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# Quantum Sensing a New View of the Universe as Revolutionary as the First Telescope

*Monday, 3 December 2018 11:00 (20 minutes)*

The use of quantum sensors to investigate gravity, dark matter, and the early universe is in the vanguard of a 2nd Quantum revolution; as significant as the first deployment of telescopes it will transform the way we understand the world. The technological innovation that is the engine of society's development has been initiated and fuelled by fundamental scientific research; from Faraday's work on electricity to the development of the world wide web. In the 20th century the application of our best understanding of the sub atomic world – quantum mechanics- generated new knowledge about the world and new technologies that improve the human condition. Examples include semiconductor microelectronics, photonics, the global positioning system (GPS), and magnetic resonance imaging (MRI). These technologies underpin significant parts of the economies of developed nations, we refer to this as the "1st Quantum Revolution". Future scientific and technological discoveries from the application of quantum mechanics may be even more impactful – a 2nd Quantum Revolution. The areas that will be potentially transformed include biology, the defence sector and fundamental science. It is the latter that is the focus of this talk.

## Presenter Biography

Ian is the Henry Moseley Centenary Professor of Experimental Physics, and Head of the Department of Physics at Oxford. He is an experimental particle physicist. He works in large international science collaborations. These collaborations seek to understand how the universe was born, how it will evolve and how it will end using particle accelerators and telescopes. Ian studies heavy quarks and the Higgs Boson, searches for dark matter, and studies dark energy. He develops the instrumenation that enables these studies; most recently a pixel detector that identfied the Higgs Boson for the first time.His contributions to the elucidation of the physics of heavy quarks were recognised by Fellowship of the American Physical Society in 2002 and his contributions to particle physics at the Large Hadron Collider by Fellowship in the American Association for the Advancement of Science in 2012. He was elected Chairperson of the Collaboration Board of the Compact Muon Solenoid Experiment (CMS) at the LHC at CERN, Switzerland (2013), elected a member of the Board of Directors of the Large Synoptic Survey Telescope Corporation (2009-12 & 2017-2021), the co-coordinator of the LHC Physics Center at Fermi National Accelerator Laboratory (Fermilab) (2009-2012), and three times elected co-Spokesperson of the CLEO experiment at Cornell University (2001-2004). He was elected Chairperson of the APS Division of Particles and Fields (DPF) (2011-2014). Ian is profoundly deaf. He has given ninety colloquia and talks to the public on hearing, cochlear implants and perception since the miracle of a cochlear implant restored his hearing. A recent example is here: https://podcasts.ox.ac.uk/bionic-hearing-science-and-experience

**Primary author:** Prof. SHIPSEY, Ian (University of Oxford)

**Presenter:** Prof. SHIPSEY, Ian (University of Oxford)

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