



Secondary School Newsletter - Volume 3 August 2007

Welcome to Volume 3 of the QCV Schools Newsletter!

In this edition the staff spotlight will fall on Dr Brant Gibson, QCV's Photonics Development Engineer. We will also profile the life and work of renowned quantum physicist and Nobel Prize winner, Richard Feynman and give you a physics update of the University Open day.

The University of Melbourne Open Day

Open Day will be held on Sunday 19 August at the Parkville campus and the Victorian College of the Arts and at the Burnley and Dookie campuses on Sunday 26 August. For everything you need to know about Open Day including the programs, maps and MetLink guide direct your web browser to:

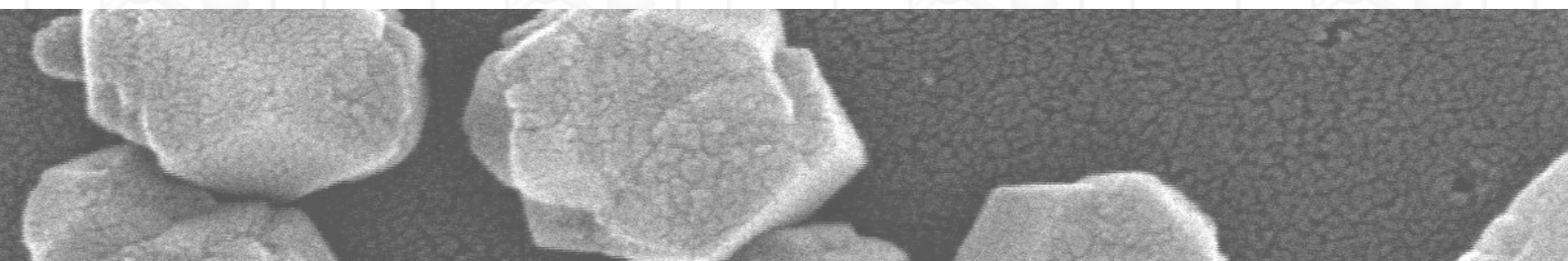
<http://www.futurestudents.unimelb.edu.au/about/penday/>

For Science specific activities, go directly to page 33 in the program. The School of Physics program starts on page 36, make sure you try to get to the internationally acclaimed *Physics and Laser Show* at 12.30pm in the Laby Theatre. The show features an extraordinary laser display as well as an amazing array of physics information. Follow the campus map link from the Open Day site, the School of Physics is building 192 and the Laby Theatre is map reference E20.

On Open Day, there will be many interactive displays located on the first floor of the Laby Theatre that students, teachers and parents will find fascinating. Don't forget the Physics Museum, also on the first floor of the Laby Theatre, which houses a collection of some 350 items of historical and scientific interest, including scientific apparatus constructed by former professors and staff for research purposes. Also included in the collection are equipment and photographs spanning the history of the School of Physics, which was established as the School of Natural Philosophy in the 1880's.

QCV will have a display on the ground floor of the Laby Theatre. We encourage all of you to come and visit us, chat to one of the Experimental Team and ask a question (or three!) and grab yourself a QCV frisbee.

We hope to see you at Open Day.



QCV Staff in the Spotlight

Dr Brant Gibson



Dr Brant Gibson completed his Year 12 at Bendigo Secondary College, from there he undertook a Bachelors degree in Electronic Engineering

(specialising in Optics) at La Trobe University. After completing this degree, Brant undertook a PhD in Optical Engineering. During his studies he worked for Virtual Photonics Inc. in product development, analysis and testing. On completing his PhD, Brant worked as a Research Fellow within the School of Physics at The University of Melbourne. He joined QCV as a Development Engineer towards the end of 2005, bringing a solid engineering background.

Brant has recently become a father for the first time, to Spencer, is an avid Collingwood supporter and game show fanatic. He also enjoys golf, a variety of musical genres, trivia (especially questions involving sport and bad 80's music!) and cooking.

Physics History

Richard Feynman

Richard Phillips Feynman (1918–1988) was born in New York City. As a child he was fascinated by mathematics and electronics, used to repair the radios of his neighbours with no knowledge of how they worked and became known as “the kid who fixed radios by thinking”.

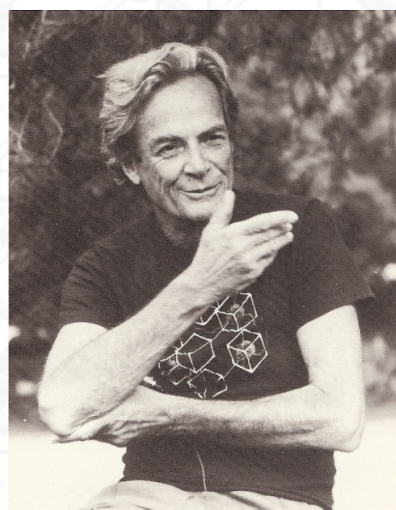
He graduated with a Bachelor's degree in physics from the Massachusetts Institute of Technology (MIT) in 1939 and obtained his

PhD from Princeton University in 1942. His thesis, entitled “*A Principle of Least Action in Quantum Mechanics*”, was typical of his use of basic principles to solve fundamental problems.

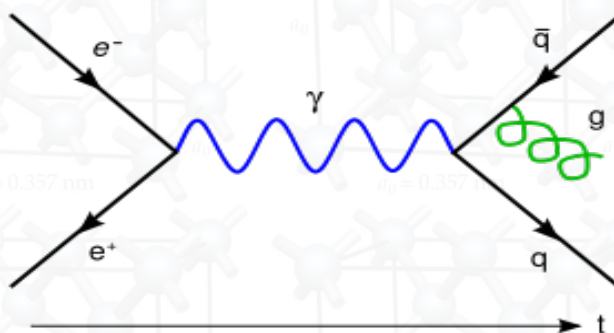
During World War II (1939-1945) Feynman worked at what would become Los Alamos National Laboratory in central New Mexico, where the first nuclear weapons were being designed and tested. While there, Feynman was in charge of a group responsible for problems involving large-scale computations (carried out by hand or with rudimentary calculators) to predict the behavior of neutrons in atomic explosions.

After the war Feynman moved to Cornell University, where German-born American physicist Hans Bethe was gathering an impressive group of theoretical physicists. Feynman continued developing his own approach to quantum electrodynamics (QED) at Cornell and then at the California Institute of Technology (Caltech), where he moved in 1950. The written version of a series of undergraduate lectures given by Feynman at Caltech, “*The Feynman Lectures on Physics*” quickly became a standard reference in physics.

Dr Feynman



He made important contributions to the theory of quarks (particles that make up elementary particles such as protons and electrons) and superfluidity (a state of matter in which a substance flows with no resistance). He also created a method of mapping out interactions between elementary particles that became a standard way of representing particle interactions and is now known as Feynman Diagrams. See below for an example.



Feynman was a noted teacher, a notorious practical joker and one of the most colorful characters in physics. He shared the 1965 Nobel Prize in physics with American physicist Julian Schwinger and Japanese physicist Tomonaga Shin'ichirō for his work on QED. Each of the three had independently developed methods for calculating the interaction between electrons, positrons (particles with the same mass as electrons but opposite in charge) and photons (packets of light energy). The three approaches were fundamentally the same, and QED remains the most accurate physical theory known.

In 1986 Feynman was appointed to the Rogers Commission, which investigated the explosion aboard the space shuttle Challenger that killed seven astronauts earlier that year. In front of television cameras, he demonstrated how the failure of a rubber O-ring seal, caused by the cold, was responsible for the disaster.

Feynman wrote several popular collections of anecdotes about his life, including *"Surely You're Joking Mr. Feynman"* and *"What do YOU Care What Other People Think?"*.

Contact

If you would like to arrange a visit by the QCV Team to your school, please contact our Operations Centre on (03) 8344-8744 or by email to wattss@unimelb.edu.au. For more information on QCV, go to our web site at:

www.qcvictoria.com

To contact the School of Physics, please call (03) 8344-7670 or email them at enquiries@physics.unimelb.edu.au. The School's web site can be found at:

<http://www.ph.unimelb.edu.au/>

To book the Physics and Laser Show and find out more about their programs, please go to:

<http://scampy.ph.unimelb.edu.au/mambo/>

For more information on Science at The University of Melbourne, go to the Faculty's web site at:

<http://www.science.unimelb.edu.au/>

