

Wednesday, 6th January, 2010

**The Problem with Mathematics**

Mr. Noel Brett



Studies reveal that many students leave school equipped with fairly limited numeracy skills coupled with a marked dislike for mathematics. Is the subject matter intrinsically impenetrable to all but an elite few students? Is innumeracy, or 'mathematical illiteracy', a consequence of poor quality teaching and not the result of the subject matter taught but rather the pedagogy used to teach it?

This lecture will reflect on the mathematics syllabus and seek to identify inherent weaknesses and difficulties with a view to proposing strategies so that we may learn from the past (or be doomed to repeat it!).

*Noel Brett has taught Applied Mathematics and Physics in both 2nd and 3rd Level colleges. He is Chief Adviser in Higher Leaving Certificate Physics and served for ten years as an External Examiner in the European Baccalaureate. He is Project Coordinator for the newly established CIT/UCC Science and Technology Teaching and Learning Centre (STTLC) based in UCC.*

Wednesday, 27th January, 2010

**From Molecules to Milk**

Professor Paul McSweeney



Milk is an extremely complex biological fluid and the chemistry and biochemistry of milk and dairy products is an active area of research with very practical applications. This presentation will overview some active areas of research in dairy biochemistry including the pathways through which the approximately 500 flavour compounds in cheese are produced, the chemistry of lactose, the principal sugar in milk, the many biologically active and health-promoting systems, compounds and enzymes that are present in milk and how the proteins in milk can be isolated and used in food products.

*Paul McSweeney is Associate Professor of Food Chemistry, Department of Food and Nutritional Sciences, University College, Cork, Ireland. He holds a BSc in Food Science and Technology, a PhD and DSc in Food Chemistry, and an MA in Ancient Classics. The overall theme of his research is Dairy Biochemistry and Enzymology and he is the co-author or co-editor of 8 books, including the 3rd edition of Cheese: Chemistry, Physics and Microbiology (Amsterdam, 2004) and the Advanced Dairy Chemistry series (New York, 2003, 2006, 2009), in addition to numerous research papers and reviews. He won the Marschall Danisco International Dairy Science Award of the American Dairy Science Association in 2004.*

Wednesday, 17th February, 2010

**Ethics, Technological Interventions and End-of-Life Choices**

Dr. Sharon Murphy



Technological interventions in the dying process complicate notions of a 'natural death' and give rise to persistent ethical questions regarding the choices made possible by such interventions. This lecture explores ethical issues relevant to end of life choices in contemporary healthcare settings by examining different approaches to extending life, 'letting die', euthanasia, and physician-assisted suicide, and considers what may be gained by reflecting on the ethical debates arising from these issues.

*Sharon Murphy has a Ph.D. in Philosophy from York University, Toronto. She teaches philosophy and ethics on a range of programmes in UCC, including the M.A. in Women's Studies, the B.Sc. in Microbiology, and the Adult and Continuing Education diploma courses in Disability Studies, Social Studies, and Environmental Science and Social Policy. Her current research interests include bioethics, philosophy of disability and feminist philosophy.*

Wednesday, 13th January, 2010

**The Cinema as Laboratory**

Ms. Claire Feeley



In French avant-garde literally means "advance guard," a military term used for troops leading an attack across the battlefield. In film and art in general it is used to describe a work that breaks new ground in order to define a new way of seeing the world and thus of living in it.

The story of cinema begins with science but the conversation has developed through artistic practice and experimentation. In this lecture we will touch upon some of the important histories of avant-garde cinema from the perspectives of both technical and artistic innovation. Some of the film makers we will look at are: Jean Epstein, Peter Kubelka, Joseph Cornell, Michael Snow and Hollis Frampton.

*Claire Feeley is currently Glucksman Fellow in curatorial practice. Claire graduated as Student of the Year from UCD Mechanical Engineering in 2006 before completing a Masters in Contemporary Art Theory in NCAD (2008).*

Wednesday, 3rd February, 2010

**Change or Collapse?  
Transforming Society and the New Engineer**

Dr. Edmond Byrne



The current societal paradigm of economic growth through ever increasing consumption of material and energy resources is clearly unsustainable. We are fast approaching the apex of this splurge; a 'perfect storm' of climate change, water, food and energy shortages has been predicted by 2030.

Society requires rapid transformation to avoid collapse. Supply and demand must both be tackled and engineers will design technologies to help realise this change. However the old engineering approach of optimising well-defined problems will not emancipate us from the current trajectory. The 'new engineer' must embrace an ethos whereby sustainability becomes the context of engineering practice.

*Edmond Byrne lectures in Process & Chemical Engineering. He is qualified with a BE (Chemical) and PhD in Process and Chemical Engineering. He is chair of the 3rd International Symposium on Engineering Education to be held at UCC on 1-2 July 2010, under the theme "Educating Engineers for a Changing World - Leading Transformation from an Unsustainable Global Society".*

Wednesday, 24th February, 2010

**What Lies Beneath?  
How Photonics Can Save the Internet  
From the Bandwidth Crunch**

Dr. Fatima Gunning



Although the Internet originated in the 1960s, it is only now, with popular applications such as Facebook, Twitter, Skype and YouTube, that we are experiencing mass social impact. The Internet, together with broadband access, allow us to be in constant communication globally, using technologies like the latest 3G mobile phones or even gaming consoles such as the PSP3. The ever-increasing bandwidth demands to deliver new applications will require service providers to upgrade the capacity for both customer delivery (broadband and fibre-to-the-home) and the largely unseen core network. In this lecture, I will consider the evolution of Internet demands, and describe how research at the Tyndall National Institute addresses imminent bandwidth bottlenecks in the access, metro and core network.

*Fatima Gunning obtained her PhD from PUC-Rio, Brasil, in 2000. Her research investigated the fundamental properties of optical fibres. She worked in the telecom industry with BT and Corning for several years and then joined the UCC Department of Physics and Tyndall National Institute in 2003, focusing on high capacity optical network research for the future. She also investigates technologies that merge telecommunications with biosensing.*

Wednesday, 20th January, 2010

**The Greenhouse Effect and Global Warming**

Professor J. Ray Bates



The natural greenhouse effect due to heat absorbing gases such as carbon dioxide in the atmosphere is essential for maintaining a comfortable temperature for life on Earth. The addition of excess greenhouse gases by human emissions upsets the natural balance and leads to global warming, with a consequent melting of sea ice and glaciers. In this lecture, Prof. Bates will discuss the basic mechanism of the greenhouse effect and the consequences of man's activities in raising greenhouse gas levels. He will also consider the question of whether the recent floods are related to global warming.

*Ray Bates is Adjunct Professor of Meteorology at UCD. He was formerly Professor of Meteorology at the University of Copenhagen and a Senior Scientist at NASA's Goddard Space Flight Centre. For most of his career he has been involved in the mathematical modeling of weather and climate. He was awarded the 2009 Vilhelm Bjerknes Medal of the European Geosciences Union for his research in these fields.*

Wednesday, 10th February, 2010

**Risk Intelligence - How Expert Gamblers  
Can Teach Us All  
to Make Better Decisions**

Dr. Dylan Evans



As the current financial crisis demonstrates, many people are bad at thinking about risk. Expert gamblers, however, seem to be an exception. They are less prone to the cognitive biases that affect most of us, and as a result, they can think about risk more clearly. During the past year, I have been interviewing expert gamblers to learn more about the way they think about risk. In this talk I will present my initial findings and outline some ways for thinking more wisely about risky choices.

*Dylan Evans is Lecturer in Behavioural Science in the School of Medicine at University College Cork. He is the author of several popular science books, including Emotion: The Science of Sentiment (Oxford University Press, 2001) and Placebo: The Belief Effect (Harper Collins, 2003) and writes regularly for The Guardian. He is a Distinguished Supporter of the British Humanist Association, and a Member of the British Fulbright Scholars Association*

Wednesday, 3rd March, 2010

**The Big Bang, the Large Hadron Collider  
and the God Particle**

Dr. Cormac O'Raifeartaigh



The Large Hadron Collider (LHC) at CERN is the world's largest scientific experiment and will re-create energy conditions last seen fractions of an instant after the Big Bang. This presentation will give an overview of the forthcoming experiments at the LHC and their relevance to several outstanding puzzles in science – from the world of the sub-atomic to the study of the universe at large.

*Cormac O'Raifeartaigh has a PhD in physics from Trinity College Dublin and lectures in physics and mathematics at Waterford Institute of Technology. He writes regularly on science in newspapers (The Irish Times) and magazines (Physics World), and is the author of the well-known science blog ANTIMATTER. He is a former Chair of the RAW debates at Science Gallery Dublin and is currently a Science Ambassador for Discover Science and Engineering, Ireland's national science promotion programme.*

Wednesday, 10th March, 2010

**A Theological Critique of  
'The God Delusion'**

Joe Egan



In an age when science has furnished us both with remarkable new insights into life and with tools to enhance the quality of life, religious belief is an anachronism to many. Few have argued the case against religion more passionately or polemically than Richard Dawkins, whose work *The God Delusion* lays the blame for much of the evil that is in the world squarely at the feet of religious belief.

Yet while advocating a strongly atheistic worldview as he seeks to displace religion, Dawkins highlights the need to replace the Ten Commandments with an amended set that encourages people to 'question everything' and that teaches them 'how to think for themselves, and how to disagree with you'.

This lecture takes up that precise challenge, questioning the work of Dawkins from a standpoint that is explicitly theistic, with a view to showing that Dawkins' approach is far too simplistic to do justice to the mystery that underpins life and that finds its perfect expression in the Triune God of Christian faith.

*Joe Egan completed his undergraduate studies in science (mathematics, mathematical physics and physics) and theology at St Patrick's College, Maynooth, in 1980, after which he was ordained priest in the Society of African Missions and went to work in pastoral ministry in Nigeria. From 1984 to 1989, he pursued postgraduate studies in theology at Rome, after which he returned to West Africa to teach theology in Liberia initially and then in Sierra Leone, during a turbulent era in the history of both those countries. Upon returning to Ireland in the mid-1990s, he lectured in theology first at the Kimmage Mission Institute in Dublin and then at the Milltown Institute of Theology and Philosophy, where he continues to work. His research interest is on the relationship of faith and culture and his publications include *Brave Heart of Jesus* (Columba Press, 2004) and *The Godless Delusion* (Peter Lang, 2009).*

**Grand Final UCC Science for All**

Postgraduate Student Public Presentation Competition

Wednesday  
24th March 2010  
7.00 p.m.

Boole Lecture Theatre 4  
UCC



Come and hear a selection of our finest postgraduate students explain their researches in science, engineering and food science, in terms understandable to a general audience. These students are the finalists in our Annual Postgraduate Student Public Presentation Competition. The competition will be held in Boole 4 Lecture Theatre, starting at 7.00p.m. The competition will be judged by a panel of lay-judges.

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If you would like a hard copy of the magazine, please e-mail your name/address to [w.reville@ucc.ie](mailto:w.reville@ucc.ie)



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**Grand Final UCC Science for All**  
Postgraduate Student Public Presentation Competition

The series is organised by  
*Professor William Reville,*  
*Public Awareness of Science Officer, UCC*

For further information  
Phone: 021-4904127/4904369 Fax: 021-4904452  
E-mail: [w.reville@ucc.ie](mailto:w.reville@ucc.ie)

<http://understandingscience.ucc.ie>



**UCC**

Coláiste na hOllscoile Corcaigh, Éire  
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**College of Science, Engineering and Food Science**

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to Ireland today*

**This public lecture series will run weekly  
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in Boole 4 Lecture Theatre at UCC**

**Lectures start at 8.00pm  
.....but please come a little earlier**

**ALL ARE WELCOME**

Brochure Design: Aisling Ní Mhurchú, Public Awareness of Science Office, UCC and Mary Heapes, Department of Biochemistry, UCC