



Science Society Termcard Lent 2017

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<http://tcss.soc.srcf.net/>

Tuesday 24th January 18:15 Winstanley Lecture Theatre

Dr. Christopher Lester: *The Large Hadron Collider and Murphy's Law*

Scientific progress is rarely achieved without some form of pain. All experiments, whether big or small, face numerous challenges from forces of bad luck, human error, and the thoroughly unexpected. This is inevitably true also for the LHC. This talk will describe a small set of the minor and unreported (and not so minor) engineering “surprises” that were encountered when the LHC began to take its first steps onto the world stage back in 2008.

Tuesday 31st January 18:15 Winstanley Lecture Theatre

Prof. Richard Barker: *Bioscience—lost in translation?*

Bioscience is advancing in leaps and bounds. But translation into transformational products and practical impact on patients lags far behind. What are the scientific, structural, process and cultural reasons for this, and what can be done about them? Does precision medicine hold some of the answers?

Tuesday 7th February 18:15 Junior Parlour

Prof. Chris Hunter: *Sequence Polymers*

The chemical compositions of biological polymers such as proteins and nucleic acids are usually well-defined sequences of different monomer units. In contrast, the synthetic polymers that form our material world are generally composed of multiple repeats of the same monomer unit. In this presentation, I will discuss the possibilities for developing synthetic polymeric materials composed of defined sequences of different monomer units. These systems would combine the functional programmability of biological molecules with the chemical diversity available in synthetic systems.

Tuesday 14th February 18:15 Winstanley Lecture Theatre

Dr. Stephen John: *Why scientists should not be sincere, honest, open or transparent*

Many central ethical problems in science concern communication: should scientists always declare conflicts-of-interest? Is it ethical to report results which others may use for evil ends? When are scientists responsible for how others use their words? In this talk, I consider four common claims about the ethics of scientific communication: that scientists should be sincere, honest, open and transparent. Using the case study of climate change, I argue against each of these claims. Does that mean that anything goes? Not quite...

Thursday 16th February 18:15 Winstanley Lecture Theatre

Dr. Sander Dieleman: *Deep learning for music recommendation and generation*

This talk is hosted jointly with the TMS.

The advent of deep learning has made it possible to extract high-level information from perceptual signals without having to specify manually and explicitly how to obtain it; instead, this can be learned from examples. This creates opportunities for automated content analysis of musical audio signals. In this talk, I will discuss how deep learning techniques can be used for audio-based music recommendation. I will also briefly discuss my ongoing work on music generation with WaveNet.

Tuesday 21st February 18:15 Winstanley Lecture Theatre

Dr. Peter Murray Rust: *Can machines understand the scientific literature?*

Every 15 seconds a new Scientific/Technical/Medical (STM) article is published and it's impossible for anyone to keep up. We need machines to help. It's much easier when everything is Open, and we are downloading and analysing papers in bioscience, astrophysics, clinical trials. I believe that Wikidata will become the primary means to index STM material and we can use this to build specialist search tools.

Technically it's becoming easy to create and deploy "text and data mining" (TDM)—or more widely "Content Mining"—and very accessible to students (our youngest developer is 15 years old). But TDM has caused huge controversy in Europe. I'll contend that Science is being held back by copyright.

You are invited to participate so bring your laptops/mobiles and we'll try some simple experiments.

Tuesday 28th February 18:15 Winstanley Lecture Theatre

Prof. Harvey Reall: *Gravitational waves from merging black holes*

General Relativity, Einstein's theory of gravity, predicts that the motion of large masses at high speeds produces gravitational waves: disturbances in the gravitational field that travel at the speed of light. In September 2015, the LIGO observatory made the first direct detection of gravitational waves. The waves were produced in the merger of a pair of black holes, during which the power output in gravitational waves exceeded the luminosity of all the stars in the visible Universe. This is the first observation of a phenomenon involving a strong, highly dynamical, gravitational field, a regime in which General Relativity had not been tested previously by observations. I will review these developments, focusing on the theoretical predictions and the extent to which these have been confirmed by observations.

Tuesday 7th March 18:15 Winstanley Lecture Theatre

Dr. Kelly BéruBé: *Recycling Medical Waste Tissues: Bringing Life Back from the Dead*

The respiratory system acts as a portal of entry into the body for airborne materials, and lung disease now represents a major cause of human morbidity and mortality worldwide. For this reason, understanding of mechanisms of human lung biology is now a principal focus within the field of inhalation toxicology.

Animal models are routinely used to investigate lung disease but they do not truly reproduce the responses that occur in humans. Scientists have been developing viable alternatives derived from human medical waste tissues, to generate in vitro models that resemble the in vivo human lung environment. Advances in tissue-engineering have made it feasible and cost-effective to construct human tissue equivalents of the respiratory epithelia. When 3-D cell cultures are employed for testing aerosolised materials (i.e. air pollution), responses are captured that mirror the events in the in situ human lung and provide human endpoint data, thus negating the need for animal models in medical research.

Sunday 12th March All Day Winstanley Lecture Theatre

Annual Symposium and Dinner

The Trinity College Science Society Symposium and Dinner is a unique event spanning an entire day of talks by Trinity students and fellows. At the end of Lent term every year, current students of Trinity College present their research and findings to their peers in a friendly, informal environment. The event is free and open to all; no particular specialist knowledge is assumed. There is no need to stay for the whole day—just drop in on any talks you find interesting. A full list of student speakers will appear on the website once they have been arranged.

As has become tradition, the Annual Dinner takes place on the evening of the Symposium. This is a sumptuous black tie dinner, taking place in Trinity Colleges Old Kitchens. Booking information will be made available via our mailing list.

Tuesday 14th March 18:15 Blue Boar Common Room

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Trinity College Science Society was founded in order to “promote the understanding of and interest in science amongst all members of Trinity College ... and encourage the discussion of science between all students of Trinity”.

This is achieved each year by providing an annual programme of interesting and engaging talks and events. Our talks try to cover as many branches of science as possible, looking at current research, history and policy.

All talks are free and open to members of the university and the general public, and are preceded by generous refreshments.

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<https://lists.cam.ac.uk/mailman/listinfo/trin-tcss>