



May 2009

ARMAGH PLANETARIUM

# ASTRONOTES

Incorporating **FRIENDS' NEWSLETTER**

Victoria College rockets ahead!

The sky this month

Wernher von Braun: hero or villain?

It was 40 years ago: Bovedy meteor

Soyuz: Russian space stalwart

# Victoria College students 'rocket' to success

By Mark Winning, Head of Technology & Design,  
Victoria College, Belfast

Not resting on their laurels and following on recent successes in the world of F1 car design, a second group of Lower Sixth girls from Victoria College in Belfast designed and built a rocket which they entered for the UKAY Rocket Competition.

The UKAYRoC provides post-primary students (3 to 5 members in a team), aged 11-18 years a realistic experience in designing a flying aerospace vehicle that meets a specified set of mission and performance requirements. Students have to work together in teams, just as aerospace engineers do. The key goal of UKAYRoC is to: "Encourage students to enter the world of aerospace and science". This is achieved by setting the students challenges in the following areas:

- Technical Challenge - Provide students aged 11-18 a realistic experience in designing a flying aerospace vehicle that meets a specified set of mission and performance requirements;
  - Team Work - Students work together in teams in the same way as aerospace engineers do;
  - Business Challenge – The Teams had to meet deadlines and raise funds to participate
- The aim of the competition was to design, construct and successfully launch a rocket, carrying one raw medium-sized hen's egg to an altitude of 750 feet with a flight time of 45 seconds, then return this payload safely and undamaged to Earth.

With a total of 54 schools from the UK registering for the competition, the teams had to complete qualification flights in front of an independent UKRA member and an independent witness, with the top 20 teams being able to qualify for the UK final fly-off event which took place on 2nd April 2009 at Charterhouse School, Surrey, London.

The competition was very close and only 5 points and 5 feet of altitude separated the first three teams with the girls from Victoria College eventually coming third and just missing out on an all paid trip to America. This was a very creditable performance as this was their first attempt in the competition.

The Victoria College 'Rocket-To-Ya Team' (the only team to qualify from Northern Ireland) consisted of 5 girls from the Lower Sixth Science and Technology classes. Included in the team were Jennifer Black, Juliet Griffen, Joanne Bamber, Nadia Traynor and Tiffany Tsang.

Juliet who recently was at Armagh Observatory on her work experience and Jennifer have ambitions to become astronauts and work in the space industry.

There has been a lot of discussion about 'girls not choosing careers in Science, Technology, Engineering and Mathematics' but the girls from Victoria College proved this a myth and that they are equal if not better than their male counterparts and fended off many challenges from all-boy teams at the competition.



**The Rocket Team**  
Front Row  
Left to right;  
Juliet, Jennifer,  
Joanna  
Back Row Left  
to right; Nadia  
and Tiffany

# Von Braun: Hero or Villain?

Opinion piece by Alyson Kerr, Education Support Officer

At times it is difficult to believe that space travel has only been possible for just over half a century. It has become such an intrinsic part of our existence that we take for granted the achievements of the people that paved the way for it. There are many names that are associated with the dawn of the Space Age. John F Kennedy is synonymous with America's determination to be the first nation on the Moon. Yuri Gagarin is globally known as the first man in space but let us think back to before those times. Behind every idea is the person who imagined it. Spacecraft do not create themselves and they do not get into space by imagination alone. Someone had to put ideas on paper and then turn them into reality. Wernher Von Braun (1912-77) was one of these men. He was responsible for the creation of the rocket that would put the first American satellite in space and take the first men to the Moon. Saturn V was Von Braun's state-of-the-art 363ft (110.6 m), three stage rocket masterpiece. Von Braun is often regarded as the Apollo project's mastermind and his input central to placing Armstrong and Aldrin on the Moon. For these reasons, he has been hailed as an American national hero but he has also been condemned as a villain for his role in World War II. What are the circumstances and evidence that allow us to categorise his status?

“He was responsible for the creation of a rocket that would put the first American satellite in space”

Von Braun was born in 1912 in Wirsitz, Germany (now Wyrzys in Poland). He was the son of a wealthy farmer who later became the Minister of Agriculture in Hindenburg's government. From a



Image Credit: NASA

**Aiming at London?** Von Braun poses with a model V-2. The missile's elegant streamlining caught the public's attention; it inspired many science fiction Moon rocket concepts in the '40s and '50s.

young age, Von Braun had shown an interest in the power of rockets, even going as far as tying rockets to a wagon and setting them off in a crowded street (to the disgust of many). In 1923, the Transylvanian physicist Hermann Oberth (1894-1989) published the book, 'Die Rakete zu den Planetenraumen' (The Rocket into Planetary Space). It was this book that captured the interest and imagination of the young Von Braun. His passion was the idea that one day a rocket could go to space and that he could be part of this project. From the age of 18 he was a member of the Verein für Raumschiffahrt (Society of Space Travel or VfR). The VfR was a forum where he could share his ideas and conduct tests on his creations.

Unfortunately, his enthusiasm was about to be



**V-2 Missile** This example (captured by British forces in 1945) was intended for testing rather than for an offensive mission, hence the high contrast black and white paint finish. Twenty years later, NASA rockets featured similar schemes

tempered by Hitler's rise to power. Even before Hitler's election, the German government was going to ban all rocketry experiments outside of the military. This was a key event in von Braun's life as he could not continue with his research unless he joined the military, which he did in 1932. While in the Reichswehr (German army), his research was controlled by the needs of Hitler's Germany and Von Braun's career focused on investigating the use of rockets as military weapons. His military career did give him the opportunity to undertake a Ph.D. in physics and a final dissertation in the problems of liquid propellant rocket engines. At this time, Von Braun and his team were conducting the first tests of his A1 liquid-fuelled rocket. This prototype would eventually evolve into the A4 missile which came to be known as the V-2, a name synonymous with the rocket attacks in Britain in the final days

of WWII.

Two of the major arguments for the portrayal of Von Braun as a villain is the fact that he created a rocket that caused the deaths of many Allied civilians (over 7200 Allied civilians and military casualties) and that slave labour, in the form of concentration camp workers (possibly as many as 20 000 victims), was used to manufacture his rockets. Von Braun was also a member of the Nazi party and played a key role in the German war effort during WWII. This was a fact that he never denied although it did not become widely advertised until the later years of his life. He also did not deny that he knew that the workers from concentration camps not only built his missiles but also died while doing it. In fact more people died building V-2's than from the bombings themselves. The question we have to ask is if he was personally responsible for the use of slave labour? At that time, concentration camp workers were responsible for the manufacture of much of Germany's needs. Von Braun used the system that was at hand, right or wrong, did he really have a choice? What would have happened if he had refused? It is easy for us to look with hindsight and judge his actions and choices but Nazi Germany was a very different time and place. I doubt that when Von Braun joined the military in 1932 he had any idea that his weapons would play a significant role in one of the worst



**V-2 Damage** A military truck burns in Antwerp after a V-2 strike in 1944. Most victims of Nazi missile attacks were civilians. Despite its performance the V-2's inaccuracy and unreliability meant it was ineffective as a warfighting weapon (instead it was hoped to cause mass terror). By WW2 standards it was also extremely expensive to build and operate compared to conventional weapons. Every penny Nazi Germany spent on building V-2s, was a penny not spent on tanks, guns and bombers. Could von Braun actually have inadvertently shortened the war in the Allies' favour?

atrocities of the 20th century. Would he even have joined the military if not for the banning of civilian rocket experimentation?

Some may argue that weapons are obviously made to cause death and destruction so Von Braun can be held accountable as he knew what he was creating. Weapons are destructive but they are even more dangerous in the hands of unscrupulous tyrants. If this argument was to stand we would also need to take into consideration his actions after WWII. If his role in the creation of missiles is inherently wrong, this premise should continue into his post war role in America where he continued to research and develop missiles at the request of the American government. The Americans had no scruples about using his technical abilities to develop nuclear-tipped Intercontinental Ballistic Missiles (ICBMs) for their use during the Cold War. For his role in the USA he has been labelled a hero yet what he created was even more advanced than anything he created during WWII.

## “Von Braun’s passion was always rockets and their potential for space travel”

Von Braun’s passion was always rockets and their potential for space travel. This was a vision he did not lose throughout the war years or hide as well as he should have. In March 1944, he was arrested by the Gestapo and imprisoned. His crime was to voice his interest in developing the V-2s not primarily for weapons but for space travel. This was a dangerous declaration to have made and he was lucky to have escaped with his life, which was only after a personal intervention from the Munitions and Armaments Minister Albert Speer. To me, this incident shows was not fully committed to his work. His crime however was the evil of complacency and unfortunately he is not the only person to have committed it. (Editor’s note: other German engineers, such as Willy Messerschmidt and Ferdinand Porsche had close links with Hitler’s regime but seem rarely to be criticised for this to the same extent as von Braun.)

His actions in the post-war years have however

showed a very different side to von Braun. In 1945, knowing that his test launch facility in Peenemunde would soon be overrun by the Red Army (and knowing well the atrocities his fellow countrymen had committed in Russia, he did not want to be captured by Soviet troops) von Braun and some of his team surrendered to the US Army (he avoided the British too, in case his part in the bombardment of London led to a charge of war crimes). He had also instigated the collection and containment of thousands of documents and prototypes pertaining to his research ensuring that they did not fall into Soviet hands.

He was interrogated and then transported to America alongside some of his colleagues. His work continued on the V-2’s using some examples that had been captured by the Allies. By 1955, he was granted American citizenship and the need for his help was compounded with the beginning of the Space Race. He had finally got to where he wanted to be and Explorer 1, the first American satellite was launched with his design, the Jupiter –C. This was based on the Redstone missile, sometimes called the “American V-2”. To mask its military links the rocket was renamed Juno 1 for satellite launching.

His career took another turn when, after he had



**Aiming at the Moon** Dr. von Braun became Director of the NASA Marshall Space Flight Center on July 1, 1960.

written successful popular level books, he was involved with a Walt Disney TV series on space exploration. This is how many people remember him, as someone who encouraged an interest in space at a time when the world waited in excitement to see what could be achieved. Von Braun was also became the first director of the newly formed Marshall Space Flight Center in Huntsville. Able and charismatic, he was admired by those he worked with during the Mercury, Gemini and Apollo projects. Von Braun played a hugely significant role in some of the most monumental

events of the 20th Century and saw his dreams become reality and more. There is no doubt that his status as an American hero has been undermined by his shadowy past but many see his achievements as a fundamental part of the history of our time and the foundation of our future. I do not believe that the memory of him as a hero will ever be 100% untarnished but I can understand those who do still view him as a hero regardless. His 'villainy' was only a small part of an incredible and noteworthy life.

# The Bovedy Meteorite

By Nigel Farrell, Education Support Officer

Among all the traditional aspects of astronomy which we take part in at the Planetarium one subject never fails to fascinate us all, that of meteorites. This month one particular space rock comes to mind as we acknowledge the fortieth anniversary of its impact. The Bovedy/Sprucefield meteorite fell to Earth on 25 April 1969 at around 9.22 pm and caused a considerable stir among those who witnessed it. At the time no-one could have imagined that this would turn out to be one of the most unique and important meteorite impacts in recent history not only because of the rock's characteristics but also because the impact itself was recorded on audio (a copy of which we at the Planetarium are extremely privileged to possess).



**Cop Rock** A fragment of the Sprucefield meteorite and the hole in the RUC store's roof.



To scientists, meteorites give vital clues as to what the Universe is composed of, especially as so far, the only cosmic bodies from which scientists have been able to directly retrieve samples are the Moon, Comet Wild 2 and the Sun.

## “Meteorites give vital clues as to what the Universe is composed of”

To be defined as meteorites these 'space rocks' need to survive a tumultuous journey through Earth's atmosphere; many, of course, do not survive, burning up in the atmosphere and producing one of our night time sky's most beautiful phenomena, 'shooting stars' (or meteors). It has been estimated that as many as 500 meteorites reach Earth's surface each year but of these the vast majority remain undiscovered, especially those with a high iron content. These tend to rust quickly, and often they erode almost completely making their identification nigh on impossible. Therefore witnessed meteorite falls, like the Bovedy one, are of particular significance as they can be retrieved for study reasonably swiftly. The Bovedy meteorite's significance stretches much further than many retrieved meteorites. The vast majority are made of rock (with some iron metal content), these are known as chondrites. Chondrites are composed mostly of

chondrules (small spherical particles of silicate material that appear to have melted) which are often difficult to see. In the Bovedy meteorite, however, the chondrules are very clear. This tells scientists much about how these particular meteorites were formed, and indicates that they are likely to have originated from the materials that calesced to form the planets. Alternatively they may be evidence of a cataclysmic collision.

In an article published in the Irish Astronomical Journal (V9 Dec 1970) entitled 'The Meteorite of April 25th 1969' the then Director of Armagh Planetarium, Dr T W Rackham

(1919-2001), gave his eye witness account of the event, one which he said could hardly have taken place at a better time of day. Dr Rackham was the second director of the Planetarium (succeeding Patrick Moore in 1968). In his account, Rackham describes the spectacular fireball. "I was parking my car beside the Armagh Planetarium when I noticed, low down in the sky to the S.S.E. and behind nearby trees, a bright object moving quickly in a northerly direction. At first sight it had the appearance of a rocket – a spectacular 'firework' type rocket such as might be used in a celebration of some festive occasion".

As Rackham pondered on the possible nature of the celebration, he noticed at least three bright trails as magnesium-white stars separated and curved downward. He went on to describe how a bright red star continued to move across the sky, and admits to a near mishap, explaining how he almost fell out of his car in an attempt to get a better view. He did however, manage to maintain his composure in the midst of all the excitement managing to in less than a minute, find keys, unlock doors and phone the speaking clock. Shortly afterward, the first reports from the public began to emerge and the phones of both the Observatory and Planetarium continued to ring well into the night.



**Meteor Crater, NI** The Bovedy impact site (marked with a white flag) in Mr Gilmore's field and the crater with a tape measure for scale.

The first telephoned report came to the Planetarium from a Mr and Mrs James Johnston of Ballygawley, Co. Tyrone. This quickly followed by others from across the Province. However, one of the most interesting witness accounts came from a Mr A. Cuddy of Dublin. His report confirmed the timing of the event in a quite unusual manner. Mr Cuddy had been visiting the Ha-

rollds Cross Greyhound Stadium and afterward described the time of the fireball in considerable detail. "... the race in question was run at exactly 9.20 p.m., five minutes later than the advertised time. The dogs ran the track in 31.90 seconds. The luminous body appeared roughly 10 to 25 seconds later. So I must be very accurate when I say that the time it passed in front of me was 9.21 p.m. It was at an angle of 55 degrees". Rackham investigated many more accounts of the meteorite in person, travelling as far as Malin Head, Co. Donegal, Dundrum Bay, Co. Down and Newton Butler, Co. Fermanagh, among others, in order to catalogue accurately the event and the many different accounts, altitudes and trajectories given by witness reports.

The fireball was also observed across much of the UK and Ireland. Witnesses in Wales noted a double sonic boom and described the meteorite as having a blue green colour. People near the Bristol Channel also heard the sonic boom and observers in Dublin noted that one part appeared to break off as the meteorite continued in flight. At Sprucefield, the sight of the first impact, a police officer heard a loud bang similar to a pistol shot while other witnesses saw an orange flash in the sky around 9.20.

At Bovedy the sight of the main impact was at a

farm owned by a Mr Samuel Gilmore. Mr Gilmore described the meteorite coming towards him and passing directly overhead. The following Monday 28th April a small crater about 14.5 inches (37cm) deep and a stone measuring 9 x 8 x 4 inches and weighing 4.95 kg. (10lb 9 oz) was recovered. Reports also indicate that some local people broke the specimen open and had taken away fragments. Reports also noted that upon further examination of the impact site no scorching of the surrounding grass or roots was visible.

An RUC (Royal Ulster Constabulary) constable at Limavady also witnessed the fall. Victor Greer saw a 'lightning flash' and commented that he had never seen anything like it before. At Sprucefield a specimen of the meteorite was found three days later at the RUC Central Stores, a hole was discovered in the building's corrugated roof and a stone object was found on the floor. The stone weighed 513gm (18oz) and was broken into two pieces. A thorough search was undertaken but no further fragments were discovered, press reports of scorching to the roof and surrounding desks were later discounted. The final word on the impact however belongs to a farmer who lived within half a mile of the

Bovedy impact. When interviewed, Tom Rackham noted that with "usual Irish eloquence", the gentleman in question summed up his experience stating, "I thought it was the end of the world".

A large fragment of the Bovedy meteorite is currently on public display at Armagh Planetarium. Dr Mike Simms, Curator of Palaeontology for the Ulster Museum will give a talk on meteorites including the extraordinary events of 25 April 1969 at the Planetarium on Thursday 28 May 2009 at 7pm (contact 028 37523689 for more details).



**A bolt from the blue** The Bovedy fireball. You can hear it at <http://fernlea.tripod.com/bovedy.wav> .

## The Sky in May

By Tracy McConnell, Education Support Officer

Welcome back to the "Night Sky Guide" for May 2009. At this time of year, partly due to daylight savings, our nights are getting later and shorter, with the sun setting soon after 11.00pm and rising at approximately 4.00am. As a result of this, the guide presented here is based on the stellar positions at midnight on 16 May, as it will only get truly dark at that time.

The planet Saturn is in the WSW at this time, and is still found just in front of the rear paw of Leo the Lion. Early in the morning, Jupiter does rise in the SE just before the Sun but the Moon is also up and in close proximity so it will make it difficult to see.

We have five signs of the Zodiac stretching

across the sky from SSE to WNW. They are Libra the Scales, Virgo the Maiden, Leo the Lion, Cancer the Crab and Gemini the Twins.

**"The ancient Greeks saw  
Libra as an extension of the  
constellation Scorpius"**

We have covered the mythologies behind most of these constellations in previous months, except for Libra which has been represented by scales of balance from as long ago as ancient Babylonian times. This was due to the autumnal equinox occurring in Libra. This was when the days and nights were the same length, or in balance. The ancient Greeks saw Libra as an extension of the constellation Scorpius the Scorpion, in fact as his

claws. This is shown in the names of the stars in Libra, their current names are Arabic translations of their Greek names. Libra is marked by the three brightest stars, one of which is one of the few green stars that can be picked out with the naked eye. It's called Zubenelchemale which means "Northern Claw". Another star is called Zubenelgenubi which means "Southern Claw" and the other bright star is called Zubenelakrab which means "Shears of the Scorpion".

## “Eventually, millions of years from now, the 2 black holes will form a binary super-massive black hole”

In the SE are two large connected constellations, Ophiuchus the Healer and Serpens the Snake. Ophiuchus is based on the story of Asclepius who learned how to keep death at bay by observing a snake administering healing herbs to another snake. Zeus, the king of the gods, interceded and killed Asclepius with a lightning bolt to prevent mankind becoming immortal. Ophiuchus was also considered to be the 13th sign of the Zodiac as the Sun, Moon and planets all pass in front of this constellation. However due to 13 being considered an unlucky number, it was dropped from the line up very early on. Ophiuchus is a large pattern which contains several star clusters, IC 4665, NGC 6633, M9, M10, M12, M14, M19, M62, and M107. It also contains NGC 6240, the well-studied remnant of a collision between two smaller galaxies. X-Ray studies have shown that there are two active galactic nuclei present, which were originally the black holes at the centres of each separate galaxy. These binary black holes are slowly merging together and are consequently triggering enormous star birth. Eventually, millions of years from now, the two black holes will form a single super-massive black hole.

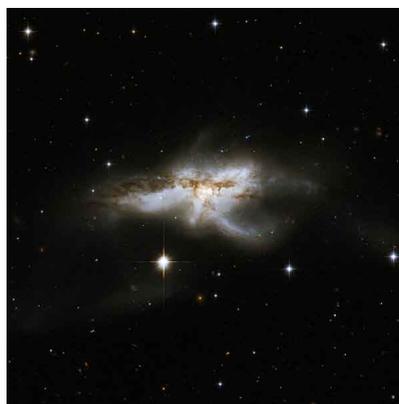
Almost directly north is the familiar constellation Cassiopeia, there is a little constellation just to the right of this celestial “W” which is sometimes called Little Cassiopeia because it looks like a smaller “w”. It's a simple constellation with no substantial features. The stars aren't particularly bright, all of 4th magnitude. There are no Messier

objects or obvious galaxies. There is an open star cluster, just right of the central peak of the “w” NGC 7243, but that's about the only thing of note. This constellation is called Lacerta, the Lizard.

The Summer Triangle has also just risen in the east. It will slowly make its way south over the next few months. The Summer Triangle is a pattern made up of three stars from three different constellations. These are Vega in the constellation of Lyra the Harp, midway up the eastern sky; Deneb in the constellation Cygnus the Swan, half way up the ENE sky; and Altair in the constellation of Aquila the Eagle which is low in the eastern sky.

The circumpolar constellations are still visible in the north, with Ursa Major, the Great Bear, directly overhead facing west, Draco the Dragon directly overhead facing north, and Ursa Minor the Little Bear just tucked in below Draco. Cepheus the King and Camelopardis the Giraffe are midway up the sky in a northern direction and Cassiopeia the Queen, we mentioned earlier is low in the north. These constellations are always visible and appear to rotate around the star Polaris which marks the tail of the Little Bear.

That's it for this months' guide of the night sky. Here's wishing you clear skies and good stargaz-



**NGC 6240** is a peculiar, butterfly- or lobster-shaped galaxy consisting of two smaller merging galaxies located 400 million light-years away in the Ophiuchus constellation.

# Farewell Soyuz...one day

By Orla O'Donnell, Education Support Officer

I will admit that I'm a big fan of NASA and of all the wonderful things that their space programme has achieved over the years. While 2009 reminds us of one of these moments of greatness, the 40th anniversary of the Moon landings, I sometimes get the feeling that NASA gets a little more praise for their achievements than their eastern brothers in Russia. The Russian space programme has after all launched the first man in space, the first women, the first space walk and the list goes on and on. Recently my interest in the achievements of the Russian space programme has been awakened when on 6 April Roscosmos (Russian Space Agency) announced that they would be commissioning a new spaceship to replace the long serving Soyuz. So I decided that after 40 years of service it was about time that I reviewed the life of this workhorse of the Russian space programme.

## “A new craft called ‘Soyuz’ was commissioned with lunar missions in mind”

If you are a massive fan of the Soyuz design there is no need to panic just yet as its replacement will not be ready for a mission until the end of the next decade. The new space ship's official name has not yet been released and is currently known by the Russian abbreviation PPTS (Prospective Piloted Transport System). The ship will carry up to six crewpersons at a time and has been designed primarily to operate in low Earth orbit but also with suitable adjustments has the possibility of longer missions to the Moon. Increased crew numbers on the International Space Station (ISS) has put a big demand on seats in Soyuz craft. The most recent Soyuz trip to the ISS in April 2009 carried Charles Simonyi, a space tourist. He will be the last space tourist for the foreseeable future as the seats are needed for professional cosmonauts to crew the ISS. Soyuz is now in the process of being



Image Credit: NASA

### Flying High A Soyuz in low orbit above most of Earth's atmosphere.

replaced by a new and hopefully exciting craft but its legacy has played an important role in the history of space travel.

The early Russian space craft were automatic, one man craft like the Vostok that launched Yuri Gagarin on the 12th April 1961 into the history books. The Vostok was followed by the two or three seat Voskhod (this was nothing more than a rebadged Vostok with extra seats squeezed in) in the mid 1960's. Both of these ships lacked the potential to travel to the Moon. The ambitious Soviet space programme desired to go to the Moon and this drive was inflated by competition with the United States of America. A new craft entitled 'Soyuz' ('Union' in English) was commissioned with this goal in mind. Designed by Sergei Korolev the Soyuz intended to reach the Moon by repeatedly docking with upper stages that had been put in orbit using the same rocket as the Soyuz, this system would not require a large rocket like the American Saturn V. This design was later altered to use a single large N1 booster but as we all know this ambition to reach the Moon was not fulfilled by the Soyuz or any other Russian manned spaceship. However several Zond spacecraft, each essentially an unmanned Soyuz did fly around the Moon. (For more on this period see 'The man behind Sputnik' in October 2007's Astronotes and 'Apollo's Soviet Rival' in the March 2009 issue.)

The first manned test flight of the Soyuz 1 was conducted in on the 23 April 1967 by the veteran pilot Vladimir Komarov. The mission as planned

called for Komarov to conduct an orbital rendezvous and docking with a second Soyuz craft launched later (this second launch was cancelled when the first Soyuz exhibited problems). The mission ended in disaster when after Soyuz-1 re-entered the Earth's atmosphere its parachutes malfunctioned. Unable to slow down, the vehicle crashed, killing Komarov. He was the first space traveller to be killed on a mission. The manned missions were put on hold due to this disaster and for two years the Russians could only conduct unmanned tests including automatic docking, but crew began flying the craft in 1968.

## “In order to dock with the ISS the Soyuz spends two days chasing the station.”

After the Americans successfully landed on the Moon, the Russians changed the focus of their space program. They moved towards living in space and a low orbit version of the Soyuz was instrumental in realizing this ambition. The Russians created the first space station entitled Salyut 1 and on 6 June 1971 the first crew successfully rendezvoused with the station. Unfortunately the mission ended in disaster when



Image Credit: NASA

**Visitor from Earth** Here we can see a Soyuz spaceship docking on to the International Space Station. Note the egg-shaped Orbital Module, Bell-shaped Descent Module and Cylindrical Instrumentation and Service Module.

the crew Georgiy Dobrovolskiy, Viktor Patsayev, Vladislav Volkov were found dead in the capsule, a vent in the capsule had opened early allowing the atmosphere to seep away suffocating the crew. To prevent further tragedies a pressure suit was introduced to protect the cosmonauts from a sudden drop in pressure. (See also ‘Russian through the air’ in the July 2008 Astronotes for an account of a recent near disaster which afflicted a returning Soyuz.)

In the 1980's an improved version (Soyuz T) of the ship took flight and was followed by the even more advanced still Soyuz TM just six years later. The Soyuz TM was used, as a shuttle for the Mir space station, which still holds the record for the longest continuous human presence in space. A TMA version of the ship is still in use today and has shuttled many astronauts and cosmonauts to the International Space Station. These improved Soyuzes look almost identical to their 1960's predecessors but use substantially more advanced technology. A Soyuz took the first crew to the ISS in 2000 and has been ferrying crews between Earth and the space station for almost ten years. Since the late 1970s cargo has been carried to space stations by the Progress series of vehicles, these are an unmanned version of the Soyuz.

In order to dock with the ISS the Soyuz spends two days chasing the station and is in constant contact with the controllers at the Russian Mission Control Centre. The rendezvous and docking with the ISS is all automatic with no human intervention. Soyuz has not only shuttled crew, space tourists and scientists to the ISS, it also acts as a life boat. A Soyuz is always docked to the ISS in case of an emergency evacuation. After the Soyuz leaves us for good at the end of the 2020's it will have given Russia over fifty years of service and left an awesome impact on the history of space travel.

## Moon Phases, May 2009

Friday 1 May	First Quarter
Saturday 9 May	FULL MOON
Sunday 17 May	Last Quarter
Sunday 24 May	NEW MOON
Sunday 31 May	First Quarter

# Image of the Month

Included in this image are Walter M. Schirra Jr, Donald K. "Deke" Slayton, John H. Glenn Jr, Scott Carpenter, Alan B. Shepard Jr, Virgil I. "Gus" Grissom and L. Gordon Cooper. These well-dressed young men are the Mercury Seven, the original crew of US astronauts, selected and presented to the world's press just one year after NASA was established. They were introduced to the world on the 9 April 1959 so this year is the Mercury Seven's fiftieth anniversary.

The first astronauts had to meet very strict criteria to enable them to make history. They all had to have college degrees, be a test pilot and be no taller than 5' 11 (180cm) and weigh no more than 12.8 stones (82 kg) to fit into the cramped capsules. The records of 508 of the very best servicemen were reviewed from which a list of 110 men was compiled. The group was then culled again to 32 candidates after initial interviews and written tests. Each of these 32 men was subjected to a battery of tests that measured their physical, psychological and mental suitability for space travel. The tests including full body X-rays, unsettling interviews and cognitive tests. After these tests 18 men were left and recommended to the Mercury Project, from which the lucky seven were selected. All of the seven men flew in Project Mercury bar Slayton who would be come



Image Credit: NASA

a crewman on a later Apollo mission.

It was these daring young men who helped pave the way for modern space flight in America. If these men had not been willing to take the risk and fly into the unknown NASA would probably not have landed on the moon.

(Caption by Orla O'Donnell, Education Support Officer)



[www.armaghplanet.com](http://www.armaghplanet.com)

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Tel: 02837 523689 Email: [cj@armaghplanet.com](mailto:cj@armaghplanet.com)

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Assistant Editor: Alyson Kerr  
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