

SATURDAY MORNING PHYSICS



DEPARTMENT OF PHYSICS
DURHAM UNIVERSITY
SOUTH ROAD
DURHAM
DH1 5LE

SATURDAY 10:50 - 12:50
OCT 7TH, 10TH
NOV 4TH, 11TH, 18TH, 25TH
DEC 2ND, 9TH

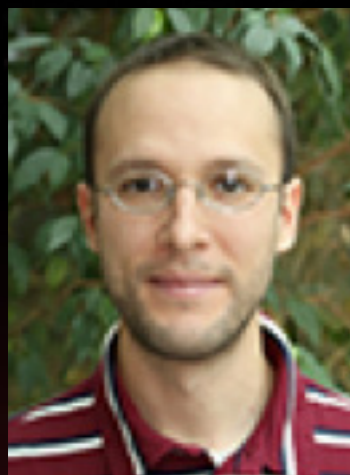


7.10. Prof Carlos Frenk: How the Universe got Structure

The laws of physics allow us to track the evolution of our Universe and calculate how structures such as galaxies emerged, over 13.7 billion years of evolution, from the Big Bang.

14.10. Dr David Cerdeno: Dark Matter on the Rocks

Astrophysical and cosmological observations have provided substantial evidence for the existence of Dark Matter, which constitutes 85% of all the matter in the Universe but does not emit or absorb light. In this talk I will explain the various experimental techniques that are being employed to try to observe this elusive new type of matter.



4.11. Fabrizio Caola: Finding Higgs

The discovery of the Higgs particle at the Large Hadron Collider near Geneva marked a milestone for our understanding of the fundamental laws governing the universe. Without it, life as we know it would not be possible. With this discovery, we now have for the first time a coherent picture of physics that combines Einstein's special relativity with quantum mechanics and allows to describe a huge variety of real world phenomena from first principles. In this lecture, I will explain why the Higgs boson is so important for this picture, and give a glimpse of how this particle is investigated at the Large Hadron Collider, one of the biggest scientific experiments ever built in human history.

11.11. Prof Chris Done: Black Holes: Science Fact, Fiction or Fantasy?

Black holes are a key plot device in science fiction and fantasy, wormholes through space and time! Here I'll separate out the fact from the fiction, and talk about how black holes went from a speculative extension of Einstein's gravity to a mainstream observational science via the development of rockets at the start of the space age.



18.11. Prof Charles Adams: The Mystery and Mastery of Photons¹

Einstein said that he had spent his whole life trying to understand light quanta. Despite their ubiquity and enormous experimental progress in quantum optics, photons still raise some fundamentally troubling questions. Ask the Nobel Prize winner for the quantum theory of light, where is the photon? He will tell you that a photon is where it is detected. In Durham we experiment on single photons to give better answers to these questions and to address applications such as the next generation quantum internet. Our greatest achievement is to make two photons interact without ever being in the same medium - something that no-one thought possible even 10 years ago! In this talk I will tell you how we did it.



25.11. Prof Andy Monkman: The Molecular Television

In this talk we shall explore the world of organic light emitting diodes that are used in the latest generation of curved, flexible and transparent televisions and mobile phones. Because these organic diodes are only a few hundred nanometres thick, whole new possibilities open up for display devices and large area lighting applications. Current and future technologies will be highlighted to show off these new possibilities.

02.12. Prof John Ghrkin: Finding Nemo's Heart

How can the combination of advanced astronomical telescopes and the humble Zebrafish help us understand and cure heart disease? By working together across traditional boundaries researchers are now solving highly complex challenges in the life sciences. This work is leading to significant advances in understanding a wide range of diseases with the target of improved healthcare and quality of life. This talk will focus on recent developments in optical microscopy in particular their use in imaging Zebrafish to help understand heart disease.



9.12. Dr Pete Edwards: Einstein, Einstein give us a Wave!

One hundred years ago Einstein predicted the existence of gravitational waves on the basis of his General Theory of Relativity. For over 20 years physicists have been trying to catch the first gravity wave without success until last year when the Laser Interferometer Gravitational-Wave Observatory (LIGO) recorded the ripples from two black holes colliding. The talk will focus on this historic discovery, the technology behind gravitational wave detectors and how they give us a new way to observe and explore our universe.



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BILL BRYSON
LIBRARY

OGDEN CENTRE



OGDEN CENTRE
WEST

All talks take place in the James Duff lecture theatre (PH8) in the Physics Department of Durham University, South Road Durham, DH1 3LE. Limited parking facilities. Sessions start at 10:30 and last for 2 hours. Refreshments will be provided during a coffee break. Various hands-on sessions will supplement the talks.