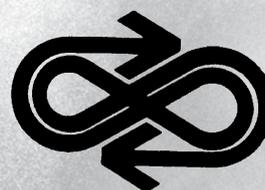


# 2015 Physics in General Science (PIGS) Conference



**Friday Afternoon, 20th February, 2014, Monash University, Clayton, Victoria**

**A conference for teachers of Science in Years 7 to 10.**

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 professional learning activity.

**The conference caters for those:**

- seeking to increase their confidence in teaching physics related topics,
- looking for new teaching ideas and resources.
- The Program has four sessions starting at 1:25pm with 20 workshops specifically on physics aspects of Years 7 - 10

## Conference Program

### Program

1:00	Registration
1:25	Workshops: Session B
2:30	Workshops: Session C
3:30	Afternoon Tea /Displays
4:00	Workshops: Session D
5:00	Workshops: Session E
6:00	Finish

The workshops start at Session B because these workshops are also being offered at the all day Physics Teachers' Conference, which has a session of workshops before lunch.

### 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.

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

**Australian Institute of Physics (Vic Branch) Education Committee.**

[www.vicphysics.org](http://www.vicphysics.org)

**Science Teachers' Association of Victoria Inc.**

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# 2015 Physics in General Science (PIGS) Conference

Registration from 1:00pm

Descriptions of Workshop Sessions:

M: Yrs 7 - 10, C: Commercial, BYOD: Bring your own Device (optional)

## Session B

1:25pm – 2:30pm

### B1 Toys, pracs, challenges (Yr 6 - 10) (M)

Dianne Wilkinson, Box Hill High School

Learning as you play is the fun way to understanding ideas and concepts. Using familiar toys and language enables difficult concepts to be discussed without fear of failure. Often this approach opens the way for further student lead investigations. Eight challenging concepts will be presented with suggestions to conquer understanding. This hands-on workshop session is aimed to stimulate ideas for teachers to use in junior science (years 6 to 10). E5 is a Years 10 to 12 version of this workshop.

### B2 The Science of Magic

(M) Repeated in D2

Peter Razos, Trinity Grammar School

Magic has always fascinated us and done properly can develop into a great unit of work in science where physics and chemistry takes on a whole new meaning. This workshop is based on a semester length, year 9-10 unit of work at Trinity Grammar. We encourage teachers who like to think outside the square and who would like to be more engaging in the science classroom to attend. It is guaranteed that participants will come away, if not with an entire new unit of work, with ideas to engage and motivate their students. Much more will be made available and we will discuss how the ASC is integrated in the Science of Magic. A great way to start and see if this workshop can truly benefit you is to go online and login with the details below. Check it out by visiting [www.dynamicscience.com.au/tester](http://www.dynamicscience.com.au/tester). Enter as a student with the details below: organisationid=dynsci password= robots.

### B3 Year 10 & 11 Motion Experiments

(M) Repeated in E4

Frances Sidari, Lakeview Senior College and Terry Tan, John Monash Science School

In many government schools, resources are scarce. Access to data loggers and motion sensors are limited. This series of experiments works around these constraints with everyday items. Students would be using their mobile phones and

stopwatches to record the entire motion practical, and transferring it to their computers to analyse the information. This series of experiments would also include students' experiences, which they can use to construct their knowledge and understanding for the concepts in Motion.

### B4 Demonstrating Electricity and Magnetism in Rural Schools

(M) Repeated in E3

Paul Millard and Jo Holdsworth, Science Discovery Project

Science Discovery Project is a rural touring program which presents to students from P-7 in schools across Australia. We have been operating since I retired as a Physics teacher in 2013. Our demonstration gives students the opportunity to see and participate in lots of interesting and dynamic demonstrations in the concepts of Circuit Electricity, Magnetism, Electricity Generation and Static Electricity. Great for the ideas I have accumulated over 30 years of teaching Physics.

### B5 Language modelling in developing a conceptual understanding in Physics

(M)

Dr Murray Anderson, Camberwell Grammar School

In this workshop a discussion about the use of language and the role it has to play in the development of a conceptual understanding in Physics will be given. The session will be reflective in nature and detail a personal journey in the art and science of teaching Physics.

## Session C

2:30pm – 3:30pm

### C1 Model Rocketry in the science classroom

(M) Repeated in E2

Peter Razos, Trinity Grammar School

Model rocketry is an exciting way to present the science of flight and space travel. Participants will be encouraged to build and launch their own model rocket. We will discuss themes such as forces and energy transformation and see first hand the engaging nature of the resource. Online worksheets and curriculum material will also be presented and can be viewed at [www.dynamicscience.com.au/tester](http://www.dynamicscience.com.au/tester) enter as a student with the details below organisationid=dynsci, password= robots.

### C2 How to Photograph the Moon and Stars with your DSLR

(M)

Phil Hart

With just a Digital SLR and a tripod, award winning photographer Phil Hart can teach you how to capture wide-field scenes of the night sky and long-exposure star trail images. Night sky photography also opens up several avenues of science exploration - the physics of how cameras and lenses work and astronomy science topics that can be explored through simple images of the night sky.

### C3 Introduction to electricity and electric circuits

(M)

Michael Foster, Thornbury High School & Graham Foster, Retired

Basic theory of electricity and electric circuits for teachers with little or no background in basic electricity or Physics. The workshop will be divided into 3 areas: 1. Basic theory of electricity, 2. Electric circuits, 3. Measuring instruments. Teachers learn Basic properties of atoms: Electric charge, Electrical current, Electrical resistance. Energy: Force on charges, Electrical potential energy, Comparison of electrical potential energy to other forms e.g. gravitational potential energy etc. Voltage. Circuits: Series & Parallel, Current and potential difference in series and parallel circuits, Power. Measuring instruments: Use of a multimeter to measure current, voltage and resistance for series and parallel circuits.

### C4 Engineering student learning

(M)

Robyne Bowering, Step Up Education

Engineering themes and activities provide engaging hands-on, minds-on learning for students. Engineering provides students with authentic reasons to want to understand many science, maths and design and technologies concepts, as well as developing effective student teamwork, problem-solving, communication and reflection skills. This is a hands-on session using cheap, every day materials to inspire teachers to include engineering in their classrooms.

Afternoon Tea/Displays  
3:30pm – 4:00pm

## Session D

4:00pm – 5:00pm

### D1 Physics Practical Activities for Year 10 Science

(M) Repeated or continued in E1

Dan O’Keeffe AIP, Helen Lye ACER and Svetlana Marchouba Camberwell Grammar School

A hands-on, self paced session in which participants work through a series of activities on electronics and DC motors. There are sufficient activities to do over the two adjacent sessions, D1 and E1. Participants can attend either or both sessions.

### D2 The Science of Magic

(M) Repeat of B2

Peter Razos, Trinity Grammar School

### D3 Easy and Engaging Light Pracs

(C)

Spiro Liacos, Cheltenham Secondary College and Liacos Educational Media

This hands-on session will introduce you to a series of practical activities that cover Reflection and Mirrors, Refraction and Lenses, and Total Internal Reflection. You will be provided with all the prac sheets that you need to teach the topic of Light to Year 9s and you will have a chance to carry out the pracs.

### D4 The Big Universe

(C)

Neil Champion, Buckley Park College

This is a chance to unpack the design, structure and riches of Unit 5, The Big Universe, in Nelson iScience10. Starting with the design features, based on “backwards by design” principles, the unit will be explored with respect to student practical work (SIS), student knowledge building: BBT, astrometry (SU, SHE), and comparisons about different cultural understandings of origins (SHE).

### D5 Introducing Forces with Inquiry

(M)

Associate Professor Peter Hubber, Deakin University

Recent Australian Research Council (ARC) funded classroom based projects exploring the role of representation in teaching and learning science have produced a ‘guided inquiry’ approach, called Representation Construction, which has proved successful in terms of improved learning outcomes for students. This session will outline the main features of this approach that has an emphasis on student construction and negotiation of representation drawing on findings from the research into the teaching of forces in the new Australian Science Curriculum. It will also discuss key issue students have in understanding the forces and the manner in which this inquiry approach resolves them.

### D6 Barbie Bungee Jumping

(M)

Dr Moses Khor and Jonathan Davies, Camberwell Grammar School

Barbie is an adventurous girl and into extreme adventure sports. You operate the RDAC (Really Dangerous Adventure Company) and need to find the length of the bungee cord that Barbie needs to make a successful and thrilling jump. This involves Barbie getting close to, but not hitting the ground. Too long ... and disaster awaits. This workshop will consider ways to use this activity for students to develop graphing, analysis and reporting skills. Ohh ... and we have some Kens too.

## Session E

5:00pm – 6:00pm

### E1 Physics Practical Activities for Year 10 Science

(M) Repeat or Continuation of D1

Dan O’Keeffe, AIP & Helen Lye, ACER

A hands-on, self paced session in which participants work through a series of activities on electronics and DC motors. There are sufficient activities to do over the two adjacent sessions, D1 and E1. Participants can attend either or both sessions.

### E2 Model Rocketry in the science classroom

(M) Repeat of C1

Peter Razos, Trinity Grammar School

### E3 Demonstrating Electricity and Magnetism in Rural Schools

Repeat of B4

Paul Millard and Jo Holdsworth, Science Discovery Project

### E4 Year 10 & 11 Motion Experiments

(M) Repeat of B3

Frances Sidari, Lakeview Senior College and Terry Tan, John Monash Science School

### E5 Toys, pracs, challenges (Yr 10 - 12)

(M)

Dianne Wilkinson, Box Hill High School

This session is an ideas factory. It is aimed at teachers of physics from Years 10 to 12 physics but many of ideas could be adapted for junior levels. By using everyday equipment and toys to model concepts, even the difficult ideas can be made more understandable to the bottom end of the market. Connecting classroom theory to everyday experiences helps to make the concepts understood and provides memory hooks for later reference. Ways of developing worksheets which are relevant, interesting, quick and easy will be shown. In addition, with the return of the poster to senior physics, ideas to think about and methods of approaching the task will be covered. B1 is a Years 6 - 10 version of this workshop.

Conference ends 6:00pm