

Introduction

In July, 2004, the planetarium celebrated its five hundredth show. Schools, community groups and public visitors have all shared the excitement of space exploration during the past year, especially the visit of Russian cosmonauts to the planetarium, the long-awaited transit of Venus, and the arrival of the spaceprobe Cassini at Saturn after a long, lonely journey of seven years. A visit to the planetarium will keep you up-to-date with what's happening in the sky, and for further details contact the planetarium director, Dr. John McCue, on 01740 630544, or visit our web-site at www.wynyard-planetarium.net, and our e-mail is planetarium@btopenworld.com.

The World Waits For Venus

No-one alive on earth had ever seen the spectacle that awaited most of the world on the morning of June 8th. The planet Venus, a twin of the earth (in size only) passed across the face of the sun for the first time in 122 years.

Many visitors descended on the planetarium to view what was seen by Captain Cook in 1769 from Tahiti, in his attempt to measure the distance from the earth to the sun accurately for the first time. Members of the Cleveland and Darlington Astronomical Society brought along telescopes to view the transit safely, and despite the overcast weather many successful pictures were taken. Jack Youdale, the society's president, obtained this spectacular image by direct photography through his reflecting telescope with a special solar filter across the aperture. As well as Venus, it shows two small sunspots.



Jack's son, John, brought pupils from Abbey Hill Technology School, Stockton, and a party from Walbottle School, Newcastle, were particularly lucky to arrive just as a spell of clear weather allowed a perfect view. As well as the portable telescopes, images were transmitted from the telescope in the observatory via an underground link to the planetarium so that everyone could see at the same time what the telescope was seeing. Tom Nicholson, as part of a community programme from Northumbrian Water, helped to ensure that all the

recording and analysis of the electronic images, both still and movie, went without a hitch, and Ed Restall manned the internet in the planetarium. He gathered images from the clear skies above the observatory in Pretoria, South Africa, to ensure that visitors here could still follow this astronomical event even when our clouds blotted it out, as they did frequently that morning! It was frustrating at times here at the planetarium, waiting for the right moment of relatively clear sky, then leaping frantically into action to take pictures and movies, but at least the transit lasted long enough, for about six hours, to give us chances to see it. Some members of the society didn't take the chance.

Neil Haggath and Don Martin went to Turkey (one of Don's pictures is shown here, taken with an 800mm telephoto lens with a Baader AstroSolar Safety Film attached, speed 1/250 second), Keith Johnson to Greece, and Julia McBride to Egypt. Truly an international effort from the society!



You heard it here first!

Three-piece rock band from Darlington, Stone Coda, released their new album, *Sleeping Vertical* (something astronauts are very familiar with), at a press conference in the planetarium on Sep. 6th. The invited guests enjoyed the video single, heard the album, and saw a brief view of the night sky. It was a privilege to be of service to the band, and good luck with the record, it's terrific!



GCSE Astronomy Trip 2004

Off into space went our intrepid explorers on a hot day, Wednesday, May 19, in support of their studies in astronomy. The students are from Our Lady & St. Bede School and Ian Ramsey School, Stockton-on-Tees, and they tackled this extra subject beyond their usual timetable. Rockets and more are there to see at the National Space Centre, Leicester, our destination.

Below is the massive Blue Streak, built by Britain in the 1960s and then abandoned.



Looking down on it from the top of the rocket tower it was amazing to reflect that this was just a firework-in-a-bottle compared with the Apollo Saturn V vehicle that took men to the moon in the 1970s; that was as tall as St. Paul's Cathedral.

We had arrived with enough time to check our bearings round the exhibitions before being called to our planetarium double-bill show. The first described the life cycles of stars, with a chance at the end to pretend we were in the audience of *Who Wants To Be A Millionaire*: we each had our key pads to answer the presenter's questions. Luckily, we'd all been listening! Then the immense scale of the universe was described in the second feature inside the impressive theatre.

After lunch, work! Questions were set by John McCue based on the numerous and attractive displays in the Space Centre. Ms. Vicky Phillips, science teacher from Our Lady & St. Bede School, kept an eye on proceedings.

The earth's natural satellite, our moon, was a handy resting pad for Nicholas Chapman as he and his group tackled their work.



But there are many thousands of artificial satellites going round our planet earth, many of which relay our TV programmes and mobile phone calls. Many others carry out vital scientific work studying the weather, agriculture, seas and oceans of our home planet.



In the foregoing picture, Warren Clough of Ian Ramsey is photographing a model of the International Space Station. It is the biggest man-made object ever built and launched into orbit, and is constantly manned (although its development is being hindered by the grounding of the Space Shuttle after the terrible Columbia accident). The ISS will eventually be as big as a football field and can be seen easily, crossing the sky in a few minutes from west to east, as bright as a dazzling star.



Alien life is a continuing fascination for everyone, and it is looking quite likely that there may be primitive microbes surviving in the harsh conditions on Mars, possibly in ice just below the Martian surface. Here Ruth Williams (on the right) and Claire Ashton, of Ian Ramsey, find out what aliens on other worlds might look like, and how we are sending our own information out into space, such as that carried by the Voyager spacecrafts. The giant planets Jupiter, Saturn, Uranus and Neptune were explored by that successful duo of probes in the 1970s and 1980s.

More information about the planets was to be found in the excellent gallery devoted to the sun's family, and being

carefully studied in the picture below, left to right, Nikki Broadbent, Sarah Higgin, Warren Clough and James Pickering (Ian Ramsey).



Comets are just flying mountains coated in ice, dust and gas, and made for a fascinating display being studied here by Our Lady and St. Bede students. The National Space Centre has a regular newsletter on its website keeping us all up to date with these comets and asteroids whizzing around our solar system. It's important to keep track of them in case one collides with earth, not a pleasant prospect as it was just such a collision 65 million years ago that wiped out the dinosaurs.



And so, all things must come to an end, but John Lawson (Ian Ramsey), and Ben Szyman (Our Lady and St. Bede) won prizes for the best worksheet scores, marked by Dr. McCue on the journey back.

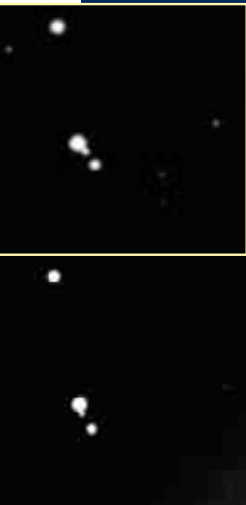
Planetarium Finds A New Star System

It's amazing what computers can do! From the Wynyard Planetarium, we are able to control telescopes in different parts of the world, in particular on top of a mountain, Las Campanas, in Chile. This scheme, NASA's Telescopes in Education, has another telescope in Australia undergoing testing at the moment. The Californian Mt. Wilson telescope is now out of service.

Another remote instrument, this time an English project, the Faulkes Telescope, boasts a reflector with a giant mirror two metres in diameter located in Hawaii, while the similar Liverpool Telescope, run from John Moores University, Liverpool, sits on top of a volcano in Tenerife. Both are undergoing tests and the Wynyard Planetarium is hoping eventually to use both of these impressive instruments with schools.

But back to Chile, and a photograph recently taken with the telescope has revealed a previously unknown triple star system, three stars performing a merry dance around each other over many years. Three other new double stars systems have also been found by this technique, and a report is being prepared for Dr. Bob Argyle of Cambridge University who is helping us with this project.

They were found by comparing the picture with one taken of the same area over fifty years ago (the planetarium has a set of photos of the sky taken by the Californian Palomar Schmidt telescope in the mid 1950s). Comets are also good targets and here are two taken of comet K4LINEAR (named after the automatic telescope LINEAR that discovered it) showing how they can blaze into glory as they approach the sun. The images were taken in April and June of 2004 with the Mt. Wilson telescope.



Touchdown on Teesside

Not many of our schoolchildren on Teesside get the chance to meet a real spaceman; so when it happens it's an inspiration and a genuine boost to their science studies. Wynyard Planetarium and the colleges Bede, Stockton Sixth Form and Prior Pursglove joined forces to bring over from Star City, Moscow, cosmonaut Alexandre Alexandrov, and ballistics expert Alexandre Martynov (pictured above at the planetarium press-call) on an educational tour of schools and colleges in the Tees Valley, from Oct 6, 2003, for a never-to-be-forgotten week.



Alexandrov flew his first space mission, to the space station Salyut, as a flight engineer in 1983, blasting off in the mighty Soyuz rocket from Baikonur in Kazakhstan on June 27. The cosmonauts would ferry to and from Salyut in the capsule Progress. In orbit everything is weightless, including Alexandrov's lunch, a water melon! Human muscles have little work to do so they begin to get weaker. Cosmonauts exercise every day to counter this effect.



In dramatic silhouette at Bede College, Billingham, Martynov described the Russian plan for sending humans to the Red Planet in an interplanetary space station, perhaps in twenty years time. Alexandre Martynov is one of the world's top space

physicists, previously Head of Ballistics at Russian Mission Control, and has been responsible for many missions including sending cosmonauts to the space station Mir and returning them safely to Earth, and landing unmanned probes on the surfaces of Mars, Venus and the moon.

A Bede student tried on a space glove used by Alexandrov, who ventured out twice on space walks. What a brave man! Alexandrov's second space mission began with a Soyuz launch on July 22, 1987, which transported him and a Syrian space traveller to the Mir orbital space station. This time Alexandrov worked in orbit for nearly six months



On Saturday, 11th. Oct., our Russians gave a presentation in the planetarium to the Gifted and Talented pupils of Stockton Schools, coordinated by Stella Cutland.



One for the album! The Stockton pupils are pictured outside the Wynyard planetarium at the end of their exciting morning.

Public Shows/Winter Events At the Planetarium

"The Lord of the Rings: Cassini explores Saturn", Find out what discoveries have been made by Cassini/ Huygens, at single-decker-bus-size, the biggest spacecraft ever launched.

"What's up in the sky this month?": What stars are up there this month, and are there any planets to see?

"Is there Life out there?" Life-forms are tough survivors, and the number is slowly growing of planets and moons in our solar system where they may be clinging on to existence.

"Impact Earth", A special public talk by Andy Heywood of the National Space Centre, Leicester. How much danger do we face from asteroid impacts? How close is Armageddon?

Public Observing through the observatory telescope. This will take place on every Friday night (except Xmas Eve and New Year's Eve, 2004). Observing will start at 7.30pm or as soon as it gets dark (clear skies permitting). On planetarium nights, observing will start after the show. Come and marvel at the universe.

All Public observing is free, and all planetarium shows are 3 pounds adults, 1.50 concessions, and 6 pounds for an unlimited family ticket.

EVENT	DATE 2004/05	TIME
What's Up (in the Sky this month)	September 3rd October 1st November 5th December 3rd January 7th February 4th March 4th April 1st & 29th	7.30 pm
Lord of Rings	September 24th November 19th December 17th	7.30 pm
Impact Earth	October 15th	7.30 pm
Is there Life out there?	January 21st February 18th March 18th April 15th	7.30 pm

School Bookings

The planetarium covers the National Curriculum requirements at all the Key Stages of school progress, and bookings are welcomed from all schools and colleges. Joint visits to include nature activities make an ideal day out for a school trip.

Saturn Gets A Visitor

The spaceprobe Cassini finally arrived at Saturn during this summer of 2004 after an eventful journey of seven years, swinging past Venus twice, and earth and Jupiter once each, gaining extra speed every time, on its way to the ringed planet. This is the first time that Saturn has ever been orbited by an artificial craft as the American-European explorer screeched on the retro-rocket brakes at the end of June and parked itself around the Lord of the Rings.

Cassini is the biggest craft ever sent out into the far reaches of the solar system, weighing in at over 5 tons, as big as a single-decker bus. Enormous solar panels with a total area of two tennis courts would have been needed to provide enough power, so NASA decided on a plutonium powered generator instead. Natural radioactive decay of the plutonium creates heat, which is then converted to electricity in the generator. This system caused some worries before the launch in 1997: if the rocket had exploded at blast-off, said some, radioactive plutonium would get into the earth, but NASA had tested the system and the generators would not have cracked open.

Now that Cassini has safely reached its destination we can look forward to four years of exciting discoveries as it orbits the ringed giant. Attached to Cassini is the European probe Huygens, named after the Dutch astronomer Christiaan Huygens who first spotted Saturn's moon Titan. Bigger than Mercury, it is the second largest moon in the whole solar system and is surrounded by a smog of nitrogen, methane and ethane. At those low temperatures out there, Titan could be like the earth in deep freeze. In November, 2004, Huygens will parachute into Titan's atmosphere. No-one knows on what it will land. The strangest suggestion is that Titan could be covered in an ocean of gooey hydrocarbon compounds.

What strange worlds exist out there, even in our own system of planets!

Contact:

For further details, contact John McCue on 01740 630544, e-mail planetarium@btopenworld.com, web-site www.wynyard-planetarium.net

The planetarium is a joint venture between the Cleveland and Darlington Astronomical Society and Stockton Borough Council.