Providing support and promoting excellence in science education

SciTalk

ISSN 1323-7667

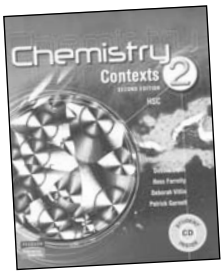
Number 4 – November 2006

Book Giveaway

You could WIN these books ...

CHEMISTRY CONTEXTS 1 & 2 with student CD (2nd Ed)

by Irwin, et al



WIN

RRP: $60.00 ea
Published by Pearson Education

Chemistry Contexts 1 & 2 (2nd Ed) with student CD have been written for the NSW Stage 6 Chemistry Syllabus for the Preliminary and HSC courses respectively.

They contain a number of new features to make teaching and learning Chemistry even easier, and have a wide range of activities and resources that will engage students, and allow them to achieve success in the classroom. The structure provides easy access to information, opportunities to review key concepts, and practice exam-style questions. The Companion Website is available online and on the Student CD.

TO WIN: Send in your name, address, ph. no. & school on the back of an envelope
by 21 December 2006 to
Book Giveaway, PO Box 442, Harbord 2096

★ ★ ★

Winner for *SciTalk 3/06*

Congratulations to Julie Carrington, Sydney Tech HS who won *The Leading Edge School Certificate Science* ($24.75) published by Harcourt Education.

★★ ATTENTION ★★

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

☐ 1. .....
☐ 2. .....
☐ 3. .....
☐ 4. .....
☐ 5. .....

Please return to file or noticeboard.

PRIZES TO WIN!

See pages 1, 4, 5, 11 & 12
Send in your entries now
(ALL IN THE ONE ENVELOPE if you prefer!)

This *SciTalk* & past issues are available at http://homepage.mac.com/robertgarner

Chemistry teachers need to remember new PIN

In 2004–2005, IUPAC (International Union of Pure and Applied Chemistry) again revised its system of nomenclature to establish their preferred system. This revised system is known as the 'Preferred IUPAC Nomenclature' (PIN).

The NSW HSC Chemistry Syllabus requires students to name a variety of common organic compounds using IUPAC nomenclature. Most chemistry texts currently used in NSW name organic compounds using the 1979 rules and the 1993 IUPAC Recommendations. Thus teachers and students need to be aware of the latest changes.

Chemistry teachers are encouraged to use the PIN name rather than other systematic nomenclatures. For details of the '2004 IUPAC Recommendations' for naming organic compounds, go to: *www.iupac.org/reports/provisional/abstract04/favre_310305.html*

The formation of a systematic name for an organic compound requires selection and then naming of a parent structure. This basic name may then be modified by prefixes, infixes, and, in the case of a parent hydride, suffixes, which convey precisely the structural changes required to generate the compound in question from the parent structure.

Alternative names can still be assigned to organic molecules under the category of General IUPAC Nomenclature as long as they are unambiguous. The recommended changes will change the preferred names of some simple organic compounds to their common name, e.g. formic acid and acetic acid are now the preferred PIN names for methanoic acid and ethanoic acid respectively.

The term 'locant' is used to designate the position of functional groups along a chain of carbon atoms. Locants are placed immediately before that part of the name to which they relate. So the name pent-1-ene is the PIN, not 1-pentene. If any locants are essential for defining the structure, then all locants should

... continued on page 6

Killer influenza resurrected

Scientists in the US have resurrected the lethal influenza virus that was behind the 1918 global influenza pandemic that left as many as 50 million people dead. This has been done in a risky bid to find clues to the workings of another potential worldwide threat: avian flu.

... continued on page 7

INSIDE SCITALK ▶▶▶▶

EDUCATIONAL EXCURSIONS & FUN DAYS AT LUNA PARK SYDNEY

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★ **Primary**: Science & Technology, English, Mathematics, Art & Peer Support

Save $$$ ... special DISCOUNT PRICES FOR SCHOOLS: see p 7

Why pay more?

SPECIAL SCHOOL PRICES

are available for ALL school faculties for Fun Park Excursions to Luna Park Sydney through Physics is Fun. See p7.

LUNA PARK

Diary Dates 2006

2006 – International Year of Deserts & Desertification

NOVEMBER 2006

3,13,17,24,27,30 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

13–17 School Certificate Tests

DECEMBER 2006

1, 8 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

19 HSC results released.

2007 – International Polar Year

JANUARY 2007 National Youth Science Forum. Enquiries: (02) 6125 2777, www.nysf.edu.au/

FEBRUARY–MARCH 2007

Feb-March Shell Questacon Science Circus: NSW Riverina: Young, West Wyalong, Cowra, Narrandera, Griffith, Wagga Wagga, Albury. www.questacon.edu.au/html/on_the_road.html

MARCH 2007

3 Schools' Clean Up Australia Day. Ph: 1800 024 890. Details. www.cleanup.com.au

4–10 Seaweek 2007: Marine Bycatch Matters. http://www.mesa.edu.au/seaweek.asp some resources at www.ausmepa.org.au

16, 19 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/]

APRIL 2007

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

MAY 2007

2–4 Science at the Shine Dome. Australian Academy of Science. Applications for awards for teachers to attend this symposium in by: tba. Details soon at: www.science.org.au

10, 11 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

JUNE 2007

1, 4, 8 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

22 Closing date Crystal Growing Comp. www.chem.unsw.edu.au/raci/crystal_grow/index

JULY 2007

1–14 International Science School: Yr 11 & 12 students, Uni of Syd. Details on page 4

8–12 CONASTA 56, ICASE 2007, & World Conference on Science & Tech Edn: *Sustainable, Responsible, Global*. (08)92662174. Fax (08)92010003. www.worldste2007.asn.au/

22–28 National Chemistry Week. www.raci.org.au/national/events/chemistryweek.html

26 National Chemistry Quiz. www.raci.org.au/national/events/nationalchemistryquiz.html

AUGUST 2007

3 Jeans for Genes Day – helps to fund scientists working at Children's Medical Research Institute to prevent & treat genetic diseases & chronic illness. (02) 9687 2800, www.jeans4genes.com.au/what.php

18–26 Australian Science Festival, ACT. School Activities will be at: www.sciencefestival.com.au

18–26 National Science Week – *Antarctic Science*. www.scienceweek.info.au/

17, 20, 23 Science Week events: Physics is Fun at Luna Park. http://homepage.mac.com/robertgarner

tba Physics Olympiad Nat'l Qualifying Exam. www.aso.edu.au/ Close date: ? July. 6125 9645

tba Biology Olympiad Nat'l Qualifying Exam. www.aso.edu.au/ Close date: ? July. 6125 9645

SEPTEMBER 2007

7 National Threatened Species Day. www.deh.gov.au/biodiversity/threatened/ts-day/index.html & www.deh.gov.au/biodiversity/threatened/information/

tba Chemistry Olympiad Nat'l Qualifying Exam. www.aso.edu.au Close date: ? July. 6125 9645

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

OCTOBER 2007

7–13 Earth Science Week 2007. www.earthsciweek.org/ & www.ga.gov.au/about/event/

19, 22, 26, 29 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

NOVEMBER 2007

2, 8, 12, 16 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

23, 26, 29, 30 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

DECEMBER 2007

6, 7 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

JANUARY 2008 National Youth Science Forum. Forms to local Rotary club by 15/5/07, interviews in July.

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.

I can live for two months on a good compliment.
... Mark Twain

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

This new program will help HSC students learn to follow the principles and practices of good scholarship, including understanding and valuing ethical practices related to locating and using information as part of their HSC program. The program will be available through the BOS website in both online and downloadable format from late 2006. The 5 modules will be: 1. Scholarship Principles and Practices, 2. Acknowledging Sources, 3. Plagiarism, 4. Copyright, 5. Working with Others (see *Board Bulletin Vol 15 No 5*).

Approved calculators for use in HSC

The BOS website always has an up-to-date list of permitted calculators for students to use in exams. For 2006 go to: www.boardofstudies.nsw.edu.au/manuals/calculators_hsc06.html (see *BOS 1/06*).

On BOS website:

- **HSC Marking Centre Notes & Guidelines**
- **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 they are a Peer Support excursion.

(as ONLY curriculum-based excursions to a fun park can claim back the GST)

Fun Park Excursions

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★ ✧ ★ ✧ ★

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

Worksheets are available for:

• Primary Science & Technology, English, Maths • Science7-10 • Technology • Maths • Photography • 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! ***

OUT AND ABOUT

SYDNEY WILDLIFE WORLD

Darling Harbour, Sydney 2000

Sydney's newest excursion venue – NOW OPEN!

- ★ Home to the largest variety of Australia's 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, all in one convenient location, Darling Harbour.
- ★ 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 9333 9288, or visit *www.sydneywildlifeworld.com.au* to view the comprehensive range of curriculum-based educational kits.

SCIENCE IN FOCUS AT IMAX

31 Wheat Rd, Darling Harbour, Sydney 2000

- ★ ***Mystery of the Nile* … SHOWING FOR SCHOOLS IN TERM 4**
  Join this expedition – the first in history to conquer all 5 246 km of the world's greatest river in a single descent from its source in the Ethiopian highlands to the Mediterranean Sea. For 114 days, the expedition team faced incredible challenges as their two rafts and one kayak traversed 3 countries in some of the world's most remote regions. Deadly crocodiles and hippos, dangerous rapids, armed bandits, AK-47-toting militia, blinding sandstorms, exposure to malaria, and the relentless heat of the fierce desert sun are just some of the obstacles they faced. Rated G.
- ★ **SOME GREAT SCIENCE FILMS INCLUDE:**
  - *Deep Sea 3D*
  - *Antarctica*
  - *Roving Mars*
  - *Forces of Nature*
  - *Bugs 3D*
  - *The Human Body*
  - *Space Station 3D*
- ★ **COMING IN 2007:** ***Dinosaurs 3D*** … starts Term 1, 2007
- ★ For other films and their session times, please visit: ***www.imax.com.au/schooltimetables***

land's edge

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SCIENCE CENTRE & PLANETARIUM

University of Wollongong
Squires Way, Fairymeadow
Only 45 mins from southern Sydney.

- ★ ***Taking bookings for 2006!***
- ★ **Star Trails Outreach Program 2006** – we visit schools with a portable planetarium and interactive Science Shows.
- ★ We have an extensive range of ***shows & exhibits***, including:
  - **Stellar Evolution** – planetarium program for HSC Physics
  - **Superconductors & Liquid Nitrogen** – live science show
  - **Zap! Understanding Electricity**
  - **Energy and Motion**
  - **The Changing Earth**
- ★ School entry includes two floors of hands-on exhibits, a science show, plus a ***planetarium / laser show***.
- ★ ***Also available***: environmental field trips, science shop, kiosk, science fun bags, membership programs.
- ★ ***Book now*** for your school excursion.
  For information and bookings, phone (02) 4286 5000.
  Website: http://sciencecentre.uow.edu.au

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

You can combine a Fun Park Excursion at Luna Park Sydney booked through 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 capture students' interest and demonstrate learning in action.

• COSTS, BOOKING DETAILS & WORKSHEETS – GO TO:

IMAX: www.imax.com.au/schooltimetables
SYDNEY AQUARIUM: www.sydneyaquarium.com.au
PHYSICS IS FUN: http://homepage.mac.com/robertgarner

• 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

UNSW Medical Sciences Schools Programs

At Museum of Human Disease & Hall of Health

The Museum of Human disease is a pathology museum offering interactive programs with amazing insights into the nature and progression of disease in its many forms. Curriculum-based Biology/ Senior Science programs are available. These include:

- 2 hr workshops for Biology students on 'The Search for Better Health'
- 2 hr workshops for Senior Science students learning about 'Bionics'
- 2 hr workshops covering micro-organisms, infectious and non-infectious diseases included in the Science 7–10 Syllabus
- Latest exhibition on digestive system & dietary disorders: *Gutsy Stuff*

★ **NEW LOCATION:** Gr'd floor, Samuels B'lding, UNSW (map is on web)
Cost: Student workshops $8/student (GST exempt). Bookings are essential.
Enquiries: Ph (02) 9385 1522. Fax/ph (02) 9385 1747
Email: museum.hallofhealth@unsw.edu.au
Website: http://hallofhealth.med.unsw.edu.au

The University of Sydney

ISS2007
EcoScience

34th Professor Harry Messel International Science School for year 11 & 12 Science students

1–14 July 2007 at The University of Sydney
Applications close Thursday 5 April 2007
Application forms will be available from mid-February 2007 at: www.scienceschool.usyd.edu.au

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

What made Gondwana split?

Scientists believe they have finally discovered proof that the cause of both Gondwana splitting and the great extinction of life hundreds of millions of years ago was a meteor impact in the Antarctic region.

The geologists used gravity fluctuations measured by satellites to peer beneath the Wilkes Land region of Antarticas's icy surface and found a 321 kilometre-wide plug of mantle material (called a mascon) that had risen up into the Earth's crust. Mascons are known to form where large objects slam into a planet's surface.

When the scientists combined their gravity images with airborne radar images of the ground beneath the ice, they found the mascon perfectly centred inside a circular ridge 482 kilometres wide. It was in fact a crater.

Based on the geological history of this area, the crater was formed about 250 million years ago and so correlates with the global extinction in the Permian-Triassic period when much of the animal life on Earth died out, clearing the way for dinosaurs.

The impact of a meteor this size would have been massive. The meteor is thought to have broken through the Earth's crust and triggered the break up of Gondwana. Scientists believe that the crater they have discovered is the missing key that they have been looking for. □

[http://researchnews.osu.edu/archive/erthboom.htm]

Science on the Web

New topics on NOVA: Science in the News – *www.science.org.au/nova*

• Epigenetics – beyond genes

Research in epigenetics suggests that you may inherit more than genes from your parents.*

All cells contain genes that determine how the cell will grow, multiply and function. Not all genes are used at all times. Epigenetic factors can regulate the amount of gene activity, and so affect an organism's growth and appearance.

Epigenetic factors appear to be inherited by following generations, and their control of gene activity plays a role in causing cancer, cardiovascular disease and several inherited genetic conditions. This is thought to involve processes such as modification of histone proteins, DNA methylation and RNA interference. For any of these methods of gene regulation, the absence of the protein product of the gene causes a change in the function or development of the cell.

This article has information about how these processes affect gene activity, plus much more on epigenetics, as well as about the Human Epigenome Project.

* *epigenetics* – the study of heritable changes in gene activity that occur without a change in the gene sequence. [*NOVA glossary*]

• Fixing cracks in disaster mitigation

Better planning and construction can greatly reduce the impacts of earthquakes and other disasters.

Two earthquakes of similar magnitude can have different impacts, e.g. an earthquake, 7.1 on the Richter scale, in San Francisco in 1989 killed 68 people and destroyed 24 000 homes, while an earthquake measuring 7.4 on the Richter scale, in Izmit, Turkey in 1999, killed 17 100 people and destroyed 300 000 homes.

The reason for such differences was partly in the time the earthquakes occurred, e.g. afternoon in San Francisco when few people were home while it was night-time in Izmit so people were asleep and could not escape their collapsing apartments. However, the main reason was that many of San Francisco's structures had been built to resist earthquakes, and emergency services were ready to help throughout the city. It was the opposite in Izmit and diseases such as typhoid and hepatitis quickly caused many deaths.

This article explains the effects of earthquakes, & how humans can reduce their impact. □

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 $66) … send in your name, school, & home address on an envelope by **21 December 2006** to:

Sydney Aquarium Teacher Offer, PO Box 442, Harbord NSW 2096

WINNER: Paulina Phillips, All Saints College – St Josephs Campus, won the Sydney Aquarium family pass for *SciTalk No. 3–2006.*

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 audiences the ultimate film experience. IMAX films are both entertaining and educational. Films are constantly changing and cover a wide range of themes. High quality resource materials & teacher guides are provided for school visits.

★ ✧ ★ ✧ ★ ✧ ★

TO WIN A FAMILY PASS* TO IMAX: (for 2 adults and 2 children worth $50) … send in your full name, school, home address & ph no. on an envelope **by 21 December 2006** 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: Samantha Ryan-Wells, St Marouns College, won the IMAX Sydney family pass for *SciTalk No. 3–2006.*

Pasteurisation, but without milk

Many people in the world are without access to safe drinking water. Many countries could soon have access to a remarkable new device due to the work of industrial design graduate Julia Frost.

Motivated by her Zimbabwean heritage, Julia Frost set about solving the problem of 1.3 billion people in the world not having access to safe, clean drinking water at present in the hope of reducing the high incidence of disease and deaths that occur from this problem. Her solution is the Mvura (meaning water), designed for transporting, purifying, storing and dispensing water in Third World and developing communities. About 60% of Zimbabwean's have been unable to access safe, clean water, but will now be able to as a result of Julia's device.

The Mvura works by pasteurising the water, a well-known method used to kill most harmful pathogens in water. The device can heat up to 15 litres of water to 65°C within two hours using the Sun's heat energy whilst it is in its pasteurisation position. This enables a large surface area of water to be exposed to the Sun and allows the device's insulating panels and black bottom to assist in the heat absorption process. The insulating panels also protect the water bag whilst the device is being carried and used.

Due to the lack of timing devices in affected communities, the device incorporates soybean wax to indicate when the water is safe enough to drink as it melts at the appropriate temperature. The water can then be stored until it is needed.

The unique design features of Mvura will enable its widespread use in communities where it is needed. It can be easily carried and can even be balanced on someone's head for transport, which is the usual carrying style of the Zimbabwean people. Any repairs will be able to be done easily within the local community.

Julia, a recent UNSW graduate, gained recognition for her outstanding design by being awarded a bronze award in the 2006 Australian Design Award–Dyson Student Awards. The international judges commented that her project was "broad thinking and intelligent; a solution that works to remedy what is an everyday, life-threatening situation in developing nations". □

... James Garner

Devigner

March 4-10 Seaweek 07 "Marine Bycatch Matters"

Marine by-catch matters

It does not matter whether you live near the sea or a long way from it, it is still important to learn to live, work and play in a sustainable way that will help to protect and preserve our terrestial and marine environments.

The Marine Education Society of Australasia (MESA), the Bureau of Rural Sciences and others will be working together in 2007 to develop and deliver an awareness raising campaign focusing on marine by-catch in wild fisheries.

It is essential that Australia has proper environmental management systems that employ the best practices for profitable and sustainable production. Conservation must be at the forefront in all fishing matters so that our marine biodiversity is not further reduced.

Activities, competitions and resources such as online teaching units and linked websites will be available for 2007 to help in teaching and facilitating sustainable practices. There will be a week long program to celebrate each day of Seaweek 2007 with a special theme. The 2007 details will soon be at *http://www.mesa.edu.au/seaweek.asp*

This MESA website has many resources and activities to do from past years which will help you to teach about marine and coastal environments.

Put the dates into your calendar, get your thinking cap on, and become involved in the 2007 theme. If you have any great ideas, activities, work-sheets or contacts, you can share them by contributing to a resource data base being put together by the Marine Education Society of Australasia (MESA). All contributions will be considered and will be acknowledged if used.

Everyone can celebrate what's being achieved and share in the collective responsibility of learning that marine by-catch does matter. □

WIN

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. 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*

Sydney Wildlife World

* * * * *

TO WIN A FAMILY PASS TO SYDNEY WILDLIFE WORLD
(for 2 adults & 2 children worth $68) … send in your name, school, & home address on an envelope by **21 December 2006** to: *Sydney Wildlife World Teacher Offer, PO Box 442, Harbord NSW 2096.*

WINNER: Naomi Eagleton, All Saints College–St Josephs Campus, won a Sydney Wildlife World family pass for *SciTalk No. 3–2006.*

School Visits and Educational Resources for Science from Children's Medical Research Institute

Apart from the Science Teachers' Forum, aimed at providing high school science teachers with a first-hand experience of current medical research, the Children's Medical Research Institute (CMRI) also have School Visits and free educational resources for teachers.

School Visits

Science Communicators from CMRI will visit schools in the Sydney metropolitan area to give dynamic and interactive presentations. Students will learn the real-life challenges and accomplishments of medical science research and its future implications.

Topics include biotechnology, gene technology, transgenic species, gene therapy, cloning, stem cell research, and even careers in health, medicine and research.

These talks meet objectives in the HSC Biology, Senior Science and Stage 4 & 5 syllabi, but can be tailored to your students' needs.

School Visits are free, but donations to support CMRI or your school's support on Jeans for Genes Day is appreciated.

Enquiries: ph 1800 436 437, or email rhardman@cmri.com.au

FREE Educational resources

A range of resources for K–12 students can be downloaded from CMRI's website at *http://www.cmri.com.au/cmri.php?page=972* The secondary resources include:

- *Imagine you're a gene therapist* – an interactive classroom activity to teach about genes, genetic disease, inheritance, DNA technology and the challenges of cutting edge medical science (includes ethical issues). Includes detailed teacher notes.
- *Trivia Quiz* – quiz students on their genetic know-how or use as a game with prizes on Jeans for Genes Day (Yr 9+).
- *Crossword* – test students' problem-solving with these clever science clues (Yr 9+). Accompanied by teacher notes.
- *Karyotyping* – a hands-on paper activity to cut-out, sort and analyse human chromosomes and genetic disorders (Yr 9+). Accompanied by teacher notes.
- *DIY DNA Extraction Experiment* – simple practical experiment for students to extract DNA from onions; also explains how the experts do it in real scientific experiments (Yr 7+). Accompanied by teacher notes.
- *DIY Electrophoresis Experiment* – an easy-to-do experiment that allows students to investigate the concept of gel electrophoresis using equipment you can buy at the supermarket! Accompanied by a student worksheet and teacher notes.
- *CMRI Talk quiz* – a pre-talk activity designed to encourage students to think about biotechnology and genetics, and prepare any questions they may have for the CMRI presenter. Accompanied by teacher notes. □

Continued from page 1 …

be cited in its name. So 2-chloroethan-1-ol is the PIN, and 2-chloroethanol (while allowed in general usage) is the non-PIN alternative.

In many examples, the student needs to decide at which end of the carbon chain the numbering will start. The IUPAC rule is to number the chain so that the lowest set of locants is achieved. The lowest set of locants is defined as the set that, when compared term by term with alternatives, cited in order of increasing value, has the lowest term at the first point of difference.

The term 'alphabetical order' is replaced by 'alphanumerical order'. Alphanumerical order is used to establish the order of citation of detachable prefixes and the numbering of a chain or ring by giving the lowest possible locants to the prefixes for each functional group. Simple prefixes for functional groups are arranged alphabetically (e.g. chloro- comes before fluoro- which comes before iodo-) and where two prefixes start with the same letter then the priority goes to the prefix with the lowest locant number at the first point of difference, e.g. for $CClF_2$-$CFCl_2$, the PIN name is 1,1,2-trichloro-1,2,2-trifluoroethane, not 1,2,2-trichloro-1,1,2-trifluoroethane.

The table provides examples of various organic molecules relevant to the HSC. The PIN is provided for a variety of common examples. In some cases alternative systematic names are also provided in brackets.

NOTE: The IUPAC system was introduced in 1979 to simplify the naming of organic compounds and to remove ambiguity in chemical communication. A major revision of the system took place in 1993. The 2004–2005 revision expands on, and amends the 1993 revision. □

Class	Structure and PIN	
alkane	$CH_3CH_2CH(CH_3)CH_2CH_2CH_3$	3-methylhexane
	$CH_3CH(CH_3)CH_2CH(CH_3)CH(CH_3)CH_3$	2,3,5-trimethylhexane
	$CH_3CH_2CH(CH_2CH_3)CH_2CH(CH_3)CH_2CH_3$	3-ethyl-5-methylheptane
alkene	$CH_2CHCH_2CH_3$	but-1-ene (1-butene)
	$CH_3CHCHCH_3$	but-2-ene (2-butene)
	$CH_2C(CH_3)CH_2CH_3$	2-methylbut-1-ene (2-methyl-1-butene)
alkanol	CH_3CH_2OH	ethanol
	$CH_3CH_2CH_2OH$	propan-1-ol (1-propanol)
	CH_2OHCH_2OH	ethane-1,2-diol
alkanoic acid	$HCOOH$	formic acid (methanoic acid)
	CH_3COOH	acetic acid (ethanoic acid)
	CH_3CH_2COOH	propanoic acid (propionic acid)
	$CH_3CH_2CH_2COOH$	butanoic acid (butyric acid)
	$HOOCCH_2CH_2COOH$	butanedioic acid
halogenated compounds	$CF_3CHBrCl$	2-bromo-2-chloro-1,1,1-trifluoroethane
	$CClF_2CHBrI$	2-bromo-1-chloro-1,1-difluoro-2-iodoethane
	$CBrF_2CClFI$	1-bromo-2-chloro-1,1,2-trifluoro-2-iodoethane
ester	$HCOOCH_2CH_3$	ethyl formate (ethyl methanoate)
	CH_3COOCH_3	methyl acetate (methyl ethanoate)
	$CH_3(CH_2)_5COOCH_2CH_3$	ethyl heptanoate

Changes to immunisation

When teaching Biology, make sure that you inform your students of the most recent changes to the immunisation guidelines. The current immunisation schedule outlines the recommended and fully funded vaccine plan by age group for the Immunise Australia Program. It also contains information on each of the diseases. The current Schedule started on 1 November 2005. You can download this from: *www.immunise.health.gov.au/internet/immunise/publishing.nsf/content/nips*

Also note that the polio vaccine is no longer an oral vaccine, but rather has been combined with the old triple antigen. It is now an inactivated poliomyelitis virus, and so safe to use in immunosuppressed people.

There are many misconceptions about immunisation. Parents deny or delay immunisation for their child, often putting forward invalid excuses, e.g. family history of convulsions; child being on antibiotics; or child having asthma, a cold or eczema; etc.

By immunising your child you are minimising the chance that he/she will develop the diseases covered or die from any of them. This will also help to make the diseases less common in society. □

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Continued from page 1 …

This project is being carried out under strict security, with retinal scanning to even enter the laboratory where the virus is stored. Biosafety Level 3+ protocols, the second highest level, are followed in the lab where the experimental rats are being injected with the virus.

The 1918 flu virus was the most lethal plague in human history. It killed young and old alike, and could cause death slowly or just within hours of the first symptoms appearing.

Using only fragments of DNA obtained from the lung tissue of the preserved body of a victim in the permafrost of Alaska, and the polymerase chain (PCR) technique, scientists have recreated the virus from its genetic code.

There will be no cure if anything goes wrong – yet researchers hope to cross the 1918 flu virus with the genes of H5N1 virus. Influenza A (H5N1) virus – also called 'H5N1 virus' – is an influenza A virus subtype that occurs mainly in birds, is highly contagious among birds, and can be deadly to them. H5N1 virus does not usually infect people, but infections with these viruses have occurred in humans. Most cases have resulted from people having direct or close contact with H5N1-infected poultry or H5N1-contaminated surfaces. Researchers say that it may help them better understand –- and develop defenses against – the threat of a future worldwide epidemic from bird flu.

Many scientists are debating whether such experiments are justified or not and whether we will learn from them. The researchers are aware of the ethical dilemmas they face and the risks of creating the very pandemic strains they fear may emerge at any time in nature. Nature in the meantime continues to conduct its own creative experiments, indifferent as always to our abilities to defend ourselves against them. □

[adapted from *Good Weekend*, 1 July 2006, and www.livescience.com, 1/10/05]

Keeping up-to date

In our busy lives we often miss reading or 'taking on-board' articles that we need to remember, so by popular request from Earth & Environmental Science teachers, the following item is reprinted:

The Ediacaran period

A new geological period, the Ediacaran Period (beginning 610–635 million years ago and ending 543 million years ago) now exists. This period was formally adopted in March 2004 by the International Union of Geological Sciences.

It directly precedes the Cambrian and is the first stratigraphically defined new period of any sort to be added since 1891 when Williams divided the Carboniferous Period into two (Mississippian and Pennsylvanian).

The reference point on which a new period is based, the Global Stratotype and Point (GSSP), is an event recorded in a single section of rock outcropping. For the Ediacaran Period, the GSSP lies at the base of a texturally and chemically distinctive carbonate layer that overlies glaciogenic rocks in an exposure along Enorama Creek in the Ediacara Hills in the Flinders Ranges (near Brachina Gorge), South Australia. The period's end coincides with the beginning of the Cambrian Period, which is defined by its own GSSP found in Newfoundland, Canada. The name Ediacara is of Australian Aboriginal origin and refers to a place where water is present. Geologists were able to use carbon isotope trends and palaeomagnetic evidence to help define the beginning and end of this new period.

Up until the Ediacaran Period, only microbial fossils have been found. The term 'Ediacaran' refers to an assemblage of fossils of the first soft-bodied marine organisms. These marine invertebrate fossils were first discovered in 1946 by South Australian geologist, Reg Sprigg. They are unique and differentiate this time from younger time periods. □

[reprint of an article by Catherine Odlum in *SciTalk No. 1 2005*]

When you tell the truth,
you never have to worry
about your lousy memory.

… unknown

Photo Spot Scent glands of a Hemiptera bug

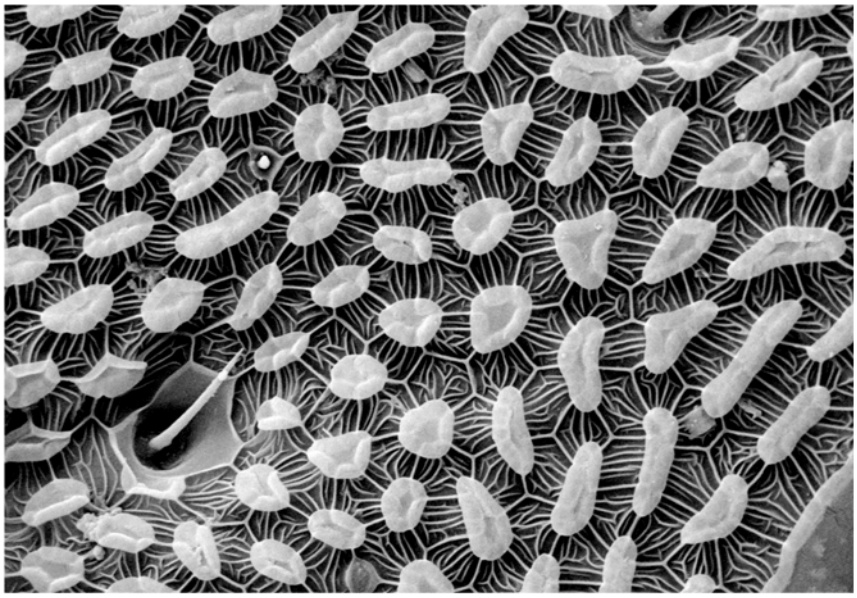
The order Hemiptera are called the 'true bugs'. There are approximately 80 000 species in the world, with some 6 000 species in Australia.

While many true bugs are important plant pests, many are also important natural enemies that help to destroy insect pests.

They generally have two pair of wings, although some species may be wingless and others have only forewings. The front wings, called hemelytra, are the most distinctive characteristic of the order. They are thickened at the base and membranous at the tip. The hind wings are membranous and shorter than the front wings. Hemiptera means 'half-wings', referring to how the wings overlap and how they are made of two dissimilar halves.

Hemiptera have antennae with 5 or fewer segments, and the mouth has a 3- or 4-segmented beak arising from the front of the head. The tarsi have 3 or fewer segments.

Hemiptera are distinguished from all other insects by both adults and nymphs having a proboscis that is usually specialised to suck the nectar from plant juices, including seeds, although some species are predatory (on arthropods and other small animals), and a few are adapted to suck blood from mammals and birds.



ABOVE: Scent glands on a Hemiptera bug Magnification: 5 000x

This photomicrograph was taken by Sue Lindsay, The Australian Museum. It is used with permission.

Some bugs may be mistaken for beetles but can be distinguished by their mouthparts as beetles have mandibulate mouthparts while bugs have sucking/piercing mouthparts.

Size

Hemiptera range in size from small aquatic and ground-inhabiting forms about 1–2 mm in length to giant water bugs 100 mm or more.

Pheromones and scent glands

The true bugs, like some of the other orders, have infochemical communication. Infochemicals convey interactions between organisms: there are pheromones which are emitted and received by members of the same species, and allelochemicals which are emitted and received by members of different species.

The pheromones include sex, attractant, aggregation, and alarm pheromones. The sex pheromones are mainly produced by males. Sex attractant pheromones are typically volatile chemicals produced by either male or female Hemiptera for successful courtship and mating. Aggregation pheromones are produced by either one or both sexes and serve to attract other individuals for feeding, mating, and protection. The alarm pheromones warn members of a species of impending danger.

Knowledge of pheromones helps scientists to monitor the time of emergence of pest populations, determine pest density, detect new pest species, make decisions about successful control programs and develop new insecticides.

Behaviour

Visual displays are achieved by expanded legs, wings, or antennae, which are sometimes brightly or contrastingly stained or very hairy. Sounds are produced by scraping together two sclerotised parts of the body or by vibrating the tymbals, as in the cicadas. Specialised hairs receive the sound waves. Some bugs drum with their legs on the substrate, and others (e.g. certain assassin bugs) scrape their beaks against their own chests, the vibration being transmitted via the legs to the substrate. Males of many water striders produce ripples on the surface with their legs, which are detected at a distance. Scent substances, the sex pheromones, usually are present too. All these signals are highly specific for attracting opposite sexes to each other. Some individuals can identify them and decide to flee, avoiding competition with individuals that had previously arrived and may have already established their territories.

Habitat

Hemiptera are found on all continents except Antarctica. They may be either terrestrial or aquatic. They occur in almost all habitats, including deserts and at high altitudes.

Most species are diurnal and dwell on the ground or on plants, searching for food or prey, for a mate, or for a suitable egg-laying site; every part of a plant, including the roots, may serve these purposes. Aquatic bugs thrive in or on water, frequently among aquatic plants, and almost all are predaceous. Stones, twigs, and other substrates may serve as perches or shelters, especially in swift-running brooks, or as egg-laying sites. In the water they swim or crawl on the bottom or on supports (aquatic bugs). On the surface they walk or skate (semi-aquatic bugs). Most water bugs depend on surface air held to the body by air spaces and hairs on the abdomen. As oxygen is depleted in the air bubble, it is replaced from the surrounding medium by diffusion.

Life cycle

Most are bisexual and oviparous, but parthenogenesis is known. Mating usually takes place on vegetation or on the ground, the pairing being end-to-end in stink bugs, squash bugs, chinch bugs, and similar species, and with the male above the female in most others.

Hemiptera undergo incomplete metamorphosis. The egg is inserted into plant tissues, bark, or soil. The egg is usually a simple elliptical shape; however, some families have unusually-shaped eggs, e.g. small barrel-shaped eggs, or eggs with spines and filaments.

In some species, such as cicadas, the nymphs who are specialised for burrowing appear quite different from the adults. Nymphs will moult 6 to 8 times depending on the species before they attain maturity. At each nymphal stage (= instar), there is an increase in size. Wing pads become visible and there are two abdominal scent glands.

Evolution

Most of the diversification of the Hemiptera started in the late Paleozoic (Upper Permian), and the major lineages diverged early in the Mesozoic (Triassic). Many key fossils unfortunately come from beds of uncertain age. Well-preserved, complete fossils are scarce. Certain well preserved specimens have been found in amber.

Hemiptera are currently divided into four sub-groupings: aphids and scale insects (and perhaps whiteflies); cicadas, leafhoppers, treehoppers, plant-hoppers (and perhaps whiteflies); conenoses, water bugs, stink bugs, and others; and moss bugs. □

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Astronomy

Observing the night sky

... Robert Garner & Catherine Odlum

You would be amazed at the difference in what you can see in the night skies if you just observe a few simple tips which are provided in this article. Viewing the night sky is a great homework activity for your students. Much of this can be done with the naked eye and/or a pair of binoculars.

Tips for observing the night sky

It is amazing how much can be seen in the night sky if you observe from a dark location, so tell your students to avoid street lights and other sources of light. Turn off all house lights if observing from a backyard. Obviously viewing will be best away from the light pollution of a city – but even going onto a headland or into the bush helps.

Allow your eyes time to adjust to the dark, e.g. for 10–20 minutes. If using a torch to view reading material or a sky map, cover it with red cellophane to preserve your dark vision.

Even though the Moon is a beautiful object to view in the night sky, its light is so bright that it will make all other objects appear fainter, so observe the evening sky on moonless nights.

When using binoculars, short of buying a binocular mount, the usual way of coping with the shakes is to observe from a reclining lawn chair that has arms. By resting both elbows on the chair arms and the eyepieces against your face, the dancing is greatly reduced.

Viewing satellites

There are thousands of satellites and bits of space debris in orbit around the Earth. They shine by reflecting light from the Sun and can sometimes be seen moving steadily across the night sky.

The International Space Station (ISS) is a good one to look out for. It orbits the Earth every 90 minutes at an average distance of 400 km. From Earth, the ISS appears as a bright star that steadily moves across the sky.

The 'Heavens-Above' website: *http://www.heavens-above.com* has the latest details on where and when to look to catch a glimpse of satellites such as the ISS, as well as other satellites such as Space Shuttle, Hubble Space Telescope (HST), Genesis-1, Envisat and many more.

This website gives how bright each satellite will be (the magnitude) – and the naked eye can see anything that is a lower number than around 3.5 or 4. It also gives the direction in which to look (the azimuth: N,S,E,W, etc) and how high in the night sky (the altitude). You can even download a sky chart for the night you plan to observe a satellite!

To access this information, you simply log on, then configure it for where you live – most major town & cities can be selected by a quick search – if your town is not there, just pick a large town close to where you live.

Let the Moon be your guide

The Moon can always be used as a pointer to find other objects in the sky.

By 18 November the Moon will be near Spica (in Virgo) before sunrise. By 23 November, it is again in the twilight sky close to the Butterfly cluster (M6) and Ptolemy's cluster (M7). On 24 November, the Moon will be near Nunki (or Sigma Sagittarii), the brightest star in the handle of the teapot of Sagittarius. In December's evening skies, the Moon will be near Pollux on 7th, near Beehive Cluster (M44) on 8th, and near Saturn and Regulus on 10th.

* * * * *

What's coming up in the skies overhead?

Planets

Saturn is the only planet visible throughout November and will be in the early morning sky. Saturn will be easy to locate in the evenings of 10–11 December near the Moon and Regulus. It will rise just after sunset in January and will be visible most of the night. Saturn will provide great viewing as it heads for opposition in February 2007.

From 10–12 December, **Mercury**, **Mars** and **Jupiter** will be low in the dawn eastern sky, forming a rare triple planetary grouping.

Venus will be found in the evening twilight from the end of November, gradually setting later in the western evening sky through December–January.

Constellations

The constellation **Orion** (the 'hunter') will be high in the north-eastern sky, and is easily located by the three bright stars that form his belt. In Australia, the major stars of Orion look like the outline of a saucepan, and Orion's belt is the saucepan's base. The handle of the saucepan (also known as the sword of Orion) contains a spectacular nebula – the Great Orion Nebula (M42) – that is easily visible through binoculars. This nebula is thought to be the birthplace of many new stars.

To the west of Orion, you should be able to locate the constellation of **Taurus** which contains the red giant, Aldebaran. Taurus contains a star cluster, the Pleiades (or Seven Sisters) which is the brightest and most famous star cluster in the sky. Approximately 7 stars can be seen with the naked eye, but binoculars reveal many more.

Crux (the Southern Cross) will be seen all night, low in the south-east, at this time of the year. The two Magellanic Clouds that sit opposite the Southern Cross, will be high in the sky, and away from city lights, they will be seen as two fuzzy patches, hence their name.

Meteor showers

November is the month to watch out for the **Leonids**. This meteor shower will be active around 3–5 am from 14–21 November, and will peak on 19/20 November. It is associated with comet Tempel-Tuttle that orbits the Sun every 33 years. The meteors will appear to come from near the Leo constellation, which will rise in the north-east.

The **Geminids** should be visible from 7–17 December and will peak around the 14 December. Since there will be a last quarter Moon, the night sky should be dark enough to make them easily seen. Best viewing will be if you centre your gaze between 45° above the horizon and straight overhead in the northern sky. These usually have average speed but are very colourful.

The **alpha-Centaurids** (28 Jan–21 Feb) will peak on 8 February – these are typically fast and bright and have many fireballs with persistent long trains that are yellow to bluish in colour.

* * * * *

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* □

A new definition for the Doppler Effect:

The tendency of stupid ideas to seem smarter when they come at you rapidly.

... David Erb

✧ ✧ ✧ ✧ 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. On dark, moonless nights with good seeing, we may also observe the brightest galaxies. In the event of cloud or rain, our all-weather program includes a mixed presentation of slides, posters and scale models.

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

No bookings needed for individuals, families, small groups, only for groups of 10^{+}: ph 0427 433 388.

For more information and details about parking: *www.astronomy.mq.edu.au/publicObs.html*

Changes in ASTRONOMICAL SCIENCE

Pluto no longer a planet

Leading astronomers declared in August 2006 that Pluto is no longer a planet under historic new guidelines that downsized the solar system from nine planets to eight.

After heated debate over the essence of the cosmos, the International Astronomical Union (IAU) stripped Pluto of the planetary status it has held since its discovery in 1930 by American astronomer Clyde Tombaugh.

Pluto doesn't make the grade under the new rules for a planet: 'a celestial body that is in orbit around the Sun, has sufficient mass for its self-gravity to overcome rigid body forces so that it assumes a … nearly round shape, and has cleared the neighbourhood around its orbit.' For now, membership will be restricted to the eight 'classical' planets in the solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Pluto is automatically disqualified because its oblong orbit overlaps with Neptune's. Instead, Pluto will be reclassified in a new category of 'dwarf planets' similar to what long have been termed 'minor planets'. The definition also lays out a third class of lesser objects that orbit the Sun called 'small solar system bodies'. This term will apply to numerous asteroids, comets and other natural satellites.

It was unclear how Pluto's demotion might affect the mission of the unmanned US spacecraft, New Horizons, which earlier this year began its 9.5 year journey to fly by Pluto and the Kuiper belt in 2015.

The IAU decision by 2 500 astronomers from 75 countries was a dramatic shift from just a week earlier, when the group's leaders floated a proposal that would have reaffirmed Pluto's planetary status and made planets of its largest moon and two other objects. That plan proved highly unpopular, causing days of argument.

Now, two of the objects that at one point were nearly made planets will join Pluto as dwarfs: the asteroid Ceres, which was a planet in the 1800s before it got demoted, and 2003 UB313, an icy object slightly larger than Pluto whose discoverer, Michael Brown of the California Institute of Technology in Pasadena, nicknamed Xena.

Charon, the largest of Pluto's three moons, is no longer under consideration for any special designation. □

Dwarf planet named

On 13 September 2006, the dwarf planet 2003 UB 313 (formerly Xena) was officially named Eris, after the Greek goddess of discord and strife. It is a fitting name for the object that caused a major shake-up of our Solar System. The dwarf planet's moon has been named Dysnomia, who was a daughter of Eris and the spirit of lawlessness.

This dwarf planet was discovered back in July 2005 and as it was thought to be a 'tenth planet' it was temporarily called '2003 UB313'. This most distant object so far found in our solar system is just slightly larger than Pluto and takes 560 years to make a very skewed orbit of the Sun. Most planets circle the Sun very near to the same plane as Earth's orbit, but the new object's orbit is off this elliptic plane by about 44°. Astronomers studying this object nicknamed it 'Xena' and in 2006 discovered it had a moon, nicknamed 'Gabrielle'.

Xena's size helped spark the drive for a decisive definition of a planet. Under a proposal presented at the start of the triennial assembly of the International Astronomical Union (IAU) in 2006, the union would have added three more planets to the solar system: Xena, the asteroid Ceres, and Pluto's satellite Charon. This could have opened the door to dozens more planets being added as more large planet-like objects were found beyond Pluto.

After much debate, the union decided to classify Xena, Pluto, and Ceres as dwarf planets. Furthermore, Pluto was declared the prototype of a new, as yet unnamed, class of trans-Neptunian objects (TNOs), including Xena. Other recently found TNOs expected to be declared dwarf planets in this class are Varuna (2000), Ixion (2001), Quaoar (2002), and Sedna (2004). □

Distant planet revealed by microlensing

A new planet has been revealed orbiting a small red star in the constellation Sagittarius, 17 000 light years away, by a technique called microlensing. It is about 1.5 times the size of Jupiter and is around three times as far from its star as the Earth is from the Sun. It was discovered when the star it orbits passed between the Earth and another star, 24 000 light-years away.

Astronomers have discovered more than 100 planets orbiting stars other than our Sun. The vast majority came to light because their gravity makes the parent stars wobble as the planets orbit around them. However, this wobble is only visible for stars up to about 170 light years away.

To try to find more distant planets, astronomers are using another technique - microlensing. Microlensing can occur when one star passes directly in front of another, as seen from Earth.

The gravity of the foreground star can bend and focus the light of the background star, making it appear to brighten briefly. If the foreground 'lens star' has a planet in orbit around it, the planet can create telltale blips in brightness that betray its presence.

Astronomers are hoping to use this gravitational microlensing to find other planets around other stars. Eventually, it may be possible to use it to find planets as small as the Earth. □

[www.newscientist.com, 15 April 2004]

Magnetar found to emit radio pulses

Astronomers using CSIRO's Parkes radio telescope in March 2006 detected radio pulses from a star (XTE J1810-197) that lies about 10 000 light-years away in the constellation Sagittarius.

The radio pulses are coming from a spinning neutron star with a superpowerful magnetic field. These 'magnetars' are the most magnetised stars in the universe, and this is the first ever found to be emitting radio waves. Astronomers were also amazed by the unexpected strength of the radio pulses.

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[www.csiro.au, Sept 2006 & wikipedia.com]

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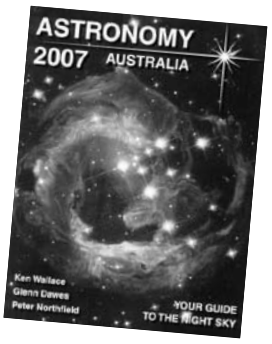

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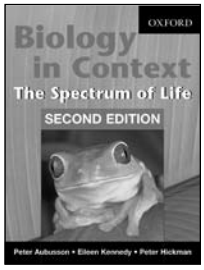

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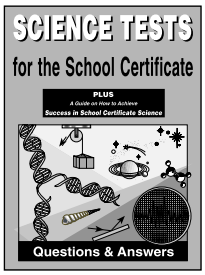

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SciTalk is a newsletter for secondary Science educators. Now in its 12th year, it is produced quarterly by Odlum & Garner as a service to Science teachers. It is sent FREE-of-charge to all secondary Science faculties in schools and TAFEs throughout NSW and the ACT.

SciTalk aims to provide science teachers with up-to-date information, important dates, the latest products available, plus 'what's on' in various excursion venues.

Please pass *SciTalk* on to all Science teachers at your school so they can benefit from it – or put it up on your notice board for reference.

Contributions, advertising and inserts are welcome.

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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 … Jan 25
- *SciTalk* No. 2–June 2007 … April 5
- *SciTalk* No. 3–August 2007 … June 29
- *SciTalk* No. 4–November 2007 … Sept 28

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