

SciTalk

ISSN 1323-7667

Number 1 – February 2008

Book Giveaway

WIN these books & CDs ...

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by Geoffrey Thickett



ISBN:

Prelim: 9780731404100, HSC: 9780731404155

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★ ★ ★

Winner for *SciTalk 4/07*

Congratulations to C Bannerman, Penrith High, who won *NSW Biology* (\$79.95 ea) published by Macmillan Education Australia.

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After you have read this, please write/tick your name below and pass it on.

- 1.
- 2.
- 3.
- 4.
- 5.

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PRIZES TO WIN!

See pages 1, 5 & 12

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This *SciTalk* & past issues are available at <http://www.odlumgarner.com>

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15, 18, 21 August 2008

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... see p 6 for full details

Diary Dates 2007-08



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.

2007 Notes from the Marking Centres

These went up on the BOS internet site in February: www.boardofstudies.nsw.edu

New Periodic Table was used in 2007 HSC

The new periodic table of elements, in line with IUPAC recommendations, was used in the last HSC exams and is available on the BOS website in 'HSC Syllabuses'. Make sure this is what your school is using.

On BOS website:

- Past HSC exams and SC Science Tests
- Amended Periodic Table

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

NOTE: Your purchase of the Odlum & Garner Past HSC Biology, Chemistry and Physics books helps to support the production of Past HSC books for Earth & Environmental Science and Senior Science. Thank you to all the teachers who support these projects.

Commonsense is the deposit of prejudice laid down in the mind before the age of 18.
 ... Albert Einstein

2008 – International Polar Year

(ALSO: *International Year of Planet Earth, International Year of the Reef, International Heliophysical Year, & International Year of Sanitation*)

For: Shell Questacon Science Circus 2008 program in NSW: www.questacon.edu.au/html/on_the_road.html

MARCH 2008

14, 17, 31 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
 20 International Earth Day. www.earthsite.org/
 [Note: 20 March is the original day, but it is celebrated on 22 April in some places: www.earthday.net/]

MAY 2008

2-4 Science at the Shine Dome, Australian Academy of Science: *Dangerous climate change: is it inevitable?* Details re teacher awards to attend, soon at: www.science.org.au
 8, 9, 30 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
 19 Science Teachers' Forum: Children's Medical Research Institute – see ad on page 4

JUNE 2008

2, 6 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
 12 & 13 Science Teachers' Workshop 2008: School of Physics, Uni of Sydney – see ad on page 4
 20 Closing date Crystal Growing Comp. (02) 9888 9077, www.chem.unsw.edu.au/raci
 20 & 21 NSW Schools Titration Competition: www.nswtitration.com – see ad on page 8

JULY 2008

4 Professional Devt Day for Biology Teachers: HD Museum, UNSW, see ad on page 3
 6-9 CONASTA 57: *Surfing the Wave of Change*. (07) 3861 5444. Fax (07) 3861 5701.
 Griffith Uni Gold Coast Campus. www.astmanagement.com.au/conasta57/
 21-25 National Chemistry Week. www.raci.org.au/national/events/chemistryweek.html
 24 National Chemistry Quiz. www.raci.org.au/national/events/nationalchemistryquiz.html

AUGUST 2008

1 Jeans for Genes Day – helps to fund scientists working at Children's Medical Research Institute. 1800 436 437, <http://www.jeans4genes.com.au/>
 16-24 Australian Science Festival, ACT. School Activities: dates tba. www.sciencefestival.com.au
 16-24 National Science Week: *Planet Earth – Planet of Change*. www.scienceweek.info.au/
 16-24 Australian Science Festival, ACT. School Activities will be at: www.sciencefestival.com.au
 15, 18, 21 Science Week events: Physics is Fun at Luna Park. <http://www.odlumgarner.com>
 20 Physics Olympiad Nat. Qualifying Exam. www.aso.edu.au/ Close date: 27 June. 6125 9645
 22-26 Ultimo Science Festival: RACI, (02) 9663 4960, www.chem.unsw.edu.au/raci
 26 GeoscienceAustraliaOpenDay: 10am-4pm, www.ga.gov.au/about/event/penday2007.jsp
 27 Biology Olympiad Nat. Qualifying Exam. www.aso.edu.au/ Close date: 27 June. 6125 9645

SEPTEMBER 2008

3 Chemistry Olympiad Nat. Qualifying Exam. www.aso.edu.au/ Closedate: 27 June. 6125 9645
 11 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
 21 Spring equinox

OCTOBER 2008

12-18 Earth Science Week. www.ga.gov.au/education/events_6249_9859 (www.earthsciweek.org)
 17, 20, 24, Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
 27, 30 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

NOVEMBER 2008

10, 14, 21, 24 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
 27, 28 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

DECEMBER 2008

4, 5, 12 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

JANUARY 2009

National Youth Science Forum. Forms to local Rotary club by 15/5/08, interviews in July.

Only for Yr 11 in 2008. Enquiries: 6125 2777, fax 6125 8015, email: nsss@anu.au, www.nysf.edu.au/

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.

Australian Science Festival

This year, the 2008 Australian Science Festival will bring climate change to the public with a range of events suitable for all ages that will explain how this very important issue will affect our daily lives.

The Festival's many free events will be held across Canberra from 16-24 August. The centrepiece exhibition and school education

program, the *Amazing World of Science*, will be at the National Convention Centre from 20-24 August.

The program consists of hands-on workshops and shows, covering many areas of the science curricula. Ticket prices start at \$4 for students with supervising teachers free.

Details at: www.sciencefestival.com.au

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- Physics • Senior Science • Biology • Photography
- Peer Support • Commerce/Bus. Studies/Tourism

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 15, 18 and 21 August 2008

Book your date now by ph (02) 9939 6107.

**** Includes complete Risk Assessment package! ****



The University of Sydney

The Science Foundation for Physics & The School of Physics

New Horizons: Science Teachers' Workshop 2008

Sydney: Thursday 12 & Friday 13 June 2008

School of Physics, The University of Sydney

Regional NSW: venues & dates TBA

The two-day *Science Teachers' Workshop 2008 (STW2008)* will focus on the NSW Physics syllabus, giving you a chance to improve your understanding of physics, share classroom tips and tricks and learn new ways to get your students excited. STW2008 includes a lecture series covering physics concepts and ideas, including sessions for new physics teachers, while hands-on sessions will provide practical ideas and classroom resources. STW2008 will run in Sydney on Thurs 12 and Fri 13 June 2008, and in regional centres in conjunction with *KickStart* HSC Physics student workshops (dates and locations TBA).

Check www.physics.usyd.edu.au/foundation for details and registration forms in early 2008.

For more information:

Ms Alex Viglienzone
 Science Foundation for Physics
 School of Physics A28
 The University of Sydney NSW 2006

Phone: 02 9036 6188
Fax: 02 9351 7726
Email: alexv@physics.usyd.edu.au
Web: www.physics.usyd.edu.au/foundation/

Science Teachers' Forum

To be held at the
Children's Medical Research Institute
 Westmead, Sydney
Monday 19 May 2008
 9.45 am–4.30 pm



**CHILDREN'S
 MEDICAL
 RESEARCH
 INSTITUTE**

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

It 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 and Eye Development** and **Brain Cell Communication**. There will also be an informative session devoted to the topic of **Genetics and Ethical Issues** followed by interactive hands-on practical lab demonstrations of simple DNA-based techniques.

Places will be limited, so please book by **Friday 11 April 2008**.

Contact: Jane Fleming (02) 9687 2800, email: jfleming@cmri.com.au

Cost: \$55 to cover cost of refreshments and lecture notes.

* An additional Forum will be held in November *

COMBINE A FUN PARK EXCURSION AT LUNA PARK SYDNEY WITH EITHER IMAX / SYDNEY AQUARIUM

Combine your Fun Park Excursion at Luna Park Sydney with Physics is Fun with a visit (before or afterwards) to either IMAX or SYDNEY AQUARIUM for a great action-packed, fun time of interactive learning. These excursions are a great way to demonstrate learning in action.

● COSTS, BOOKING DETAILS & WORKSHEETS – GO TO:

IMAX: www.imax.com.au/schools

SYDNEY AQUARIUM: www.sydneyaquarium.com.au

PHYSICS IS FUN: <http://www.odlumgarner.com>



● PLANNING YOUR DAY:

Allow 1 hr for IMAX (any film),

or 2 hrs for a Sydney Aquarium excursion.

Allow 2–3+ hours for Luna Park Sydney (open 11 am–6 pm)



BOOK & PAY SEPARATELY FOR EACH EXCURSION

AUSTRALIAN MUSEUM SCHOOLS PROGRAMS 2008

Involve your students in exciting exhibitions and stimulating curriculum-linked programs exploring nature and cultures.

PRIMARY

We offer sessions with a Museum educator:

- Animals past and present
- Fossils
- Aboriginal studies

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Sessions with a Museum educator include:

- Human Story (Yr 11–12)
- Fossils (Yr 7–12)
- Evolution of Australian Biota (Yr 11–12)
- Geoscience Sessions (Yr 11–12)
- Investigations Days (Yr 7–10)
- Evolution Trail Combo (Yr 9–10)
- Aboriginal studies talks (Yr 7–12)
- Site Study for History students (Yr 7–10)

K–12 self-guided activities are also available.

COMING SOON

DINOSAURS (Opening 15 March 2008)

Encounter dinosaurs as you've never seen them before in this exciting new immersive exhibition at the Australian Museum.

Special preview night for teachers on 1 April from 5.15 pm

Register by email (include name, school, address) at: Dinosaurs@austmus.gov.au

SURVIVING AUSTRALIA (Opening June 2008)

This new exhibition showcases the diversity of Australia's unique fauna and how they have adapted to an amazing array of habitats. Preview night for teachers on 30 July.

For bookings and further information

Ph (02) 9320 6163

Fax (02) 9320 6072

www.australianmuseum.net.au/visiting/education

AUSTRALIAN MUSEUM

6 College Street, Sydney

(opp. Hyde Park)

open daily 9.30 am – 5 pm

www.australianmuseum.net.au



HSC statistics: Science entries in the 2007 HSC

The total number of entries for the HSC Science courses* in 2007 was 38 487 and the total number of HSC entries for the 2007 HSC was 66 473. So Science entries were 57.9% of the total entries.

The number of HSC Science entries as a percentage of the total HSC entries from 1992–2007 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 1992–2007 as a percentage of the total number of HSC entries#																
YEAR	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
%	90.8	87.7	80.1	72.0	73.8	72.3	70.2	69.9	64.1	58.0	55.8	56.5	58.3	58.4	59.4	57.9

The pattern of options presented at the 2007 HSC for each Science course is given as a percentage in the following tables.

Biology	
Total 2007 candidature 14 447 (♂ 5 406 ♀ 9 041)	
Q28. Communication	60.6%
Q29. Biotechnology	7.2%
Q30. Genetics: The Code Broken?	20.3%
Q31. The Human Story	10.9%
Q32. Biochemistry	0.6%
	99.6% §

Physics	
Total 2007 candidature 9 126 (♂ 6 889 ♀ 2 237)	
Q28. Geophysics	1.5%
Q29. Medical Physics	26.9%
Q30. Astrophysics	25.0%
Q31. From Quanta to Quarks	45.2%
Q32. The Age of Silicon	1.2%
	99.8% §

Chemistry	
Total 2007 candidature 10 287 (♂ 5 636 ♀ 4 651)	
Q28. Industrial Chemistry	41.6%
Q29. Shipwrecks, Corrosion and Conservation	40.3%
Q30. The Biochemistry of Movement	1.9%
Q31. The Chemistry of Art	4.0%
Q32. Forensic Chemistry	12.2%
	100.0% §

Earth & Environmental Science	
Total 2007 candidature 1 244 (♂ 685 ♀ 559)	
Q28. Introduced Species & the Australian Environment	78.2%
Q29. Organic Geology – A Non-renewable Resource	8.4%
Q30. Mining and the Australian Environment	4.2%
Q31. Oceanography	8.7%
	99.5% §

Senior Science	
Total 2007 candidature 4 210 (♂ 2 358 ♀ 1 852)	
Q28. Polymers	6.2%
Q29. Preservatives and Additives	5.8%
Q30. Pharmaceuticals	17.7%
Q31. Disasters	60.8%
Q32. Space Science	9.2%
	99.7% §

[Note: Individual option percentages are rounded to the nearest 0.1%, thus totals are not exactly 100.0% for some courses.]

- * These are the total number of entries in Science courses, and not the actual number of students who study a Science course, since a fair percentage actually study 2 courses in the same year, and some students since Pathways do 3 science courses.
- # The total number of entries prior to 1996 was based on the total English candidature. Since then, due to Pathways, the total figure each year is still based on English entries, but is slightly affected by acceleration students, Pathways students, etc.
- § The total number of students below reflects the actual number of students who received a result for each subject. It differs from the figures given in the media as their figures are the number of HSC entries for each subject as of September 2007. There is usually a difference between these two sets of figures because some students have illness/misadventure and so do not sit for the examination.

Distinction Cosmology: Total 2007 Candidature was 28 (20 males, 8 females).
Science Life: Total 2007 Candidature was 389 (241 males, 148 females).
 (These courses are part of the total science entries.)

These tables were prepared by Robert Garner using data provided by Board of Studies, Feb 2008.

WIN A FAMILY PASS TO SYDNEY AQUARIUM



Sydney Aquarium at Darling Harbour is a great science excursion venue. It showcases Australian aquatic habitats, their fauna and flora, information on habitat characteristics, animal adaptations and conservation issues. Bookings are essential. Excursions are self-guided. Information: www.sydneyaquarium.com.au

* * * * *

TO WIN A FAMILY PASS TO SYDNEY AQUARIUM: (for 2 adults & 2 children worth \$68) ... send in your name, school, & school address on an envelope by **14 April 2008** to:
Sydney Aquarium Teacher Offer, PO Box 442, Harbord NSW 2096

WINNER: Geoff Roberts, Beverly Hills GHS won the Sydney Aquarium family pass for *SciTalk* No. 4–2007.



WIN A FAMILY PASS TO IMAX

IMAX Sydney, at Darling Harbour, is open every day. More than 8 storeys high, it has the world's biggest cinema screen to give the ultimate film experience. IMAX films are entertaining and educational. They constantly change and cover a wide range of themes. Quality resource materials & teacher guides are provided for schools.

★ ◆ ★ ◆ ★ ◆ ★

TO WIN A FAMILY PASS* TO IMAX: (for 2 adults and 2 children worth \$50) ... send in your name, school, & school address on an envelope **by 14 April 2008** to:
IMAX Give Away, PO Box 442, Harbord NSW 2096

* This pass will be valid for any one film for any session, except public holidays and films advertised as 'no free list'.

WINNER: Maureen O'Connor, The Riverina Anglican College won the IMAX Sydney family pass for *SciTalk* No. 4–2007.




WIN A FAMILY PASS TO SYDNEY WILDLIFE WORLD



Sydney Wildlife World at Darling Harbour is a great NEW science excursion venue, which opened in September 2006. It displays Australian fauna and flora in 9 different habitats. With over 6000 animals, this will link well to the syllabus. Details: www.sydneywildlifeworld.com.au

* * * * *

TO WIN A FAMILY PASS TO SYDNEY WILDLIFE WORLD (for 2 adults & 2 children worth \$68)

Send in your name, school, & school address on an envelope by **14 April 2008** to: *Sydney Wildlife World Teacher Offer PO Box 442, Harbord NSW 2096.*

WINNER: Vivienne Gilkes, St Charbels College won a Sydney Wildlife World family pass for *SciTalk* No. 4–2007.





FUN PARK EXCURSIONS

2008 DATES*

March 14, 17, 31. May 8, 9, 30.
June 2, 6. Aug 15, 18, 21, 25.
Sept 11. Oct 17, 20, 24, 27, 30. Nov
10, 14, 21, 24, 27, 28. Dec 4, 5, 12.

Note: ALL OTHER SCHOOL DAYS (not Tues/Wed) are also available ... from \$22* per student ...

TIME 11 am–6 pm

COST \$21* / student (2008) plus \$20* booking fee / school
Teachers **FREE:** 1/8 primary or 1/15 secondary students.

Entry to Luna Park is FREE. Extra teacher ride tickets are \$24.50* ea.

* plus 10% GST (schools can claim this back, only if doing a curriculum-specific excursion).

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<http://www.odlumgarner.com>

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ALL school faculties can book just a FUN DAY or an EDUCATION DAY at Luna Park Sydney through Physics is Fun and save \$\$\$.

Numbers are limited to ensure minimal queues. Come and join us for a fun-filled day at LUNA PARK Sydney. Curriculum-based worksheets are available.

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-filled 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.

JOINT EXCURSIONS

Save \$\$\$ – see an IMAX film or visit Sydney Aquarium, before or after Luna Park ... see p3.

Physics is Fun Fun Park Excursions The original and best

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.

Please 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.

★ Book NOW – don't miss out! ★

ENQUIRIES/BOOKINGS

Book now by ph/fax/email, then send a deposit of \$100 (+ 10% GST) to confirm your booking and receive your worksheets.

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Ph (02) 9939 6107 Fax (02) 9939 6105

Email: physicsisfun@mac.com

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Jacaranda HSC Physics 2 book

Worked Solutions for the HSC Physics 2 text are available on jaconline.com.au and for schools using this popular series, a CD-Rom containing the 'Age of Silicon' Option is available upon request from Jacaranda.

ABC TV:

Science Programs for schools



These 15–20 minute programs are broadcast weekdays from 10–12 noon. Science TV Guide and Programs, dates and times are at: www.abc.net.au/schoolstv/ as well as Teachers' Resources.

.....
If you are not confused by
quantum physics, then you
have not really understood it.
.....
... Neils Bohr

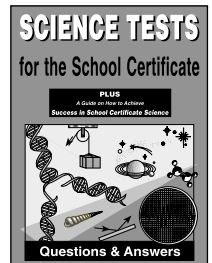
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- complete **WORKED ANSWERS** that would **score full marks** to ALL the Core and **ALL OPTIONS** ... with **full EXPLANATIONS** for all **multiple choice** questions.
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- a comprehensive **GUIDE ON HOW TO ACHIEVE SUCCESS IN THE HSC** ... with essential exam techniques and how to study effectively to help students maximise their marks in the HSC
- a **GLOSSARY OF EXAMINATION TERMS**

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Photo Spot 'Calla Lily' – a scanning EM of a piece of brass swarf

This image is a brass swarf that has formed in a shape similar to a Calla Lily – see Figure 1. Swarf (or turnings) are shavings and chippings of a metal such as brass or bronze. They are the debris or waste resulting from metalworking operations.

Swarf can usually be recycled, and this is the preferred method of disposal due to the environmental concerns regarding potential contamination with cutting fluid or tramp oil. The ideal way to remove these liquids is by the use of a centrifuge which will separate the fluids from the metal, allowing both to be reclaimed and prepared for further treatment.

The chips are extremely sharp, and this creates a safety problem, as they can cause severe injuries if not handled correctly. Depending on the composition of the material, it can persist in the environment for a long time before degrading. This, combined with the small size of some, allows them to disperse widely by piggy-backing on soft materials and also to penetrate the skin as deep splinters.

Disposing of swarf is a tedious but necessary task. For ease of transport and handling, swarf may be compressed into bricks, which greatly reduces associated problems with storing and cost and it also improves material handling for all concerned with its reclamation and recycling.

The Calla Lily (*Zantedeschia aethiopica*) that this brass swarf resembles is also known sometimes as Lily of the Nile or as an Arum Lily, although it does not belong to the genus *Arum* nor is it even a lily (genus *Lilium*) – see Figure 2. Originally native to southern Africa, this plant is now grown in many parts of the world. A number of cultivars have been selected for use as ornamental plants.

It is an herbaceous perennial plant, evergreen where rainfall and temperatures are adequate, deciduous where there is a dry season. It grows 1–2.5 m tall, with large clumps of broad, arrow shaped dark green leaves up to 45 cm long. The flowers are large, produced in spring, summer and autumn, and have a pure white spathe (a petal-like, modified broad leaf) up to 25 cm which attracts pollinators and a yellow spadix (a type of spike) up to 9 cm long, as seen in Figure 3. □



FIGURE 2 Calla Lily (*Zantedeschia aethiopica*)

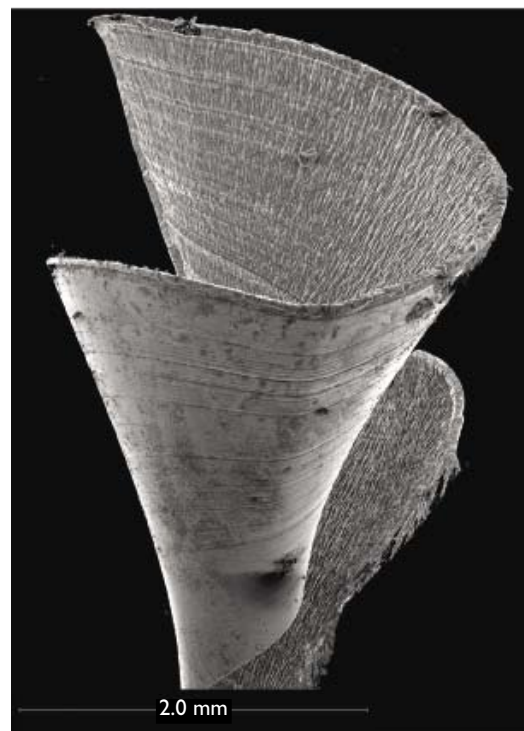


FIGURE 1: 'Calla lily' – a scanning electron micrograph of a piece of brass swarf. This photomicrograph was taken by Bryony James, University of Auckland.



FIGURE 3 Calla Lily (*Zantedeschia aethiopica*) showing the spadix extending up from the spathe

RACI NSW SCHOOLS TITRATION COMPETITION 2008

21 June (most Syd Metro, Wollongong Uni), 20 June (UNSW, St John Bosco College); tba – most regional venues

The 2008 NSW Schools Titration Competition is a great way for Year 11/12 chemistry students to test their quantitative analytical skills. It is organised by the Chem Ed'n Group of Royal Australian Chemical Institute (RACI). Students have 90 minutes to complete a set of acid-base titrations to determine the unknown concentration of a weak acid. Entry costs \$33/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 around 20 September 2008. All students receive a Certificate of Excellence or Merit or Participation. The **de Miklouho-Maclay Prize** (certificate & \$100) is awarded to the NSW student with the best overall results.



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- ★ **For details, entry forms, hints & tips:** www.nswtitration.com
 - email: ajhey@ozonline.com.au • ph/fax: 9601 1021
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- ★ **2007 NSW Schools Titration Competition:** 28 teams achieved an Excellent award. Congratulations to the following teams:
 - 1st: Blue Mountains Grammar 2nd: Merewether HS
 - 3rd: Freeman Catholic College

- ★ **2007 National Competition:** 256 teams entered the 2007 NSW competition and 33 teams went on to the National Competition. Five of the top 25 places went to NSW teams: 2nd (Trinity Catholic), 3rd (St Vincent's College), 5th (SHORE), 17th (Merewether HS), 21st (Girraween HS). 1st place in Australia – Park Ridge SHS, Qld.

- ★ **2007 de Miklouho-Maclay Prize** for excellence in Chemistry went to Jaismine Kaur of Girraween High with a perfect score of zero!
- ★ Congratulations to all these competitors! □

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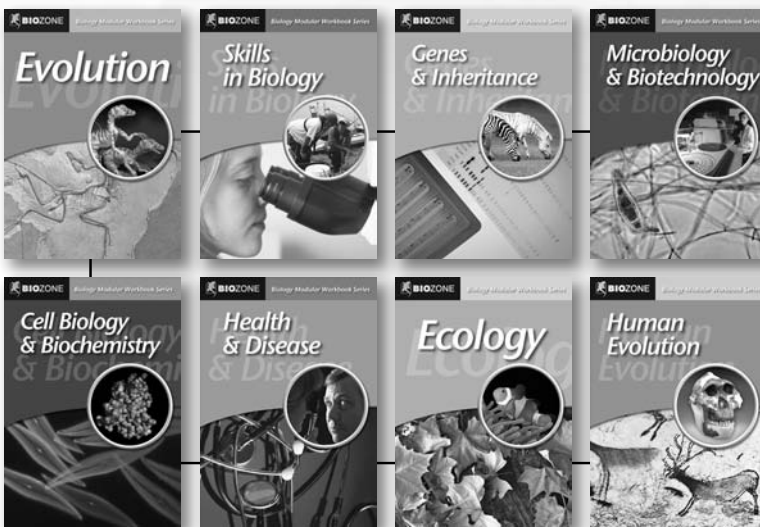
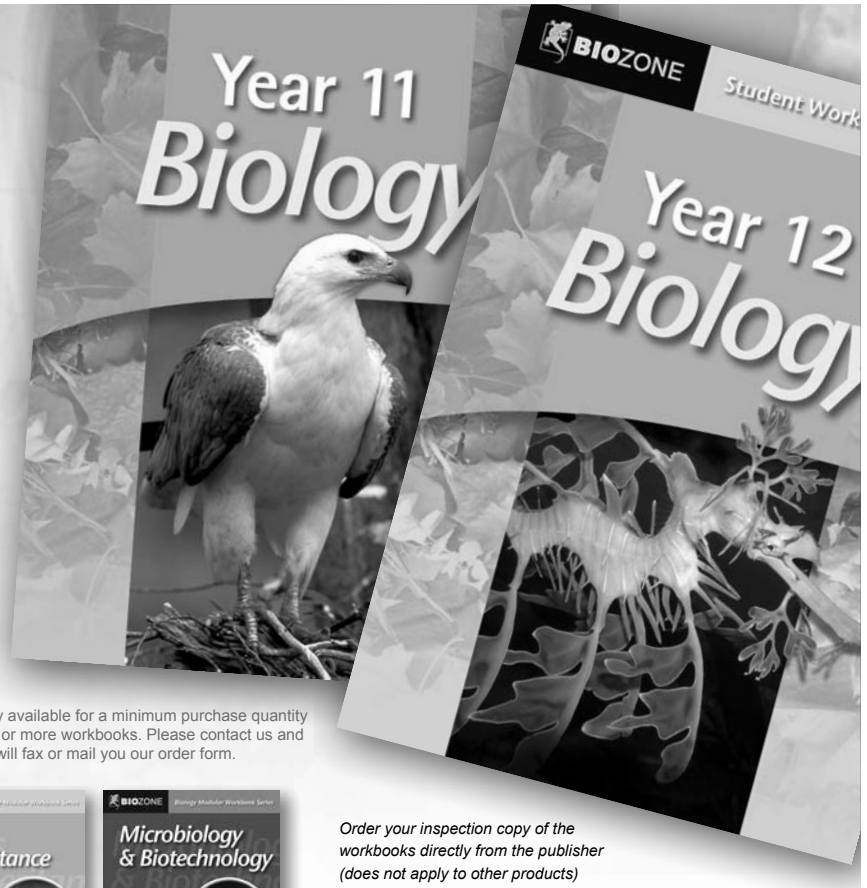
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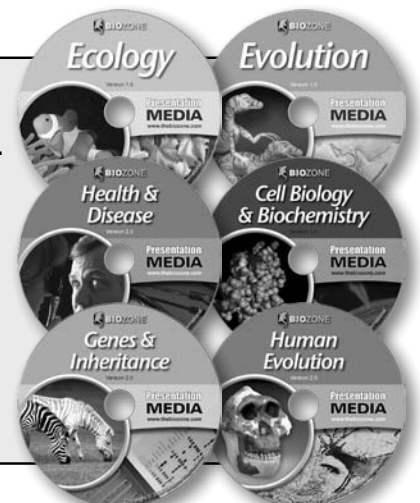
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Constellations to see in the Autumn night skies

... Don Whiteman, Robert Garner and Catherine Odium

Two great constellations that students can easily locate in the Autumn skies at present are Crux and Scorpius.

Naked eye observing can be great fun and a great way to initially learn the sky. Constellations are by definition 'a group of stars that can be connected together to form a figure or picture'.

Crux constellation

Some constellations form shapes that are very obvious, such as The Southern Cross (*Crux*) – its four brightest stars make the shape of a kite and once seen, is never forgotten. *Crux*, which is depicted on the Australian flag, is the smallest of the constellations, and can be found slightly east of due south in autumn with the two pointers, α and β *Centauri* to the east of it. These two bright stars are not part of *Crux*, but are part of the neighbouring constellation, *Centaurus*. The Southern Cross is a good constellation to watch throughout the entire year because it never disappears below the horizon. It can always be seen circling around the South Celestial Pole. The star at the top of *Crux*, γ *Crucis*, is a red giant and so cooler than the other stars in *Crux*.

At present, the brightest star, α *Crucis*, is at the bottom of the cross. Then moving in a clockwise direction are β *Crucis*, γ *Crucis* and δ *Crucis*. The fifth brightest star in *Crux* is hard to see unless the sky is really dark.

You can locate the Coal Sack (a dark region or nebula) between α *Crucis* (at the bottom of *Crux*) and β *Crucis*. The Jewel Box is just above the Coal Sack and to the left of β *Crucis*. If you have some binoculars, you will be able to see that the Jewel Box has over 50 stars with many different colours, hence its name.

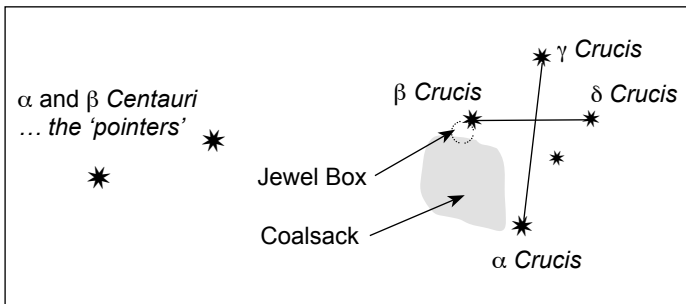


Figure 1: Crux - the Southern Cross

Scorpius constellation

The constellation of *Scorpius* is also easy to find in our evening skies around this time and into winter. It can be found to the east of *Crux*. In Greek and Roman tradition, the hook shape made by the brightest stars represented the scorpion whose sting caused the death of the great hunter Orion. The brightest star in *Scorpius* is Antares (α *Scorpii*). The name Antares means 'the rival of Mars' because the red colour of this star is similar to the planet Mars. This star is also known as the heart of the Scorpion. It is a red supergiant star about 700 times the size of the Sun. The Moon is very close to Antares on 23 April and 20 May so it can act as a pointer to *Scorpius* in the eastern evening sky. □

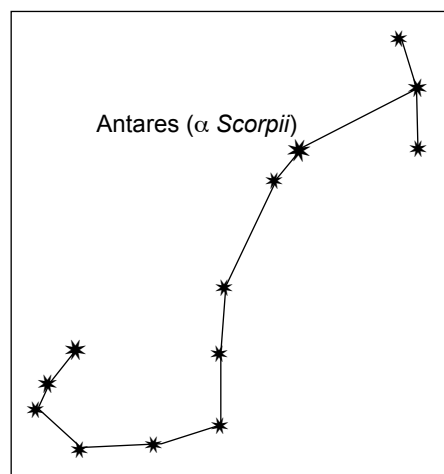


Figure 2: Scorpius

Other celestial objects to see in the Autumn night skies

The welcome rains of Summer have meant disappointing times for amateur astronomers wanting to do some observing. Hopefully Autumn will allow you and your students to locate the following celestial objects.

Mercury & Venus: In early March, Mercury and Venus will be very close to each other. On the morning of 6 March, Mercury will be just 3° above the rising Moon with Venus in between them about an hour before sunrise. Mercury is often hard to see, but its nearness to Venus and the Moon will help. In early March, Mercury will be at its greatest elongation west of the Sun and can be viewed in the eastern morning sky. Venus will be getting lower in the eastern sky each morning, and harder to see in the twilight, but will reappear as an 'evening star' later in the year.

Mars: This planet is rapidly decreasing in both size and brightness as it gets further away from the Earth. It will be visible in the northern sky after dusk. During March, Mars will move from the constellation *Taurus* into *Gemini*, as it heads towards *Cancer* by May. To locate the *Taurus* constellation, find *Orion* in the north and *Taurus* will be adjacent to it (see diagram in *SciTalk No 4-2007*).

Saturn: It will rise in the east around sunset and move across the sky towards the west. It will be visible all night. The current orientation is not favourable for seeing the rings, as Saturn is 'edge-on' to us at present.

Jupiter: This planet will rise just after midnight in March and rises earlier each night. So through Autumn, Jupiter will be prominent in the sky from around midnight until dawn.

Meteor showers: The best meteor shower during this time of the year is Eta-Aquarids. This shower is linked to Halley's Comet and is a well regarded southern shower that should be observable from around the 19 April to 28 May a few hours before dawn. Peak rates are predicted on the 6 May with around 30 or more a few days either side of the date. Some of the characteristic traits of the Eta-Aquarids are persistent trains, swiftness and a striking yellow colour. The best period of observation will be virtually Moon free, so it should be worth the effort to get up early, a few hours before dawn. □

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>

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