



**Australian Institute of Physics  
NSW Branch (September Public Talk)**

**“Photonic Crystals: Light’s Playground”**

**Dr Felix Lawrence**

**School of Physics, University of Sydney**

**Tuesday 21<sup>st</sup> September 2010 @ 5.30PM**

**At the**

**Slade Lecture Theatre, School of Physics, University of Sydney**

**Public talk arranged by: The Australian Institute of Physics (NSW Branch)**

***Entrance is FREE***

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***Summary of talk:***

Photonic crystals (PCs) provide an interesting platform for light to propagate through. A PC has a periodic variation in refractive index – this periodicity can be in one, two or three dimensions. These variations in refractive index cause light to diffract, giving rise to a number of interesting effects: PCs can slow and intensify light, sensitively split it according to frequency (the *superprism effect*), guide light around tight bends, or stop light's propagation completely over a range of frequencies (the *photonic band gap*). Like many 'novel' materials, there are naturally occurring examples of PCs, such as opals, the wings of some butterflies, and in the spines of the sea mouse. But with modern fabrication technology and a bit of imagination, scientists can move beyond pretty colours and use photonic crystals for optical signal processing that will speed up the internet, or even to cloak objects. In this talk I will provide a broad overview of photonic crystals, explaining how light propagates (or not) through PCs, and outline the dreams and deeds of photonic crystal researchers.





### ***Brief Biography of the Speaker:***

Felix Lawrence is a third-year postgraduate student studying the impedance of photonic crystals. He studies at CUDOS (the Centre for Ultrahigh-bandwidth Devices for Optical Systems) in the School of Physics at the University of Sydney, where he also completed his undergraduate studies. He is supervised by Martijn de Sterke, Ross McPhedran, Lindsay Botten and Kokou Dossou. In 2008 he won an award for his

talk at ACOFT/OECC, and has now taken out the CUDOS Student Prize two years running; in 2009 for a feature article on metamaterials and cloaking, and in 2010 for a rap video in which the protagonist insults his enemies by unfavourably comparing them to various optical phenomena. He won the 2009 NSW-AIP Postgraduate Award for his talk *Photonic Crystals and Impedance*.

### ***Detailed Schedule for Tuesday, 21<sup>st</sup> September 2010:***

- 5.30-6.30 pm **LECTURE by Dr Felix Lawrence.**
- 6:35-7.00 pm **REFRESHMENTS, Slade Lecture Theatre.**
- 7.00-8.00 pm **LECTURE by Associate Professor David Coutts.**
- 8.15 pm **DINNER with the Speakers at Buon Gusto (Italian), 368 Abercrombie Street, Chippendale.**  
*E-mail Dr Fred Osman ([fred\\_osman@exemail.com.au](mailto:fred_osman@exemail.com.au)) if you will be able to join us for dinner.*

### ***Travel Directions:***

- Train to Redfern station and walk to the **School of Physics**.
- Buses 422, 423, 426, 428, 448, and 450 from Circular Quay to City Road / King, or 412, 435, 438, 470, 483 etc. along Parramatta Road from Circular Quay.
- Drive and park in various parking lots. You will need to pay for parking (**\$6 flat-rate after 4 pm**) and display the ticket in your car. You may also find parking places on public roads outside the Uni.

### ***Event sponsored by:***



***The Australian Institute of Physics – NSW Branch  
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