

2012 STAV/AIP Physics Teachers' Conference



**Friday 17 and Saturday 18 February 2012
Monash University, Wellington Road, Clayton, Victoria**

Each participant will have web access to proceedings from the VCE conferences series as part of their registration.

The Physics Science Teachers' Conference is an approved pdi professional learning activity.



The Program includes:

- Day and evening sessions. Participants can attend the day and/or evening sessions.
- Opening address on 'Misconception Alchemy: Turning thought-lead into thought-gold' by Dr Derek Muller, University of Sydney and the developer of the popular Veritasium website on misconceptions in science.
- The Physics Oration on 'New ways of controlling light: photonic crystals, metamaterials and beyond' by Prof Tanya Monro, Director of the Institute for Photonics & Advanced Sensing at the University of Adelaide.
- Report by Bruce Walsh and Geoff Davies, the Chief Assessors, on the June and November Exams, during the day program and again in the evening program.
- Over 50 workshops across five sessions.
- A Saturday program of excursions (free).

Wireless internet and laptops at the conference

Wireless internet is available to participants; a username and password will be needed. Some presenters have invited participants to bring along their own devices including laptops. Check descriptions below for (BYOD). To store laptops during the day, laptop lockers with power are available in the lobby of the S9 - S12 lecture theatres at no cost. Lockers need to be booked on the Application Form. Keys can be picked up at Registration.

Conference Program

Friday Day Program

8:00am	Day Registration
8:50am	Conference Opening
9:00am	Opening Address
10:05am	Workshops: Session A
11:05am	Morning Tea / Displays
11:50am	Workshops: Session B
12:50pm	Lunch / Displays
1:50pm	Physics Oration
2:50pm	Workshops: Session C

Friday Evening Program

4:30pm	Evening Registration
5:30pm	Workshops: Session D
6:30pm	Workshops: Session E
7:30pm	Finish

Saturday Excursion Program

Tour A

9:00am	Australian Synchrotron (1 hour)
11:00am	Brash's Soundhouse (90 min)
12:45pm	Lunch at a Southgate restaurant
3:00pm	Victorian Space Science Education Centre (90 min)

Tour B

10:00am	Peter McCallum Cancer Centre (2 hr)
12:45pm	Lunch at a Southgate restaurant
3:00pm	Victorian Space Science Education Centre (90 min)

Registration information, La Trobe University Map and all conference information is available on the **Science Victoria website: www.sciencevictoria.com.au/conferences.html**

Science Teachers' Association of Victoria Inc.

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Email: stav@stav.vic.edu.au Website: www.sciencevictoria.com.au

STAV/AIP VCE Physics Teachers' Conference 2012

Opening Address

9:00am – 10:00am

Dr Derek Muller, University of Sydney and the developer of the popular Veritasium website on misconceptions in science.

Misconception Alchemy: Turning thought-lead into thought-gold

Day Program

Descriptions of workshop sessions:

(Commercial: C, Units 1 & 2: 1&2, Units 3 & 4: 3&4, General: G)

Session A

10:05am – 11:05am

A1 Australian Synchrotron Physics Excursions (3&4)

Jonathan De Booy, The Australian Synchrotron

Schools can now book full day excursions to the Australian Synchrotron that includes a tour of the facility and an opportunity to do a range of practical activities for the Synchrotron Detailed Study as well as the Light and Matter area of study.

The activities use equipment that is not often available to schools. The session will describe what the students will see and do and will analyse some basic results.

A2 What's Up? Recent Astronomical Discoveries & Projects (1&2)

Robert Hollow, ATNF

Astronomy in a lively field of research with a wealth of new discoveries. In this presentation CSIRO Astronomy and Space Science's Rob Hollow will discuss key recent work in astronomy and astrophysics and how you can use this in the curriculum. Emphasis is placed on Australia's involvement in the field and will include the 2011 Nobel Prize in Physics and new telescopes including the Australian SKA Pathfinder and the Square Kilometre Array.

Repeated in B2

A3 Hands on with Pearson/Heinemann Physics (C) (BYOD)

Doug Bail, Ciderhouse ICT

The latest updates for the enhanced 3rd edition of Pearson's Heinemann Physics include a range of activities adapted for electronic measure and written as ready to go PASCO SPARKlabs. This session will include the opportunity to run through a few of these activities and also look at how

you can produce SPARKlabs for your own favourite activities.

A4 Circular Thinking (G)

Dr Ken McGregor, formerly RMIT

Rotational mechanics is generally beyond the syllabus for school classes, and yet it has the ability to confront students with some fascinating problems which may be studied from a wide range of student perspective and ability. One of the main advantages is that it lends itself to simple experimentation in which the answer can be felt as well as reasoned. I'll explore some of the activities that might be usefully undertaken, from snooker analysis with a consumer camera through to the throwing of a bola.

Repeated in C7

A5 Glowing Graveyards- Radioactivity, Nuclear Decay and Nature (1&2)

David Hoxley & Bob Aikenhead, La Trobe University

In this hands-on session, participants will measure the radioactivity of a number of sources, and learn how to distinguish between background, alpha, beta and gamma radiation. Opportunities for school groups to do their VCE SACs through La Trobe Physics will be discussed. Not appropriate for the pregnant.

Repeated in B5

A6 Video Analysis Using Tracker (G) (Computer lab, so BYOD optional)

Michael Pekin, Northcote High School

Tracker is a great free program for analysing videos in Physics. Download prepared videos from the web and take measurements, draw graphs and fit equations. In this session you will get an introduction to Tracker and see some of Northcote High's videos taken at 30fps using our Canon cameras and also at 210fps and higher using one of the high speed Casio Exilim range of cameras which are now within the budget of schools

A7 Uncertain Physics (G)

Theo Hughes, Physics Dept, Monash University

This workshop will explore the significance of uncertainty in experimental physics and how it underpins the whole of physics. While dealing with uncertainties is not explicitly included in VCE physics teachers should have a clear understanding of their importance so that they correctly convey the meaning of such oft abused words as error, accuracy, precision, and uncertainty itself... or, at least, don't convey incorrect information in this area.

Repeated in E2

A8 How to Plan & Do a School Assignment Using the Dual Temperature System

Andrew Reid, Imaging Associates International

This session will introduce the ThermoSense Mk1 and the free ThermoSoft Mk1 supporting software and show how they can be used by students in investigations. ThermoSense MK1 measures two temperatures over the range -10 degrees centigrade to 115 degrees centigrade accurately with a resolution of 0.1 degree centigrade with rapid response times. The two sensors track closely with temperature difference measurements often needed in the evaluation of heat energy conduction, convection, and radiation relating to thermal insulation materials and on-site investigations.

Repeated in C8

A9 Kinaesthetic Activities to teach Waves and Optics in Senior Physics Courses (1&2)

Louise Mason, St Leonard's College

Gardner's Multiple Intelligences have been successfully used to teach topics in junior science and the life sciences. However, apart from traditional experiments, this approach is not often applied in senior physics classes, perhaps due to time considerations and the mathematical content required in such courses. This session will outline several activities that can build up an understanding of Waves and Optics. They involve role-plays, cut and paste tasks, inexpensive hands on materials and melted chocolate!

A10 Beyond The Electronic Filing Cabinet: Delivering VCE Physics Online and Interactive (G) (BYOD)

Bruce Carpenter, Bendigo Senior Secondary College

The Virtual Learning Network (Physics) Project based at Bendigo Senior Secondary College aims to provide comprehensive online courses for senior curriculum that are more than just a collection of independent, electronic documents. Our recently completed online Physics course is interactive, instructional and available to students 24/7, allowing self-paced learning within a traditional school environment or access to curriculum for remote students. Bruce has been delivering Unit 3-4 VCE Physics in a self-paced, blended mode during 2010 and will share his learning about online delivery and show some examples of the instructional videos, virtual prac activities and online learning objects he has employed. Participants will have an opportunity to explore the course materials.

A11 Teaching Einstein's Relativity in VCE Physics (3&4)

Keith Burrows, Australian Institute of Physics (Vic Branch) Education Committee
The Einstein's Special Relativity DS provides a wonderful opportunity for students to experience one of the real joys of physics - a feel for the way in which physics helps us to understand the fundamental nature of our universe. It is not a difficult topic and teachers and students who have done it invariably enjoy it. This session will outline an approach to this DS using a power point presentation which is available on the AIP website. There will also be an opportunity to discuss FAQs on the subject.

A12 StudyON for VCE Physics: Want to Improve Your Students' Exam Results? (C) (Computer Lab, so BYOD optional)

Neale Taylor, Jacaranda / John Wiley and Sons Pty Ltd

In this hands-on workshop you will explore StudyON for VCE Physics Units 3&4 and our new StudyON Teacher Edition. StudyON is Jacaranda's online study, revision and exam practice tool which lets you track the progress of your students throughout the year at an individual, group or class level; and view each student's online performance on actual past VCAA exam and practice questions. StudyON incorporates videos, animations, interactive study activities and a results tracker. You will receive complementary packs of studyON Physics 3 and full access to StudyON Teacher Edition for 12 months. Repeated in C11

A13 CanSat: Teaching Electronics Using Real-World Applications (3&4)

Milorad Cerovac, King David School & Dr Naomi Mathers, Victorian Space Science Education Centre

CanSat is the basic components of a satellite (structure, power, sensors, CPU, and communications system) inside a soda can. It provides an effective context for teaching electronics, satellite systems, remote sensing, data processing and data analysis. It's also an effective context for building higher order skills such as problem solving, analysis and team work. In 2011, The King David School was chosen by VSSEC to represent Australia in the French International CanSat Competition. Students reported that their involvement helped them better understand the concepts covered in the Physics course and identify with a career in science or engineering. The involvement of university mentors added a rich learning opportunity for both groups of students. Repeated in B14

A14 Reverse Classroom Downunder (G) (BYOD)

Gary Bass, Macleod College
This workshop will explore strategies which can incorporate online out of class learning. 'Flipped Classrooms' or Reverse classrooms engage students in theory, reading references, note-taking/making as their homework out of class activity. In class is for discussion practical work problem solving and clarification of material met earlier. Online support URL: www.vodcasting.ning.com (i) Reverse downunder group (ii) Physics group. Gary Bass regularly uses a variety of web2.0 and ICTs. He is currently exploring pencasting, high speed video and appropriate iPad applications at Macleod College.

A15 Online Science (G) C2 (Computer lab, so BYOD optional)

Peter Razos, Trinity Grammar
Creating the teachable moment day in day out, lesson after lesson can be a difficult task. Let us share the ways in which we engage students in chemistry and use online resources at Trinity Grammar through visual resources, online testing and units of work such as the Science of War, Sports Medicine and Bad Science in Advertising and many more. This is an excellent opportunity to come and see something that can change the way you teach. Participants will be given passwords to create their own self-assessed multiple choice tests. Access the site at www.dynamicscience.com.au/tester enter as a guest and go to curriculum material to view the resources.

**Morning Tea/Displays
11:05am - 11:50am**

Session B 11:50am - 12:50pm

B1 Cheap Tricks and Tips for Inexperienced Physics Teachers, (G)

Colin Hopkins, Bialik College
A series of useful ideas for engaging students in the study of Physics. Colin will provide a range of resources and ongoing support for teachers new to Physics. Repeated in E1

B2 What's Up? Recent Astronomical Discoveries & Projects (1&2)

Robert Hollow, ATNF
Repeat of A2

B3 Hands-on Photonics for VCE physics (C)

Sean Elliott, CSIROSEC
CSIRO offers an exciting hands-on program examining the physics of this rapidly growing and exciting new field of communications. With experiments ranging from a simple exploration of Total Internal Reflection to advanced concepts in telecommunications, students will be able to learn how new advances are enabling us all to keep in touch faster and more efficiently.

B4 Victorian Young Physicists' Tournament (1&2)

Dan O'Keeffe Australian Institute of Physics (Vic Branch) Education Committee
The Victorian Young Physicists' Tournament (VYPT) is a competition for Year 11 physics students established by the AIP (Vic Branch) Education Committee. In the course of the year, in teams of three, students carry out a range of experimental investigations drawn from a common set that relate to Units 1 & 2 content, then later in the year in December, present and defend their findings in scientific discussions with other teams. This session will outline the topics for the year, the support for teachers and students and advice from teachers who entered teams in previous years. Video footage from the previous competitions will also be used to show what the students do. The value of the tournament is that it is team based, focuses on experimental investigations and encourages communication skills. Repeated in E4

B5 Glowing Graveyards- Radioactivity, Nuclear Decay and Nature (1&2)

David Hoxley & Bob Aikenhead, La Trobe University
Repeat of A5

B6 Electricity Ideas for the Classroom (C)

Bronwyn Quint, Scienceworks
Explore how current electricity is produced using permanent magnets and coils of wire and how this principle is applied in power stations and electrical devices. Observe how electrical motors transform electrical energy into movement energy and see how an electromagnet can be created. Find out about static electricity, conductors and insulators, electric circuits, fuses and safety switches.

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B7 Quick and Easy Activities and Demonstrations for Astronomy (1&2)

Paul Natoli, Ballarat High School

A selection of ideas and tasks that can be used with a range of students from Yr11 Astronomy/Astrophysics to primary school classes. This session will cover ways to use ICT as well as hands on activities. Including ways to read stars, finding south at night, scale solar systems, running an observing night and more.

Repeated in C9

B8 Discovering Physics at Ecolinc (C) (Computer lab, so BYOD optional)

Suzanne Clarke & Jacqui Slattery, Ecolinc

Ecolinc is a Department of Education and Early Childhood Development (DEECD) Science Specialist Centre situated in Bacchus Marsh (www.ecolinc.vic.edu.au) Ecolinc is a unique educational facility, demonstrating a range of award winning ecological sustainable design (ESD) features. In addition Ecolinc's online CSIRO designed Weather Wall and Building Management System (BMS) provide the opportunity for Physics students to explore the efficiency of the building design. This session will overview Ecolinc's Units 1 & 2 Detailed study 3.5 to initiate or conclude an investigation into sustainable energy sources.

Repeated in C2

B9 Teaching Resources from CERN, the LHC and Perimeter Institute (G) (BYOD)

Kim Northmore, Simonds Catholic College

Kim Northmore used the 2011 AIP Travelling Scholarship to attend a three week course for physics teachers at CERN, which was held mostly during our mid year break. The session will outline the diverse range of resources that CERN and the Large Hadron Collider provide for teachers as well as information about the course.

Repeated in E5

B10 Teaching the Detailed Study: Further Electronics (3&4)

Murray Anderson, Camberwell Grammar School

A teaching program for Further Electronics along with prac notes and equipment lists is presented as well as discussion of the key concepts and skills to be attained by students. Both hardware and software circuit construction is discussed and an appropriate balance is of the two is outlined.

B11 Make It Real! Technology in the Physics Classroom (C)

Phil Jones, The Logical Interface

(Computer lab, so BYOD optional)

Sophisticated technology, once only the domain of forensic and research laboratories, is now within the reach of every science teacher. In this workshop I examine a number of such technologies for teaching physics, including * TLI Motion video analysis software - ideal for analysing motion in one and two dimensions. * Interactive Physics - perfect for creating simulations in physics - from Kepler's Laws through to Electromagnetic simulations. * TLI WaveGen and TLI CRO exploit the power of the sound card in your PC. * and convert your PC into a powerful Signal Generator and Oscilloscope. * Krucible is revolutionary software for creating simulations and demonstrating experiments that are impractical in the secondary science lab. With Krucible you can even convert your PC into a fully functional Ripple Tank! * Data loggers support a wide range of experiments from elementary to more advanced experiments such as force on current carrying wire, electromagnetic induction, apparent mass and electronic ticker timer.

Repeated in C4

B12 100% Renewable Energy for Australia by - Is it Possible? (G)

Keith Burrows, Australian Institute of Physics (Vic Branch) Education Committee and members of Beyond Zero Emissions

The Zero Carbon Australia plan is a collaborative effort between Beyond Zero Emissions (BZE) and Melbourne University Energy Research Institute showing how Australia can achieve zero carbon emissions this decade. Australia has the world's best renewable energy resources and the first of five planned ZCA reports shows how we can utilise these resources to supply virtually all our stationary energy (electricity) needs. In this workshop members of BZE will show how, with a combination of wind and solar energy, this is possible - and why it is necessary.

B13 Happy to be Wrong (G)

Theo Hughes, Physics Dept, Monash University

Physics (and science) is not about bowing to an authority (i.e. Newton's Laws). It is about investigating and questioning the world around us. However, students seem to typically view physics as a bunch of facts handed down by authorities. To combat this I would assert that one needs to be comfortable letting students know that you don't know everything and being able to stimulate them into being

confident investigators of the world. To get the ball rolling I will demonstrate/ admit something I don't fully understand and one small example of a possible stimulating investigation. Please bring along a concept/idea/topic that you don't fully understand in VCE physics, or have difficulty explaining, and hopefully we can work some of them out together, as a group or in groups. What is covered will depend on what you don't understand. Also, if you can, bring along a practical idea you have about stimulating students' natural desire to investigate.

B14 CanSat: Teaching Electronics Using Real-World Applications (3&4)

Milorad Cerovac, King David School & Dr Naomi Mathers, Victorian Space Science Education Centre

Repeat of A13

B15 Australian Synchrotron Tour (3&4)

Jonathan de Booy, The Australian Synchrotron

A one hour tour of the Australian Synchrotron located in Blackburn Rd. Transport to the Synchrotron will not be provided. Participants will be given an opportunity to arrange a ride and should leave the University grounds about 10 minutes before the scheduled start.

**Lunch/Displays
12:50pm - 1:50pm**

Physics Oration 1:50pm - 2:50pm

New ways of controlling light: photonic crystals, metamaterials and beyond

Prof Tanya Monro, Director of the Institute for Photonics & Advanced Sensing at the University of Adelaide

Session C 2:50pm - 3:50pm

C1 Chief Assessors' Report on 2011 Units 3 & 4 Exams (3&4)

Geoff Davies, Melbourne Grammar School & Bruce Walsh, Xavier College

General areas of concern and specific questions will be discussed. The session will include the examination statistics for both June and November. A brief overview of the on line marking procedure will also be given.

Repeated in D1

C2 Discovering Physics at Ecolinc (C) (Computer lab, so BYOD optional)

Suzanne Clarke, Ecolinc
Repeat of B8

C3 Practical Activities for Light (1&2)

Helen Lye, ACER & Dan O'Keeffe,
Australian Institute of Physics (Vic Branch)
Education Committee

This session will illustrate the numerous practical activities that are possible in this topic, including introductory exploratory exercises, POE's, demonstrations, short exercises, longer experiments and investigations.

Repeated in D2

C4 Make It Real! Technology in the Physics Classroom (C) (Computer lab, so BYOD optional)

Phil Jones, The Logical Interface
Repeat of B11

C5 SACs and Pracs from the \$2 Shop (G)

Paul Fitzgerald, Ivanhoe Girls' Grammar
School and Paul Fielding, Billanook
College

'SACs, Apps and Pracs with P1 and P2'. This workshop will cover several proven practical experiments. Some have successfully been used as SACs as they require significant student analysis and thought. Most utilize very low cost equipment. Topics include circular motion, electricity, sound, force and atomic structure.

Repeated in D3

C6 Australian Synchrotron: The Physics of the Machine (3&4)

Jonathan De Booy, The Australian
Synchrotron

The Australian Synchrotron is a particle accelerator used for the production of x-rays millions of times brighter than the sun. This session describes the physics of the machine, the production of x-rays and how this ties to the unit 4 curriculum.

C7 Circular Thinking (G)

Dr Ken McGregor, formerly RMIT
Repeat of A4

C8 How to Plan & Do a School Assignment Using the Dual Temperature System (C)

Andrew Reid, Imaging Associates
International

Repeat of A8

C9 Quick and Easy Activities and Demonstrations for Astronomy (1&2)

Paul Natoli, Ballarat High School

Repeat of B7

C10 Youtube Physics (G) (BYOD)

Gary Bass, Macleod College

Physics has a lot to do with observing. YouTube, Flickr, Vimeo are a few of the online repositories where there are hundreds of great videos. The issue becomes of knowing where the good ones are, before you could use them in class. This workshop will examine some of the uses for video, including video analysis of second hand material, and a variety of methods for posting to students to gain maximum benefit of your effort of collecting the links. There are several excellent collections of online Physics video www.veritasium.com, the website of the opening speaker, is highly recommended.

Repeated in D5

C11 StudyON for VCE Physics: Want to Improve Your Students' Exam Results? (C)

Neale Taylor, Jacaranda / John Wiley and
Sons Pty Ltd

Repeat of A12

C12 Climate Change – New Science, Old Arguments (G)

Keith Burrows, Australian Institute of
Physics (Vic Branch) Education Committee

Since the 2007 IPCC report climate science has progressed a long way, and yet according to some people 'climate science is crap'. How is it that although the science is actually well established the public perception of it seems to be quite the opposite? The answer of course is that it is being badly misrepresented in the media. The purpose of this session is to try to bring you the latest developments in climate science and to give sound science based answers to much of the nonsense that we hear 'out there' in the public arena.

Repeated in D4

C13 Drive the VSSEC Mars Rover (C)

Naomi Mathers, Ian Christie, VSSEC

The VSSEC Robotic Mission to Mars allows students to remotely control a real rover on the VSSEC Mars surface. After completing a pre-mission training program and site selection activity, students take on the roles of scientists and engineers in Mission Control to complete a mission and collect data for further analysis. The web-based Mission Control software allows students to control the rover, monitor its systems and collect scientific data for analysis. This program delivers hands-on, minds-on, web-based learning; encourages students to work scientifically; and explores the interaction between scientists and engineers. Join this session and drive the rover.

Repeated in D6

C14 The Physics of Rocket Science

Peter Razos, Trinity Grammar School

The physics of Rocket Science Model Rocketry excites and engages students in a way no other activity can do. Participants will be encouraged to build and launch their own model rocket. We will discuss how this resource can be used to engage students in topics such as forces, energy and flight or even used as a science club activity. At a time where we should be engaging more young minds into science this resource definitely provides an avenue to do so. We will also share online resources and participants can view these at www.dynamicscience.com.au/tester enter as a guest and go to curriculum material to view the resources.

Friday Day Program ends

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Evening Program

**People attending the Physics Day Program can also attend the Evening Program at no extra cost. Please ensure you have made your session selections for Sessions D and E on the Registration Form.
There is a light meal available for \$35 per person. Please indicate on your registration form if you will require a meal.*

Light Meal and Tea/Coffee 4:30pm
Evening registration 4:30pm – 5:30pm

Session D*

5:30pm – 6:30pm

D1 Chief Assessors' Report on 2011 Units 3 & 4 Exams (3&4)
Geoff Davies, Melbourne Grammar School & Bruce Walsh, Xavier College
Repeat of C1

D2 Practical Activities for Light (1&2)
Helen Lye, ACER & Dan O'Keeffe, Australian Institute of Physics (Vic Branch) Education Committee
Repeat of C3

D3 SACs and Pracs from the \$2 Shop (G)
Paul Fitzgerald, Ivanhoe Girls' Grammar School & Paul Fielding, Billanook College
Repeat of C5

D4 Climate Change – New Science, Old Arguments (G)
Keith Burrows, AIP Education Committee
Repeat of C12

D5 Youtube Physics (G) (BYOD)
Gary Bass, Macleod College
Repeat of C10

D6 Drive the VSSEC Mars Rover (C)
Naomi Mathers & Ian Christie, VSSEC
Repeat of C13

Session E*

6:30pm – 7:30pm

E1 Tips for Beginning Physics Teachers, (G)
Colin Hopkins, Trafalgar High School
Repeat of B1

E2 Uncertain Physics (G)
Theo Hughes, Physics Dept, Monash University
Repeat of A7

E3 Using X-Rays to See Into the Nano World (3&4)
Jonathan de Booy, The Australian Synchrotron

The Australian Synchrotron is a particle accelerator used for the production of x-rays millions of times brighter than the sun. This session describes how this is used to peer into the nano world by explaining how they interact with matter. Using research examples, this session will discuss the physical processes behind absorption and scattering of X-rays by electrons and the ability to determine atomic and chemical structure through these processes.

E4 Victorian Young Physicists' Tournament (1&2)
Dan O'Keeffe Australian Institute of Physics (Vic Branch) Education Committee
Repeat of B4

E5 Teaching Resources from CERN, the LHC and Perimeter Institute (G) (BYOD)
Kim Northmore, Simonds Catholic College
Repeat of B9

Friday Evening Program ends 7:30pm

Saturday Excursion Program

Numbers are limited to 24 for each tour. Participants will pay for their own lunch.

Tour A

9:00am

The Australian Synchrotron

<http://www.synchrotron.org.au/>

Participants will have a guided tour of the facility as well as an opportunity to see the range of practical activities that are available for secondary students to do as part of an excursion.

11:00am

SoundHouse at the Digital Learning Hub: Physics and Science offers

<http://www.theartscentre.com.au/discover/education/science--physics.aspx>

The presentation will highlight aspects of the workshops that are available for students of Physics and Secondary Science related to sound and waves. These include:

- i) The year 12 Recording & Reproducing Sound session, in which students will be given demonstrations and conduct experiments at computer-based stations. The content includes microphone characteristics and loudspeaker designs.
- ii) A hands-on workshop designed to prepare Year 11 students for 'Sound'. It picks up on the wave aspects in the study of light, as well as aspects of the electricity.
- iii) A practical and fun session for junior science, linking simple sound & wave principles with the world of mp3s and digital audio.

Lunch at a Southgate restaurant 12:30pm

3:00pm

Victorian Space Science Education Centre

<http://www.vssec.vic.edu.au/>

The tour explains the various student programs that VSSEC offers. Their programs provide a sensory rich, hands-on, scenario-based science experience for

students from primary to senior secondary. There are also programs on Astronomy (co-ordinate systems, solar system and telescopes) and Astrophysics (models of the nature and origin of the Universe, and the life cycle of stars)

Tour B

10:00am

Two hour Medical Physics In-Service at Peter MacCallum Cancer Centre

The program will feature a one hour talk on:

- the physics aspects of the effect of radiation on the human body and of the medical technology at Peter Mac
- how the technology is used in diagnosis and treatment, as well as
- information on the training and career paths associated with medical physics.

The second hour will be an extensive tour of the facilities at Peter Mac.

Then join Tour A for lunch and VSSEC (see above)