

SciTalk

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Get involved in the 2011 International Year of Chemistry

Chemistry is all around us. The matter that fills our world is made up of chemicals. Chemicals are in our bodies, the air we breathe, the food we eat, plants, animals, oceans, mountains, as well as in the other planets and stars in our universe, to name just a few examples.

Scientists have learnt much about chemistry since the early days when 'chymistry' (as chemistry was called) and alchemy referred to the same discipline. Today, alchemy only refers to attempts to transmute base metals into gold, while chemistry is the science of matter and the changes it undergoes with respect to the composition, behaviour, structure, and properties of matter, as well as the changes it undergoes during chemical reactions.


Chemists study various substances, atoms, molecules, crystals and other aggregates of matter whether in isolation or combination, as well as concepts of energy and entropy in relation to chemical processes. There are now many types of chemistry, such as organic, inorganic, biochemistry, physical, analytical, nuclear, polymer, biophysical, forensic, environmental, and more.

2011 is the time to get your students really involved in chemistry, as it is the International Year of Chemistry. The theme is 'Chemistry – our life, our future'. It will be a celebration of the achievements of chemistry and its contributions to the well-being of humans.

Every year, there are many chemistry activities available for students organised by the NSW Royal Australian Chemical Institute (RACI), e.g. Titration Competition (see p5), National Chemistry Week, National Chemistry Quiz and the Crystal Growing Competition. The 2011 theme for National Science Week is 'React to Chemistry'. Why not join in? These events are listed in Diary Dates on p2 and you can visit www.raci.org.au/branches/nsw-branch for more details. □

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Get 12, 15 or 19 August 2011
into your school calendar
for this year's Physics is Fun
in National Science Week

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- 5.

Please return to file or noticeboard.

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★★ See pages 1, 11 & 12 ★★
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★★★

Winner for SciTalk 4/10

Congratulations to Matt Pope, Holy Spirit College,
 Bellambi, who won a *studyON HSC Physics Value Pack* (rrp \$89.90) published by Jacaranda.

Diary Dates



International Year of
CHEMISTRY
2011

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.

Official Notices are now online ONLY

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

Curriculum to use in 2011 (BOS 18/10)

All NSW schools are to continue to use the existing NSW K–12 syllabuses for 2011.

Review of NSW School Certificate

The Year 10 School Certificate review report is still underway. No major changes are anticipated for the 2011 School Certificate. The Board hopes to begin developing new curriculum documents in 2011 with a view to substantial implementation of the Australian curriculum by 2013.

HSC–University Pathways Program commences 2011 (BOS 32/10)

A new HSC–University Pathways program has replaced the Distinction courses. This program offers greater flexibility for highly able students to begin university study through a variety of delivery modes. The subjects undertaken will not contribute to the HSC or to the ATAR.

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

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• Primary Science & Technology, English, Maths

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For: Shell Questacon Science Circus 2011 program:

www.questacon.edu.au/html/on_the_road.html

tba: Astronomy Open Nights & Lectures: Macquarie Uni,

www.physics.mq.edu.au/astronomy

MARCH 2011

- 6–13 Seaweed 2011: www.mesa.edu.au Some resources will also be at: www.ausmepa.org.au
Theme: 'Spotlight on Marine Science'
- 4 Schools' Clean Up Australia Day. Ph: 1800 282 329. www.cleanupaustriaday.org.au/
- 21, 25, 28 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 21 Autumn Equinox (10.21 am AEDT)

APRIL 2011

- 1, 4 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 22 International Earth Day. www.earthday.net/ & www.earthsite.org/ [Note: 20 March is the original day to celebrate the equinoctial Earth Day, but it is now celebrated on 22 April in many places.]

MAY 2011

- 4–6 Science at Shine Dome conference, Australian Academy of Science: 'Australia 2050: Population Challenges to Sustainability'. www.science.org.au/events/sats/sats2011/ta.html
(Closing date: 6 March)
- 6, 27 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

JUNE 2011

- 1 Rio Tinto Big Science Comp: www.asi.edu.au/bigscience/competition.php (close date 2/5)
- 3, 6, 10 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 5 World Environment Day
- 17/18 (metro) NSW Schools Titration Competition. www.nswtitration.com/ (see ad on page 5)
- 22 Winter Solstice (3.16 am EST)
- 30 Closing date Crystal Growing Comp. www.raci.org.au/branches/nsw-branch Ph: 9663 4960

JULY 2011

- 3–16 International Science School: *Light & Matter*. Details: science.edu.au/science/physics/foundation
- 10–13 CONASTA 60 in Darwin: *Science at the Top*. Details: www.conasta.edu.au/
- 25–30 National Chemistry Week. www.raci.org.au/branches/nsw-branch Ph: 9663 4960
- 28 National Chemistry Quiz. <http://www.ancq.com/> Ph: 9663 4960. Closing date: 9 May

AUGUST 2011

- 1–14 Australian Science Festival, ACT. For school Activities visit: www.sciencefestival.com.au
- 5 Jeans for Genes Day. www.jeansforgenes.org.au/
- 12, 15, 19 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 13–21 National Science Week. *React to Chemistry*. www.scienceweek.gov.au
- 12, 15, 19 National Science Week events: Physics is Fun at Luna Park. www.odlumgarner.com
- 15 Phys Olympiad Nat. Qualify. Exam. www.asi.edu.au/olympiads/ Close date: 22/7. 6201 2552
- 17 Chem Olympiad Nat. Qualify. Exam. www.asi.edu.au/olympiads/ Close date: 22/7. 6201 2552
- 18 Biology Olympiad Nat. Qualify. Exam. www.asi.edu.au/olympiads/ Close date: 22/7. 6201 2552

SEPTEMBER 2011

- 9, 12 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 23 Spring Equinox (7.04 pm EST)

OCTOBER 2011

- 9–15 Earth Science Week. www.earthsciweek.org & www.ga.gov.au/education/events, ph (02) 6249 9111
- 17, 21, 24, 28 31 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

NOVEMBER 2011

- tba? Science Teachers' Forum. Children's Medical Research Institute. www.cmri.com.au
- 4, 14, 18 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 21, 25, 28 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105

DECEMBER 2011

- 2, 9, 12, 16 Physics is Fun at Luna Park Sydney. Enquiries: ph (02) 9939 6107, fax (02) 9939 6105
- 22 Summer Solstice (4.30 pm AEDT)

JANUARY 2012 National Youth Science Forum. Forms to local Rotary club by 29/5/11, interviews from July. Only for Yr 11 in 2011. Enquiries: 6125 2777, email: nss@anu.au, www.nysf.edu.au/

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

The Australian Science Festival is on again in 2011. It will be in Canberra from 1–14 August.

This year's exciting program will link into the International Year of Chemistry. There will be over 50 Science events to learn more about chemistry



– details will soon be at: www.sciencefestival.com.au
Enquiries to ph 6205 0588.

The schools' programs will be on again during the festival and will provide opportunities for your students to become captivated with the world of Science.

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ISS2011: *Light & Matter*

3–16 July 2011 at The University of Sydney

Application forms will be available from mid-February 2011
science.edu.au/science/physics/foundation

In July 2011, 140 students from across Australia and nine other countries will meet at The University of Sydney for two weeks of cutting-edge science. *Light and Matter* will feature leading researchers speaking on subjects ranging from photonics and communications, to astronomy and cosmology — and featuring Prof John Pendry, creator of the first practical 'invisibility cloak'!

Beyond the lecture theatres, ISS scholars participate in diverse activities — experiments, museum visits, lab tours and social events such as an evening harbour cruise. These two weeks are often described by the scholars as 'the best two weeks of my life'. All scholars are competitively selected at State level, and attendance is by scholarship only. The scholarships are valued at approximately \$3000 and cover return travel within Australia, full board at Women's College, 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: Chris Stewart, School of Physics, ph (02) 9351 3622, fax (02) 9351 7726, email c.stewart@physics.usyd.edu.au or visit science.edu.au/science/physics/foundation

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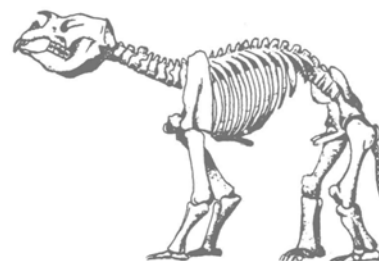
COMING: *Rituals of Seduction: birds of paradise*

Download self-guided activities from the website, such as:

- Biodiversity Trail and Clue Cards (Yr 5–8)
- Evolution Trail Combo (Yr 9–10)
- Evolution, Extinction and Survival (Yr 11–12)

Sessions with a Museum educator include:

- Fascinating Fossils (Yr 7–10)
- Human Story (Yr 11–12)
- Learning from Fossils (Biology) (Yr 11–12)
- Earth and Environmental Science Fossils (Yr 11–12)



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Science Update

Tagging penguins is detrimental

The standard way of tagging penguins for science – putting bands around their flippers – affects their chances of survival and breeding, a study by French researchers has found.

The metal bands, looped around the top of the flipper where it meets the body, have been used for decades. They allow for easy visual identification of individual birds from a distance. Foot tags are not used because of the penguin's anatomical shape.

This new study claims that the seemingly harmless bands affect the penguin's swimming performance, causing it to waste more energy in foraging for food, sometimes with life-threatening consequences.

The French researchers followed a group of 100 king penguins (*Aptenodytes patagonicus*) in a colony on Possession Island off the Antarctic coast. All were tagged with

a minute, electronic transponder that was implanted under the skin, and which could only be read by using specialist equipment placed close to the bird. Fifty of the 100 birds were additionally given a flipper band. The team then recorded sightings of the group over the next 10 years. They found that banded birds were 16% likelier to die than non-banded counterparts, and had 39% fewer chicks if they were banded. So continuing to use the tags would in most situations appear be unethical.

These results add to small-scale studies on captive Adelie penguins by other scientists that suggest these birds – which beat their flippers about three times a second when swimming – lose up to 24% of their power when banded. The penguins arrived much later (16 days later on average) at breeding grounds compared with non-banded counterparts. Late arrival is a known factor for poor breeding success, for chicks that are born later are nurtured in harsher weather and there are more

predators around to grab them. Birds failing in reproduction also spent five days longer at sea foraging for food for their chicks – 21 days against 16 days – and this again was thought to be due to impeded swimming.

The new findings raise doubts over studies that use penguins in climate research as a tool for measuring the impact of global warming on cold-water wildlife. Such studies may now have to be reviewed, for penguin population data could be skewed by flipper banding, according to the researchers. They found that when the sea temperature was low and food resources were abundant, there was virtually no difference between banded and non-banded birds. However, when there was a rise in sea temperature and food was less abundant, the penguins had to swim farther, and banded penguins stayed longer at sea to forage compared with non-banded birds. □

[References: *France 24 International News* (www.france24.com/en/20110112)... 13/1/11; & *BBC News* (www.bbc.co.uk/news/science-environment-12162725) ... 12/1/11]

HSC statistics: Science entries in the 2010 HSC

The total number of entries for the HSC Science courses* in 2010 was 42 307 and the total number of HSC entries for the 2010 HSC was 70 602. So Science entries were 59.9% of the total entries.

The number of HSC Science entries as a % of the total HSC entries from 1992–2010 in the table on the top right. This % has decreased significantly from a peak of 90.8% of the total candidature in 1992[#] with 54 414 students doing a Science course to only 55.8% in 2002. Since 2004, it has hovered around 58–60%, which is much lower than in past years. The pattern of options in the various science courses for the 2010 HSC has not varied greatly, although still more Biology students are doing 'Communication' and less doing 'Human Story' than in previous years.

The pattern of options presented at the 2010 HSC for each Science course is given as a percentage in the following tables.

Biology	
Total 2010 candidature 15 849 (♂ 6135 ♀ 9714)	
Q28. Communication	65.7%
Q29. Biotechnology	6.1%
Q30. Genetics: The Code Broken?	18.9%
Q31. The Human Story	8.3%
Q32. Biochemistry	0.3%
	99.3% [§]

Chemistry	
Total 2010 candidature 10 330 (♂ 5643 ♀ 4687)	
Q28. Industrial Chemistry	45.8%
Q29. Shipwrecks, Corrosion and Conservation	36.0%
Q30. The Biochemistry of Movement	1.4%
Q31. The Chemistry of Art	3.8%
Q32. Forensic Chemistry	12.5%
	99.5% [§]

Physics	
Total 2010 candidature 9359 (♂ 7256 ♀ 2103)	
Q28. Geophysics	1.2%
Q29. Medical Physics	27.8%
Q30. Astrophysics	23.0%
Q31. From Quanta to Quarks	46.5%
Q32. The Age of Silicon	1.1%
	99.6% [§]

Earth & Environmental Science	
Total 2010 candidature 1449 (♂ 741 ♀ 708)	
Q28. Introduced Species & the Australian Environment	76.7%
Q29. Organic Geology – A Non-renewable Resource	6.7%
Q30. Mining and the Australian Environment	3.4%
Q31. Oceanography	12.5%
	99.3% [§]

Senior Science	
Total 2010 candidature 4901 (♂ 2704 ♀ 2197)	
Q28. Polymers	2.7%
Q29. Preservatives and Additives	3.9%
Q30. Pharmaceuticals	22.7%
Q31. Disasters	62.8%
Q32. Space Science	7.4%
	99.5% [§]

Entries for HSC Science courses 1992–2010 as a percentage of the total number of HSC entries [#]																			
YR	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10
%	90.8	87.7	80.1	72.0	73.8	72.3	70.2	69.9	64.1	58.0	55.8	56.5	58.3	58.4	59.4	57.9	60.5	59.8	59.9

* These are the total number of entries in Science courses, and not the actual number of students who study a Science course, since a fair percentage actually study 2 courses in the same year, and some students since Pathways do 3 science courses.

The total number of entries prior to 1996 was based on the total English candidature. Since then, due to Pathways, the total figure each year is still based on English entries, but is slightly affected by acceleration students, Pathways students, etc.

§ The total number of students below reflects the actual number of students who received a result for each subject. It differs from the figures given in the media as their figures were the number of HSC entries for each subject as of October 2009. There is usually a difference between these two sets of figures because some students have illness/misadventure and so do not sit for the examination.

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

Science Life Skills: Total 2010 Candidature was 419 (263 males, 156 females). (This course is part of the total science entries.)

These tables were prepared by Robert Garner using data provided by the NSW Board of Studies, Jan 2011.

"A wise man will make more opportunities than he finds."

... Francis Bacon

RACI NSW SCHOOLS TITRATION COMPETITION 2011

17 and 18 June – venues in Sydney and country venues (tba)

The NSW Schools Titration Competition is on again in 2011. This competition is a great way for Year 11/12 chemistry students to test their quantitative analytical skills. It is organised by the NSW Chemical Education Group of the Royal Australian Chemical Institute (RACI). Students have 90 minutes to complete a set of acid-base titrations to determine the unknown concentration of a weak acid. Entry is \$36/team of 3 students – with a maximum of 8 teams/school.



A team's score depends on the accuracy of each member. At each venue, each member of the winning team wins a trophy. Winning teams may then be invited to the National Competition on 17 September 2011 in Sydney. All students receive a Certificate of Excellence or Merit or Participation. The **de Miklouho-Maclay Prize** (certificate & \$100) is awarded to the NSW student with the best overall results.

Competition entry can be used to satisfy 1.5 hours of practical experience and contribute to the Chemistry Syllabus outcomes: P2, P10, P12 & H12 [12.2(a), 12.2(b), 12.4(b)].

★ **2010 NSW Schools Titration Competition:** 55 teams achieved an Excellent award, 29 achieved a Merit award. Congratulations to: *1st:* St Mary's High, Casino, *2nd:* Lucas Heights Community School, *Equal 3rd:* Hunters Hill High and Bethlehem College

★ **2010 National Competition:** Of the top 25 scores, 4 were achieved by NSW teams. Our strongest result was St Mary's High, Casino in 9th place. Other strong results were: 13th & 20th places (Shore) and 15th eq place (Sydney Tech High).

★ **2010 de Miklouho-Maclay Prize** for excellence in Chemistry with the best overall result in the National Titration Competition went to Nat Lee of Shore who achieved a near perfect score.

★ Congratulations to all these competitors!

★ **For details, entry forms, hints & tips:**

- www.nswtitration.com
- Email: ajhey@nswtitration.com • Ph: 4655 2961
- Post: PO Box 306 Camden 275 • Closing date: 6 May 2011 ☐

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 May 6, 27. June 3, 6, 10.
 August 12, 15, 19. Sept 9, 12.
 Oct 17, 21, 24, 28, 31. Nov 4, 14,
 18, 21, 25, 28. Dec 2, 5–9, 12–16.

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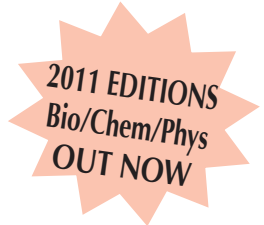
Please note: Our excursion notes are only for use when on an excursion day booked through Physics is Fun. It is an offence under Copyright Laws to use them on any other occasion without written permission from Physics is Fun.

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PhoTo Spot *Azolla* spp – aquatic ferns

The free floating aquatic plant, *Azolla* spp, is a genus of seven species in the family Azollaceae. They are sometimes referred to as mosquito fern, duckweed fern, fairy moss, or water fern. *Azolla* are found in tropical and warm temperate regions, including Australia.

The photo in Figure 1 shows some *Azolla* leaves. *Azolla* plants tend to be small and are about 1.5–2.5 cm long. Their leaves are minute, about 1–2 mm long.

Being extremely reduced in form and specialised, *Azolla* do not look like conventional ferns. They tend to resemble duckweed or some mosses. Not being tolerant to salinity, *Azolla* are found in fresh, slowly moving or still water such as dams, ponds, lakes, drains and suburban waterways. The water needs to be 25°C or below and preferably in the shade. Numerous, small, closely-overlapping scale-like leaves, with their roots hanging in the water, enable *Azolla* to float on the surface of water.

Azolla are serious weeds in many parts of the world. They multiply rapidly to form dense mats on the water surface, and can entirely

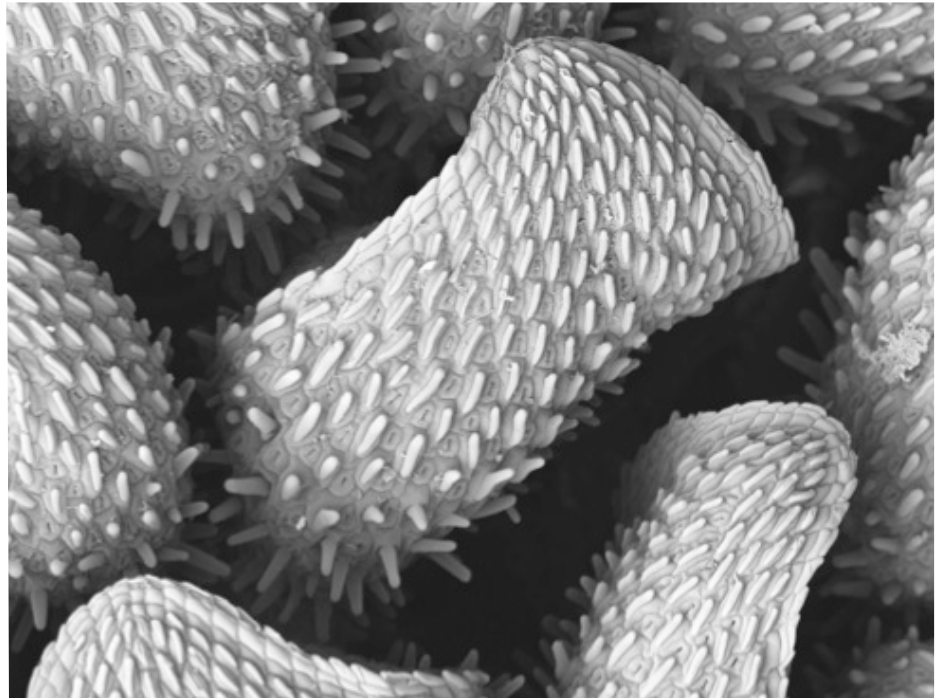


FIGURE 1: Aquatic fern, *Azolla* sp. ... taken using a scanning electron microscope by Sue Lindsay, Australian Museum

cover waterways. These dense surface mats degrade water quality by reducing oxygen levels. The lack of oxygen chokes mosquito larvae and so its growth in rice fields helps to control mosquitoes. The thick mats interfere with boating, fishing and recreational activities.

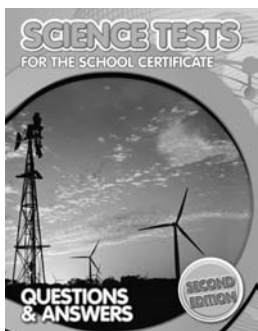
Azolla are commonly mistaken for the noxious weed, *Salvinia*. However, *Azolla* have a different leaf shape and colour to *Salvinia*.

Azolla forms a symbiotic relationship with the blue-green algae (cyanobacteria), *Anabaena azollae*, in the fronds of the plant, taking advantage of their ability to fix nitrogen. So in some regions of the world this plant is used as a nitrogen biofertiliser, namely in rice fields.

Azolla is 25–30% protein and rich in vitamins and minerals, so it is being increasingly used for sustainable production of livestock feed, e.g. for dairy cattle, pigs, ducks, and chickens, with reported increases in milk production, weight of broiler chickens and egg production in egg-layers, as compared to conventional feed.

Only phosphorus limits the growth of *Azolla*, which removes phosphates from water for nutrition. An abundance of phosphorus, due for example to eutrophication or chemical runoff, often leads to *Azolla* blooms. □

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Summer Skies!

... Robert Garner & Catherine Odum

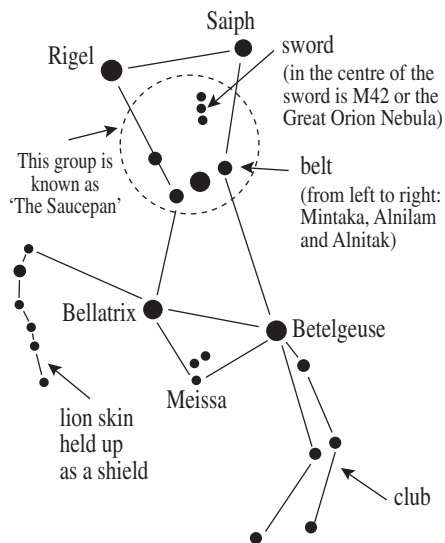
Make the most of the warmer months to view the Summer skies. This article will help you guide your students as they do their practical astronomy work.

Looking for the Orion constellation

Summer is the best time for observing *Orion*, as it is high in the northern sky around 9 pm. In March and April, *Orion* will be setting a little earlier each evening. Remember, we see the traditional mythological figure of *Orion* upside down because we are in the southern hemisphere (see Figure 1).

Orion is well-known for its saucer-shaped group of stars. The bottom of the saucerpan corresponds to *Orion*'s belt and comprises three bright stars: Mintaka (900 light years away), Alnilam (1300 light years away) and Alnitak (800 light years away). These stars have Arabic names as do many other stars. Arabic astronomy was very advanced in ancient times. Above *Orion*'s belt is the very hot, blue-white supergiant star, Rigel (1050 light years away) on *Orion*'s leg and below, the red supergiant, Betelgeuse (425 light years away) is at *Orion*'s shoulder. Rigel has a temperature of 12 000°C, while Betelgeuse has a temperature of 3000°C. Our own Sun, a white star, has a temperature of about 5000°C. Notice the large variation in distance to objects in *Orion*. Like typical constellations, the components are seen in a group close together in the sky, but are actually vast distances apart from one another.

Figure 1: Orion constellation



Using Orion to find other constellations

To the east and below *Orion* is the constellation *Gemini*. *Gemini* is dominated by two bright stars, Castor and Pollux. Castor, lower in the sky and further to the west than Pollux, appears as a bright star to the naked eye. Binoculars or a small telescope will resolve Pollux as a double star, but a large telescope will resolve it as a group of three separate stars. A bigger telescope still will show that each is actually a double star, so that there are actually six stars in Pollux.

Below *Orion*, and slightly to the west, is the constellation *Taurus*. This group of stars appears as an upside V shape with the orange-red star, Aldebaran, being the brightest star in *Taurus*. The Pleiades cluster is at the eastern end of *Taurus* on a line from the middle of *Orion*'s belt through Aldebaran. Regulus, the brightest star in *Leo* is rising in the East about four hours after *Orion*.

In the southern sky, *Crux* (the Southern Cross) lies on its side with the two pointers below it. Between the two brightest stars is The Jewel Box. This open cluster of about 100 stars is a beautiful binocular or telescope cluster to observe with its 'ruby' in the middle of the many bright 'diamonds'.

The Planets

The start of this year is not all that good for viewing the planets other than *Saturn*, which is a good telescope object with its rings closed and its satellites able to be viewed. *Saturn* rises mid-evening in February and is at opposition in early April, rising in the evening soon after nightfall thereafter.

Venus is the morning star over summer and into autumn appearing to the east in the predawn sky. *Mercury* is behind the Sun in February with conjunction on 25 February. It reappears in the western twilight in the second half of March before it again gets too close to the Sun to see as it reaches inferior conjunction on 10 April. It reappears in the morning sky later in April. *Mars* is behind the Sun for the first part of the year and will appear in the predawn twilight in April. *Jupiter* starts the year in the evening twilight and reappears in the dawn sky late in April.

A highlight for naked eye viewing will be on 20–23 April in the early dawn sky. The morning star, *Venus*, will be shining brightly from the east about 20° above the horizon. In order extending below *Venus* will be *Mercury*, *Mars* and *Jupiter*. On the 20 April, *Mars* and *Mercury* will be <1° apart.

Meteor showers

The best prospect for meteor showers in this period is the alpha Centaurids. These will originate in the south near *Crux*'s Pointers. They are active from 28 Jan–20 February and will peak around 8 February when the Moon is favourable.

Transits across the Sun

The orbits of the inner planets around the Sun and the Moon's orbit around the Earth are close to being in the one plane, but not quite. When Mercury, Venus or the Moon are in inferior conjunction, these bodies lie between the Sun and the Earth in almost a straight line. Occasionally, the line up is exact. When this happens, the shadow of Mercury, Venus or the Moon crosses the disc of the Sun. The angular extent of the shadow of Mercury and Venus on the Sun is small compared to the angular size of the Sun's disc. Thus a small circular shadow is seen to move across the Sun. This is a transit of Mercury or a transit of Venus. Either is a rare event. The next transit of Venus is in June 2012 and the whole event is visible in Sydney. If it is cloudy and you miss it, you will not see the following transit because it will not occur until 11 Dec 2117.

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Located in the grounds of Macquarie Uni (access via Gymnasium Rd), the observatory is open to the public every Friday night, March–Nov inclusive, 7.30–9 pm. Bookings are essential – ph 9850 4409 or email starinfo@mq.edu.au before 4 pm. If doubtful weather, phone 9850 8914 or check at www.astronomy.mq.edu.au/observatory/

Lunar eclipses

The angular size of the Moon and the Sun from Earth is about the same. When the Earth is between the Sun and the Moon and the line-up is exact, the Earth blocks light from the Sun reaching the Moon and there is an eclipse of the Full Moon. It will be a total eclipse if the line-up is exact and a partial eclipse if the line-up is not exact. Mostly the line-up is only approximate and so a normal Full Moon occurs (see Figure 2a).

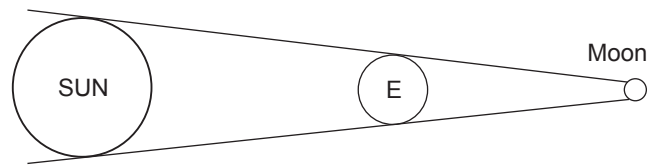
This year, there are two total eclipses of the Moon on 15 June and 10 December visible in our night skies. We will see the first half of the June eclipse and all of the December eclipse.

Solar eclipses

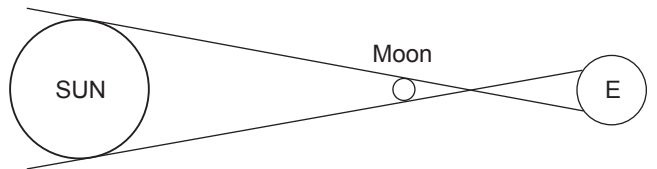
When the Moon is between the Sun and the Earth and the line-up is exact, there is a total eclipse of the Sun. The Moon blocks light from the Sun. If the line up is not exact but nearly so, there is a partial eclipse of the Sun (see Figure 2b).

Figure 2: Eclipses

(a) LUNAR ECLIPSE



(b) SOLAR ECLIPSE



Diagrams not to scale

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>

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- The Emu ... *SciTalk* No. 1-2004
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- Colour of stars in Hyades ... *SciTalk* No. 4-2010

Remember that dreaming stories and characters vary among Aboriginal groups. Although they may share many of the same beliefs, the messages and the characters in their stories are different. The various Aboriginal groups divided the night sky into about 40 different constellations. They named them after different native birds and animals, including crows, eagles, parrots, lorikeets, emus, eagles, tortoises, kangaroos, broilgas, dancing men and song men. □

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CLOSING DATES

- *SciTalk* No. 1–January 2011 ... Dec 17
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- *SciTalk* No. 3–August 2011 ... July 1
- *SciTalk* No. 4–October 2011 ... Sept 23

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