

# SciTalk

ISSN 1323-7667

Number 2 – May 2009

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... see page 6 for full details

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### ★★ 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, 11 & 12  
Send in your entries now  
**(ALL IN THE ONE ENVELOPE if you prefer!)**

This SciTalk & past issues are available at [www.odlumgarner.com](http://www.odlumgarner.com)

## Book Giveaway

WIN a copy of this book ...

**Understanding Science for Years 9 & 10**



ISBN 978 1 875918 06 5

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This book provides comprehensive coverage of the Stage 5 Science Syllabus Dot Points using questions and answers. It is the ideal revision guide for Year 9 and 10 Science. It covers the Syllabus Prescribed Focus Areas, Knowledge and Understanding and Skills sections. Students can complete this book after each topic during Years 9 and 10, or for revision during Year 10. There is a great discount for class sets (see p6).

**TO WIN:** Send in your name, school & school address, on the back of an envelope by **10 July 2009 to:**

Book Giveaway, PO Box 442, Freshwater 2096

★★★

Winner for *SciTalk 1/09*

Congratulations to Karlyn Hawkins (Manning Valley Anglican), Michael Robson (Keira HS) & Mark Doyle (Billabong HS), who won *Biology/Chemistry/Physics Past HSC Papers with Worked Solutions 2001-2008* respectively, published by Odlum & Garner.



Start planning now to celebrate  
**National Science Week**  
15–23 August 2009

# Diary Dates 2009



## Update on BOS matters

Regularly check the BOS website to ensure you have the latest data – for syllabuses, past exam papers, news, Official Notices, Board Bulletins, the statistics archive & more.

### 2009 School Certificate Tests

These are on from 9–13 November 2009.

### 2009 HSC examinations timetable

These are on from 20 October–13 November. The HSC timetable is now on the BOS website. Every HSC student can access a personalised timetable at Students Online.

### Official Notices are now online ONLY

Official Notices will be effective from the date they appear on the BOS website.

### Approved scientific calculators for 2009 HSC (BOS 08/09)

Approved calculators are on BOS website.

### BOS enquiries:

Ph: (02) 9367 8111, fax: (02) 9367 8484

Website: [www.boardofstudies.nsw.edu.au/](http://www.boardofstudies.nsw.edu.au/)

BOS contacts for Science:

- Inspector Science, K–12 & Senior
- Assessment Officer – Science

## 2009 – International Year of Astronomy

### MAY 2009

4 May–5 June Shell Questacon Science Circus at Gosford, Woy Woy, Wyong, Newcastle, Maitland, Scone, Cessnock, Singleton, Muswellbrook, Quirindi, Mudgee: [www.questacon.edu.au/html/on\\_the\\_road.html](http://www.questacon.edu.au/html/on_the_road.html)

27–31 Australian Science Festival, ACT. School Activities: 27–29/5. [www.sciencefestival.com.au](http://www.sciencefestival.com.au)

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

### JUNE 2009

1, 5 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

5 World Environment Day: [www.unep.org/wed/2009/english/](http://www.unep.org/wed/2009/english/)

8 World Ocean Day: [www.theoceanproject.org/wod/](http://www.theoceanproject.org/wod/)

19 Closing date Crystal Growing Comp. [www.chem.unsw.edu.au/RACI/](http://www.chem.unsw.edu.au/RACI/) Ph: (02) 9663 4960

19, 20 NSW Schools Titration Competition. [www.nswtitration.com/](http://www.nswtitration.com/)

### JULY 2009

4–7 CONASTA 58: *Science Education – a Bridge to the Future*. Ph (07) 3861 5444.

Fax (07) 3861 5701. Launceston, TAS. [www.cdesign.com.au/conasta58/](http://www.cdesign.com.au/conasta58/)

25 July–1 Aug National Chemistry Week. [www.raci.org.au/national/events/chemistryweek.html](http://www.raci.org.au/national/events/chemistryweek.html)

30 National Chemistry Quiz. [www.raci.org.au/national/events/nationalchemistryquiz.html](http://www.raci.org.au/national/events/nationalchemistryquiz.html)

12–25 35th International Science School: The Science Foundation for Physics. Ph: (02) 9351 7726

### AUGUST 2009

7 Jeans for Genes Day. [www.jeansforgenes.org.au/](http://www.jeansforgenes.org.au/)

15–23 National Science Week. *Astronomy: Science Without Limits*. [www.asta.edu.au/nswck](http://www.asta.edu.au/nswck)

14, 17, 21 National Science Week events: Physics is Fun at Luna Park. [www.odlumgarner.com](http://www.odlumgarner.com)

19 Physics Olympiad Nat. Qualifying Exam. [www.aso.edu.au/](http://www.aso.edu.au/) Close date: 27 June. 6125 9645

26 Biology Olympiad Nat. Qualifying Exam. [www.aso.edu.au/](http://www.aso.edu.au/) Close date: 27 June. 6125 9645

29 Astronomy Open Night & Lecture. Macquarie Uni E7B. 6–10pm, lecture 7.45pm. Cost: Adult \$10/Child \$5/Family \$25, (02) 9850 7111, [www.physics.mq.edu.au/astronomy/news/calendar.html](http://www.physics.mq.edu.au/astronomy/news/calendar.html)

### SEPTEMBER 2009

2 Chemistry Olympiad Nat. Qualifying Exam. [www.aso.edu.au/](http://www.aso.edu.au/) Closedate: 27 June. 61259645

18, 21 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

22 Spring Equinox

### OCTOBER 2009

11–17 Earth Science Week. [www.ga.gov.au/education/events](http://www.ga.gov.au/education/events), 6249 9859 ([www.earthsciweek.org](http://www.earthsciweek.org))

18 Geoscience Australia Open Day: 10am–4pm, [www.ga.gov.au/education/events/open-day.jsp](http://www.ga.gov.au/education/events/open-day.jsp)

20 Oct–16 Nov HSC Examination period

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

### NOVEMBER 2009

tba Science Teachers' Forum. Children's Medical Research Institute. [www.cmri.com.au](http://www.cmri.com.au)

2, 16, 20 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

9–13 School Certificate Tests.

23, 27, 30 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

### DECEMBER 2009

4, 11 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

21 Summer Solstice

**JANUARY 2010** National Youth Science Forum. Forms to local Rotary club by 15/5/09, interviews in July.

Only for Yr 11 in 2008. Enquiries: 6125 2777, fax 6125 8015, email: [nsss@anu.au](mailto:nsss@anu.au), [www.nysf.edu.au/](http://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.*

"Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful."  
... Albert Schweitzer

**NOTE:** Your purchase of the Odium & 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.

## Fun Park Excursions

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- Primary Science & Technology, English, Maths

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Australian wildlife is in trouble and needs your help! If you would like to help Australian scientists and conservationists, you can take part in this year's Night Stalk.

Tiwest Night Stalk is easy, fun and something everyone can do. All you need is a torch and a Spotter's Log. Choose one night or a number of nights between 1 September and

16 October and spotlight in your local bushland. Record all native/introduced animal

### 1 September–16 October 2009

species: mammals, birds, bats, reptiles and frogs, that you find and send your Spotter's Log to Perth Zoo.

This annual national survey, now in its 11th year, is designed to collect information about animals still living in the wild, especially near urban areas, and their distribution over time.

For information: Tiwest Night Stalk  
PO Box 489 South Perth WA 6151  
Fax: (08) 9474 4113  
Email: [nightstalk@perthzoo.wa.gov.au](mailto:nightstalk@perthzoo.wa.gov.au)

Visit: [www.perthzoo.wa.gov.au/Get-Involved/Nightstalk](http://www.perthzoo.wa.gov.au/Get-Involved/Nightstalk) & download a Spotter's Log or complete one online.





## Some activities to celebrate the 2009 International Year of Astronomy

The International Year of Astronomy, 2009 (IYA 2009) commemorates 400 years since Galileo used the telescope to observe and record the night sky, changing our understanding of our place in the Universe forever.

IYA 2009 provides a wonderful opportunity for teachers to engage students with topical and exciting Science. There are many exciting events, activities and projects taking place across Australia during this year. More details on some of these are provided in this article and at [www.astronomy2009.org.au/](http://www.astronomy2009.org.au/) ... see the 'Events Calendar'.

With the theme of *The Universe, Yours to Discover*, IYA 2009 hopes to reconnect people with the day- and night-time sky so that they gain a deeper insight into astronomy's role in enriching all human cultures, and learn more about the latest astronomy discoveries and role of astronomy in Science education.

### MACQUARIE UNI OBSERVATORY FRIDAY NIGHT OBSERVING

On clear nights, our 'starfinder' (planisphere) sessions demonstrate how to identify bright stars, constellations and planets. This is followed by observing with the telescopes (12" & 16" Meade 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, our program includes a mixed al fresco presentation of slides, posters and scale models.

Located in the grounds of Macquarie Uni (access via Gymnasium Rd), the observatory is open to the public every Friday night, March–November inclusive, 7:30–9 pm, subject to bookings or rain. You can phone 0427 433 388 if the weather is doubtful.

### COME TO PHYSICS IS FUN AT LUNA PARK FOR IYA 2009 & VISIT SYDNEY OBSERVATORY

'Luna' means 'moon' in Latin. So IYA2009 is a great time to book a visit to Luna Park Sydney through 'Physics is Fun' for a physics/science excursion. This year, why not consider taking your students for a day or night visit to Sydney Observatory before or after Luna Park Sydney.

For more information about Sydney Observatory, go to: [www.sydneyobservatory.com.au](http://www.sydneyobservatory.com.au)

### ASTRONOMY OPEN NIGHT AT MACQUARIE UNIVERSITY 29 August 2009

Look through ~20 different telescopes to see the Moon, stars, planets, nebulae and clusters. An illustrated talk will begin at 7.45 pm. See displays of telescopes, software, magazines, books, maps and posters.

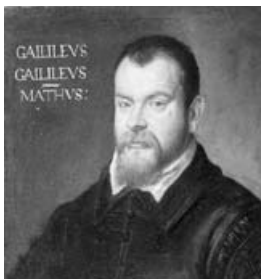
Venue: Macquarie Uni E7B. 6–10 pm.  
Cost: Adult \$10/Child \$5/Family \$25.  
More details: (02) 9850 7111, [www.physics.mq.edu.au/astronomy/news/calendar.html](http://www.physics.mq.edu.au/astronomy/news/calendar.html)

### PARKES OBSERVATORY OPEN WEEKEND 2009

Sat 18 July: 9 am–4 pm and 5:30 pm–8 pm; Sun 19 July: 9 am–4 pm

Telescope tours (enclosed footwear required), Astronomy talks, & Ask an expert. This is a rare chance to inspect the telescope. There are only a limited number of tours. To avoid disappointment arrive early. More details at: <http://outreach.atnf.csiro.au/events/opendays/2009/index.html>

### Galileo Galilei



Galileo (1564–1642) was an Italian physicist, mathematician, astronomer, and philosopher who played a major role in improving the telescope. His first telescope in 1609 had 3x magnification, while his later ones were up to 30x. Galileo made many contributions to science as well as technology, e.g. his research into falling bodies and parabolic trajectories. In astronomy he was one of the first people to make great discoveries with the telescope. He is especially remembered for his

telescopic confirmation of the phases of Venus, the discovery of the four largest satellites of Jupiter, the observation and analysis of sunspots, and his support for Copernicanism. As a result of these, and his many other contributions to science and astronomy, Galileo has been called the 'father of modern observational astronomy', the 'father of modern physics', and the 'father of science'. Einstein once remarked that, 'Galileo, perhaps more than any other single person, was responsible for the birth of modern science'.

## The AUSTRALIAN MUSEUM presents two fabulous temporary exhibitions in Term 2, 2009

### ● When MAMMOTHS roamed

10 April to 24 July 2009

Step back in time and explore the prehistoric home of the Woolly Mammoth, the colossal mammal that roamed the Earth until the last ice age around 10 000 years ago.

### ● Climate change: our future, our choice

2 May to 16 August

Is the climate really changing? Which parts of Sydney will be flooded by rising sea levels? Visit this interactive exhibition and get involved.

### NEW PERMANENT EXHIBITIONS

#### ❖ *Surviving Australia*

This extensive and exciting exhibition showcases the diversity of Australia's unique fauna and how they have adapted to an amazing array of habitats.

#### ❖ *Dinosaurs*

This extensive and exciting exhibition showcases the diversity of Australia's unique fauna and how they have adapted to an amazing array of habitats.

For further information about syllabus related resource kits, hands-on activities and other exhibitions – Skeletons, Birds and Insects, Planet of Minerals, Search and Discover and Indigenous Australians – please check the Museum website or request a brochure.

#### For bookings and further information

Ph (02) 9320 6163 Fax (02) 9320 6072 [www.australianmuseum.net.au/visiting/education](http://www.australianmuseum.net.au/visiting/education)

In partnership with: Scitech, Perth.

Season sponsor: Department of Environment and Climate Change.

Major sponsor: The Sydney Morning Herald.

Program sponsor: City of Sydney.

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NATIONAL GEOGRAPHIC CHANNEL



AUSTRALIAN MUSEUM  
6 College Street, Sydney  
(opp. Hyde Park)  
open daily 9.30 am – 5 pm  
[www.australianmuseum.net.au](http://www.australianmuseum.net.au)





## Chemical Safety Mandatory Training

Would your school pass a Workcover inspection?

- Is there a record in the school files of the date and who attended the previous Chemical Safety Mandatory Training?
- Is there a system in place to record whether the teachers have read the risk assessment prior to doing the experiment or procedure?
- Does the school exceed the statutory amount of ammonium nitrate stored on site?

If you are not sure, perhaps you need to refresh the **Chemical Safety Mandatory Training** at your school.

Representatives of the Royal Australian Chemical Institute (RACI), NSW Chemical Education group can come to the school and present a training course that:

- is up-to-date with the latest legislation and the latest list of DET banned substances
- is presented by experienced trainers who are members or fellows of the RACI
- is illustrated with PowerPoint and has interactive engagement with adult participants
- comes complete with participants notes and customised certificates of completion are provided
- is registered with the NSW Institute of Teachers for the maintenance of Professional Competence in DET schools
- Takes 2¼ hrs for the non-technical group, 3 hrs for the technical group, including a break.



### Contact details – Booking information

Cost is \$1000 in Sydney area, \$2000 plus travel and accommodation expenses for country areas.

A flier can be sent to you if you require more information.

Email course convener Margaret Lindsay at: [margaret.lindsay@nowt.com.au](mailto:margaret.lindsay@nowt.com.au)  
or phone 0403 079 788 to discuss terms and available dates.

New exhibition 20 March–23 August 2009

# Charles Darwin

VOYAGES AND IDEAS  
THAT SHOOK THE WORLD

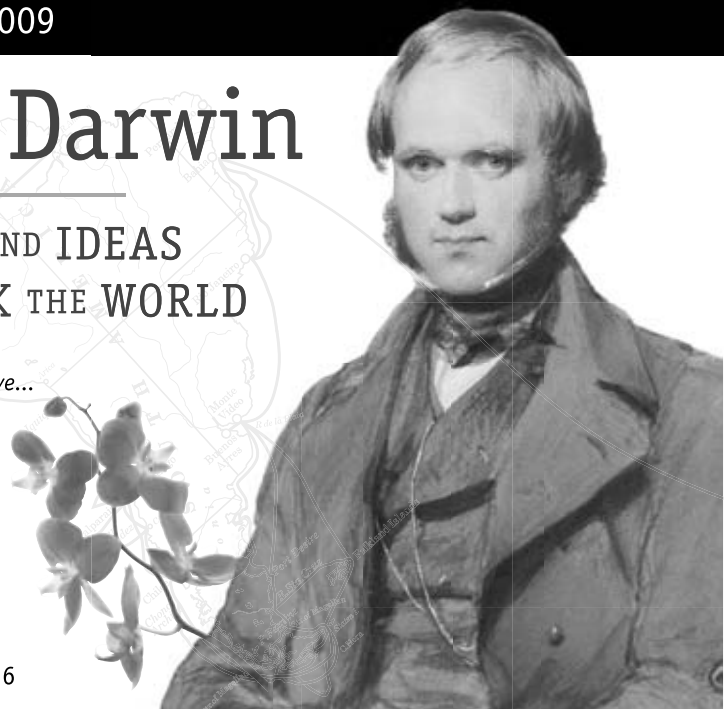


*"I have just finished my sketch of my special theory, if, as I believe... my theory is true, and if it be accepted even by one competent judge, it will be a considerable step in science."*

Charles Darwin, note to his wife Emma, 1844

Two hundred years since the birth of Charles Darwin and 150 years since the publication of *On the Origin of Species*, we invite you to join Darwin and his colleagues on the voyage of a lifetime!

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or visit our website [www.anmm.gov.au/education](http://www.anmm.gov.au/education)

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AUSTRALIAN  
NATIONAL MARITIME  
MUSEUM



# FUN PARK EXCURSIONS

## 2009 DATES

March 13, 16, 30. May 8, 29.  
June 1, 5. Aug 14, 17, 21.  
Sept 18, 21. Oct 23, 26, 30. Nov  
2, 16, 20, 23, 27, 30. Dec 4, 11.

**PLUS: OTHER SCHOOL DAYS**  
are also available

[Note: Luna Park only open on Mondays & Fridays]

**TIME** 11 am–6 pm

**COST** Only \$23\*/student  
plus \$25\* booking fee/school  
[Non-scheduled days: from \$24\*/student]

Teachers **FREE:** 1/8 primary or  
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Entry to Luna Park is **FREE**. Extra  
teacher ride tickets are \$26\* ea.

\*plus 10% GST (schools can claim this back,  
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**ALL school faculties can book 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. You can come for just a fun day,  
or curriculum-based worksheets are available.

Interactive learning is a great way for  
students to discover that learning is not so dull  
after all! Students learn as they ride at these  
fun-filled excursions, which 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.

★ **BOOK NOW THROUGH PHYSICS IS FUN** ★

## ENQUIRIES/BOOKINGS

- Book now by ph/fax/email:  
Robert Garner or Catherine Odlum  
PO Box 442, Freshwater NSW 2096  
**Ph (02) 9939 6107 Fax (02) 9939 6105**  
**Email: robertgarner@mac.com**
- Then send a deposit of \$100 (+ 10% GST)  
to confirm your booking.
- Worksheets (if requested) are sent after  
your deposit is received.

**Physics is Fun – The original and best**  
ABN 54 942 891 924

Come for a great fun day.  
Hands-on learning is fantastic fun!

### 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,  
2004-2009) 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.

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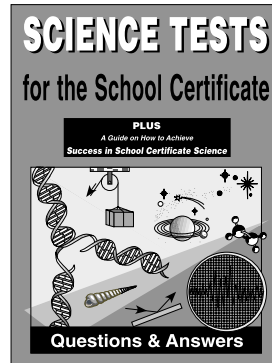
## ★ For Success in School Certificate Science ★



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*If no ... please send a cheque OR your Master/ Visa Card details (name on card, card no, expiry date)*

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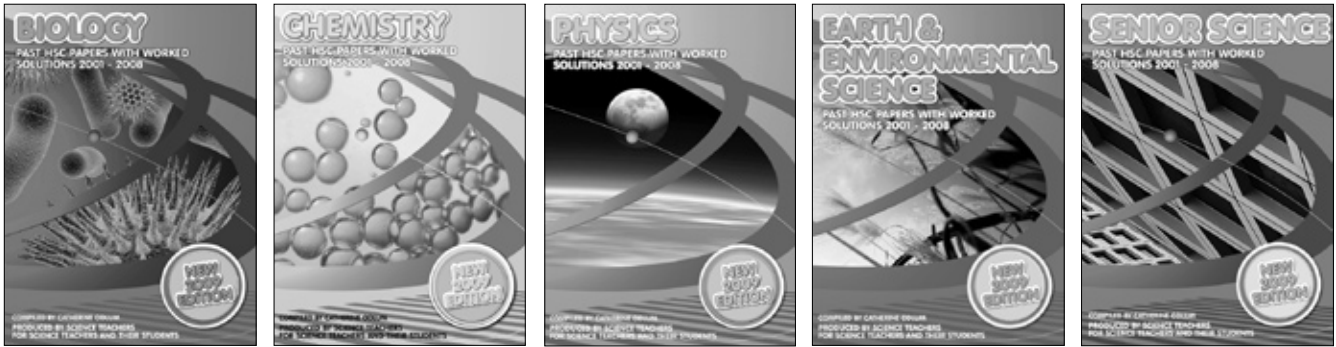
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# PhoTo Spot 'Gear sticks' – trichomes on a *Caladenia filamentosa* ovary

*Caladenia filamentosa*, the Spider Orchid, belongs to the orchid family, Orchidaceae. It has also been known as *Jonesiopsis capillata* or *Caledenia capillata*. The Orchidaceae (or Orchid family) is the largest family of the flowering plants (Angiospermae).

Found in drier inland districts in the southern parts of Australia, this terrestrial orchid's common name, 'Daddy long-legs', derives from its appearance. This can be seen in Figure 2. The flowers are usually a pale colour with darker veins that vary from red or crimson to a reddish greenish white colour, and sometimes yellowish white.

Its leaves are narrow-linear, and up to 18 cm long and 3 mm wide. They are densely hairy with simple glandular hairs called trichomes – these consist of a stalk terminating in a glandular head.

The word trichome comes from the Greek, meaning 'growth of hair'. Trichomes may be formed on all parts of the plant as outgrowths from an epidermal cell. Leaf and stem trichomes increase the reflection

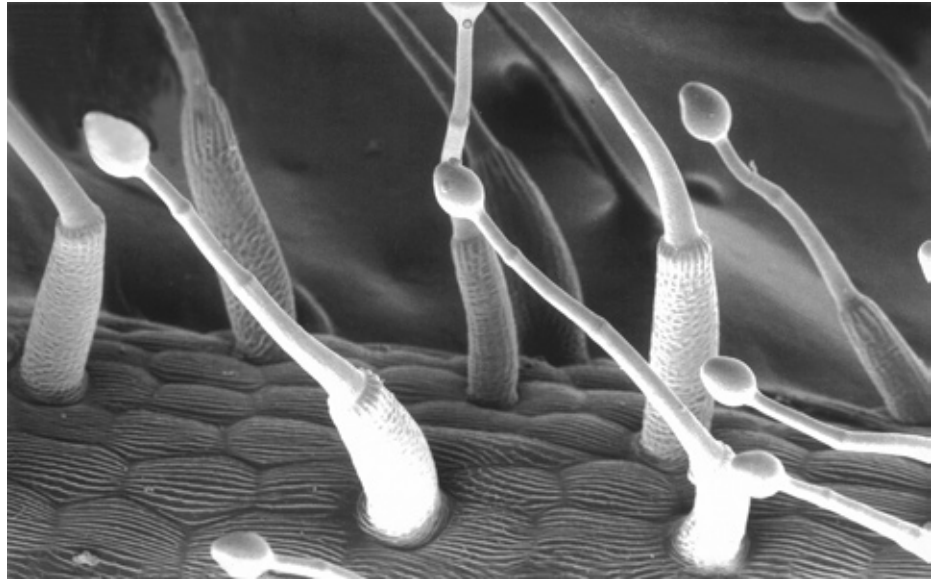


FIGURE 1 (above): 'Gear sticks' – the trichomes on the ovary of the plant, *Caladenia filamentosa*.

This photomicrograph was taken using a scanning electron microscope by David Jones and Roger Heady (RSBS, Australia National University, ACT).

of solar radiation, thereby reducing internal temperatures, and thus reduce water loss in plants growing under arid conditions. They also help to trap moisture, thereby inhibiting total water loss. □

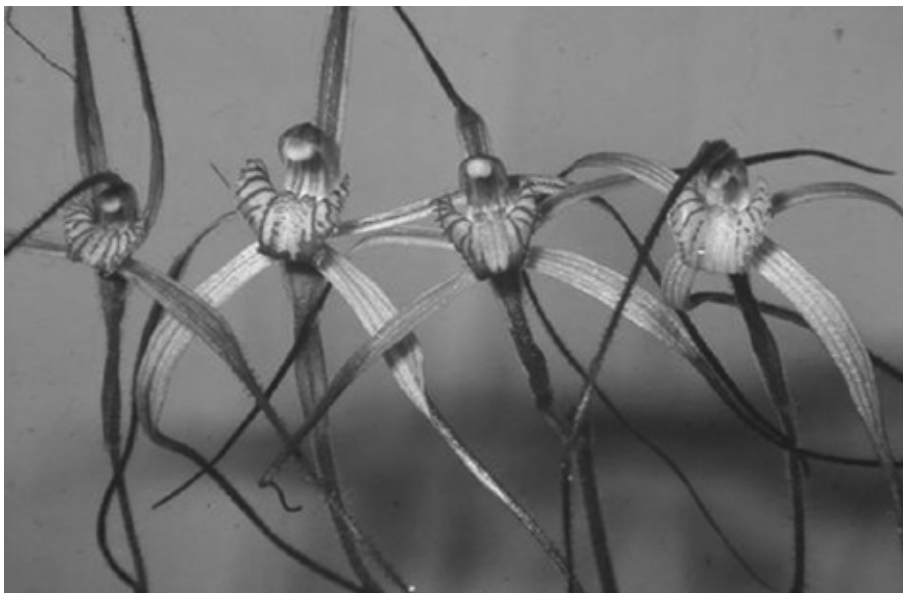


FIGURE 2 (left): *Caladenia filamentosa* – by Ron Herberle, The Species Orchid Society of Western Australia (Inc).

This orchid has one enlarged petal called the labellum (up to 10 mm long and 3 mm wide), plus 5 long narrow sepals and petals with narrow bases. They are a pale colour with darker veins running down them. Its long narrow-linear leaves can also be seen.

Happiness is not an absence of problems; but the ability to deal with them.

... H Jackson Brown

## Progress towards a National Curriculum

If you wish to follow the progress of the National Curriculum, go to: [www.ncb.org.au/our\\_work/curriculum\\_development\\_process.html](http://www.ncb.org.au/our_work/curriculum_development_process.html)

Draft timelines for writing the national curriculum are set out on their website.

You can be fully involved and up-to-date with national curriculum development by registering for the online consultation and feedback system available on the NCB website in the 'Getting involved' section. □

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The SKA will be built either in South Africa or Australia, both in the southern hemisphere, where the view of our own galaxy, the Milky Way, is best and radio interference least. With a budget of A\$2.9 billion, construction is scheduled to begin in 2012 for initial observations by 2016 and full operation by 2020. If chosen, Australia's proposed site in WA would accommodate the largest array, comprising several hundred antennas and would have exceptional radio quietness and observing conditions.

SKA is being developed by 19 countries, and will revolutionise our understanding of the Universe by providing answers to fundamental questions about its origin and evolution. For more details, go to the Australian Academy of Science site at: [www.science.org.au/nova](http://www.science.org.au/nova) □



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## Viewing the winter skies

... Robert Garner

As we move towards winter, the time available for sky watching increases with long nights. This year is the International Year of Astronomy 2009, so it is the ideal time to get out the binoculars and interest your students in astronomy.

This year, the winter solstice occurs on 21 June at 4 pm. On 4 July, the Earth is at aphelion, the point in its orbit when it is at the greatest distance from the Sun, at 1.017 AU. The winter also means good viewing because a lot of cloud has usually cleared away and humidity is low so that generally there are clear skies. It does, however, require sky watchers to rug up against the winter cold.

### Locating constellations

The constellation *Orion* is now setting soon after the Sun and will soon be rising in the eastern pre-dawn sky. In the overhead winter sky, we see *Scorpius*, *Sagittarius*, *Aquila*, *Cygnus* and *Lyra*. *Scorpius* is now rising in the eastern evening sky to the south-east. The 'heart of the Scorpion' is the bright red star, Antares. This is the 15th brightest star in the sky. At a distance of nearly 500 LY, it is one of the largest stars known. Low down near the western horizon is Sirius, the brightest star we see in the night sky and above it and slightly south is Canopus, the next brightest star that we see.

To the south, *Crux*, the Southern Cross constellation is quite high in the sky during winter. It is on its side with the two pointers ( $\alpha$ -Centauri and  $\beta$ -Centauri) to its east.

### Locating Planets

As we start the winter period, Saturn is the only planet visible in the night sky. It is in the north-eastern sky after sunset and sets after midnight. As winter continues, Saturn sets earlier each evening (around 11 pm in June, 9 pm in July) and, by August, will be lost in the evening twilight as it moves towards conjunction on the 18 September. Jupiter, Mars and Venus are in the early morning pre-dawn sky. Mercury is currently too close to the Sun to be seen. In early June, it will reappear in the dawn sky.

Mars and Venus remain close together in the morning sky throughout winter this year. They are both rising in the eastern sky around 3–4 am throughout winter. They are very close to one another and to the crescent Moon on 21 and 22 May, and even closer together on 19 and 22 June. By 19 July, Mars is above the Moon with Aldebaran to its right and the star cluster, Pleiades, to its left. Venus is below Aldebaran and to the right of the Moon. You can read more about Pleiades later on in this article.

Jupiter is rising in the east around midnight in early winter. It rises earlier each night as winter progresses rising around 10 pm in mid-June and soon after dark in July. Throughout June, Jupiter remains within  $1^\circ$  of the planet, Neptune. Neptune, at magnitude 8, is a telescopic object and usually hard to find. Jupiter can point you to Neptune throughout June. On 16 June, Jupiter is stationary against the background stars and then begins a four month long period of retrograde motion, in which it moves from west to east against the background stars instead of the usual east to west movement.

Students should watch Jupiter's position relative to adjacent stars from late May to early July to see its motion slow down and then reverse. Jupiter's apparent size increases as it approaches opposition on 15 August.

The larger angular size of Jupiter also makes winter a good time to emulate Galileo's observations of the changing positions of the four largest of Jupiter's sixty three moons. On July 15, at 9:17 pm, Ganymede will eclipse Io. On July 21 at 12:16 am, Ganymede will eclipse Europa, while all four moons lie to the same side of the giant planet. The moons move quite rapidly, so viewing for only a half hour or so will allow the complete event to be observed.

### Meteors

The delta-Aquarids should appear from mid-July until mid-August with a peak around 26–28 July.

\* \* \* \* \*

### The star cluster, Pleiades

In astronomy, the Pleiades (Messier object 45) is an open star cluster in the constellation of *Taurus*. Known as the 'Seven Sisters' because of its seven brightest stars, it can be easily viewed with binoculars. It is among the nearest star clusters to Earth and is the cluster most obvious to the naked eye in the night sky.

The cluster is about 500 light years from Earth and is dominated by hot blue stars. The dust that can be seen as a nebulosity around the brightest stars in the Pleiades (see Figure 1) is an unrelated dust cloud in the interstellar medium that the stars are currently passing through.



Figure 1 – the star cluster, Pleiades, showing dust clouds (nebulosity) around the brightest stars.

Credit: NASA/ESA/AURA/Caltech.

### Aboriginal perspectives on the origin of the Pleiades

The Australian Aborigines' understanding of the movement of the planets and stars through the evening sky is profound. The presence of particular stars or groups of stars in the evening sky gave information regarding the availability of particular food sources, the time for ceremonial events or the reinforcement of moral issues.

The various groups of Aboriginal people have many dreamtime stories to explain the world around them. There are a number of different dreamtime stories to explain 'how the Pleiades came about'. The following stories will help your students complete Stage 5 Dotpoint 5.1.

One dreamtime story explains that there were once seven beautiful sisters called the Maya-Mayi. These are the seven stars we now call the Pleiades. Any man who even set eyes on one of the sisters, wished that he could marry one or even two of them. One of the sisters was stolen by the warrior Karambal to be his bride. Having escaped, she is still pursued by Karambak, who is now the nearby star, Aldebaran.

The Aborigines of Cape York believe that the Seven Sisters were placed in the sky to warn girls who were lazy and would not help their mothers. The Aborigines of South Eastern Australia believe that the Pleiades were seven brave and courageous young women placed in the sky as role models because, while they were on Earth, they insisted on undertaking initiation rites in order to become better mothers.

Some Aboriginal tribes believe that the stars of Orion's Belt and sword were the Barai-Barai. These young men deeply loved the seven sisters, or the Meamoi.

... continued next page

Yet another story tells of seven sisters who sat down to enjoy a feast of wood ant larvae. As they sat using their digging sticks to open the ant nest, they were being watched by the warrior, Warrumma, who crept in and took two of the sticks. The two sisters who then went looking for the missing sticks were grabbed by him. He told them that he did not want to hurt them but that he was lonely and wanted to marry them. The two sisters devised a way to escape from him up a pine tree while gathering fire wood. They went up and up the pine tree until eventually they were in the sky. There waiting for them were their other five sisters who welcomed them back into the group. □

**BOX 1 Sky Charts & Planispheres**

- You can download free sky charts each month to explore the night sky from: <http://skymaps.com/downloads.html>
- A planisphere (star wheel) is a great aid for exploring the stars and locating constellations. These are inexpensive and available from astronomy shops, or you can download one from the internet – make sure it is for the Southern Hemisphere. There is a planisphere (star wheel) to print and use at: <http://members.ozemail.com.au/~starrylady/Planis1.htm>

**Science on the Web**

● **PET bottles potential health hazard**

[www.abc.net.au/science/articles/2009/04/29/2555698.htm](http://www.abc.net.au/science/articles/2009/04/29/2555698.htm)

Water bottles made from PET plastic leach compounds that mimic the hormone oestrogen, raising questions about their safety, say German researchers. Previous research has focused on plastics containing the chemical bisphenol-a (BPA). During that time, regular PET plastic water bottles have maintained a reputation as safe, at least as far as human health is concerned. But new evidence suggests that PET, or polyethylene terephthalate, may not be so benign after all. It's too soon to say whether drinking out of PET plastic bottles is harmful to human health. Shanna Swan, an epidemiologist at the University of Rochester School of Medicine and Dentistry in New York commented, "This is coming at a good time because the use of bottles for consuming water is getting very bad press now because of its carbon footprint. It's just another nail in the coffin of bottled water, the way I see it."

● **Will a face mask protect me from swine flu?**

[www.abc.net.au/health/talkinghealth/factbuster/stories/2009/04/29/2556226.htm](http://www.abc.net.au/health/talkinghealth/factbuster/stories/2009/04/29/2556226.htm)

Face masks will only protect the wearer if worn correctly (to cover your nose and mouth) and are changed roughly every 8 hours or when they become moist. Because the influenza virus is transmitted in droplets of moisture, rather than through the air, placing a protective barrier over your face can block its entry into your mouth or nose. So when the passenger sitting next to you on the bus coughs and splutters all the way into town (instead of staying home as they should), those virus-bearing droplets will stay on the outside of the mask rather than entering your system. If the threat of swine flu continues, then more people will probably use masks on public transport and in other crowded places.

Apart from wearing a mask, the best way to protect yourself from influenza – and any other infectious disease – is to follow normal good hygiene practices, e.g. wash your hands with soap and water after removing a mask and before you eat, keep your hands away from your face, don't cough or sneeze into your hand, use a tissue and dispose of it properly when you have finished, and do not to run your hands along surfaces when in public places. It is also important to have your flu shots. Although the currently available vaccine probably won't provide any protection against swine flu, it will protect against other strains of influenza circulating in the community.



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\* \* \* \* \*



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SciTalk 1/09 answer: pulsars

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*SciTalk*

*SciTalk* is a newsletter for secondary Science educators. Now in its 15th 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.

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- *SciTalk* No. 4–October 2009 ... Oct 2

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