National Science Week & 2007–2008 International Polar Year

The International Polar Year (IPY) begins in March 2007. This scientific program will focus on the Arctic and Antarctic and their global impacts and will actually span two years, extending to March 2009 to ensure that both poles are sampled over consecutive summers.

To help schools celebrate IPY in 2007, the Australian Science Teachers’ Association (ASTA) has announced that the schools’ theme for National Science Week 2007 will be “Antarctic Science”. ASTA’s Resource Book on Antarctic Science will be sent to schools around May (www.asta.edu.au). National Science Week aims to increase community awareness and understanding of the role of science, technology and innovation in everyday life and our future. So join in and be part of this international event.

The IPY in 2007–2008 will provide an opportunity to engage the next generation of young scientists and to get the public to realise that what happens at the poles does influence us.

The IPY 2007–2008 will involve over 200 projects, with thousands of scientists from around the world studying a wide range of physical, biological and social research topics related to the polar regions.

The IPY website (http://www.ipye.org/) has information on five focus areas: ice, atmosphere, land, oceans, people, space; and many activities for teachers to use in the Educators section, e.g. the project “Breaking The Ice” (PDF) – a hands-on, interactive way to introduce the IPY to your students. There is also a special Australian site (www.ipyeducation.org.au/) for educators, with a calendar of IPY-related events and polar science related activities.

The IPY comes at a time when scientists are warning us about global warming and its consequences. There is abundant evidence of changes in snow and

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INSIDE SCITALK

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to Luna Park Sydney

through Physics is Fun - see p7
Diary Dates 2007

2007 – International Polar Year AND International Year of the Dolphin

February–March 2007


March 2007

- Physics is Fun at Luna Park Sydney. Enquiries. Ph (02) 9939 6107, fax (02) 9939 6105
- International Earth Day. www.earthsite.org

April 2007

- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

May 2007

- Science at the Shine Dome. Australian Academy of Science. Applications for awards for teachers to attend this symposium in: thea. Details soon at: www.science.org.au
- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- CMRI Science Teachers’ Form at Westmead Sydney. Details on page 3.

June 2007

- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- RACI NSW Schools Titration Comp. Details on page 5 & at: www.nswtitration.com
- Closing date Crystal Growing Comp. www.chem.unsw.edu.au/raci/crystal_grow/index

July 2007


August 2007

- Australian Science Festival, ACT. School Activities will be: www.sciencefestival.com.au
- Science Week events: Physics is Fun at Luna Park. http://homepage.mac.com/robertgarner

September 2007

- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

October 2007

- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

November 2007

- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

December 2007

- Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

January 2008


While all dates have been checked to ensure that information in DIARY DATES is correct, no responsibility will be accepted by the publisher or Editor for any omissions or inaccuracies in it.

Update on BOS matters

Regularly check the BOS website to ensure you have the latest information. It contains syllabuses, past exam papers, Official Notices, Board Bulletins, a statistics archive & more.

HSC: All My Own Work … from 2008

From 2008, students entered for one or more HSC courses will be required to have satisfactorily completed this program. It will help them learn to follow the correct principles and practices for locating and using information as part of their HSC program.

(See Board Bulletin Vol 15 No 5 and No 6)

Minor amendments to Stage 6 Syllabuses

Changes have occurred to the syllabuses for Chemistry, Biology Physics and Senior Science. These latest changes incorporate what to do about the changes in the IUPAC names for Chemistry (see BOS 51/06, 52/06, 52/06 and 54/06 and latest versions of each syllabus is now on the BOS website). On BOS website:

- HSCMarkingCentreNotes&Guidelines: these will be available during Tm 1 2007
- Past HSC exams and SC Science Tests
- Amended Periodic Table (BOS 22/05)

BOS enquiries:
Ph (02) 9367 8111, fax (02) 9367 8484
Website www.boardofstudies.nsw.edu.au
BOS contacts for science: Inspector Science K–12 & Senior Assessment Officer-Science.

Attention: Year Advisers

End-of-year Fun days & Reward days at Luna Park Sydney are cheaper if booked through Physics is Fun as a Peer Support excursion.

(ONLY curriculum-based excursions can claim back GST)

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These days are held throughout the year and are a great way to have FUN learning (see p 7).

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  - Primary Science & Technology, English, Maths
  - Science7–10 Technology, Maths, Photograph
  - Physics, Senior Science, Biology, Art
  - Peer Support, Commerce/BUS, Studies/Tourism

NATIONAL SCIENCE WEEK DATES
17, 20 and 23 August 2007
Book your date now by ph (02) 9939 6107,
** Includes complete Risk Assessment package! **

March 4-10 Sea week 07

Marine by-catch matters

Whether you live near the sea or a long way from it, it is important to learn to live in a sustainable way that will help to protect and preserve our terrestrial and marine environments. It is everyone’s responsibility to learn that marine by-catch does matter. The Marine Education Society of Australasia (MESA) has activities, competitions, resources and linked websites each year for Sea week. 2007 things will soon be available (as well as past years) at: www.mesa.edu.au/seaweek.asp

2
OUT AND ABOUT

SYDNEY WILDLIFE WORLD
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Sydney’s newest excursion venue – NOW OPEN!
★ Home to the largest variety of Australian plants and animals under one roof, Sydney Wildlife World provides an amazing educational and entertaining experience.
★ With 9 different habitats, each representing a unique Australian environment or animal, students learn of the immense diversity of Australia’s extensive flora and fauna, in one convenient location. Animals featured include butterflies, koalas, echidnas, reptiles, birds, many invertebrates and more.
★ NSW and ACT teachers are encouraged to preview Sydney Wildlife World for excursion purposes. Simply present teacher ID at the Admissions Desk for complimentary entry at any time.
★ Open 9 am–10 pm
★ Book your excursion NOW on 8251 7811, or visit www.sydneywildlifeworld.com.au to view the comprehensive range of curriculum-based educational kits.

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  • Superconductors & Liquid Nitrogen – live science show
  • Zap! Understanding Electricity
  • Energy and Motion
  • The Changing Earth
  • Dinosaurs, Fossils & Coal … NEW EXHIBITION!
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★ Book now for an excursion. Information/bookings: (02) 4286 5000. Website: http://sciencecentre.uow.edu.au

MUSEUM OF HUMAN DISEASE
2007 SCHOOLS PROGRAM & TEACHERS DAY
The Museum of Human Disease is a pathology museum at The University of New South Wales offering interactive programs with amazing insights into the nature and progression of disease in its many forms. In 2007 we are offering 2 hour curriculum-based programs in the following areas:
  HSC Biology – The Search for Better Health
  HSC Senior Science – Bionics
  Junior Science – Infectious & Non-infectious diseases
The 2007 Professional Development Day for teachers of HSC Biology will be held on Friday 20 July.
Further information and registration forms will be distributed to schools in early March.
Further information and bookings
T 02 9385 1522 E museum.hallofhealth@unsw.edu.au
W www.hallofhealth.med.unsw.edu.au

Science Teachers’ Forum
To be held at the
Children’s Medical Research Institute
Westmead, Sydney
Wednesday 23 May 2007
9.45 am–4.30 pm

This one-day Science Teachers’ Forum will focus on the science of genetics and disease, concentrating on topics relevant to the HSC Biology syllabus.

The forum will include an introduction to the use of Gene Technology in medical research, followed by captivating presentations from two prominent CMRI research scientists on Genes in Development and Genetically Modified Mice to study Muscle and Muscle Diseases. There will also be an informative session devoted to the topic of Genetics and Ethical Issues followed by interactive hands-on practical laboratory demonstrations of simple DNA-based techniques.

Places will be limited, so please book by Wednesday 11 April 2007.
Contact: Jane Fleming 02 9687 2800 or email: jfleming@cmri.com.au
(an additional Forum will be held in November)

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• Dinosaurs 3D … starts March
• Mummies: Secrets of the Pharaohs … starts April
• Sea Monsters 3D … starts September
• Wild Africa 3D … starts November

★ DINOSAURS 3D
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OR Visit our new website: www.imax.com.au/schools
In July 2007, 140 students from across Australia and around the world will gather at the School of Physics, The University of Sydney for two weeks of cutting-edge science. EcoScience will include daily lectures with a central theme of ecology and environmental science. Many diverse areas of this interdisciplinary field will be featured, with each topic examined in one or two lectures by internationally respected scientists.

Beyond the lecture theatres, ISS scholars participate in other activities — experiments, museums, lab tours, a harbour cruise — all designed to enthuse and excite their scientific curiosity.

All scholars are competitively selected at State level, and attendance is by scholarship only. The scholarships are valued at approximately $3,000 and cover return travel within Australia, board and accommodation at Women’s College for the duration of the School, all events and activities organised by the Science Foundation for Physics and a copy of the official ISS book of lectures.

For more information contact: Dr Chris Stewart
ph (02) 9351 3622, fax (02) 9351 7726, email c.stewart@physics.usyd.edu.au
or visit www.scienceschool.usyd.edu.au

Errata
In the article “Pasteurisation, but without milk” in SciTalk No. 4–2006 the name of the inventor was unfortunately misspelled. Apologies to Julie Frost, a recent graduate of UNSW, who designed the Mvura.

The Mvura (meaning water) is a unique device designed for developing communities where many people at present may be used to help such people. The Mvura can hold up to 15 litres of water and works by pasteurising the water using the Sun’s heat energy, thus killing most harmful pathogens in it. (Ed)
The 2007 NSW Schools Titration Competition is a great way for Year 11/12 chemistry students to test their quantitative analytical skills. Organised by the Chemical Education Group of the Royal Australian Chemical Institute (RACI) it is held across NSW. Students have 90 minutes to complete a set of acid-base titrations to determine the unknown concentration of a weak acid. Entry costs $24/team of 3 – with a max of 8 teams/school.

A team’s score depends on the accuracy of each member. At each venue, each member of the winning team wins a trophy. Winning teams may then be invited to the National Competition in September 2007. All students receive a Certificate of Excellence or Merit or Participation. The de Miklouho-Maclay Prize for Practical Chemistry (certificate & $100) is awarded to the NSW student with the best overall results.

Closing date is 4 May 2007

★ 2006 NSW Schools Titration Competition
30 teams achieved an Excellent award. Congratulations to the following teams:
• 1st: Fort St HS;
• 2nd: Fort St HS;
• 3rd: Christian Bros HS Lewisham.

★ 2006 National Competition results
305 teams of three students entered the 2006 NSW Schools Titration competition. 29 teams went on to compete in the National Competition in September at UNSW. Of the top 25 scores, 3 were by NSW teams: 10th place (SHORE), 18th place (Sydney Girls’ HS) and 21st place (Willoughby GHS). 1st place in Australia was Marymount College from Queensland.

★ 2006 de Miklouho-Maclay Prize
The 2006 de Miklouho-Maclay Prize for excellence in Chemistry went jointly to Edward O’Neill and Chao Wang of SHORE School with a near perfect score!

★ Congratulations to all these competitors!
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All papers will be delivered in Week 1 of Term 3. Invoices will be sent with the papers. Papers can be used as exams at any time after delivery but are not to be released to students before 15 August (Trial) or 17 September (Preliminary and School Certificate.)
ice: reductions in extent and mass of glaciers and ice sheets, reductions in area, timing, and duration of snow cover, and reductions in extent and thickness of sea ice. Changes in snow cover and sea ice have immediate local consequences for terrestrial and marine ecosystems. Permafrost influences nearly 25% of the northern hemisphere landmass, and shows substantial decomposition due to the warming climate. Permafrost degradation affects local ecoxoni and hydrology as well as coastal and soil stability. How these changes will impact on millions of people are described in detail on the IPY website.

The IPY will be a time of discovery and interactive learning is a great way for your students to discover that learning is not so dull after all! Students will learn as they ride at these fun-fillled excursions. These fun park excursions are presented by experienced teachers.

WORKSHEETS … secondary / primary
Secondary: Science 7–10; Physics, Biology, Senior Science; Technology; Visual Arts; Maths; Peer Support; Commerce; Business Studies, Tourism, Photography.
Primary: Science & Technology; English, & Mathematics; Art; or Peer Support.

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Physics is Fun was co-authored in 1983 by Robert Garner and Sylvia Jennings and was based on their earlier excursions at Luna Park in the 1970s. Robert has conducted these fun park excursions since their inception … both at Luna Park (1983–1987, 1995, 2004–2007) and Wonderland Sydney (1990–2004) … covering many different subject areas. With the closure of Wonderland Sydney in early 2004, these Fun Park Excursions have been at Luna Park Sydney since its re-opening in April 2004.

Note: Our excursion notes are only for use when on an excursion day booked through Physics is Fun. It is an offence under Copyright Laws to use them on any other occasion without written permission from Physics is Fun.

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2007 Crystal Growing Competition
Students in K–8 are invited to grow crystals of potassium aluminium sulfate (= alum or potash alum) for five weeks and submit them to the RACI for judging by Friday 22 June 2007. Biggest will not necessarily be the best!

All details and rules are at:
www.chem.unsw.edu.au/raci/crystal_growth/index.htm

What marvels of photochemistry occur when spring’s first light strikes winter snow? How do microbial communities in the upper ocean influence cloudiness in the atmosphere above? How have humans survived in the Arctic for thousands of years?

The 2007–2008 IPY is the fourth IPY – the first was in 1882–83 and was inspired by Karl Weyprecht, an Austro-Hungarian naval officer who believed polar exploration ought to focus on scientific goals. The second IPY was in 1923–33 (although this was diminished due to the global depression) and the third in 1957–58.

The International Heliophysical Year (IHY), is also set for 2007 and will extend the focus to the entire solar system and beyond. You can find out more about this at: http://ihy2007.org/

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These starch granules are from the plant *Marsilea drummondii*, or Nardoo (also Ngardu) as it is more commonly known. The image shows two whole granules in ‘plan’ view and a third in ‘profile’ view giving an idea of the size and shape of the granules. The image also shows a vesicle within which the starch is stored in the lower left.

*M. drummondii* (Nardoo) was a staple economic plant used by Australian Aboriginals who lived in semi-arid or arid zones. The starch is found in underground storage organs called sporocarps and was collected and processed before consumption. Aboriginal people in arid Australia would collect the spore cases, roast them, discard the cases, and grind the spores with water to make a dough which they cooked to make cakes.

The deaths of Burke and Wills in 1861 whilst on their expedition across Australia are thought to have been exacerbated from eating Nardoo that was not processed properly. Nardoo must be ground with water to remove the toxins (thiaminase) and baked before eating (see Box 1). Nardoo is toxic to humans if the thiaminase is still present in it when eaten, though we know that modern feral pigs regularly consume it. It is generally not favoured by stock when alternative feed is available. It has been claimed to cause poisoning in sheep, horses and cattle. However, ingestion does not always result in poisoning.

The starch granules are left as residues on the surface of grinding stones and may persist for thousands of years. Archaeologists who recover grinding stone tools during excavation have been able to isolate these residues and starch granules from grasses to demonstrate the antiquity of the plant processing of these plants in Australia in excess of 25 000 years.

**Nardoo** is endemic to inland areas of Australia, in all states and territories except Tasmania and the ACT. It is an aquatic perennial fern that forms clumps about 8–10 cm high at the edge of inland lakes, waterholes, claypans, swamps, rivers and floodplains, but is more usually a submerged plant with leaves, reminiscent of four-leafed-clover, floating on the water surface. Its reproduction and germination is almost completely dependent on cycles of flooding and drying. It has a low salinity tolerance and is potentially a species that may provide useful indication of health of mudflats as well as being a suitable plant for monitoring purposes.

Nardoo is now a popular horticulture subject and is widely cultivated as a garden pond plant.

**BOX 1. Nardoo can lead to beri-beri** Aboriginals helped the explorers on Burke and Wills’ expedition across Australia by feeding them with damper and seedcakes made from Nardoo. Interestingly, Wills wrote that ‘while Nardoo was abundantly available as a food source, it assuaged their hunger but provided virtually no nutrients and did nothing to curb their physical deterioration’. Unbeknown to the explorers, Nardoo seeds contain thiaminase which depletes the body of Vitamin B1. As a result, it is likely that Burke and Wills’ deaths resulted in part from beri-beri (see Box 2). Evidence to this effect is further provided by fellow explorer, John King’s, account, in which it is revealed that Burke complained of leg and back pain shortly before his death.

**BOX 2. Beri-beri** This nervous system ailment is caused by thiamine (vitamin B1) deficiency. Its symptoms include weight loss, emotional disturbances, impaired sensory perception, weakness and pain in the limbs, and periods of irregular heart rate. Edema (swelling of body tissues) is common. In advanced cases, there may be heart failure and death.

Treatment is with thiamine hydrochloride, either in tablet form or injection. A rapid and dramatic recovery within hours can be made when this is administered to patients with beri-beri, and their health can be transformed within an hour of administration of the treatment. Thiamine occurs naturally in fresh foods and unrefined cereals, especially fresh meat, legumes, green vegetables, fruit, and milk.
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Comet McNaught

Comet McNaught (C/2006 P1) was a routine discovery by Rob McNaught on 7 August 2006, with the Uppsala Schmidt telescope at Siding Spring Observatory, near Coonabarabran, NSW as part of a survey. The mission of the Siding Spring Survey is to contribute to the inventory of near-earth objects (NEOs), or more specifically, the potentially hazardous asteroids (PHAs) and comets (PHOs) that may pose a threat of impact with Earth.

The ‘coma’ is the diffused patch of light that forms around the nucleus as the comet approaches the Sun. The heat from the Sun makes the nucleus unstable and material (gas and dust) is ejected and forms the coma.

Many comets have two ‘tails’, not one. Notably the tails are always pointed away from the Sun regardless of the comet’s motion and can be up to 150 million km in length. The ‘gas tail’ (called the ‘ion tail’) is composed of many different types of ionised molecules being drawn away from the coma by solar winds. The ‘dust tail’ is composed of dust particles liberated from the nucleus as the ices are vapourised by the Sun. Typically, the ion tail will be almost straight, and the dust tail will exhibit a slight curve back along the comet’s path. This means that a comet’s ion and dust tails are separated, and are often seen as such, normally in photographs, but sometimes visually as in Comet McNaught.

Comets are influenced by the gravity of the Sun (and other objects in the Solar System). Most comets move in elliptical orbits around the Sun. Some comets are on smaller orbits and are seen more regularly. These are called Periodic Comets. Others that return within less than 200 years are called Short Period Comets. The comet with the shortest known period is Comet Encke, which moves around the Sun every 3.3 years and is due to appear.

Some comets are on such large orbits that they take thousands of years to complete each revolution. A great example of this was Comet Hyakutake in 1996, Comet Hale-Bopp in 1997 and indeed Comet McNaught. Any close approaches to the planets can significantly affect the orbits of Comets.

What’s coming up in the skies overhead?

Planets

Venus has been low in the early western night sky during January and was often mistaken for Comet McNaught. It will remain an early evening object through February until mid-August. By mid-February it is in Pisces but will move into Aries by mid-March. It will stay there until mid-April when it moves into Taurus for the remainder of the month moving into Gemini in early May.

Saturn has just passed opposition (11 Feb) and will be at its brightest and largest through into April. It will remain an all night object in the north-eastern sky until the end of April when it will be setting around midnight. Any size telescope will reveal its magnificent rings. Larger apertures will show the Cassini Division.

By early March, Jupiter will be rising in the eastern sky just before midnight in the constellation of Ophiuchus (just below the belly of Scorpius) and will be easy to find with the naked eye. Jupiter will be really close to the Moon on 12 March, 8 April and 5 May. A 15 cm telescope will reveal its equatorial bands and its paler temperate zones. From 6 April it begins its retrograde motion which will continue until early August. It will be rising around 9 pm and should be fairly high in the eastern sky by midnight. By early May it will be rising before 8 pm. Jupiter is heading towards a perihelic opposition in June.

Note about Sky Charts & Planispheres:

• You can download free sky charts each month to explore the night sky from: http://skymaps.com/downloads.html OR www.sydneyobservatory.com.au

• Better still, there is a planisphere to print and use at: http://members.ozemail.com.au/~starrylady/Planis1.htm

Meteor showers

The delta-Leonids will be active 15 Feb–10 March and peak on 25 Feb. The Virginids will be active in late evenings from 25 Jan–15 April with several peaks in this period.

* * * * *

Figure 1. Comet McNaught: a 120 second exposure taken by Scott Branson on 21 January 2007 near Snowtown in SA

Figure 2. Structure of a typical comet when it is near the Sun. In this diagram, the Sun would be to the lower right.

Figure 3. Taking photographs of a comet can be a lot of fun, especially if you have a tripod and can use time exposure.

What a way to start 2007! … Don Whiteman

Comet McNaught put on the best naked eye display of any comet for the last 40 years and even then it was better than Comet West in 1976. For anyone who looked at the sunset in the western skies around mid January was treated to a view that will last a lifetime.

Don Whiteman

Tim said he “had fun contending with cows and the two pet sheep who live them. These animals are intensely curious and anything happening in their space gets attention! Finally, satisfied I was not interesting any more and had no hay for them, they settled down content to just watch what I was doing, totally oblivious to the amazing show behind them.”
HSC statistics: Entries for science courses and options for the 2006 HSC

The total number of entries for the HSC Science courses* in 2006 was 38 942 and the total number of HSC entries for the 2006 HSC was 65 602. So Science entries were 59.4% of the total entries.

The number of HSC Science entries as a percentage of the total HSC entries from 1992–2006 is shown in the table below. This percentage has decreased significantly from the peak of 90.8% of the total candidature in 1992 with 54 414 students doing a Science course to only 58.0% in 2001. Since 2001, the percentage of Science entries has not varied greatly from around 58.0%, but this is much lower than in past years.

### Entries for HSC Science courses 1992–2006 as a percentage of the total number of HSC entries

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Total 2006 candidature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>90.8</td>
<td>87.0</td>
</tr>
</tbody>
</table>

The pattern of options presented at the 2006 HSC for each Science course is given as a percentage in the following tables.

#### Biology

<table>
<thead>
<tr>
<th>Course</th>
<th>Total 2006 candidature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q28. Communication</td>
<td>14 067</td>
<td>58.7%</td>
</tr>
<tr>
<td>Q29. Biotechnology</td>
<td></td>
<td>7.8%</td>
</tr>
<tr>
<td>Q30. Genetics: The Code Broken?</td>
<td></td>
<td>20.3%</td>
</tr>
<tr>
<td>Q31. The Human Story</td>
<td></td>
<td>12.5%</td>
</tr>
<tr>
<td>Q32. Biochemistry</td>
<td></td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>99.8%</td>
</tr>
</tbody>
</table>

#### Physics

<table>
<thead>
<tr>
<th>Course</th>
<th>Total 2006 candidature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q28. Geophysics</td>
<td>9 116</td>
<td>2.1%</td>
</tr>
<tr>
<td>Q29. Medical Physics</td>
<td></td>
<td>26.8%</td>
</tr>
<tr>
<td>Q30. Astrophysics</td>
<td></td>
<td>26.0%</td>
</tr>
<tr>
<td>Q31. From Quanta to Quarks</td>
<td></td>
<td>44.0%</td>
</tr>
<tr>
<td>Q32. The Age of Silicon</td>
<td></td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.0%</td>
</tr>
</tbody>
</table>

#### Chemistry

<table>
<thead>
<tr>
<th>Course</th>
<th>Total 2006 candidature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q28. Industrial Chemistry</td>
<td></td>
<td>38.9%</td>
</tr>
<tr>
<td>Q29. Shipwrecks, Corrosion and Conservation</td>
<td></td>
<td>42.8%</td>
</tr>
<tr>
<td>Q30. The Biochemistry of Movement</td>
<td></td>
<td>1.4%</td>
</tr>
<tr>
<td>Q31. The Chemistry of Art</td>
<td></td>
<td>3.4%</td>
</tr>
<tr>
<td>Q32. Forensic Chemistry</td>
<td></td>
<td>13.2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>99.7%</td>
</tr>
</tbody>
</table>

#### Earth & Environmental Science

<table>
<thead>
<tr>
<th>Course</th>
<th>Total 2006 candidature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q28. Introduced Species &amp; the Australian Environment</td>
<td>1 140</td>
<td>78.0%</td>
</tr>
<tr>
<td>Q29. Organic Geography – A Non-renewable Resource</td>
<td></td>
<td>8.1%</td>
</tr>
<tr>
<td>Q30. Mining and the Australian Environment</td>
<td></td>
<td>4.4%</td>
</tr>
<tr>
<td>Q31. Oceanography</td>
<td></td>
<td>9.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>99.5%</td>
</tr>
</tbody>
</table>

#### Senior Science

<table>
<thead>
<tr>
<th>Course</th>
<th>Total 2006 candidature</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q28. Polymers</td>
<td>4 019</td>
<td>4.4%</td>
</tr>
<tr>
<td>Q29. Preservatives and Additives</td>
<td></td>
<td>3.5%</td>
</tr>
<tr>
<td>Q30. Pharmaceuticals</td>
<td></td>
<td>17.3%</td>
</tr>
<tr>
<td>Q31. Disasters</td>
<td></td>
<td>65.5%</td>
</tr>
<tr>
<td>Q32. Space Science</td>
<td></td>
<td>9.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>99.8%</td>
</tr>
</tbody>
</table>

Distinction Cosmology: Total 2006 Candidature was 26 (20 males, 6 females). Science Life: Total 2006 Candidature was 357 (212 males, 145 females). (These courses are part of the total science entries.)

These tables were prepared by Robert Garner using data provided by Board of Studies, Jan 2007.

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**Macquarie University Observatory Public Observing Program**

Open to the public every Friday night from March–November (except Good Friday). Opens 8.30–10 pm in March & Nov, & 7.30–9 pm in April–October. Entry is via Gymnasium Rd, near Culloden & Waterloo Roads roundabout. If raining, please ring 0427 433 388 to confirm if open.

On fine nights, we offer a ‘starfinder’ session to demonstrate how to identify bright stars, constellations and planets. This is followed by observing with the telescopes. Even with the light pollution of the city, we can easily see double and multiple stars, open and globular star clusters, and the brighter nebulae. The Moon and planets, when in suitable positions, are easily viewed with any of our instruments.

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Admission: $5 per person. Children under 5 are free.

No bookings needed, unless you have 10 or more. ph 0427 433 388.

For parking information: www.astronomy.mq.edu.au/publicObs.html

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**CONGRATULATIONS**

SciTalk No. 4 – 2006 “Astronomy Giveaway” winners, George Green, Keira HS & Sally Staniforth, Coolah Central, each won a copy of:

**ASTRONOMY 2007**

A PRACTICAL GUIDE TO THE NIGHT SKY

by Glenn Dawes, Peter Northfield, Ken Wallace


OR The Binocular & Telescope Shop, 84 Wentworth Pk Rd, Glebe ph 9518 7255, fax 9518 5711, email: info@bintel.com.au/ Cost:$20 (plus $3 post)

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CONTRIBUTIONS

SciTalk is due into schools mid-term. All contributions for SciTalk should be directed to the Editor (see below).

CLOSING DATES

SciTalk No. 1 – February 2007 … April 5
SciTalk No. 2 – June 2007 … Sept 28
SciTalk No. 3 – August 2007 … June 29
SciTalk No. 4 – November 2007 … March 5

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