



VCE Physics Teachers' Conference 2019

Friday 15 and Saturday 16 February 2019 at La Trobe University, Bundoora

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

Conference Program - Friday 15 February

7.30 am – 8.20 am	Registrations Open, Exhibition Viewing and tea/coffee	Union Hall and Annexe
8.30 am – 8.45 am	Welcome by STAV President & VicPhysics President	Agora Theatre
8:45 am – 9:45 am	Keynote Address – Dr Laura Wolz	Agora Theatre
10:00 am – 11:00 am	Session A	
11:00 am – 11:45 am	Morning Tea	Union Hall
11:50 am – 12:50 pm	Chief Assessor – Andrew Hansen	Agora Theatre
12.55 pm – 2:00 pm	Lunch	Union Hall
2:00 pm – 3:00 pm	Session B	
3:15 pm – 4:15 pm	Session C	
4:15 pm – 5:15 pm	Meet n' Greet	Eagle Café

Conference Program - Saturday 16 February

Excursion Tasters and Medical Physics in-Science

9:00 am	Australian Synchrotron (1 hour)
11:30 am	Medical Physics In-Service at Peter MacCallum Cancer Centre (2 hours)
2:30 pm	Victorian Space Science Education Centre (VSSEC) (90 minutes)

Wifi and laptops at the Conference

Wifi is available to participants, a username and password will be provided on the day.

Electrical Appliance Compliance

Please ensure that any electrical device you bring has a compliance tag on the power lead otherwise you may be prevented from using it.

Disclaimer

STAV does not accept any responsibility for any damages caused by any individual on the day.

Registration information, La Trobe University Map and all conference information is available on the

Science Victoria website: www.sciencevictoria.com.au/conferences.html



Proud Sponsor of the Coffee Cart, come and enjoy a free fresh hot beverage.



VicPhysics Teachers' Network Inc.

www.vicphysics.org



Science Teachers' Association of Victoria Inc.

VCE Conference Series 2019

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VCE Physics Teachers' Conference 2019

**Registration
Tea/Coffee
7:00am – 8:20am**

**Welcome
8:30am – 8:45am**

**Keynote Address
Dr Laura Wolz
8:45am – 9:45am**

Precision cosmology with the next generation of telescopes

Dr Laura Wolz, ARC DECRA fellow - University of Melbourne

During the past two decades we have entered the era of precision cosmology. We have a precise picture of the very early universe at 400,000 years using CMB surveys with latest results coming from the Planck mission, as well as accurate measurements of the matter distribution and the universal expansion rate during the past few billion years using optical galaxy surveys. In the near future, radio observations with instruments such as the Square Kilometre Array (SKA) will complement optical galaxy surveys and explore much earlier times. I will review the history of our Universe and highlight the experimental results manifesting the current standard model of cosmology, Λ CDM. I will introduce the international SKA observatory, partly based in Western Australia, and present the challenges faced by cosmological surveys in the era of Big Data.

Session A 10:00am – 11:00am

A1 VCE Physics beyond the current mess

Neil Champion, Retired Physics Teacher

The current VCE Physics study design lacks clear narrative lines. With a review in sight, now is the time to consider the logic behind a well-constructed VCE Physics course. This workshop is designed to explore possible ways to make the current design less incoherent and the next study design positively coherent.

Suitability: VCE Units 1, 2, 3 & 4

Repeated in B1

A2 Online Learning through VCE Physics Unit 3 Revision

Soula Bennett and Toni Little, Quantum Victoria

In this session, teachers will have the opportunity to interact with the VCE Physics courses on the Quantum Victoria Portal. These courses are available for FREE and participants will be able to access the ability to observe student growth and provide the necessary scaffolding that deepens their students' knowledge as they prepare for the VCAA exams. Teachers will be shown how to access the individual and class data produced once a student has completed a course.

The courses cover VCE Physics Unit 3 "How do fields explain motion and electricity", "Einstein's theory of special relativity", "How do things move without contact", "How are fields used to move electrical energy" and "How fast can things go"

Delegate Note: Delegates are to bring their own laptop or tablet fully charged.

Suitability: VCE Unit 3

Not Repeated

A3 Instructional strategies targeting L3 (Language, Learners and Literacy)

Deepa Jain, Kew High School

"Teachers can teach however they like, as long as it is ethical and effective in imparting valuable learning, within applicable curriculum and resource constraints" (Scriven, 1994), however, to transform Physics from challenging to interesting; converting challenging sophisticated language and texts into meaningful setting; students have to learn how to learn.

Learn how and which "instructional strategies" could make your teaching more effective and valuable when activating prior knowledge, setting a purpose, comprehending text; or modelling the process of being an effective reader/writer. Walk away with ideas and strategies, which are applicable from year 7 to 12.

Suitability: All

Not Repeated

A4 VCAA Update

Maria James, VCAA

After 2 years of implementing Units 3 and 4 VCE Physics, and 3 years of implementing Units 1 and 2 VCE Physics, how are teachers managing the curriculum? What is working? What could be improved? What opportunities does the VCE Physics Study Design present? This session provides information from VCAA school audits, statistics and surveys to reflect on teacher practice.

Suitability: VCE Units 1, 2, 3 & 4

Repeated in B4

A5 Shining Light on Diffraction, Interference and Image Resolution

Dr Barbara McKinnon, Kew High School

The nature of diffraction, the difference between diffraction and interference and the role of diffraction in image resolution pose conceptual difficulties for students. This workshop explores strategies for clarifying the physics of imaging and the transition from a ray/particle model to wave model to wave-packet model of light and matter.

Suitability: VCE Unit 4

Repeated in C5

A6 Image analysis for electron diffraction using Tracker

Dr Penny Hale, Wellington Secondary College

Physics exams often use images and diffraction patterns to illustrate the wave nature of light and matter, however this data is limited to black and white lines or circles. How can we use common software such as Tracker to enhance students understanding of these images as spectra with real intensities. This workshop will demonstrate the use of tracker for analysing the double slit experiment using lasers and extend this analysis to images from electron diffraction.

Suitability: VCE Unit 4

Repeated in B6

A7 Space: What's Up? CSIRO's Space Research Program

Robert Hollows, CSIRO Astronomy and Space Science

CSIRO created a Centre for Earth Observation and an active Space Research Program in 2018. These exciting developments are detailed. The physics underpinning Earth Observation satellites such as NovaSAR in which CSIRO is a partner is explained. Data sources and suggestions for activities in the classroom and student investigation are explored. We discuss how investment in Space can support the UN's Sustainable Development Goals with a focus on the Asia-Pacific region.

Suitability: All

Not Repeated

A8 Uncertain Uncertainties

Theo Hughes, Monash University

With more emphasis on experimental activities in the current curriculum (including questions in the exam) there is confusion around aspects of experimental analysis and the meaning of experimental results. I will address a couple of key issues about which there are misconceptions harboured by teachers and students alike.

Suitability: VCE Units 1, 2, 3 & 4

Repeated in B8

A9 Usain Bolt vs Spiro Liacos: It was neck and neck! And then the gun went off.

Spiro Liacos, Cheltenham Secondary College

Pracs, print resources, videos, and activities that will help you to fire up your Unit 2 and/or Year 10 Motion units. For example, using nothing more than a digital camera, find out how fast you can kick a soccer ball. In this session you will also compare Usain Bolt's 100m sprint with your own 100m sprint, analyse the motion of NASA's Space Shuttle as it blasts off into orbit, investigate how the velocity and acceleration of projectiles change, and a whole lot more. Activity sheets will all be provided.

Suitability: Years 7 - 10, VCE Unit 2

Not Repeated

A10 Yr 11 SAC collaboration

Paul Natoli and Steve Kuhn, Ballarat High School

A chance to work with other teachers on making Year 11 SACS. I will run through all the tasks that I use and will share with anyone interested. Would be a good chance to help others fine tune their SACS.

Suitability: VCE Units 1 & 2

Not Repeated

A11 Unit 3 Electricity and Magnetism Demonstrations

Man Lam, Mount Alexander College

We have all seen the shape of a magnetic field using iron filings. However, it is not so easy to visualise an electric field. In this session, we use high voltage, lawn seeds and oil to show the shape of an electric field.

The definition of Ampere is the force between two parallel wires that are separated by one metre ($2 \times 10^{-7} \text{N/m}$). The magnitude of the force is small and as such, this concept is usually difficult to demonstrate, but in this session, we will show you how to set up equipment to demonstrate the existence of this tiny force.

Delegate Note: Please bring your own laptops

Suitability: All

Not Repeated

A12 Fatter Physics (increase your class size)

Dianne Wilkinson, Box Hill High School

Discover the secret to full senior physics classes. Find out how to overcome "It's too hard" tag for physics. Share the ideas, practical experiments, and worksheet stepping stones to encounter enthusiasm plus high marks. From the year seven "what is physics?" question to the year twelve "how can I get a 40+?" work through a structure of activities to put learning back into the hands of the students and release their inner feline curiosity.

Suitability: All

Repeated in C12

A13 Using Wolfram tools to advance exploration in Physics

Craig Bauling, Wolfram

The Victoria Department of Education is supplying to all public and private schools the complete Wolfram tools suite including Mathematica - for higher secondary explorations,

Mathematica Online - for iPads and Tablets, Wolfram|Alpha Pro - for cross discipline exploration,

Wolfram Programming Lab - for introductory coding and Algorithm explorations, and

Wolfram SystemModeler - for visual modelling and simulation.

Join Craig Bauling as he presents an overview of these tools and details on how to gain access for you and your students. Specific examples will highlight tool use in the field of Physics.

Suitability: Years 7 - 10, VCE Units 1-4

Repeated in C13

A14 Skilling up with electronic measure

Doug Bail, Cider HouseTech

So called "datalogging" is something of a misnomer, particularly these days when a datalogger could be a phone, computer, a stand alone sensor or even an exercise band. The opportunities these devices provide for student investigations open up all sorts of new and engaging possibilities for physics investigations at not only senior levels but also middle school.

This session will look at a range of tools and ways they can be employed to get reliable first hand data in student experiments and investigations. While the session will use PASCO sensors in part, its intended to be helpful to all and will include reference to a range of devices, their strengths, weaknesses and appropriate settings for use in your classroom and beyond.

Suitability: All

Repeated in B14

A15 Are we there yet? Engaging students in studies of motion through qualitative, immersive experiences.

Elke Barczak & Skye Bennett, Museum Victoria

How do you engage students in meaningful exploration in the physics of motion, when those students could be beginning their study of physics or concluding it? In a way that will be equally appealing to the student who 'doesn't really get science' and the student who reads Cosmos in their spare time? At Road to Zero, TAC's brand-new and world first road safety education centre at Melbourne Museum, this was our challenge. This workshop explores our approach and how it can be incorporated into your classroom learning.

Suitability: Years 7 - 10

Not Repeated

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Morning Tea

11:00am – 11:45am

Chief Assessor

Andrew Hansen

11:50am – 12:50pm

Responding to short answer questions

Andrew Hansen, Ringwood Secondary College

For students Physics is often portrayed as an extension of Mathematics but with more than half the marks being awarded for short answer responses it is important for students to be able to discuss and apply concepts clearly and concisely. This session will draw on assessment data from the 2018 exam to identify the errors that students are making and suggest strategies for preparing students to respond to these questions.

Suitability: VCE Units 3 & 4

Lunch/Displays

12:55pm – 2:00pm

Session B

2:00pm – 3:00pm

B1 VCE Physics beyond the current mess

Neil Champion, Retired Physics Teacher

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Suitability: VCE Units 1, 2, 3 & 4

Repeat of A1

B2 Immersive Science: Virtual Reality in the Scientific Process

Jackie Bondell and Mark Myers, Ozgrav

Virtual Reality (VR) can provide a useful tool for students engaging in the scientific process, allowing observations and data collection in an immersive environment. OzGrav has developed multiple Physics and Astrophysics VR applications for use in classrooms and in public outreach. OzGrav will present our digital VR assets, sharing how these are used in classroom programs and highlighting some benefits of VR data collection. Participants will be able to work through modules using VR and can receive feedback from presenters on incorporating interactive and immersive (and free) technology into their classes.

Suitability: Years 7 - 10, VCE Units 1-3

Repeated in C2

B3 Using Log-books and Rubrics to Scaffold Inquiry

Dino Cevolatti & Stuart Bird, Castlemaine Secondary School

The focus of this session will be on, how structured Log-books, Rubrics, and similar tools, can be used in the classroom to support students in engaging effectively in the inquiry process. We will begin with a presentation of the commercially available (QATs) structured Log-book and accompanying Rubric for the Unit 4 Outcome 3 Practical Investigation. This will include details about how and why they were constructed in the way that they were. The session will end with a workshop exploring strategies to address the obstacles to inquiry learning in VCE Physics.

Delegate Note: Commercial Work being presented as part of the session is from Quality Assessment Tasks (QATs) but the session does not rely on this material

Suitability: VCE Units 2, & 4

Repeated in C3

B4 VCAA Update

Maria James, VCAA

After 2 years of implementing Units 3 and 4 VCE Physics, and 3 years of implementing Units 1 and 2 VCE Physics, how are teachers managing the curriculum? What is working? What could be improved? What opportunities does the VCE Physics Study Design present? This session provides information from VCAA school audits, statistics and surveys to reflect on teacher practice.

Suitability: VCE Units 1, 2, 3 & 4

Repeat of A4

B5 Real Astronomy Data in the Classroom

Robert Hollow, CSIRO Astronomy and Space Science

Astronomy is a discipline in which real scientific data is freely and easily accessible. This makes it an ideal area for both first hand and second hand student investigations with the potential to undertake engaging and exciting projects. This workshop discusses a variety of data sources and programs, how to access them and what tools are available. Examples of possible student investigations are outlined.

Suitability: All

Not Repeated

B6 Image analysis for electron diffraction using Tracker

Dr Penny Hale, Wellington Secondary College

Physics exams often use images and diffraction patterns to illustrate the wave nature of light and matter, however this data is limited to black and white lines or circles. How can we use common software such as Tracker to enhance students understanding of these images as spectra with real intensities. This workshop will demonstrate the use of tracker for analysing the double slit experiment using lasers and extend this analysis to images from electron diffraction.

Suitability: VCE Unit 4

Repeat of A6

B7 Designing SACs and assessments that aren't tests

Jane Coyle, St Columba's Essendon

The study design offers many alternatives for SACs and assessments in our year 11 & 12 study, but often when we are pushed for time and energy, we fall back to using a test or similar. In this session I will present some of the alternatives I have used and examine how we can use understanding by design, UbD (also known as backwards by design) as a model to enhance our physics instruction and assessment. The primary goal of UbD is student understanding the ability to make meaning of "big ideas" and transfer their learning. Effective curriculum is planned "backward" from long-term desired results through a three-stage design process (Desired Results, Evidence, Learning Plan). I encourage any attendees to bring any SACs they have created that could be shared with the group.

Suitability: VCE Units 3 & 4

Repeated in C7

B8 Uncertain Uncertainties

Theo Hughes, Monash University

With more emphasis on experimental activities in the current curriculum (including questions in the exam) there is confusion around aspects of experimental analysis and the meaning of experimental results. I will address a couple of key issues about which there are misconceptions harboured by teachers and students alike.

Suitability: VCE Units 1, 2, 3 & 4

Repeat of A8

B9 Relative Motion and Frames of Reference

Spiro Liacos, Cheltenham Secondary College

The two related concepts of Relative Motion and Frames of Reference form an essential part of a deeper understanding of vectors, Newton's Laws of Motion, and, of course, relativity. It makes sense therefore to take some time to explicitly teach these concepts fairly early on in any motion unit (before some of the more challenging concepts are introduced). In this session, we will look at some demonstrations, activities, and worksheets that will help students to quickly grasp the basics of these concepts. (And, for what it's worth, your students will be fascinated by actually seeing that at any given moment an object can be travelling at different speeds AND in different directions!)

Suitability: Years 7 - 10, VCE UNIT 2

Not Repeated

B10 Tips and hints for teachers new or returning to Physics

Colin Hopkins, Retired Teacher

Recently retired from Head of Science at Bialik College, Colin will share tips and hints for engaging students in VCE Physics. Useful resources will be shared, so bring a laptop

Suitability: VCE Units 1, 2, 3 & 4

Repeated in C10

B11 Constructing DC Motor from the kit and Ideas on EPI projects used

Gracie Saxena and Joshua Le, Manor Lakes P12 College

A hands-on workshop, in which participants will construct a working model of a DC motor from the kit and exploring different ideas for EPI projects successfully used in my Physics class. Participants will be dissecting a small motor and compare with the one constructed. The purpose is to understand-

- various components of a simple DC motor
- its operation including the role of the commutator (slip rings)
- Interaction between the magnetic field of the magnet and the magnetic field generated around a conductor carrying current
- EPI projects-based on DC motors & Sound topics.

Suitability: VCE Units 3 & 4

Repeated in C11

B12 Effective Formative Assessment with Education Perfect

Michael Villanti, Education Perfect

A key recommendation from Gonski 2.0 is the move from summative assessments measured against year level outcomes to more regular formative assessments that acknowledge learning progressions. Of particular importance is the role that formative assessments can have to help students become active partners in their learning journey. One component that makes formative assessment so powerful is the feedback that is provided to students. Feedback is most effective when it is timely and specific. It can be incredibly difficult for a teacher to mark and review every student's responses, efficiencies can be gained through an automatic marking and analysis tool to accelerate the feedback provided to students. This in turn frees up teacher time to further target specific areas to follow up with students. Education Perfect is a resource that has a range of content aligned to the

Australian and Victorian Curriculum. It has an assessment tool that can automatically mark and analyse class and student results. Plus overall, it provides the resources to implement effective regular formative assessments in your classroom to empower you as a teacher and encourage a growth mindset in your students. This session will explain how to do this using Education Perfect.

Suitability: All

Repeated in C8

B13 Create an Impact: The Lightboard Videos For Better Student Engagement

Prince Kurumthodathu Surendran and Dr Jose Smitha, Swinbourne University of Technology

Recently, video tutorials have grown as one central part of technology enhanced pedagogy for engaging students in cognitive process. The Lightboard videos are impressively getting accepted due to its advantages of providing a greater visual connection with the lecturer over screencasts and whiteboard recordings. Here, I present the preliminary evaluation of delivery of engaging and flexible physics video tutorials together with learner's experiences. In nutshell, this study provides positive impact of student learning via better student engagement and the importance of visual interaction in learning videos.

Suitability: All

Not Repeated

B14 Skilling up with electronic measure

Doug Bail, Cider HouseTech

So called "datalogging" is something of a misnomer, particularly these days when a datalogger could be a phone, computer, a stand alone sensor or even an exercise band. The opportunities these devices provide for student investigations open up all sorts of new and engaging possibilities for physics investigations at not only senior levels but also middle school.

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Suitability: All

Repeat of A14

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B15 Green Galaxies - The World's Largest Data visualisation Teaching Tool

Raymond Harvey, Stephen Harris & Jamie Astill, Ciderhouse ICT, Solar Schools/ Green Galaxies & Sirius College

This workshop will be the first public view of Green Galaxies, the biggest, real-time data visualisation ever created for teaching and learning.

Created in Australia by government and commerce, the ambition is to change energy understanding globally in less than one generation.

Experience -

- Live Data Portal
- Learning application (teacher-led, interactive game for grades 1-12)
- Australian Curriculum Approved Teachers Toolkit (unit/lesson plans, student activities, off-the shelf resources)
- The world's most comprehensive Knowledge Bank (8 years data / 3 years visualisation development).

Come and discover how this world-leading program engages higher-order thinking skills and curiosity regarding the environment and humanity.

Delegate Note: Delegates to bring their mobile devices for Hands-On interaction

Suitability: Years 7-10, VCE Unit 1

Not repeated

B16 Climate Change - The Missing Science

Keith Burrows, Beyond Zero Emissions

Endless arguments about renewable energy and greenhouse emissions rage on in the media and politics. What seems to be missing are the real reasons we need to reduce emissions. These reasons have little to do with politics and a lot to do with science - something you wouldn't guess from much of the so called "debate"? This session will attempt to provide some of that missing science. Keith is a (not entirely) retired Physics teacher who has been looking closely at this issue since he retired from full time teaching. He has a website called "Climate Science for Sceptics"?

Suitability: All

Not Repeated

Session C **3:15pm – 4:15pm**

C1 Literacy from a physics education perspective

Neil Champion, Retired Physics Teacher

How do we expect our students to communicate? What values do we expect to see in their communications? It is high time physics teachers interrogated the way the literacy discourse has been commandeered by one academic discipline. We have a specialised literacy, which needs to be taught explicitly. This workshop will explore the specific literacy demands of the physics classroom and how those demands can become part of the learning and assessment cycle.

Suitability: All

Not Repeated

C2 Immersive Science: Virtual Reality in the Scientific Process

Jackie Bondell and Mark Myers, Ozgrav

Virtual Reality (VR) can provide a useful tool for students engaging in the scientific process, allowing observations and data collection in an immersive environment. OzGrav has developed multiple Physics and Astrophysics VR applications for use in classrooms and in public outreach. OzGrav will present our digital VR assets, sharing how these are used in classroom programs and highlighting some benefits of VR data collection. Participants will be able to work through modules using VR and can receive feedback from presenters on incorporating interactive and immersive (and free) technology into their classes.

Suitability: Years 7 - 10, VCE Units 1-3

Repeat of B2

C3 Using Log-books and Rubrics to Scaffold Inquiry

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Suitability: VCE Units 2, & 4

Repeat of B3

C4 Model Rocketry in the Classroom

Peter Razos, Caulfield Grammar School

"Now that Australia has geared up to be a player in space exploration the interest in physics through space and rocketry should be running high. Talk of further Moon exploration and having a colony on Mars further fuel the interest in the physics behind rocketry as a means to transport hardware and humans. Come and experience how model rocketry can be part of an exciting science curriculum activity. All participants will be encouraged to build and launch their own model rocket. We will also explore ways of incorporating this exciting activity into the junior science curriculum to explore energy conversion, acceleration and forces."

Suitability: All

Not Repeated

C5 Shining Light on Diffraction, Interference and Image Resolution

Dr Barbara McKinnon, Kew High School

The nature of diffraction, the difference between diffraction and interference and the role of diffraction in image resolution pose conceptual difficulties for students. This workshop explores strategies for clarifying the physics of imaging and the transition from a ray/particle model to wave model to wave-packet model of light and matter.

Suitability: VCE Unit 4

Repeat of A5

C6 Minkowski Diagrams

Theo Hughes, Monash University

Minkowski Diagrams are a great tool to help in visualising aspects of special relativity. Some teachers may use them with their students (particularly with keen / advanced students) but for some teachers it may just be a really good tool to help their own understanding. Whichever it is, I will provide participants with insights into what these diagrams mean and how they might be used at the VCE level.

Suitability: VCE Unit 3

Not Repeated

C7 Designing SACs and assessments that aren't tests

Jane Coyle, St Columba's Essendon

The study design offers many alternatives for SACs and assessments in our year 11 & 12 study, but often when we are pushed for time and energy, we fall back to using a test or similar. In this session I will present some of the alternatives I have used and examine how we can use understanding by design, UbD (also known as backwards by design) as a model to enhance our physics instruction and assessment. The primary goal of UbD is student understanding the ability to make meaning of "big ideas" and transfer their learning. Effective curriculum is planned "backward" from long-term desired results through a three-stage design process (Desired Results, Evidence, Learning Plan). I encourage any attendees to bring any SACs they have created that could be shared with the group.

Suitability: VCE Units 3 & 4

Repeat of B7

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Suitability: All

Repeat of B12

C9 Newton's Laws of Motion Pictures

Spiro Liacos, Cheltenham Secondary College

"You know when you're in a bus and you get thrown forward?" We often ask students to imagine different scenarios as we teach Physics, but actually showing them how Newton's Laws of Motion affect us is much more interesting and much more effective.

Suitability: Years 7 - 10, VCE UNIT 2

Not Repeated

C10 Tips and hints for teachers new or returning to Physics

Colin Hopkins, Retired Teacher

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Suitability: VCE Units 1, 2, 3 & 4

Repeat of B10

C11 Constructing DC Motor from the kit and Ideas on EPI projects used

Gracie Saxena and Joshua Le, Manor Lakes P12 College

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Suitability: VCE Units 3 & 4

Repeat of B11

C12 Fatter Physics (increase your class size)

Dianne Wilkinson, Box Hill High School

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Suitability: All

Repeat of A12

C13 Using Wolfram tools to advance exploration in Physics

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Suitability: Years 7 - 10, VCE UNITS 1-4

Repeat of A13

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C14 Outreach workshops contextualise student learning

Jessica Kvansakul & Emma Gill, La Trobe University

Physics workshops in La Trobe's Outreach Program provide context and background for students. Developed in collaboration with researchers, academics and experienced teachers, the workshops align with the VCE curriculum. Workshop activities provide students with a better understanding of scientific methods and consolidate science inquiry skills, core components of all science studies.

Delegates have the opportunity to explore activities from a number of workshops including Radioactivity (Unit 1, AOS 3), Transmission of Electrical Power (Unit 3, AOS 2), and Photoelectric Effect (Unit 4, AOS 2).

Suitability: All

Not Repeated

C15 Tune to the music and wave to the Science

Brian Lannen, Wodonga Institute of TAFE

A forensic science scenario is used to introduce a case for analysing sound waves. Both the generation and analysis of sound is considered along with technology to examine period, frequency and note. The science, mathematics and technology are all there. Now can you engineer some music?

Delegate Note: A preview of the activity can be found at the following weblink, but it is not essential to read beforehand. <https://education.ti.com/en/tiscienspired/us/detail?id=9C3D1196CF23482C8036ED935F797F7E&t=8CE921F03DC247628767C9BD34D788BC>

Suitability: Years 7 - 10

Not Repeated

C16 Australian Seismometers in Schools, how waves rock our world.

Dr Michelle Salmon, Australian National University

Find out how you can participate in a nation wide science experiment, and how you can watch seismic waves roll across Australia from earthquakes across the world. Earthquake activity provides a real-time link between science and big news events. This provides a real-world application to the study of waves, resonance and even electromagnetics.

Suitability: All

Not Repeated

Meet'n Greet
4:15pm - 5:15pm

Saturday Excursion Tasters and Medical Physics In-Service

9:00am

D1 The Australian Synchrotron

(1 hour) Clayton

The Australian Synchrotron
(<http://www.synchrotron.org.au/>)

Participants will see the range of practical activities that are available for secondary students to do as part of an excursion and have the opportunity of a short guided tour of some aspects of the facility. Location: Blackburn Rd, Clayton.

11:30am

E1 Medical Physics In-Service at Peter MacCallum Cancer Centre

(2 hours) Grattan St, Parkville

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.

2:30pm

F1 Victorian Space Science Education Centre (VSSEC)

(90 min) Strathmore Secondary College

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 the Unit 1 Area of Study, The Origin of Atoms and two Unit 2 options: How Heavy Things Fly and What are Stars?