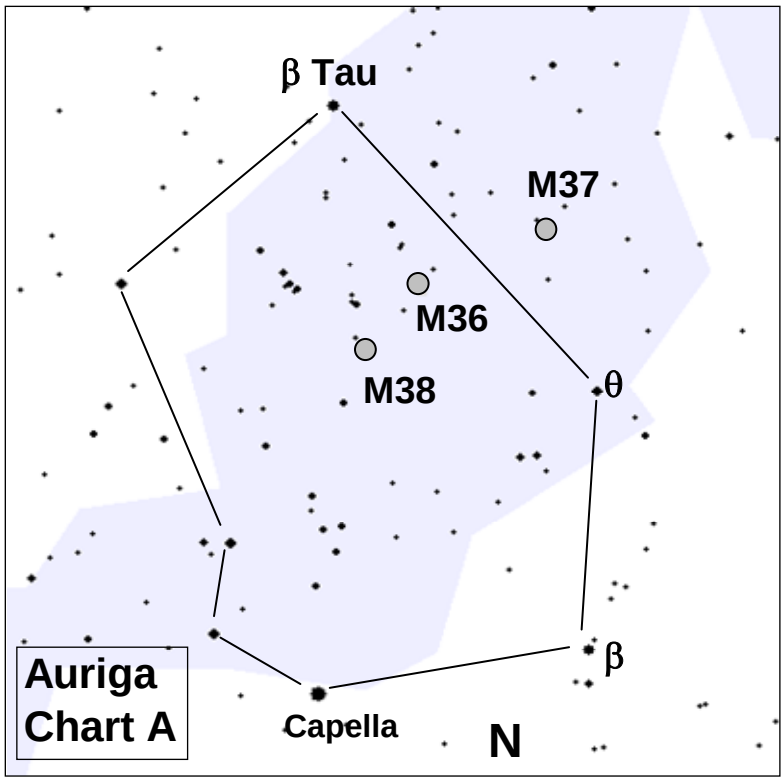


The best way to go is from Sirius. You'll be moving straight down the line to Procyon. In your f/s, get Sirius and the mag 4.1 star θ CMa in the FoV (they are just on 5º apart). Move down that line till θ is on the edge of the FoV. **M50** should be near the other edge, 4.2º away. There's a mag 6 star only ½º away from M50. Check in your main eye piece. M50's a nice open cluster about half the Moon's diameter.

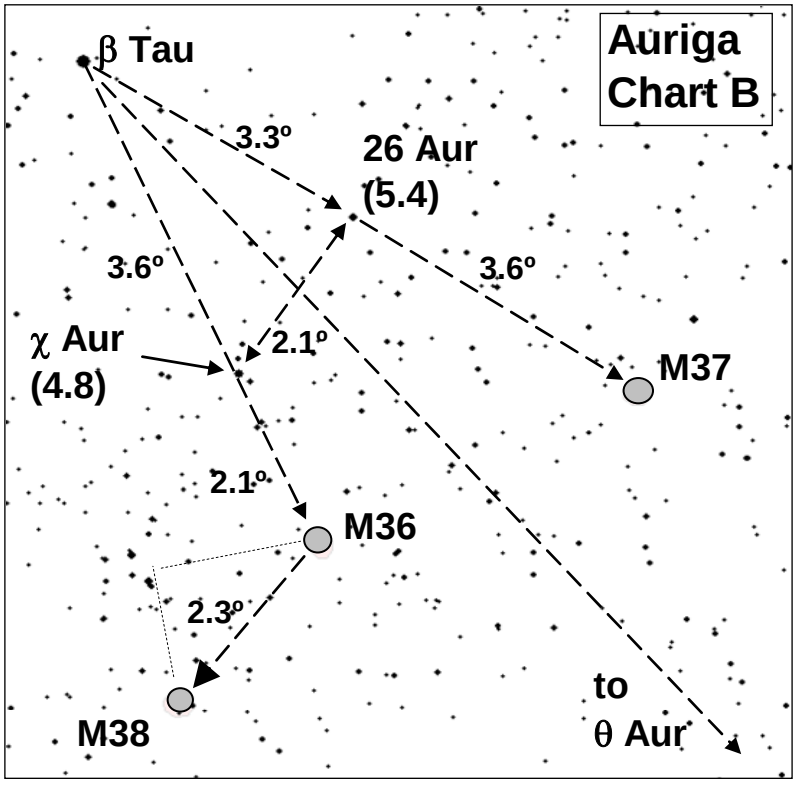
Auriga: M36, N37 & M38.

This constellation, with its bright star Capella, is very close to the northern horizon from Sydney. The three Ms are fairly close together as shown on 'Auriga Chart A' below. The first step to finding them is to identify the stars θ Aur and β Tauri (Alnath, the northern horn tip). The Ms fall on either side of their connecting line, roughly half way. They are all scattered open clusters, visible (to varying degrees) in binoculars and small telescopes.

Star hopping details are shown in 'Auriga Chart B'.



Now the line connecting β Tau and θ Aur is fairly devoid of bright guide stars. There's nothing brighter than mag 7. It's easier to use other guide stars to the east and west of the line to find M37 and M36 respectively. Refer to Auriga Chart B below.



Start with finding **M37**. Put your f/s centre on β Tau and move down towards θ Aur but sightly east (i.e. right) of the line to find a mag 5.4 star 26 Aur. (26 Aur is the brightest star in that part of the FoV, so it's fairly easy to identify.) It's only 3.3º from β so it and 26 are in the same f/s

FoV. Once you've got 26 Aur, continue in that line for another 3.6º and you should land right on M37.

Now we'll go left (west) of the $\beta - \theta$ line. Starting at β Tau again, move downwards 3.6º till you find the mag 4.8 star χ Aur. Again, it is the brightest star in that part of the sky. In fact, β Tau, 26 Aur and χ Aur should all be visible in the same f/s FoV as a triangle, with 26 and χ only 2.1º apart. χ is the lower one. Keep moving down along the line from β to χ for another 2.1º to arrive on **M36**.

To find **M38**, rotate the line from χ to M37 by 120º about M36 (see the chart) and move 2.3º down and westwards. You should land on **M38**. Another trick is to move west from M36 to a tight group of mag 5 and 6 stars, then drop down at right angles to M38. Both will work.

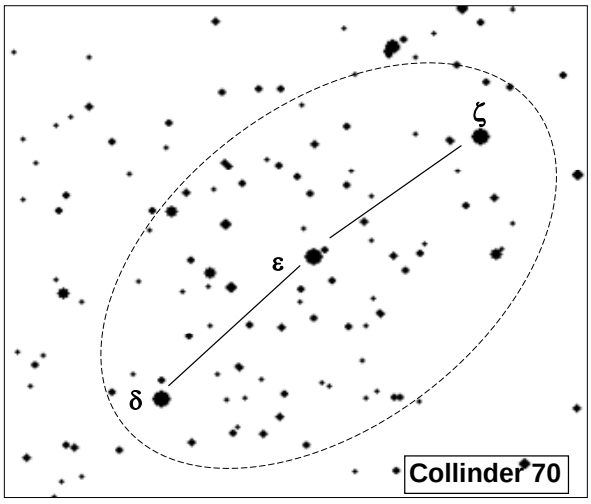
Good Hopping!

S is for Saucepan

Bob Bee

I discovered a quaint asterism the other day (courtesy of S&T) and realized I've been looking at it for decades and not knowing it.

There is a cluster of stars named Collinder 70. It's best seen in binoculars or a low power finder scope.



The cluster is in fact all in and around Orion's Belt, a couple of dozen stars of 5th magnitude and fainter. We usually spend so much time observing the belt's main stars that we don't notice all the others in plain sight.

But the 'quaint' feature is: If you look at the area between, above and below the centre and left Belt stars (δ and ε), you can see a winding trail of stars that have a distinct 'S' shape. I even see it as a sea-horse, or, for the mathematical, an integral sign. Look at the chart above and you can see it. It's even more obvious 'in the flesh' through your binoculars and finder scope.

In fact, if you relax your vision and look at Collinder 70, you can see all types of shapes. What else can you spot?

As for the S, maybe it stands for Saucepan?

Black Holes Ain't Holes – Part 7

An essay on the problems perceived with the concept of black holes

Robert Zindler

(Editors Note: Robert Zindler has kindly offered the readers of Prime Focus sections of an essay he producing. Each month you will find the next extract from this essay.)

Purpose of retro-reasoning

Retro-reasoning was invoked to provide cosmologists with answers to three issues:

- The explanation for the various phases of the interpreted current expansion of 'the universe' from the initial singularity.
- The putative source for the generation of the entire cosmos.
- The explanation for the mathematically derived physical conditions of this singularity, with its properties of infinite or near-infinite temperature, density and gravity.

These putative properties of the singularity were crucial, in that they were essential to facilitate their eventual putative trans-configuration from the hyper-properties of the singularity into the entire ensuing cosmos, replete with its matter and energy, as well as space and time. And this new cosmos would also be infinite in size, as some present-day cosmologists would have it.

Problems with a spontaneous, autogenous big bang

This line of reasoning, however, also has some serious problems which have never been resolved.

How would this putative primordial big bang singularity have come into being spontaneously and autogenously in the first place:

- If there was *no* preceding cosmic contraction and implosion into a point-singularity, how did this singularity acquire its putative hyper-qualities?
- If the cosmos is infinite in size, as claimed by some cosmologists, then this process of trans-configuration of the initial infinite hyper-qualities to an eventual infinitely sized cosmos, clearly cannot be completed and this process must, therefore, continue indefinitely into the future. In the first place this concept is difficult to comprehend, and secondly, this concept is tantamount to the concept of a, by now discarded *steady-state* universe, for which there is no direct or indirect evidence. It is evident, that the currently prevailing concept of black holes and their singularities is difficult to sustain, and that a different concept is really needed.

The pea or thimble-sized singularity

Some cosmologists, recognizing the insuperable problems presented by the proposed zero-dimensioned, physically non-existent point-singularity have in recent years shied away from this representation of such a singularity and *did* attempt to avoid violating conservation law by adopting the concept of a singularity with the size of a pea or a thimble. This substitution has been made in order to overcome the absurdities associated with the zero-dimensional point-singularity, as well as to account for the otherwise physically impossible hyper-properties of the *singularity*. However, it is fatuous and bordering on the incredulous, to unilaterally change the dimensions of the *point-singularity* to the size of a pea or a thimble for convenience.

Three types of black holes

There are reputed to be at least three types of black holes. The difference is a matter of scale and origin. Theorists have considered other types of black holes, but both their putative modes of formation and scales are entirely different and they are therefore not considered here.

- The *primordial cosmic big bang black hole* with its core *singularity* and its properties

and other attributes, which also purport to herald the *beginning of all space and time and the entire universe* and its subsequent expansion. The question should then be asked: Does the concept of the generation of space and time simultaneously with the generation of the entire cosmos by the trans-configuration of energy by the big bang, perhaps unwittingly, foreshadow a close link between space, time and energy? This subject will be addressed in another essay.

Note: It is noteworthy to recognize that the process of retro-reasoning is also a description of the process of cosmic *contraction* to form *the big cruncher* in a *closed universe.* The putative ultimate conditions of the *big cruncher* appear to be the same as the initial conditions of the big bang singularity, thereby implying that the big bang cosmic expansion was, or could have been preceded by an earlier *big crunching cosmic implosion or contraction*, thereby implying *a cyclic cosmos.*

- The *black hole* resulting from the gravitational collapse of Type II supernovae with the mass of matter which is *not less than* three solar masses. This is known as 'the Chandrasekhar limit'. Its massive total internal gravitational attraction is generally accepted to be the cause of its implosive collapse.
- The *galactic black holes.* In recent years, cosmologists considered that most, if not all, galaxies must have a black hole at their centre. Galactic black holes can be much larger than the black holes of collapsed supernovae, as envisaged in "Supermassive black hole: Large black holes with "millions to billions of solar masses of material" (Fred Adams and Greg Laughlin, *The Five Ages Of the Universe,* The Free Press, 1999, p 214).

  Take also, for instance, the statement: "The Milky Way's own central *black hole*, which weighs in at 3.6 million solar masses..." in *Update in Massive Black Holes* R.N., Sky & Telescope, May 2007, p 20 and countless similar articles. Then ask yourself the question: How much does a hole – a hollow structure without physical boundaries like a black hole – weigh? The clear, unequivocal answer is – *nothing*! A hollow has no matter component and cannot weigh anything. But *black holes* tend to be described as consisting of solar masses as referred to above. Their weights amount to enormous and sometimes even unimaginable values. This amounts to a serious contradiction. If black holes consist of or contain 'millions to billions of solar masses of material', then *black holes cannot be holes or hollow* and should *not* be represented as holes, as they connote values and properties of matter which differ fundamentally from those of holes.

There are qualitative and quantitative differences between these black holes which will be addressed below. I will, however, indicate in the next section, that I have good reasons to believe that only two types of black hole are extent.

According to Einstein's theory of relativity, a black hole is "a never-ending implosion" (Robert Kunzig, *Black Holes Spin?*, Discover, July 2002, p35).

No supernova black holes

I propose that there are only two types of 'black holes': the primordial cosmic and the galactic black holes. Supernovae cannot contract into black holes because they are cosmically too small, if they consist of less than the minimum three solar masses which are known as the *Chandrasekhar limit.* May I suggest that supernovae and small galaxies only have *neutron-star* cores.

The primordial cosmic black hole

The 'big bang' is seen as a primordial cosmic black hole. In the currently prevailing standard cosmological model (SCM), the big bang purports to be *the ultimate beginning of the universe.*

This precludes any pre-big bang existence. This concept is reinforced by Einstein's t = 0, where "t" connotes ultimate cosmic time, and "0" connotes zero, which defines that nothing – not even time and space – could have existed prior to t = 0. This is, indeed, a problematic concept. But the entity of a black hole and its singularity requires a relatively detailed description of prior *developmental* phases of a black hole as described in the process of *retro-reasoning*. This is in stark contrast with the concept of t = 0. This, of necessity, is a wholly speculative issue and is the exclusive realm of cosmology.

This, however, has not deterred cosmologists from theorising about, and ascribing properties to the big bang and its singularity.

Putative properties of a conventional black hole

The development and structure of a black hole and its singularity is conventionally explained by the *thought-experiment* of *reverse or retro-reasoning*. In the case of the primordial big bang 'origin of the universe', the gravity generated by the total mass of cosmic matter is deemed to be sufficient to generate the pressure required to compress that entire body of matter of the cosmos to the size of a singularity and in the process to trans-configurate that matter into energy according to Einstein's $E = mc^2$. Something akin to the primordial black hole also occurs to the galactic black holes, but on a much smaller scale and also not to the extent and extreme level of the primordial black hole. Thus, according to the standard cosmological model (SCM), black holes are deemed to have the following characteristics which are supplemented by my comments:

- A *black hole* must clearly be spheroidal, as due to its intrinsic, ultra-high gravitational force, a *black hole* cannot display any shape other than that of a sphere whose boundary is known as *the event horizon*. The familiar funnel-shaped illustrations of *black holes* are grossly misleading and lead to perceptual absurdities. (Refer below to Illustrative problems).
- A *black hole* is a physically hollow cosmic structure of significant size equivalent to the number of solar masses that are contained and by which they are officially described.
- A *point-singularity* is at its geo-cosmic and geo-galactic focus or centre with *hyper-quality properties* of the singularity in the order of *infinite* or *near-infinite* levels of temperature, density, gravity, and clearly also pressure.
  It is noteworthy to observe that among the hyper-qualities of density, temperature and gravity, which putatively result from the formation of the singularity during the retro-reasoning process, *pressure* is rarely if ever reported, despite the logical requirement of *hyper-pressure* to ensure the invariously reported *hyper-density.* This seems to be a curious oversight and *hyper-pressure* will be added to the other three putative hyper-qualities of the singularity in this work as a matter of routine and where appropriate.
- An *event horizon*, is "an imaginary surface beyond which no matter or radiation can reach us." (Laurence M. Krauss and Robert J. Scherrer, *The End of Cosmology?*, Scientific American, February, 2008). The event horizon constitutes the spherical boundary that defines the geophysical limits of the black hole and separates the black hole from the rest of the galaxy and, therefore, of the cosmos.
- A distance – an *empty space* – between the black hole singularity and its event horizon.
- The *Schwartzschild radius* of the spheroidal event horizon which may manifest cosmologically significant dimensions and is proportional to the number of solar masses accreted and absorbed by the black hole.
- Gravitational forces in black holes are so great, that even light – which travels at the speed of 187,000 km per second – emanating from this inflowing matter cannot escape.
  As a result also, cosmic matter and 'information' that crosses this boundary can never escape from black holes and is 'lost forever'. (Hawking repudiated this afterwards

publicly.) This has lately been reconsidered and some radiation has been detected to emanate from black holes. This is known as *Hawking radiation* which does allow a slight leakage of light from black holes and hence the new name *of grey holes* (refer to Steven Hawking's papers).

Invisible black holes

The standard statement about black holes is that its gravity is so great that 'even light cannot escape'. This is the crucial reason why black holes are called black – they are invisible. I posit, however, that this statement merely represents a theoretical concept and in no way represents the real reason why black holes are invisible to the observer. The cores (and their surrounding matter) of galaxies invariably manifest the greatest concentration of matter; densities at the galactic cores are therefore at a maximum. I therefore propose that the inability to directly observe 'black holes' at the centres of galaxies is due to the *density* and *opaqueness to light* of galactic matter surrounding these galactic cores (*Black holes by the thousands,* Astronomy, July, 2007). I found confirmation of this concept in the following two media reports: "Jim Lovell, a CSIRO radio astronomer , explained that the Milky Way's *core was obscured by masses of gas, dust and stars. It's a tough one to look at. There is a lot of stuff between us and it* (my emphasis)." (Richard Macey, *Black hole spotted in our backyard,* Sydney Morning Herald (?) 4/11/05) And: "Most astronomers think a *torus* of gas surrounds an active galaxy's central black hole...." (*Black holes by the thousands*, Astronomy, July, 2007)

A choice of destinations?

Characteristic of countless similar articles is the following statement: "A massive star ends its life by exploding as a supernova, leaving a neutron star or a black hole as a remnant. (*New Mysteries of Black Holes*, Sky & Space, Dec/Jan, 2001-02, p 22) Let us briefly examine this statement.

It is interesting to note that the collapsing remnant of an exploding massive star ends up in one of two diametrically opposite physical structures, i.e. a *solid* neutron star *or* a *hollow* black hole. And merely the greater mass of the original star determines this spectacular difference. Where lies the dividing line and what exactly makes or causes this crucial difference? No other mechanism or criterion is either offered or even suspected for this outcome. This borders on the incredulous and is illogical. And as neutron stars and their solid cores are well known, it may be logically concluded, that the collapse of a larger original star, or the merger of a collection of stars and therefore galaxies, with their respective massive masses of matter that result in a hole, is stretching intellectual credulity to uncomfortable limits, especially when the 'masses' of black holes – meaning the substance of matter – are compared with the substance of the mass of the Sun. Thus: hollow black holes?

Prime Focus Article Submission

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

Monday 9th March 2009

All Articles can be submitted via email cyberpiggy@optusnet.com.au
Or via snail mail to the MAS Postal address