2011 STAV/AIP Physics Teachers' Conference

Founded 1943

Friday 18 and Saturday 19 February 2011
Monash University, Wellington Road, Clayton, Victoria

Each participant will receive proceedings from the VCE Conference Series 2011 as part of their registration.

The Program includes:

- Day and Evening sessions. Participants can attend the day and/or evening sessions
- Opening address on ' Exploring student difficulties with mechanics and electricity' by Prof Dick Gunstone, Brian McKittrick, Monash University and Pam Mulhall, University of Melbourne
- The Physics Oration on 'The Physics of the Large Hadron Collider' by Prof Geoffrey Taylor
- Report by Bruce Walsh, the Chief Assessor, on the June and November Exams, during the day program and again in the evening program
- Over 50 workshops across five sessions with many related to Teaching strategies, Practical activities and new Content
- A Saturday program of an excursion with preference given to interstate participants.

Laptops at the Conference

In the past some participants have brought their laptops. 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
4:00pm	Tea/Coffee

Friday Evening Program

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

Saturday Excursion Program

(Limit: 24) Bus available at no cost	
9:00am	Australian Synchrotron
11:00am	Brash's Soundhouse
12:30pm	Lunch at a Southgate restaurant
2:00pm	Victorian Space Science Education Centre
3:30pm	Travel to Airport.

Science Teachers' Association of Victoria Inc.
Postal Address: PO Box 109 Coburg VIC 3058
Phone: (03) 9385 3999 • Fax: (03) 9386 6722
Email: stav@stav.vic.edu.au Website: www.sciencevictoria.com.au

Opening Address

9:00am – 10:00am

Prof Dick Gunstone, Brian McKittrick, Monash University and Pam Mulhall, University of Melbourne
'Exploring student difficulties with mechanics and electricity'

Day Program

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

Session A

10:05am – 11:05am

A1 Australian Synchrotron Excursion: What it offers (3&4)

Jonathan de Booy, The Australian Synchrotron

Schools can now book 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 often not available to schools. The session will describe what the students will see and do. The Synchrotron also plans to develop practical activities for middle school level.
Repeated in D3

A2 Effective Teaching for VCE Astronomy & Astrophysics (1&2)

Robert Hollow, ATNF

Astronomy and Astrophysics are often perceived as difficult topics to teach in the classroom due to a lack of "practical" work. This workshop presents simple ideas for effectively conveying key concepts to students and engaging them in critical thinking. It also shows how freely available visualisation tools and real data can be used in the classroom to challenge and extend students.

A3 Applying Physics to Patient Care (1&2)

Mr Chris Fox, Senior Medical Physicist, Peter McCallum Cancer Centre

The session will briefly describe the physics aspects of the effects 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.

A4 SPARKscience - A 21st Century Learning Environment (C)

Doug Bail, Ciderhouse

PASCO's has always stood committed to giving teachers and students the most modern and effective tools for science education. That striving has culminated in SPARKscience, an authentic, research based learning environment that combines cutting edge data collection, interactive visualization, analysis tools that encourage exploration and collaboration and discovery-based interactive lab activities. The main components of SPARKscience are SPARKvue Software, the SPARK Science Learning System, PASPORT sensors and SPARKlabs. SPARKlabs are discovery-based interactive activities that seamlessly integrate content with data collection and analysis. Fully self-contained, students are engaged throughout with self-check questions, prompts for predictions and assessment questions. Teachers can design their own SPARKlabs or use labs created by PASCO and an ever growing list of partners. Learn how to use existing labs and build your own for Physics. Please feel free to bring your own laptop, tablet, iPad, iPhone or iPod Touch.

A5 Glowing graveyards – radioactivity, nuclear decay and nature (1&2).

David Hoxley and 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 The Milky Way Galaxy from Go to Whoa! (G)

Patricia Dove, Huntingtower School

This session will present an innovative Year 9/10 astronomy unit on the Milky Way Galaxy that covers the latest information about the structure of the galaxy in a student-friendly format. Based on the Teaching for Understanding Framework (developed by Harvard University), this unit includes some of the 'Science Understandings', as well as aspects of 'Science as a Human Endeavour' and 'Science Inquiry Skills' from the draft National Curriculum. The unit is designed so that no prior knowledge of astronomy is necessary to teach it.

A7 The Virtual Lab - Using Learning Objects in VCE Physics (G) Justin Vincent, Warrnambool College

In recent years, the number & quality of online learning objects as grown enormously. Physics is especially well suited to the use of such resources. This session will show how online simulations are used to improve students' understanding at all year levels and as the basis of VCE assessment tasks. Participants will receive a copy of the resources from flashscience.com.
Repeated in C2

A8 The (Un)Classroom (G)

Adrian Camm, Quantum Victoria

In the global, networked environments of the 21st Century, we are seeing a growing divide between how students learn and the curriculum that is being offered in most schools. At home, students are learning through game-based, participatory, peer-assisted channels in the forms of communities based around a particular interest. And yet, once at school students are required to be passive consumers of content. This session will focus on how gaming can be used as a vehicle for learning and how open content and social networks are enabling conversations that highlight the tentative nature of scientific inquiry and the need for collaborative critical thinking.

A9 USA/NASA Space Camp – The Science Excursion of a Lifetime! (C)

Ken Cohen –Official Space Camp Ambassador for Australia and director of Aussiespacetours.

You don't have to be a rocket scientist to realize that taking students to the United States to visit Kennedy Space Centre at Cape Canaveral in Florida and attending a space camp in Huntsville, Alabama, would be an unforgettable experience. However, teachers are extremely busy these days and the effort required to set-up a space camp trip can be daunting. In this session, Ken will demonstrate how to organize such a tour with examples of previous tours and how the trips can motivate, excite and engage your science students into becoming the scientists and science educators of the future. Teacher notes will be supplied. See www.aussiespacetours.com.au.

A10 Hands on Photonics for VCE Physics (3&4)

Sean Elliott and Nicola Steward, 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.

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

Keith Burrows, AIP 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 Using 'Conceptual Understanding Procedures' (CUPs) in the teaching of Motion (G)

Pam Mulhall, University of Melbourne, Brian McKittrick, formerly Monash University

This workshop is a follow up to the Opening address by Prof Dick Gunstone. The workshop explores how the CUP activities enhance students' understanding of essential concepts in Motion. The session will also demonstrate how to use a CUP with your class.

A13 Video Analysis Using Tracker (G)

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.

A14 Electricity and Electric Power (C)

Bronwyn Quint, Scienceworks

This session will offer VCE Physics teachers an insight into the VCE program covering topics in the Unit 1 Electricity area of study and the Unit 4 Electric Power area of study. Electrical Safety and the effect of current on humans will be discussed as well as the devices used to protect both humans and circuits. The generation, transmission and distribution of power will also be discussed. There will also be a look at the presentations that are available in the Lightning room at Scienceworks and how they can enhance the VCE program.

A15 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.

Morning Tea/Displays
11:05am – 11:50am

Session B

11:50am – 12:50pm

B1 Tips and Hints for Beginning Physics Teachers (G)

Colin Hopkins, Trafalgar High School

A series of tips and tricks to engage students in the study of Physics. This session is aimed at teachers that are relatively new to teaching senior Physics. A resource package will be provided.

Repeated in E4

B2 100% Renewable energy for Australia by 2020 - Is it possible? (G)

Keith Burrows, AIP Education Committee

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.

B3 Victorian Young Physicists' Tournament (VYPT): Challenge for students (1&2)

Dan O'Keeffe, AIP Education Committee

The AIP (Vic Branch) Education Committee established the Victorian Young Physicists' Tournament (VYPT), a competition for Year 11 physics students in 2010. In the course of the year, in teams of three, students carry out a range of experimental investigations drawn from a common set, then later in the year in December, present and defend their findings in scientific discussions with other teams. This session will outline the year's program and the support that will be available to teachers and students and advice from teachers who entered teams last year. The value of this exercise is that it is team based, focuses on experimental investigations and encourages communication skills.

B4 Arguably the best science online free resource (G)

Peter Razos, Trinity Grammar School

Participants will be introduced to this free online resource packed with teaching ideas, units of work, resources and online testing. A password will be given to all participants that will enable them to make full use of the facilities. Not only are the unique units of work a very useful resource but the online testing facility is fantastic in VCE preparation or quick general science testing. Check it out at www.dynamicscience.com.au/tester enter as a guest and go to curriculum material.

B5 Glowing graveyards- radioactivity, nuclear decay and nature (1&2).

David Hoxley and Bob Aikenhead, La Trobe University

Repeat of A5 - see abstract on page 2

B6 The Smarties model for electric circuits (1&2)

Dr Christina Hart, AIP Education Committee

The Smarties model for electric circuits
In this workshop I will demonstrate my version of the smarties model of electric circuits and show how it can be used to promote students' understanding of the highly abstract concepts of current and electrical energy. I will take participants through the model, illustrating the questions and discussion that it can promote, and showing how it can be used to make explicit the meaning of some standard formulae.

B7 Prac Ideas for Sound (3&4)

Kelvin Barraclough, Gisborne Secondary College

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

B8 Teaching "Synchrotron and its applications" Detailed Study (3&4)

Kim Northmore, Simonds Catholic College

Notes, hints, pracs and experiments and how to introduce the Synchrotron in the VCE syllabus.

B9 StudyON for VCE Physics - Want to Improve Your Students' Exam Results? (C)

Claire Lord, John Wiley & Sons

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
* 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&4 and full access to studyON Teacher Edition for 12 months.

B10 Make it real! Stimulating Technology in the Physics classroom (C)

Phil Jones, The Logical Interface

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

B11 Australian Curriculum and VCAA Update: A physics perspective (G)

Maria James - VCAA

What's happening with the Australian curriculum? When will it be implemented? What will happen to VELS? What will happen to VCE studies? Who will be involved? What are the issues and implications of an Australian curriculum? This session will summarise progress in the development of an Australian curriculum for Years K to 12, including the management of a Victorian response by the VCAA. Time will be available to respond to audience questions.

B12 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 of the two is outlined.

B13 Approaches to learning: Designing and implementing a VCE electricity unit in an IB idiom (G)

Neil Champion, Buckley Park Secondary College

The backwards design process used to prepare an IB unit based on the Area of interaction: Approaches to learning is described. The unit involved a range of constructivist activities and included a cross-age activity. Experience in a year 11 classroom is discussed, along with suggestions for improvement to the process.

B14 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!

B15 Australian Synchrotron Tour (3&4)

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

Lunch/Displays
12:50pm – 1:50pm

Physics Oration

1:50pm – 2:50pm

Prof Geoffrey Taylor
'The Physics of the Large Hadron Collider'

Session C

2:50pm – 4:00pm

C1 Chief Assessor's Report on how students' performed on the Unit 3 & 4 Exams in 2010 (3&4)

Bruce Walsh, Xavier College

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

Repeated in D1

C2 The Virtual Lab - Using Learning Objects in VCE Physics (G)

Justin Vincent, Warrnambool College

Repeat of A7 - see abstract on page 2

C3 Climate change – Can we help improve public understanding? (G)

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

How often have you been asked whether you "believe in climate change"? Science is about evidence, not 'belief'. The evidence suggests that climate change is happening and that our use of fossil fuels is the cause. As science teachers we can help the general public to understand the seriousness of the situation and to come to grips with the real issue of what to do about it. The AIP Ed Comm 'Science Teachers for Climate Awareness' group have produced materials to help you talk with both your school community and the wider community on this crucial issue.

C4 Make it real! Stimulating Technology in the Physics classroom (C)

Phil Jones, The Logical Interface

Repeat of B11 - see abstract on page 4

C5 Pracs and SACs from the $2 shop (G)

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

"Pracs and SACs 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.

C6 The Physics of the Synchrotron (3&4)

Jonathan de Booy - Australian Synchrotron

The Australian Synchrotron is a particle accelerator used for the production of X-rays millions of times brighter than the sun. Learn how X-rays are produced in synchrotron sources and 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.

C7 'Flight' and the uses of Wind Tunnels (1&2)

Peter Cheung (Nagle College), Murray Anderson (Camberwell Grammar School), Doug Bail (Ciderhouse) and Prof Lachlan Thompson (RMIT)

A panel of teachers discuss the different styles of wind tunnels and how they can be used in the Detailed Study 'Flight' and related topics in Years 7 - 10. Prof Thompson will outline the range of practical activities that are possible with simple equipment.

C8 VCE Astronomy and Astrophysics at VSSEC (C)

Ian Christie, Victorian Space Science Education Centre

This session will provide an overview of the VCE Astronomy and VCE Astrophysics programs offered by the Victorian Space Science Education Centre (VSSEC). Participants will see how both programs cover all the Key Knowledge and Skills for both of these Detailed Studies in an engaging full day program. Participants will use the Galactic Explorer software used in the VCE Astrophysics program and see how VSSEC uses the concept of the serious game to deliver scientific content.

C9 How to make the Physical Sciences Meaningful to Students

(G) Eroia Barone-Nugent, Santa Maria College

The research literature is strongly indicating that students need to see the connectedness of what they learn in science. The Growing Tall Poppies in Science program is a curriculum-based program that has been connecting students with the importance and relevance of science to the real world. The projects are interdisciplinary and students have the opportunity to work with scientists on current research projects that are linked to social issues. Students are given the opportunity to publish their project results. This new learning environment is being extended into cyberspace with a new web based forum to engage scientists and students in extended projects where Biology, Physics and Chemistry are learned in an interdisciplinary way. This program exposes students to cutting edge technologies that are integral to the sciences such as the Australian Synchrotron.

Repeated in D2

C10 A representational focus to introducing the topics of 'Forces' and 'Ideas about Matter' in Year 7/8 (G)

Dr Peter Hubber, Deakin University

This session draws on recent video-captured classroom research on Year 7/8 classes where students learnt the topics of 'Forces' and 'Ideas about Matter'. The teaching approach adopted involved teachers and students constructing and negotiating representations related to key ideas about these topics. Activities undertaken by the teachers will be described and examples of students' work given. Issues for teachers and students will be discussed.

C11 Physics and Speech: Great things to do with Sound (3&4)

Russell Downie, PLC

This is a repeat of a session that has been presented at recent conferences. Attendees will go away with real fun things they can do immediately with their students whenever sound is dealt with in syllabus, in general science or in Year 12 Physics. The session will focus on what our body does when we make sounds as well as other demonstrations.

Repeated in E2

C12 Practical Activities for Light (1&2)

Helen Lye, ACER, Dan O'Keeffe, AIP 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 E3

C13 Amazing fun Physics Tools & Gadgets that will teach, engage & connect (C)

Carl Ahlers, Prof Bunsen Science

Not only do classroom demonstrations and fun activities motivate students but they also teach principles that make science seem less abstract. This session is about the unusual application of everyday items to emphasize core science principles. We will discuss air pressure using a new air pressure mat, create handy classroom vacuums, prepare clouds in bottles using adiabatic cooling, diffract light with feathers, demonstrate a "Pringles" spectroscope, float objects and accelerate ball bearings with magnets and demonstrate simple but effective light modulation. All easily replicated.

Repeated in E1

C14 Practical Activities for Unit 4 Photonics (3&4)

Craig Anderson, Mark McPherson, Leongatha SC

For the past few years the AIP has coordinated a VCE Photonics Workshop, which included lectures and a number of practical activities. Our students regularly rate "the photonics pracs" as one of their favourite things in VCE Physics. This session will give participants an opportunity to experience these practical activities, which include optical waveguides, attenuation and acceptance angle of optical fibres, estimating semiconductor band gap using LEDs, wavelength division multiplexing, optical voice link and laser audio communications. Most of the activities can be easily and cheaply conducted in your own school. Participants will receive a copy of the student booklet.

Repeated in D4

C15 Minkowski Diagrams (3&4)

Theo Hughes, Physics Dept, Monash University

How can one visualise the weirdness of relativity? Minkowski diagrams are often mentioned as some sort of magic formula in terms of achieving this and solving relativistic problems. At the same time they are often viewed with some mysticism and dread. This talk aims to lift the veil of mystique that surrounds the mention of them and provide a tool that may help teachers to understand relativity and so aid in conveying relativistic ideas to students. Though, it should be understood, teaching students to use them is not necessarily recommended.

Tea/Coffee
4:00pm

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 $30 per person. Please indicate on your registration form if you will require a meal.

Light Meal and Tea/Coffee
4:00pm

Evening registration
4:30pm – 5:30pm

Session D*

5:30pm – 6:30pm

D1 Chief Assessor's Report on the Unit 3 & 4 Exams in 2010 (3&4)
Bruce Walsh, Xavier College
Repeat of C1 - see abstract on page 4

D2 How to make the Physical Sciences Meaningful to Students (G)
Eroia Barone-Nugent, Santa Maria College
Repeat of C9 - see abstract on page 5

D3 Australian Synchrotron Excursion: What it offers (3&4)
Jonathan de Booy, The Australian Synchrotron
Repeat of A1 - see abstract on page 2

D4 Practical Activities for Unit 4 Photonics (3&4)
Craig Anderson, Mark McPherson, Leongatha SC
Repeat of C14 - see abstract on page 5

Session E*

6:30pm – 7:30pm

E1 Amazing fun Physics Tools & Gadgets that will teach, engage & connect (G)
Carl Ahlers, Prof Bunsen Science
Repeat of C13 - see abstract on page 5

E2 Physics and Speech: Great things to do with Sound (3&4)
Russell Downie, PLC
Repeat of C11 - see abstract on page 5

E3 Practical Activities for Light (1&2)
Helen Lye, ACER, Dan O'Keeffe, AIP Education Committee
Repeat of C12 - see abstract on page 5

E4 Tips and Hints for Beginning Physics Teachers (G)
Colin Hopkins, Trafalgar High School
Repeat of B1 - see abstract on page 3

Finish
7:30pm

Saturday Excursion

Numbers are limited to 24 and preference will be given first to interstate participants, then to regional participants. Allocations will be done on Friday, 11th February. Participants will pay for their own lunch.

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

2:30pm
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)

Transport: A seat on bus can be booked. The bus will pick up interstate participants at their nearby hotel before 9:00am and take them to the airport by 4:30pm. The bus will also return to the Synchrotron after going to the airport for those who wish to leave their car there for the day.

Science Teachers' Association of Victoria Inc.
Patron: Prof. Peter Rathjen B.Sc (Hons) D. Phil. (Oxon) ABN 59 004 145 329

Science Victoria
ABN 94 108 759 762

Founded 1943

OFFICE USE ONLY
Registration Number

2011 Physics Teachers Conference Registration Form

Register online at: www.sciencevictoria.com.au/conferences.html

Personal Details

School Purchase Order No. _____ Membership Number _____

Title First name Surname Male/Female

☐ STAV/Other professional association, please indicate

School/Organisation

Address

Suburb State Postcode

Telephone Fax Mobile

Email* **(all correspondence is by email)**

***You must provide your correct email address as ALL correspondence is by email**

School Type: ☐ Government ☐ Independent ☐ Catholic ☐ Other

Region: ☐ Northern Metro ☐ Southern Metro ☐ Eastern Metro ☐ Western Metro
☐ Grampians ☐ Barwon Sth Western ☐ Gippsland ☐ Hume ☐ Loddon Mallee

Dietary requirements: Call STAV on 03 9385 3999

Privacy Statement:
In registering for the conference relevant details may be incorporated into a participant list for presenters only (name and organisation). If you want your name and organisation on the list tick this **yes** box. ☐

Workshops: Session Selection

*There is a limit to the number of participants in many sessions.
*Sessions will be allocated on a 'first come, first served' basis.
*You will be notified by email of the sessions to which you have been allocated prior to the conference.
*Register as early as possible to ensure your choice of sessions.
***Session codes must be used, eg. A1, B1**

Preferences

Day Sessions

	1st	2nd	3rd	4th
Session A				
Session B				
Session C				

Evening Sessions

	1st	2nd	3rd	4th
Session D				
Session E				

Saturday 19th February 2011 Tour Program: One excursion (First preference to interstate applicants)

☐ Yes I would like to join the tour

☐ Yes I would like to do the tour by bus

Please complete details overleaf>>

2011 Physics Teachers Conference Registration Form

Name: _____

Registration includes

Conference Proceedings CD (Chemistry, Biology, Physics and Environmental Science 2010), morning tea and Friday lunch. All prices quoted are GST inclusive. A tax invoice will be issued.

VCE Physics Conference

☐ STAV/AIP/ASTA Individual Member - **$160** (Full Day rate)*

☐ STAV/AIP Individual Member - **$86** (Evening rate)

☐ Non-STAV member/STAV School Subscriber - **$295** (Full Day rate)*

☐ Non-STAV member/STAV School Subscriber - **$106** (Evening rate)

☐ Retired Teacher/Student - **$78** ☐ Presenter - FREE

** People attending the Physics Day Program can also attend the evening sessions at no extra cost. Please ensure you have made your session selections for Session D & E.* ***NOTE*** *- The light meal at 4.30pm is not included in conference fee see cost below.*

VCE Physics Conference Light Meal at Monash University Union Building

☐ $30 Light Meal, Tea and Coffee

Accommodation

Accommodation is available at Mannix College, adjacent to Monash University and nearby hotels.
Check www.vicphysics.org/confextras.html for booking details. (You need to book own accommodation)

☐ If you require a **laptop locker please tick this box**

An Excel file containing a list of teachers' names, their schools with postcodes will be compiled. If you do not want your name included on this list, **please email: admin@stav.vic.edu.au**

Offer to help: I am willing to introduce the presenter of one of my workshops.

☐ Yes

☐ No

Payment details ABN 94 108 759 762 **TAX INVOICE**

☐ Cheque - make payable to: **SCIENCE VICTORIA** ☐ Invoice School/Purchase order supplied

☐ Credit Card *(Please tick applicable)* ☐ VISA ☐ MasterCard

Card No. ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry Date ☐☐/☐☐

Name of Cardholder (please print) Signature

Cancellation policy: A 50% cancellation fee will apply.
Notification of cancellation must be in writing.
There will not be any refund for cancellations made less than 2 weeks prior to the conference.

CLOSING DATE for all Registrations is 5 business days prior to each conference

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