Dear Science Faculty,

There are a number of opportunities for digital excursions in the month of November. The great thing about them is most are FREE!

Some are targeted to Stage 6 Physics, but there are a number for Stages 4 & 5.

Please let me know if you are interested in these. I can then look at the timetable and the logistics of getting these organised.

**DYNAMIC EARTH**

Date: Wednesday 7th OR 14th Nov 2012 OR 21 Nov 2012

Time: 2:00 - 2:45pm

Cost: $50

**Target: Stage 4**

This is an interactive workshop with experiments that explores the structure of the earth and plate tectonics. Students will be able to make a volcano erupt in their own classroom and learn about the

layering of lava flows. The lesson will also show Australian Museum specimens and involve question and answer opportunities.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=173157>

**Solar Eclipses and Planet Hunting**

Date:Wednesday 7th Nov 2012

Time: 1:00 - 1:45

Cost: FREE

**Target: Stages 4 to 6 (Physics - Cosmic Engine, Space and Astrophysics)**

A total solar eclipse is a rare and spectacular astronomical event. The next eclipse will happen on 13 November and will be visible from northern Australia. You and your students are invited to join Dr Paul Hancock as he leads an inspiring discussion about the science behind eclipses and how astronomers use eclipses to find planets around other stars.  Your students are encouraged to chat with a professional astronomer about what it’s like to be a scientist and the tools that astronomers use to understand the Universe.  Dr Paul Hancock is a Super Science Fellow at the University of Sydney. He uses radio telescopes to search for exploding stars, flickering quasars, and other exotic objects.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213292>

**The EXPANDING UNIVERSE**

Date: Thursday 8th Nov 2012

Time: 1:00 - 2:00

Cost: FREE

**Target: STAGE 6 Physics: Cosmic Engine, Space, Astrophysics, Prescribed Focused Area "contributions physics has made to society, with particular emphasis on Australian achievements".**

One of the most exciting scientific discoveries in the past ten years is that our Universe is pervaded by a mysterious ‘dark energy’. This strange phenomenon was discovered by Australian astronomer Prof Brian Schmidt and colleagues, for which they were awarded the 2011 Nobel prize in Physics. You and your students are invited to join Prof Schmidt as he leads an inspiring discussion about dark energy and how he discovered that the Universe is accelerating. Your students are encouraged to chat with him about what it’s like to be a scientist and the tools that astronomers use to understand the Universe.

Prof Brian Schmidt is an ARC Laureate Fellow at the Australian National University. He is now leading the SkyMapper project that will produce the first digitised maps of the entire southern sky.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213271>

**COSMIC EXPLOSIONS**

Date: Tuesday 13 Nov 2012

Time: 11:00 - 11:45

Cost: FREE

**Target: Stage 6 Physics - Cosmic Engine, Astrophysics and Space.**

What are the biggest explosions in the Universe? How do we measure them and how can we use them to learn about the Big Bang?  You and your students are invited to join Dr Fang Yuan as she leads an inspiring discussion about the most explosive events in the cosmos.

Your students are encouraged to chat with a professional astronomer about what it’s like to be a scientist and the tools that astronomers use to understand the Universe.  Dr Fang Yuan is a research fellow at the Australian National University. She grew up in China and received her PhD in physics from the University of Michigan in the US. She is an expert on powerful cosmic explosions such as supernovae and gamma-ray bursts.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213310>

**LIQUID NITROGEN PROPERTIES**

Date: Wednesday 14th Nov 2012

Time: 9:00 - 9:45 & 10:00 - 10:45

Cost: $55

**Target: Stages 4 & 5**

Outcomes:

4.6. identifies and describes energy changes and the actions of forces in common situations

4.7. describes observed properties of substances using scientific models and theories

4.8.1.(a) identify that living things are made of cells

5.6. applies models, theories and laws to situations involving energy, force and motion

5.7. relates properties of elements, compounds and mixtures to scientific models, theories and laws

5.8.1 (a) explain that systems in multicellular organisms serve the needs of cells

Find out how solids, liquids and gases change when rapidly heated and cooled.

Smash a squash ball! Shrink a balloon instantly!

What happens to living things if they are frozen?

How can Newton's 3rd Law of Motion explain a liquid nitrogen sprinkler? Pop can lids and expand balloons... + many others!

Your class will have a chance to run an experiment during the event using materials supplied by your school. Fizzics Education will provide background information required prior to the event date. Should you require a different day please contact us and we'll arrange a suitable time for you!

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213319>

**Einsten and Special Relativity**

Date: Thurs 15 Nov 2012 OR Friday 16 Nov

Time: (Thurs) 1:00 - 1:45pm; (Fri) 10:00 - 10:45)

Cost: FREE

**Target: Stage 6 Physics - Space**

Strange things happen when objects start moving near the speed of light. Einstein showed that our common sense ideas of time, distance, and mass are not quite right. In this videoconference, Dr Greg Madsen will talk about on the fundamental concepts behind special relativity and give illustrative examples.

The session will include plenty of time for questions from the students. Your students are encouraged to chat with a professional astronomer about what it’s like to be a scientist and the tools that astronomers use to understand the Universe.

Dr. Greg Madsen is a Senior Research Fellow at the University of Sydney and a member of the ARC Centre of Excellence for All-Sky Astrophysics. His research interests include the physics of the interstellar medium, transient and variable stars, and radio telescope instrumentation.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213301>

**HUNTING FOR BLACK HOLES**

Date: Thursday 22 Nov 2012

Time: 1:00 - 2:00pm

Cost: FREE

**Target: Stages 4, 5 and 6**

**Stage 4 & 5 Science:**

• Outcomes 4.9 and 5.9

• Prescribed Focus Area: “Current issues, research and development: Science as a human endeavour”

**Stage 6 Physics:** “Cosmic Engine”, “Space”, and “Astrophysics”

What are black holes made of? How are they work? How do you find them? You and your students are invited to join Dr Sean Farrell as he leads an inspiring discussion about some of the most mysterious objects in the Universe.

The session will include plenty of time for questions from the students. Your students are encouraged to chat with a professional astronomer about what it’s like to be a scientist and the tools that astronomers use to understand the Universe.

Dr Sean Farrell is an ARC Postdoctoral Fellow at the University of Sydney. He researches black holes by looking at the light they emit when gas falls into them. His most recent work has uncovered an entirely new class of black holes that live in the outskirts of galaxies.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213277>

**GALACTIC ASTRONOMY**

Date: Friday 23 Nov 2012

Time: 11:00 - 11:45

Cost: FREE

**Target: Stage 6 Physics - Cosmic Engine, Space and Astrophyics**

What kinds of galaxies can we see and how are they made? What happens to them as they grow older? What will happen to our Milky Way galaxy?

You and your students are invited to join Dr Amanda Bauer as she leads an inspiring discussion on topics in the Cosmic Engine, Space, and Astrophysics modules of the Physics Stage 6 Syllabus.

Your students are encouraged to chat with a professional astronomer about what it’s like to be a scientist and the tools that astronomers use to understand the Universe.

Dr Amanda Bauer is a Super Science Fellow at the Australian Astronomical Observatory. She uses telescopes to explore how galaxies are formed, how they lived their lives, and how they evolved into the diverse array of galaxy species we see today.

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=213282>

**SUSTAINABLE SOLUTIONS WORKSHOPS**

Date: Friday 30th Nov 2012

Time: 12:00 - 1:00pm

Cost: FREE or $40 per class (includes materials and shipping)

**Target: Stage 4 and 5 Science 4.3, 4.7.6, 4.11, 5.3, 5.7.6, 5.11**

Bring your eco-designer thinking caps to this hands-on workshop! Discover the properties of plastics and polystyrene foam, analyse their lifecycles, then explore innovative solutions to create more environmentally-friendly materials. Pull up your sleeves — make your own eco-friendly bioplastic to ensure a better future for the planet.

Each class will require the following EQUIPMENT to take part in the workshop:

Hotplates

Beakers

Stir sticks

Each class will require the following MATERIALS to take part in the workshop:

1 box (300g) of corn starch/corn flour

1 bottle (1 litre) of white vinegar

1 bottle (500 mL) of glycerine

1 roll of baking paper

Teachers can purchase their own materials OR materials can be provided by the Powerhouse Museum and shipped to the school (extra $40.00 cost applies for materials and shipping).

<http://dartconnections.org.au/BookingRetrieve.aspx?ID=205238>