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The Photonics Institute



## Public Lecture

# The maggot in the apple: peaceful coexistence of incompatible theories

Prof Sir Michael Berry, H H Wills Physics Laboratory, University of Bristol, UK

**Date: Tuesday, 12 April 2016**

**Time: 2.30pm to 3.30pm** (Please be seated by 2.15pm)

**Venue: NTU, LT24, Block SS1 SS1-B2-03**



### ABOUT THE SPEAKER



Sir Michael Berry received his PhD in Physics from St Andrews University in 1965, and has been on the faculty of Bristol University for over 50 years, where he is now the Melville Wills Professor of Physics (Emeritus). He has made numerous groundbreaking contributions in the fields of quantum chaos and optics; one of his theoretical discoveries, the Pancharatnam-Berry phase, has found profound and widespread use in optics, condensed-matter physics, and many other fields of physics. He is a Fellow of the Royal Society, and has won numerous prestigious awards including the Maxwell Prize (1978), the Dirac Prize (1990), and the Ig Nobel Prize (2000).

In physics, as in science generally, most phenomena can be understood in more than one way: the gas in an engine obeys the laws of thermodynamics and also those of the motion of its molecules. The different theories correspond to different levels of description. These must overlap, but understanding their consilience is far from straightforward because they are usually based on seemingly incompatible concepts. The discordance arises from the fact, unappreciated until recently, that the limit in which the more general theory reduces to the less general (usually older) theory is mathematically singular. One consequence is a range of phenomena, of intense current interest, inhabiting the borderlands between the theories. I will explore this theme with examples from the physics of fluids, light and the quantum world.