

SPÉIR

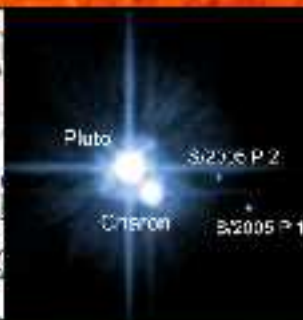
No.4 Autumn 06

Astronomy with a Kerry Twist

THE SUN

**SPOTS, OUTBURSTS, FLARE UPS, TANTRUMS,
IS THE SUN BEGINNING TO ACT UP AGAIN**

Autumn Sky
Pluto
Giordano Bruno
Galaxies



www.kerryastronomyclub.com

Welcome

Welcome back to another season of Kerry Astronomy Club. Hopefully this season will bring lots of clear skies and an opportunity for everyone to grow their astronomical knowledge and experience, if only a little. Well, summer has been and it looks like its gone at the time of writing and with it the glorious skies of the southern sky. (Although one lives in hope). When the summer started, I had two extremely broad observing goals, the first to get to know the far south milky way and all the treasures it holds, particularly in the Sagittarius, and Scutarius region. In this I had a measure of success, I managed to observe this region twice from a dark sky and three or four times from my back garden, so I now have a passing familiarity with the region, and I hope to have another crack at it before it disappears below the horizon. My second goal was to spend some nights on the flat of my back with a pair of binoculars soaking up the sights that the summer sky has to offer; I was less successful at this and apart from a few fleeting moments here and there, I do not think I managed at all. As the nights grow longer, it is now time to put together some Autumn observing goals. I really do not have a clue where to start, but an increased familiarity with constellations like Aquarius and Capricorn is definitely on the cards, as is some time studying the great Andromeda galaxy and seeing if I can catch a glimpse of its dust lanes. Whatever the Autumn brings, it will surely bring darker skies and longer nights and the opportunity for observing at respectable hours. Hopefully, as a club we can enjoy it together, until then clear skies.

Trevor O'Donoghue

Club News



Club outing to Birr

It has been a quiet summer for Kerry Astronomy Club, no club observing sessions were held, but we did have our club outing to see the great telescope at Birr. We also set up our stall at the Rose of Tralee but unfortunately we were no where near as busy as we were last year. We may

have to reconsider the rose of Tralee for next year. It might be no harm to move to the day time on a Sunday when families are out and about.

Giordano Bruno father of extrasolar planets.



The first in a series of articles by John Keane looking at lesser known astronomers and cosmologists.

Not too many people have every heard of Giordano Bruno, but back in the beginning of the 1600's Giordano Bruno was a man with some very controversial ideas. Born at Nola (in Campania, then part of the Kingdom of Naples) in 1548, he was originally named **Filippo Bruno**. At 15, Bruno entered the Dominican Order, taking the name of Giordano. He continued his studies, completing his novitiate, and becoming an ordained priest in 1572.

Over the next few years he became influenced by the writings of Copernicus and by the newly rediscovered ideas of Plato. In 1576 he left Naples to avoid the attention of the Inquisition. He left Rome for the same reason and abandoned the Dominican order. He traveled to Geneva and briefly joined the Calvinists, before he was excommunicated, ostensibly for his adherence to Copernicanism. For the next several years he wandered through out Europe where he held down various teaching post and enjoyed the protection of powerful patrons most notably Henry III of France. It was in this time Bruno wrote about the existence of other worlds and that our Sun was not the centre of the universe but one of many millions of Suns. He also went on to state in his writings that they were also inhabited by intelligent beings. In 1591 he received an invitation to Venice from

one Zuane Mocenigo, who wished to be instructed in the art of memory, and also heard of a vacant chair in mathematics at the University of Padua. Apparently believing that the Inquisition might have lost some of its impetus, he returned to Italy. He went first to Padua, where he taught briefly, but the chair he sought went instead to one Galileo Galilei, so he went to the University of Venice. For two months he functioned as a tutor to Mocenigo, who probably was an agent of the Venetian Inquisition. Upon attempting to leave Venice, Mocenigo denounced Bruno to the Inquisition, which had prepared a total of 130 charges against him. He was arrested May 22, 1592, and given a first trial hearing before being sent for trial in Rome in 1593.

In Rome he was imprisoned for six years before he was tried, lastly in the Tower of Nona. The numerous charges against him included blasphemy, immoral conduct, and heresy in matters of dogmatic theology, and involved some of the basic doctrines of his philosophy and cosmology. He tried in vain to obtain a personal audience with Pope Clement VIII, hoping to make peace with the Church through a partial recantation. His trial, when it finally occurred, was overseen by the inquisitor, Cardinal Robert Bellarmine, who demanded a full recantation, which Bruno refused. Consequently, he was declared a heretic, handed over to secular authorities on January 8, 1600. At his trial, he said: *"Perhaps you, my judges, pronounce this sentence against me with greater fear than I receive it."* A month or so later he was brought to the Campo de' Fiori, a central Roman market square, his tongue in a gag, hung upside-down naked and burned at the stake, on February 17, 1600. Since 1889, there has been a monument to Bruno on the site of his execution, erected by Italian Masonic circles. All his works were placed on the *Index Librorum Prohibitorum* in 1603. Four hundred years after his execution, official expression of "profound sorrow" and acknowledgement of error at Bruno's condemnation to death was made, during the papacy of John Paul II.

John Keane

Don't forget, I am still looking for volunteers for the next issues. If you want to help out, just write an article and email it to trevor@framecommunications.com

WHAT'S A...GALAXY



Spiral Galaxy M101 or the Pinwheel Galaxy in Ursa Major

If we look up at the sky on a clear night we will see areas which contain small numbers of stars, some areas which contain quite a large amount of stars and a white streak crossing the sky where stars are much more numerous. This streak is the Milky Way. We now know that this white streak is in fact our galaxy as observed from planet earth.

During the 18th century the German astronomer Sir William Herschel constructed a twelve meter long reflector telescope and proceeded to observe the Milky Way. He produced a paper 'On The Construction of the Heavens' which was based on his star counts of three thousand sample portions of sky and concluded that the Milky Way was a circular lens-shaped aggregation of stars with the sun at its' centre. This system he called a Galaxy and declared it was in fact the entirety of our universe. This theory was held by some astronomers up to the 20th century. During the first two decades of the 20th century American astronomer Harlow Shapley (1885-1972) carried out studies of Cepheid variable stars (which pulsate regularly in size). These he could use as indicators of distance. He used this method to establish the distance of Globular clusters in the Milky Way. He discovered that the centre of the Globular Cluster system is far from the sun and therefore the sun could not be at the centre of our galaxy. This provoked the 'Great Debate' of 1921 and with the acceptance of Shapley's conclusions he was appointed Director of Harvard College Observatory in 1921. After Shapley's discovery another American astronomer Edwin Powell Hubble (1889-1953) observed that there are countless other galaxies in our universe. He also discovered in 1929 that these galaxies appear to be moving away from each other with speeds which increase with their distance. This phenomenon is known as the expansion of the Universe. There are three types of galaxy –

Elliptical, Spiral and Irregular. The Milky Way galaxy is Spiral and consists of a disc, a central bulge and a large spherical halo composed of old stars. It revolves around a central point and takes the shape of a spiral with four arms. These are known as the Crux-Centaurus, Perseus, Orion and Sagittarius arms. Our Solar system lies in the Orion arm and is about two thirds of the way from the centre of the galaxy. The time span for one revolution of the central point is approximately 230 million years. The galaxy is about 30,000 parsecs in diameter (over 100,000 light years) and contains over 100 billion stars.

There are many theories as to how the Milky Way Galaxy was formed. One theory suggests the halo formed first as a large spherical mass of gas contracted and stars began forming. Star formation increased as the density of gas increased. As gravity pulled the halo material inwards a disc was formed. Stars in the halo continued to evolve producing metals. Our galaxy is rich in heavy metals. Stellar winds and supernova explosions spewed these metals towards the disc. This is known as the 'outside-in' theory. The second theory known as the 'inside-out' theory suggests the disc and bulge formed first from a small cloud of material. Later the halo formed as other small clouds were attracted to it by gravity.



The Large Magellanic Cloud. An irregular galaxy

The youngest and brightest stars together with interstellar material are found in the spiral arms. Older stars form a less flattened subsystem and the oldest group of stars make up the halo centered about the galactic nucleus. In addition to individual stars there are star clusters concentrated in the disc near the spiral arms. Globular Clusters are scattered throughout the halo. There are vast numbers of old and dying stars closer to the centre of the galaxy and radio evidence suggests a

core which is possibly a massive black hole. Star formation continues in the spiral arms but in an ever decreasing rate.

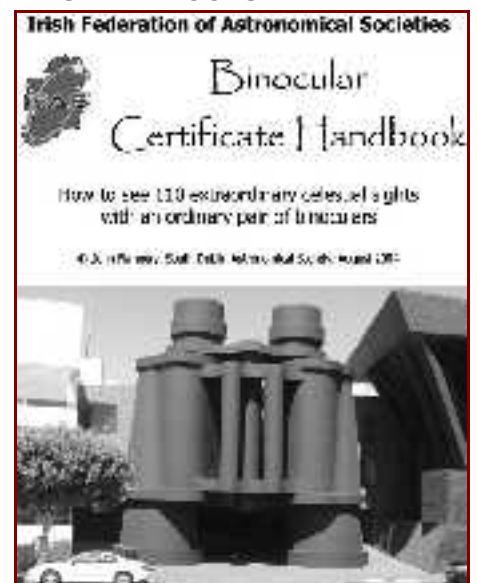


Elliptical galaxy M87 in Virgo

1998 The Royal Astronomical Society announced that a new study by astronomers Dr Michael Merrifield and Dr Robert Olling of the University of Southampton found that the Milky Way Galaxy was considerably smaller and was spinning more slowly than previously calculated. They suggested that our sun is located about 23,000 light years from the galaxy's centre. They concluded that astronomers had previously overestimated the size of other objects and of the universe itself. At the present time NASA's Hubble Space Telescope is providing us with new and exciting information on galaxy formation. Recent pictures suggest that elliptical galaxies developed remarkably quickly while spiral galaxies that existed in large clusters went through long evolutions of formation and destruction phases.

Marian Gunning

SPÉIR REVIEW IFAS HANDBOOKS



This issue I look at a series of three publications which are free to

download, free to use and have something to suit all amateur astronomers. The IFAS handbooks which can be found in the resource section of www.irishastronomy.org take the form of a series of observing challenges tailored at different audiences. The Novice Handbook written by Seanie Morris comprises an excellent introduction to astronomy, followed by a series of challenges designed to familiarise the reader with the night sky. Tracking sunspots, the phases of the moon, tracking the planets, comets and meteors provide the core of this excellent handbook.

An excellent companion to the novice handbook is the Binocular Handbook. Described by the author John Flannery as "How to see 110 extraordinary celestial sights with an ordinary pair of binoculars." This handbook certainly lives up to its claim, It guides you on a wonderful tour of the night sky, stopping off at constellations and directing the reader to the most prominent sights in binoculars. Globular Clusters, Open Clusters, Nebulae, double and multiple stars as well as galaxies and some of the most interesting stars in our night sky are described in excellent detail. Finder charts are included but, a knowledge or map of each constellation is needed to place the finder charts in context. Each entry is also accompanied by text describing what you can expect to see as well as an overview of the particular area of study, providing further information that enhances the experience for the observer. Entries are described as easy, moderate or challenge, giving the reader an idea of what to expect when binoculars are turned skyward. I have been using this handbook over the last couple of years and have no hesitation recommending it to both beginning and experienced observers alike. The final handbook, penned by Michael O'Connell is the IFAS Messier Handbook. This handbook provides finder charts and information on each of the messier objects, and is the only guide needed when tracking down the Messier List. The handbook is accompanied by some interesting information on each of the objects found in the Messier list and a brief biography of Charles Messier. Its such a pity that at present these handbooks exist in electronic format only. All three combined in a field guide would without doubt be a best seller. For the moment, download them, print them out and get observing.

Trevor O'Donoghue

The Planets for

Autumn

Mercury – Very hard in sunset during September and October. Shines brightly in the late November morning Sky

Venus – low in the dawn sky for September. Not visible Oct-Nov.

Mars – Not visible. Near the Sun.

Jupiter – Shining bright in the west South west for September at sunset. Gets harder as October progresses. Not visible in November

Saturn – Near Regulus in Leo, visible near dawn in start of September, rising earlier and earlier until it rises at 10 pm towards end of November. It is not as bright as last year as its rings are tilted less towards us.

Trevor O'Donoghue

PLUTO, A HISTORY



Artist impression of Pluto and its moon Charon

What is all the fuss about a planet no-one can even see without the most powerful of telescopes? Tiny planet Pluto came in with a bang and went out with a whimper. After discovering Neptune in 1846 astronomers quickly realised that calculations of its predicted gravitational effect on the planet Uranus didn't fully explain that planet's orbital motion. There had to be another planet. This as yet unknown body came to be known as Planet X and its' pursuit taxed the minds of the greatest astronomers of the late 19th and early 20th centuries including D.P. Todd, W.H .Pickering, M.L. Humason and Percival Lowell who all tried in vain to find the elusive ninth planet. In 1894 Lowell (b.1855, d.1916) founded his own observatory on Mars Hill, Flagstaff, Arizona initially to search for intelligent life on Mars and later to find the missing planet. It wasn't until 1929 the Lowell Observatory in

Arizona hired 24 year old Clyde W Tombaugh.



Using a 13" Astrograph (still in use today and seen above) he made pairs of exposures of portions of sky with time intervals of 2 – 6 days and then examined each pair for signs of any slight movement in any of the thousands of points of light. The search covered an area most likely to contain the missing planet. He hit the jackpot when two photographs taken on the 23 and 29th of January in the region of Delta Geminorum showed definite signs of planetary movement. On February 18th 1930 Clyde Tombaugh discovered the planet Pluto.

It was impossible at that stage to make any determination of Pluto's mass. The frigid and rocky planet which is smaller than our own moon (and Io, Europa, Callisto, Ganymede, Titan and Triton) was named Pluto after the Greek god of the underworld.

In 1950 Gerard Kuiper using a 200" Hale telescope gave a figure of under 4,000 miles(6,400Kms) later confirmed by occultation. It was therefore considered too small to have significant effect on the path of Uranus.

Pluto differs from other planets in our solar system in that it is the only planet to cross the orbital path of another planet (Neptune). From January 1979 to March 1999 Neptune was the outermost planet. Also, Pluto's period of rotation is 6 and one third days. This is many times longer than the other planets. One theory for this eccentric orbit is that Pluto was once a Neptune satellite in an orbit outside Triton. A particularly close approach of the two sent Triton in a retrograde motion out of its' orbit and Pluto ejected entirely to follow its' own orbital path.

Though Pluto has now been redefined as a Dwarf Planet, scientists will remain interested in it and to this end, NASA's New Horizons Pluto/Kuiper Belt mission was launched in January 2006 which should reach Pluto by 2015.

Marian Gunning

THE IAU RULING ON PLANETS

In late August the International Astronomical Union took a vote on a number of resolutions that in effect stripped Pluto of its planet hood. Pluto is now to be known as a dwarf planet.

Also in this category is Ceres, the largest of the asteroids in the Asteroid belt between Mars and Jupiter and the recently discovered 2003 UB313 (Xena).

The solar system now has three categories of objects according to the IAU, planets, dwarf planets and small solar system bodies. The new definitions which only apply to our solar system state that **A planet** is

- a) in orbit around the sun
- b) nearly round
- c) has cleared the neighbourhood around its orbit

A dwarf planet is

- a) not a satellite
- b) in orbit around the sun
- c) nearly round
- d) has not cleared the neighbourhood around its orbit.

A small solar system body is

- a) any other object that orbits the sun that is not a planet or dwarf planet.

The controversy surrounding these definitions is far from over, The chief objection being that Earth, Mars, Jupiter and Neptune, have still not cleared their orbits of debris. Earth has over 10,000 near earth asteroids, Jupiter has 100,000 asteroids on its orbit, while Pluto still crosses Neptune's orbit. This debate is far from over, and will definitely raise its head again.

Trevor O'Donoghue

THE SUN



Image of the sun through a PST taken by Michael O'Connell from Kildare. He projected the image onto his Canon 300D using a 20mm eyepiece. Prominences are visible on the limb as is the granular appearance of the sun's surface.

In a teenager, the emergence of spots indicates a few years of tantrums, erratic and increasingly wild behavior. The same is true for our Sun. The Sun goes through an eleven year cycle of behavior from relative calm to a period of intense activity and back to relative

inactivity. During the course of this 11 years, the sun's magnetic poles will shift. The north pole will become the south pole and vice versa. These periods are known as Solar Minimum and Solar Maximum. Currently we are experiencing Solar Minimum, the sun is calm and quiet with only the occasional sunspot to blemish its skin. Recently these spots have begun to exhibit some markedly strange behavior which scientists say is indicative of the beginning of the return to Solar Maximum which will occur in 2011. Sunspots are caused by local changes in the magnetic field of the sun's surface, which leads to a reduction in temperature, hence they appear darker. Sunspots display a polarity with distinctive north and south regions. An indicator that a new solar cycle is underway is the appearance of sunspots with reversed polarity. This has recently happened. Sunspot 905 which was prominent at the end of August has this reversed polarity and may signal the start of the Solar Cycle. An increase in the activity of the sun has noticeable effects here on earth, the most striking of which is Aurora Borealis. These are usually only visible from high latitudes, but when the sun is particularly active they can be seen much further south than normal.



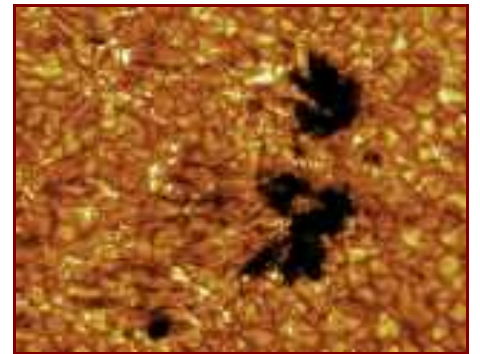
This image of Aurora was taken from Tralee in October 2003 by Michael Scully

Scientists using latest prediction techniques are predicting that this solar Maximum will be particularly active. If this is the case we should be treated to some prominent Auroral Displays over Kerry.



The sun is a vast nuclear furnace and is made up of distinctive layers as seen in the diagram above.

At the inside is the core, the powerhouse of the sun, with temperatures reaching about 15,000,000 C. Outside the Core is the radiative zone, which acts as a kind of insulator for the core. It is such a good insulator that light from the core can take up to 50 million years to reach the surface of the sun. Outside the radiative zone lies the convective zone. This is the last of the inner layers of the sun and is responsible for bringing the heat from the radiative zone to the surface of the sun via Convective cells. These are visible as granules on the surface of the sun. The convective zone is also a key player in sunspot and flare formation. The top of this convective zone is the visible surface of the sun known as the photosphere. Above the photosphere is the sun's atmosphere made up of the chromosphere and Corona. The sun displays a number of features which are within the reach of earth based telescopes. The easiest to see are sunspots which are visible in white light and can be seen by using a standard solar filter on your scope or by solar projection. Solar Flares are temporary outbursts of energy from a small area of the sun's surface. Flares are often associated with sunspots, and can



The granular appearance of the surface of the sun caused by convective cells. A sunspot grouping is also visible

last from minutes to hours. Solar prominences are large eruptions of luminous hydrogen gas that rise thousands of kilometers above the chromosphere. They can last for anything from a day to a few weeks. A coronal Mass ejection is a huge cloud of hot plasma, expelled from the Sun. It may accelerate ions and electrons, and may travel through interplanetary space as far as the Earth's orbit and beyond it, often preceded by a shock front. When the shock reaches Earth, a magnetic storm may result.

This usually takes the form of spectacular aurorae. In recent years solar observing for the amateur astronomer has undergone a revolution. The availability of Hydrogen alpha telescopes at affordable prices has put solar observing within the reach of all amateur astronomers. For \$500 you can arm yourself with a PST (personal solar telescope) from Coronado which will provide stunning views of the surface of the sun and show, prominences, scars and flares.

Trevor O'Donoghue

MEMBER PROFILE

In the second of our series, we profile a member each issue. This issue....



Name: Kevin Lawlor
Observing Location: Ardfert.

My earliest astronomical activity was in the mid 80 s when Halley's comet was visible in the night skies. At this time I was working as a Garda in Galway city and this comet was the subject of intense interest because of the publicity given it in the news media. The news bulletins advised people where to find the comet in the skies and to use binoculars or telescopes to find it. I happened to get some glimpses of it while visible.

The next event happened in 1997 when comet Hale-Bopp was visible in the night skies over Ireland. This was a particular easy comet to locate in the skies and it appeared spectacular by using binoculars. During the same year, I became a club member of the recently founded Galway astronomy club. It wasn't easy for me to attend all their monthly meetings due to my work schedule, but I made great endeavors to attend their observation sessions out at Tra Ban, Inverin. I owe a sincere gratitude to Martin Quirke, chairman of the club, who was only too willing and able to enlighten me in all the various planets, galaxies and star clusters visible in the night skies. I retired from the Gardai in March 03, so I was therefore able to give full concentration to the Galway astronomy club activities and club meetings. In

Oct.03 I went with the members of the club to Newgrange, where we had a spectacular day and with the assistance of a tour guide we were told all about the light shining into the inner chamber during the winter solstice, absolutely fabulous. In January 04, I said goodbye to Galway where I had spent 31 glorious years in the Gardai and returned to my native Kerry. At this particular time, I became the treasurer of the newly founded Kerry astronomy club, a job not too difficult thanks to the support from all the other committee members that I get when advice is needed.

In Dec.04 I bought my 1st telescope in Lidl Killarney having had to make the trip there because all the same models were sold out in Tralee. Now the real fun started in getting to learn all the various functions that this small 3" scope has to offer. For the price of €159 it was money well spent. I got great satisfaction in bringing it to observation sessions and furthering my knowledge of the night skies. In July 05 I decided to get a bigger scope and eventually chose a Meade LX200GPS 12" goto. This scope is a fantastic precision piece of kit. Being very heavy it requires 2 strong people to lift it onto its tripod. It has only seen outdoor activity once and hopefully in the coming months I can make more use of it.

Kevin Lawlor

OBSERVING LOCATIONS

Banna Beach – To get to our Banna Beach observing location, take the road from Tralee to Ballyheigue, pass through Ardfert and take a left a mile or two outside the village, where the sign says Banna beach. Continue to the end of this road and when you reach the dunes, turn left to the boathouse. There is some flat land and lots of space to park your cars here.

Short Mountain – from Killarney side. When you reach Castlemaine, take the road for Tralee. About a mile or so outside the town on the left there is a sign which says "Scenic Route". Take this road to the top of the mountain where you will come across a car park on your right. If you reach the summit you have gone too far.

Short Mountain – from Tralee Drive past the entrance gate to the Aqua dome and after about 2 km (a mile and a half), you come to a Tee junction where you turn left. Then after just 50m turn right up the

narrow winding road that will take you to the top of the hill. Proceed over the summit and 150m later there is a car park on your left. This is the observing site.

Dromid Pearse GAA grounds (near Waterville) – from Killorglin. After crossing the bridge in Killorglin coming from Tralee or Killarney turn left at the cross and proceed past Glencar and over Balach a Sheen pass towards Waterville. About 15 km before Waterville, Dromid Pearse's GAA grounds are on your right.

IFAS PODCAST

Irish Federation of Astronomical Societies are now producing podcasts, that you can download and listen. To get to them just log on to our website and follow the links. Don't forget to visit <http://www.irishastronomy.org> where Irish astronomers live when its cloudy. Join in the discussions, ask a question or just see what other amateurs are up to.

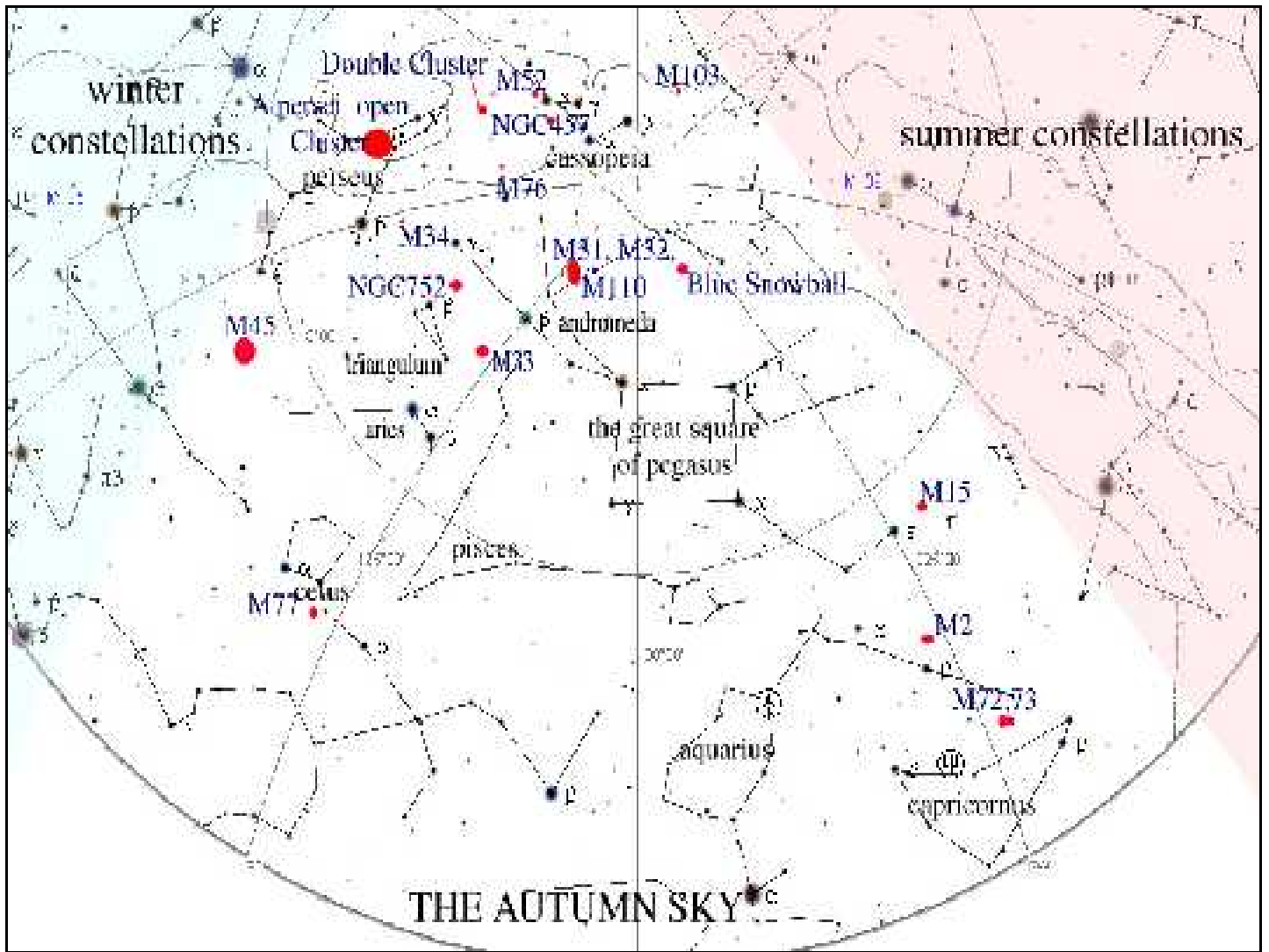
IMAGE GALLERY



Photo by Michael Scully of the Southern Sky Featuring Scorpius and Sagittarius at the Zenith. A view like this is only visible from the Southern Hemisphere.



A green flash from the setting sun is visible in this photo by Tony Curran. Green flashes are rare optical phenomena that occur shortly after sunset or before sunrise, when a green spot is visible for a short period of time above the sun, or a green ray shoots up from the sunset point. It is usually observed from a low altitude where there is an unobstructed view of the horizon, such as on the ocean.



A TOUR OF THE AUTUMN SKIES

As the Summer Triangle is moving to the west, the Autumn sky is dominated by a square of bright stars, the great square of Pegasus. This square of stars is the dominant star pattern in the southern autumn sky and from it you can find your way to the Autumn Constellations. While not as bright as the summer stars, the stars of the autumn constellations hide within them, a plethora of interesting objects.

Did you know that under a dark sky your naked eyes can see over 2 million light years away. The Andromeda galaxy shines at a distance of around 2.2 to 2.5 million light years away. Located just off the square of Pegasus, you can see it without optical aid as a hazy spot in good conditions. The way I find it with binoculars is to start at the top left hand star of the square, which is alpha Andromeda, star hop to the left to the next star and then left again to the bright star beta Andromeda, now take a right angle upwards and star hop to the next brightish star and the same distance again to the Andromeda galaxy. This galaxy is truly vast and is best seen with a pair of binoculars or wide field scope. If you have dark skies and a decent pair of binoculars or telescope

you should be able to pick out its companion galaxies M32 and M110. From the Andromeda galaxy we will now visit the Triangulum galaxy M33. First find the small faint constellation Triangulum located underneath the constellation Andromeda. M33 is a large galaxy that is easily seen from dark skies with binoculars and is located just of the tip of Triangulum. It has a low surface brightness and because it extends over a large area of the sky, it is hard to see with a telescope. On the other side of Triangulum lies a faint open cluster NGC 752. This is a lovely sight in a telescope. Moving up towards Perseus we come to another open cluster m34, a stunning sight in binoculars or a telescope. From M34 turn a pair of binoculars on the brightest star in Perseus (alpha), you are now looking at a loose open cluster known as stock 2 or the alpha persei association, and is another stunning sight. Half way between Perseus and Cassiopeia you can spot another hazy patch with your eyes. This is the famous Double Cluster, two tight clusters that lie within a degree of each other. These clusters are easily separated in binoculars and begin to resolve into stars. Turn

a wide field telescope or a powerful binoculars on these clusters and you will be blown away by different colour stars and strings of stars that appear as pinpricks of light scattered on a dark background. These clusters are one of the best sights in the sky. From the double cluster it is only a small hop to Cassiopeia and an overwhelming amount of open clusters. For the purposes of this article I suggest you first have a quick look at the two messier clusters, M52 and M103 before moving on to NGC 457 which is known by various names including the E.T. cluster. This is another fantastic sight in a telescope and is a showpiece of the winter sky. Back to Perseus with a telescope or powerful binoculars to take in the planetary nebula M76, known as The Little Dumbell. From this planetary nebula located in Andromeda and known as the Blue Snowball. This is visible in binoculars and is meant to be striking in a telescope. I have recently hunted for it but failed to find it, a testament to my skills as an observer and not the difficulty of this object. From here we take a big jump to the constellation Cetus and

track down the galaxy M77, which is one of the hardest objects in Messier's list. We finish off our tour around the autumn sky by having a look at the globulars, M2, M15, M72 and an asterism of 4 stars, M73.

One trick I have used to find Aquarius is to drop down from the square of Pegasus and head right until you reach a squiggle of stars near Alpha Aquarius. You can then star hop to Beta Aquarius and use it to find M2, M72 and M73. The map provided here is only a guide, and only contains the rough position of the deep sky objects. This map will suffice for the brighter objects but a more detailed atlas may be needed to track down some of the fainter Objects.

Trevor O'Donoghue

DARK MATTER



In a recent paper, scientists say they have the first actual proof of the existence of dark matter. Dark Matter which is believed to make up 22% of the universe is extremely hard to see and or monitor because it does not emit or reflect light. It can be inferred by its gravitational effects on the speed of rotation of galaxies and the speed at which galaxies move in clusters. The recent evidence is different in that scientists say it provides direct evidence for the presence of dark matter.

The Bullet cluster consists of two colliding clusters of galaxies. We should be able to track the movements of these colliding galaxies according to Newtonian gravity. Scientists have tracked the movement of the stars and gas in the galaxies, but gravitational lensing (the bending of light due to light passing near a heavy object) of background objects occurred in a location different to what should be expected under Newtonian gravity alone. The new location of this gravitational lensing can only be explained by the gravitational effects of dark matter. Proof positive, scientists say of its existence. Despite this proof we still do not know what dark matter is. No one has ever trapped, it measured it or touched it. To be honest we really don't know

what it is, but a Nobel prize awaits for whoever can explain what it is.

OBSERVING REPORT

On the night of 29th-30th May, myself and Mike Scully decided to head to Shortt mountain for midnight to see if we could tackle a few of the objects in the summer milky way. I arrived before Mike and set up my 8" and 20X80's. The wind was very strong so I had to set up behind the car with the boot and doors open to kill the breeze a little. First observation was of a setting moon with lots of earth shine, I managed to have a quick look before it slid down behind the mountain. Next up was Saturn and the beehive in the 20X80's needless to say it was very pretty, even if the sky was still very light behind it.

Being lazy and unwilling to take a logbook to the eyepiece, I also recorded my observations onto mp3 as I made them, this made observing much better and I found that I studied each object for longer, trying to spot as much detail as possible.



Sagittarius and the summer milky way between Killarney and Castlemaine

A quick flick around the summer triangle was first on the list, M27, M71, and M56 before a quick look at M13 for contrast.

Next was M11 and M26. M11 was stunning in binoculars and I found M26 boring at low power in the dob but when viewed at X100 was much nicer and showed distinct shape. Had a brief look at M9 and M28 in Mike's Dob. then continued onto M16, followed by M17 and M18. M24 and M25 followed before moving onto M8 M20 and M21

To finish off we had a look at three globulars which Mike found low in the muck in Sagittarius, M69, M70 and M54 followed by M6 and M7 in Scorpius.

This was my first night looking at this region and It was stunning. Each movement of the scope brought another excellent object into the FOV, It would be extremely hard to pick a highlight but if I was forced it would be the Sagittarius star cloud M24, so many stars and chains and knots, M17 the omega nebula and

M6 the butterfly cluster and M16 This is one region of the sky that will be visited again and again...

Trevor O'Donoghue

STARDUST@HOME

I am sure most of you remember the Stardust mission which flew to Comet Wild2 to collect dust fragments from its tail. Though Stardust's main mission was to capture dust from the tail of comet Wild 2 - dust dating from the origins of the solar system some 4.5 billion years ago - it also captured a sprinkling of dust from distant stars, perhaps created in supernova explosions less than 10 million years ago. This dust was captured in a gel called Aerogel. The dust is so small that it would take an awfully long time for scientists to scan for the dust themselves, and so instead, are releasing their scanned images of the aerogel onto the internet, where volunteers can log on and search for interstellar dust particles. Volunteers are trained by studying a number of examples, then pass a test before being let loose to begin to look for dust particles. There is no limits on who can look for the dust particles. You do not need a degree in astrophysics, or any other formal qualifications for that matter. You simply register your details, look at some examples, pass an easy test to see if you have learned from the examples and start looking for interstellar dust. Its that easy. If you have spare time and fancy checking this out, simply google stardust@home and start hunting.



This aerogel array, which was mounted atop the Stardust spacecraft, was used to collect interstellar dust particles as well as dust from the tail of comet Wild 2.

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