

Euroscience Open Forum 2012

JULY 11 • WEDNESDAY

C Careers Programme **E** Events **K** Keynote Address **P** Partnership Symposia **S** Science Programme
N Science-2-Business

6:00AM – 1:30PM	E Exhibition Set-Up	The Forum
11:00AM – 6:30PM	E Delegate Registration	Entrance Foyer
4:00PM – 5:00PM	E Fáilte Reception NOTE: Event time to be confirmed	The Forum
5:00PM – 6:00PM	K Opening Ceremony: Céad Míle Fáilte <i>Speakers: Máire Geoghegan-Quinn, Prof. Patrick Cunningham, Prof. Enric Banda, Michael D. Higgins, Richard Bruton T.D.</i> <i>Compère: Dara Ó Briain</i>	Auditorium
6:00PM – 7:00PM	K Keynote Address: Jules Hoffmann (Nobel laureate) "From insects to mammals: reflections on a European journey through basic research on immune defenses" <i>Speakers: Prof. Jules Hoffmann</i> <i>Session Chair: Dara O'Briain</i>	Auditorium

JULY 12 • THURSDAY

8:00AM – 9:30AM	C Peer Review: meeting the challenges <i>Speakers: Julia Wilson, Alaa Ibrahim, Irene Hames, Dr John McConnell</i> 'Stem cell research is being blocked by biased reviewers'; 'Peer review keeps scientists firmly grounded'; 'Impact factors corrupting peer review'. These are just some of the recent discussions among researchers, the media and the public about challenges to peer reviewed publishing. Peer review results in 1.3 million learned articles being published each year and is fundamental to the integration of new research findings in hundreds of fields of inquiry. Many early career researchers want to find out about the peer review process, how to get involved in reviewing, and what to make of public discussions about fraud and misleading research claims in science and medicine. The typical questions raised by early career researchers will be addressed in a short guide that will be distributed to participants and discussed at the session. This interactive session will be a chance for early career researchers to directly question academics and editors closely involved in the peer review process. It will explore how peer review works, approach some of the criticisms of the process, and discuss whether peer review has wider implications in society beyond the research world.	Liffey Hall 1
8:00AM – 9:30AM	S Energy that Works: Practical solutions to our energy and climate crisis <i>Speakers: Karyn Morrissey, Rory Monaghan, Jamie Goggins, Henrike Rau, Mark Foley, David Taylor</i> Fossil fuels are the cornerstone of modern life, but as we face increasing energy demands, decreasing oil reserves, and hazards due to filling our atmosphere with greenhouse gases, it is clear the world is facing an energy crisis. Researchers strive to find solutions, and policy makers and the public are continually presented with 'solutions' that promise the answer. So, what is the answer? Does it lie in renewables or nuclear energy? Perhaps it is in fundamentally changing the way that we live and build our homes? With so many proposed solutions, which ones are practical for the EU? Various perspectives will be presented by five experts who have five minutes each to persuade the audience. The audience will then be asked which solution they would support if they had the power to invest in them. The audience will gain an understanding of the difficulties decision makers face in dealing with our Energy and Climate crises.	Wicklow Hall 2A
8:00AM – 9:30AM	S Exoplanets: the search for planets beyond our solar system <i>Speakers: Don Pollacco, Heike Rauer, Giovanna Tinetti, Prof. Jocelyn Bell Burnell</i>	The Liffey B

Until recently, the science and technology to detect exoplanets did not exist. However, in the past two decades, astronomers have developed new techniques and instruments that are providing growing observational evidence that our home galaxy, the Milky Way, is rich with planetary systems. Despite the wealth of data on our own solar system, there is no way to directly measure its formation history. Studying other planetary systems provides us with a major opportunity to determine if our solar system is unique or just average, and also to re-examine some of our theories on the formation of planetary systems. This session will introduce the various methods of exoplanet detection and the technology being used and developed (e.g. ground- and space-based telescopes), with a focus on the efforts of Europe's leading scientific nations. Different methods allow us not only to infer an exoplanet's existence, but its atmospheric composition, pressure and temperature. The question of what we can learn from exoplanet systems will be explored, with separate talks focusing on planetary system formation and the search for biological markers.

8:00AM – **S I, Human: are new scientific discoveries challenging our identity as a species?** The Liffey A
9:30AM *Speakers: Lone Frank, Armand Leroi, Brian Christian, Daniel Glaser*
From neurobiology to genetics to information technology, we're now living at a time of rapidly unfolding revolutions in science.
These discoveries are not just changing the way we live and die, but have the potential to explode old ways of looking at ourselves. Neuroscience is taking away the illusion of an essential self. Genetics has shown us just how close we are to other life forms, how we've even incorporated DNA from unexpected places into our own, and become inextricably dependent upon it. In the race to build computers that can think like humans, technology continues to raise new questions about what we are; and indeed what we are not.
As scientific understandings continue to seep into culture, what impact will they have on our view of what it is to be human?

8:00AM – **S Is the future of mathematics medieval?** Wicklow Meeting Room 1
9:30AM *Speakers: Anthony Harvey, Lorraine Hanlon, David Howlett, Immo Warntjes, Emer O'Boyle*
Is mathematics more than just a single subject and what do we lose by teaching it in isolation? Ireland's medieval heritage can provide tantalising hints at the answer. It suggests that mathematics is more a way of thinking that has applications from art and astronomy, to music and geometry. Moreover mathematical skills were considered intrinsic to intellectual, literary and artistic expression.

Ireland has a rich tradition of scientific endeavour, yet today uptake of mathematics is dismal. Does this suggest that the complex mathematical skills found in Irish monastic schools should be considered as a way forward for modern teaching?

The panel will argue that medieval education is relevant today. Indeed Dan Shechtman's Nobel Prize-winning work on quasicrystals has connections to Kepler's 16th Century work on Platonic solids and Fibonacci's 13th Century aperiodic number sequences.

8:00AM – **S Planetary robots: exploring the new frontier** Ecocem Room
9:30AM *Speakers: Jean-Pierre Lebreton, Rita Schulz, Gernot Grömer, László Bodnár, Norbert Wesely*
Planetary robots are the current explorers of the Solar System. They can be instruments in their own right, investigating planetary surfaces or atmospheres, or deployment devices for instruments or sample collectors. They can be static, like the Huygens probe that landed on Titan, or mobile like the Mars Exploration Rovers. This is a challenging time for Europe as it develops its planetary exploration plans.

In this interactive round table session, scientists and engineers involved in planetary robotics will discuss current and planned missions, demonstrate hardware and look to the future of planetary exploration. The latest images and animations will be used to illustrate. Audience members will have the opportunity to test their engineering skills with a LEGO model of the Rosetta Lander.

8:00AM – **S Planting the seeds of genetically modified trees** Liffey Hall 2
9:30AM *Speakers: Cristina Vettori, Jeremy Bruton Sweet, Klaus Minol, Rosemary Hails, Matthias Fladung, Richard Meiland*
Genetically Modified Trees (GMTs) can provide a high timber yield, and are a potential counter for global warming through carbon sequestration. The public in some countries remain sceptical about the need for genetically modified organisms. What are the researchers in this area doing to foster an informed public debate on these issues?
The COST Action FP0905 is focusing on key aspects of GMTs related to biosafety: gene containment; gene

targeting prior to the commercial introduction of GMTs into the environment; monitoring; socio-economic and cost-benefit analyses. Experts from this programme will discuss public concerns about the real and perceived importance and dangers of plantations across Europe from a scientific, societal, and policy perspective.

8:00AM – **S Science's progress against psychiatric disorders** Wicklow Meeting Room 2
9:30AM *Speakers: Dr. Philip Campbell, Andreas Meyer-Lindenberg, Jim van Os, Ilina Singh, Graham Thornicroft*

The personal and economic burdens of mental ill-health are huge. World Health Organization studies show that the burdens of early deaths and loss of productive working life from brain diseases exceed those of other diseases, while a recent review has highlighted the costs across Europe – costs that are too widely ignored. But cutting-edge genetics, neuroscience, psychology and other disciplines are gradually revealing the biological roles of genes and of environmental influences on the development of our brains and the illnesses that can arise. Meanwhile social scientists are uncovering social and cultural factors in, for example, children's disorders such as ADHD, and are also investigating the impacts and causes of the stigma of mental illness. In this session, four of Europe's leading researchers will provide updates on the state of these studies, and will answer questions about the prospects for lessening the burden of these disorders.

8:00AM – **N Female Researchers and Entrepreneurship: Why Does Gender Matter?** Wicklow Hall 1
9:30AM *Speakers: Ellen Hazelkorn, Susanne Rostmark, Paula Fitzsimons, Eucharía Meehan*

Although over 50% of university graduates in Europe are female, the number of start-ups from university through female entrepreneurs remains just somewhere between 0 and 15%. The reasons for this are manifold and will be explored during the course of the workshop. The workshop will also examine the myths concerning female entrepreneurship and will reveal facts that will offer encouragement to young female scientists. A key objective of the workshop is to demonstrate to female scientists how they can ensure that their research results will not end up on shelves but instead are brought through the process of commercialisation. Finally, the workshop will reinforce the argument that missing out on female entrepreneurs from science means missing out on innovation, competitiveness, growth and jobs.

9:30AM – **K Keynote Address: Eric Karsenti "TARA-OCEANS: A world-wide study of oceanic plankton ecosystems"** The Liffey B
10:30AM

Speakers: Dr. Eric Karsenti

Summary

Plankton ecosystems are at the root of oceans foodweb, and play a key role in the regulation of our atmosphere's dynamics and overall earth climate. Yet, their organisation, evolution and dynamics remain poorly understood. The Tara Oceans Project was launched in September 2009 for a 3 year exploration of the world's ocean plankton ecosystems aboard the ship TARA. This project is collecting and archiving coherent and comprehensive physico-chemical data sets, oceanographic, ecological and biological samples. The sampling has been devised to allow "end to end" quantitative and genomic analysis of organisms from viruses to fish larvae. Starting as a grassroots initiative of a few scientists, the project has grown into a global consortium of over 100 specialists from diverse disciplines, including oceanography, microbial ecology, genomics, molecular and cell biology, taxonomy, bioinformatics and physical modeling. This multidisciplinary community organises and analyses the Tara Oceans project samples and data with the aim of generating coherent, open access data sets, usable for global ecosystems modeling as well as symbiosis, marine life evolution and ocean metabolomics analyses. This project will generate important information and tools to better understand the relationship between environmental changes and ocean life, result in the identification of new functions and genes of importance to human health and energy production. In the seminar I will show how the expedition has been organised, the sampling strategy, the on-land analysis strategy, the types of results that we expect and why this will be important. I will show some initial results using metagenomics concerning the biodiversity of bacterial, viral, protist and metazoan populations and preliminary results on the ecosystems structure to indicate how we will make sense of the large amount of data generated by this expedition.

Session Chair: Geoffrey O'Sullivan, The Marine Institute, Ireland

9:30AM – **K Keynote Address: Mary Robinson "Equity and Climate Science"** Auditorium
10:30AM *Speakers: Mary Robinson*

Former President of Ireland and former UN High-Commissioner for Human Rights

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- 10:45AM – **C Careers Programme Keynote Address: Daniel Funeriu "From science lab to science minister - a perspective" and the European Young Researchers' Awards** Auditorium
12:15PM
- Speakers: Prof. Enric Banda, Dr. Daniel Funeriu*
- Dr. Funeriu** will deliver a 30 minute keynote address entitled "From Science Lab to Science Minister - a Perspective".
- Following the keynote address, **Professor Enric Banda** will present the European Young Researchers' Award to the winners for 2011 and 2012, who will then give a 5 minute summary of their research.
- Session Chair: Conor O'Carroll, Research Director, Irish Universities Association*

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- 10:45AM – **E Hot Science 1: "Tiny but mighty: How today's nano-materials will lead to tomorrow's technologies"** Wicklow Meeting Room 1
12:15PM
- Speakers: Jonathan Coleman*
- This talk will introduce nanoscience and nanomaterials for a lay audience. This will lead into a description of some of the research on-going in Prof Coleman's group with an emphasis on the practical applications of this work. Finally, collaborations with industry will be discussed and the possibility of commercialising such research explored.

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- 10:45AM – **S Archaeology meets radioactive waste** Liffey Hall 2
12:15PM
- Speakers: Cornelius Holtorf, Erik Setzman, Anders Högberg, Patrick Charton*
- This session discusses the final repository of radioactive waste as an issue of global relevance at the interface of science and the humanities. Engineers are investigating safe ways to handle and store the radioactive spent fuel from nuclear power plants for at least 100,000 years to come. Archaeologists contribute to this planning process with a long-term perspective on human evolution, technological innovation and cultural change. Given that 100,000 years back in time humans did not share our own present-day capacity for abstract thinking, how are we best communicating the inherent dangers of radioactive waste to human beings who will live 100,000 years from now?

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- 10:45AM – **S Big Science for Small Countries** The Liffey B
12:15PM
- Speakers: Dr. Beatrix Vierkorn-Rudolph, Sean Sherlock T.D., Dr. H. Frederick Dylla, Prof. Patrick G. O'Shea, Prof. Ramon Pascual, Dr. Alastair Glass, Prof. Margaret Murnane, Prof. Richard Milner*
- This session seeks to examine the benefits to small EU countries like Ireland of establishing Big Science Facilities in terms of scientific and technological output and economic growth, as well as looking at the alternatives for the large investments required.
- The session will highlight two case studies on "big science" discussing the experiences of Catalonia with the ALBA synchrotron light source and Virginia USA with Jefferson Lab.
- We will also explore the issue from the EU perspective with a view to policies already in place and strategies that could be employed by the smaller EU countries like Ireland to attract such an investment.
- The speakers will each speak for 10 minutes followed by a formal discussion.
- For more information see <http://www.bigscienceireland.org/>

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- 10:45AM – **S Can we use genomic tools to select healthier livestock?** Ecocem Room
12:15PM
- Speakers: Anne-Sophie Lequarre, Stephen Bishop, Donagh Berry, Martina Daly, Mary Poss, Nicole Mideo, Alain Vanderplasschen*
- Recent and rapid advances in genomic tools and statistical methods, together with the increasing amount of genetic and phenotypic data recorded now allow us to accurately define the genomic regions associated with disease resistance in livestock. The identification of animals 'resistant' to a specific disease can then be used in selection schemes, with the aim to develop a more robust, healthier livestock population. This would be followed by a reduction in the use of veterinary medicines such as antibiotics or anthelmintics, slowing down the development of resistance to these drugs.

There are nevertheless limitations to breeding for improved livestock robustness. For example antagonist

interactions between the resistances to different diseases, as well as interactions with some production traits are expected. Another problem is the fast evolution of pathogen genomes to overcome host resistance making this kind of breeding selection programme sometimes unsustainable. Future research should help to develop accurate and low-cost biomarkers, unravel the mechanisms of the infections and produce effective vaccines and prophylactic treatments.

10:45AM – **S Exploding myths on nuclear reactor security, harm reduction and GMOs** The Liffey A

12:15PM *Speakers: Dr Roland Schenkel, Alan Leshner, Prof. Anne Glover, Prof. Gerry Stimson, Dr David O'Reilly*

This session explodes myths about the seldom seen science behind some of today's most controversial public policy issues, particularly in Ireland. Case-studies will spotlight that crucial interface between science, policy and society vis-à-vis nuclear energy, crop innovations (GMOs), and harm reduction (tobacco). Accepting that societal problems are not necessarily problems with purely scientific solutions, speakers will argue that calculated risks are fundamental to realising proven benefits. Fukushima or not, why is it so difficult to separate fact from fiction on nuclear reactor safety and waste management solutions? What are the known and unknown implications of innovation in biotechnology and genetic engineering? Is tobacco harm reduction the greatest public health imperative today or is quit or die enough? Their common cause will be to demonstrate that innovative science is ever more prevalent and important. Their common aim will be to urge the wider scientific community to think – and act – in the global interest, while pressing the re-set button for evidence-based policy above policy-biased evidence. Their approach will not be to assume that scientific consensus can exist or to frame issues as science vs. the public with science in the right. Yet, all governments face challenges in terms of how science is viewed and used with the gap between public perceptions and scientific realities widening. Citizens are, nevertheless, unequivocal in their support for finding solutions to global issues.

10:45AM – **S Making gene and cell therapy medicines a reality** Wicklow Hall 2A

12:15PM *Speakers: Frank Hallinan, Michele Lipucci Di Paola, Tim Allsopp, Sarah O'Meara*

The focus of this session will be on outlining the regulatory framework and challenges of translating the exciting basic science discoveries related to molecular and cellular biology into novel, commercial gene and cellular therapies. It aims to bring together leading experts from Regulatory Agencies like EMA and FDA with expert academic and industrial scientists in this area for a fruitful interaction. It also aims to ensure that representatives of patients and those with an ultimate need for these products will be actively included in the meeting in line with an aim of ESOF2012 which is to bring science to the public.

10:45AM – **S Milk: Nature's perfect food?** Wicklow Meeting Room 2

12:15PM *Speakers: Catherine Stanton, Mark Fenelon, Bruce German*

The composition of milk has evolved with each mammalian species to reflect the particular environmental conditions and evolutionary demands of the young of that species. Humans have exploited this valuable resource since the dawn of the agricultural revolution through domestication of animals, in particular the cow. We have developed the technology to preserve milk during times of abundance and this has resulted in an array of foods now common in the diets of most human cultures.

In addition to its base nutritional composition, research is revealing that there are a multitude of additional benefits of milk, undoubtedly many of which are as yet, undiscovered. Foremost in the public mind is the fact that milk is an excellent source of dietary calcium, essential in bone development and prevention of osteoporosis.

This session will reveal the extensive health benefits associated with milk consumption, it will demonstrate how modern processing technologies can be exploited to maximise these benefits.

10:45AM – **S We must all do something about mathematics!** Wicklow Meeting Room 3

12:15PM *Speakers: Eoin Gill, Paul Nugent, Steve Humble, Andrew Jeffrey, Fernando Blasco, Fiacre O'Caibre*

Mathematics is a key subject in all other sciences, therefore the state of mathematics should be of concern to all scientists. There is widespread anxiety in many European countries about the level of engagement with mathematics and performance of students in schools. It was in response to this that Maths Week Ireland was founded in 2006, and has now grown into a major public event. It is a successful, effective and low cost model that could be adopted in all European Countries.

This session will be delivered by experienced practitioners and is designed to present the audience with an overview of the proven means for promoting maths. Participants will also be challenged by puzzles and entertained by a few tricks. The short snappy form of the presentations will give an entertaining but brief

overview of the subject area.

10:45AM – 12:15PM	N Digital Innovation and Entrepreneurship: what next? <i>Speakers: Gráinne Millar, Joan Mulvihill, Neil Leyden</i> Innovative Entrepreneurship is at the intersection of innovation and entrepreneurship and is a new policy direction that is more than the sum of its parts. “Digital Innovation & Entrepreneurship – What Next” covers both the establishment of start-ups based on the development and transfer of new digital technologies and the impact on established firms of the application of existing digitally-based knowledge and know-how. The audience will examine how digital innovation and entrepreneurship will contribute to growth now and in the future and investigate the different types of roles, opportunities and collaborations that will occur. They will explore the diversity of digital entrepreneurs, e.g. teenage entrepreneurs, digital artisans, native digital development companies, digital services agencies and traditional entrepreneurs who transform their businesses by embracing digital technology. Participants will debate how digital technologies will enable tiny creative operations to produce innovations and sell services and products to remote niche markets. They will discuss and contribute answers to the question: “How can we better understand the nature of entrepreneurship in the digital economy?” The audience will benefit from being actively involved in helping to position digital entrepreneurship within the context of Ireland’s National Digital Strategy and Innovative Entrepreneurship Agendas.	Wicklow Hall 1
12:15PM – 1:15PM	K Keynote Address: A conversation with James Watson (Nobel laureate) <i>Speakers: Prof. James Watson, Prof. Luke O’Neill</i>	The Liffey B
12:15PM – 1:15PM	K Keynote Address: Alvaro Giménez Cañete "The Future of European Space Exploration" <i>Speakers: Leo Enright, Alvaro Giménez Cañete</i> ESA Director of Science and Robotic Exploration	The Liffey A
12:15PM – 1:15PM	K Keynote Address: Enrico Giusti "Touching the Abstract; Mathematics at the Museum" <i>Speakers: Prof. Enrico Giusti</i> Mathematics has always played a minor role, if any, within traditional science museums. Recently, a number of museums and centres entirely dedicated to mathematics and its applications have opened, among which Il Giardino di Archimede (The garden of Archimedes) in Italy (1999), and the Mathematikum (2000) in Germany. More are either planned or under construction, including the MaMuseum in New York. What part of mathematics can be shown in a maths museum? And more importantly: how? In my talk, I shall address these questions and discuss some of the possible answers in the light of the experience gained at Il Giardino di Archimede. <i>Session Chair: Professor James Slevin, National University of Ireland Maynooth</i>	Liffey Hall 2
12:15PM – 1:45PM	S Science and the future of cuisine <i>Speakers: Hervé This, Mark Post, Bill Yosses, Jill H. Pace</i> Cuisine is both an essential daily dose and a strong marker of national identity. It is also an ever changing entity. In recent years the workshop for new foods and new cuisine is taking food out of the kitchen and in to the lab. Indeed the role for those who wish to create new <i>haute cuisine</i> is really changing from ‘head chef’ to ‘head scientist’. The scientific approach to food became popularised as something of a novel notion for the elite in society, yet now it has become the norm in approaching everything that we eat. Sustainability too brings about a necessary task in changing the way we look at and source our food. This teases us to find new ways and new solutions to how we maintain both ourselves and our food sources. This session will look at the progressive role that science is playing in the advancement of cuisine and the way we look at food. Panellists of this lunchtime session will include the ‘father of molecular gastronomy’; Hervé This (AgroParisTech), President Obama’s Executive Pastry Chef; Bill Yosses, and Mark Post (Maastricht University) who has developed a process for growing meat <i>in vitro</i> . Following the panel discussion, attendees will be able to sample some futuristic cuisine.	Auditorium
1:15PM – 2:45PM	C CANCELLED Creating the ideal workplace for women researchers in STEM <i>Speakers: Dr. Virginija Sidlauskiene, Dr Anne Pépin, Caroline Roughneen, Ronan O’Beirne, Dr Sue Couling</i> We regret that this session has been cancelled and will no longer be taking place. The gender balance in research in science, technology, engineering and maths is a concern across Europe. The numbers of women are low, and few hold senior positions.	Liffey Hall 1

Join us for this lively discussion and speaker session, which aims to generate a vision of the research environment that will enable women to participate and progress equally alongside their male colleagues. The benefits of this diverse and thriving research workforce will be set out.

The empowerment of decision makers, organisational structures, career progression, development and support, and work-life balance will all be up for debate.

Four expert speakers will share their visions of a gender-balanced future in STEM research and identify strategies to transform. The speakers will also outline the INTEGER Project, an EC FP7-funded initiative focussing on women researchers in STEM.

The session will be chaired by Ronan O'Beirne, Director for Learning Development and Research at Bradford College (UK). There will be an emphasis on audience participation through hand held voting, open discussion and feedback.

1:15PM –

C European Crucible: A catalyst for inter-disciplinary innovation and collaboration

2:45PM

Speakers: Alan Miller, Quentin Cooper, Ruth Neiland, Sara Shinton, Claire McNulty, Crucible Fellows, Gill Clark

Wicklow Meeting Room 1

Ever wondered what a biochemist and a mathematician might have in common, or how a social scientist and a particle physicist could work together? European Crucible at ESOF is designed to help you find out just what great minds and creative thinkers can do when they come together!

European Crucible builds on the success of the UK's award-winning Crucible programme and its pool of multi-national, multi-disciplinary researchers from science, technology, engineering, medicine, arts, design, and social and political science. European Crucible invites other talented early stage researchers from across Europe – Europe's 'research leaders of the future' – to come and participate in this session and satellite event to expand their innovative potential, form a collaborative peer network, and address the challenges of proposing new ideas for interdisciplinary research with impact!

Innovative, collaborative, inter-disciplinary research is becoming increasingly important to match European research priorities and meet global 'grand challenges'. European Crucible aims to help early stage researchers develop skills, knowledge and connections to enhance their research capacity and impact through interdisciplinary collaborations and knowledge exchange. For ambitious early stage researchers committed to a research career in Europe, European Crucible will i) harness skills and aptitudes for interdisciplinary research and innovation; ii) inspire and empower a network of potential European research leaders and iii) explore and enable collaborative linkages between academia, business, policy and the media.

European Crucible @ ESOF : Satellite Event

European Crucible - A catalyst for inter-disciplinary innovation and collaboration

Wednesday, 11th July 2012 – Convention Centre Dublin 10am-12.00 noon - the Ecocem Room.

Registration: By registering for our satellite event and conference session (European Crucible), delegates are eligible for a reduced registration rate of €100 incl 23% VAT registration rate.

Email: EuropeanCrucible@hw.ac.uk

Related website: Scottish Crucible: <http://www.hw.ac.uk/scottishcrucible/>

Twitter: Follow European Crucible on Twitter: <https://twitter.com/EuroCrucible>

Register using this link

The first field asks for an Offer Code to validate the registration – please enter the code: ESOF Crucible

1:15PM –

S Africa: A scramble for natural resources or knowledge economy partnerships?

The Liffey B

2:45PM

Speakers: Dr. Philip Campbell, Dr Patrice Christmann, Dr Alan Belward, Prof John Mugabe, Prof Roseanne Diab

Africa is a continent rich in natural resources such as oil, gold, timber, diamonds, platinum, uranium and chrome. It has the potential to feed itself and others but the scramble for Africa's riches has often led to mismanagement, environmental degradation, and in some instances, to conflict. A number of important developments are changing the dynamics related to natural resource management and exploitation in Africa. Among these is the determination of a number of African countries to move from a resource-dependent to a knowledge-based economy, leveraging the potential of science and technology to ensure better management and exploitation of resources. The aim is to explore a few pertinent issues in a manner that will lead to a better understanding of opportunities and challenges

to harness S&T cooperation for sustainable development.

1:15PM – 2:45PM	S Atlantic ocean literacy: a grand challenge <i>Speakers: Albert Gerdes, Jan Seys, Evy Copejans, Peter Tuddenham, Ana Noronha</i> Building on ocean literacy efforts in the USA and Europe, this session will present some of the science, education and policy facts and challenges to create an Atlantic Ocean literate public, and encourage interdisciplinary contribution, participation, engagement and energy from the session participants. Using the examples of creatures and features of the Atlantic, this session will present Atlantic literacy and the work to define concepts and issues that are important for all persons connected to the Atlantic Ocean to know and understand.	Ecoem Room
1:15PM – 2:45PM	S Building a better athlete? <i>Speakers: Werner W. Franke, Michele Garfinkel, Julian Savulescu</i> Humans have been enhancing themselves throughout human history and have succeeded in living more comfortable and longer lives than their predecessors. But rapidly developing scientific, medical and biotechnological advances are steadily increasing the constellation of abilities and characteristics that may be altered to improve specific abilities, up to and including a person's genetic constitution. This session will focus on an emerging kind of performance enhancement, the so-called "mimetic" doping drugs. They are receptor-binding agents, mimicking known and established doping mechanisms, in particular for steroid and protein molecules. The speakers in the session will explain the mechanisms of this kind of doping, and discuss the ethical, social, and legal implications for the world of sports and for society. If enhancement in sport is acceptable, will it be acceptable for other kinds of human enhancement? What does the acceptance (or rejection) of any enhancement say about human identity and social solidarity? Will enhancement make us happier?	Wicklow Meeting Room 2
1:15PM – 2:45PM	S Emerging therapies for brain and retinal diseases <i>Speakers: Gerald Grant, Shomi Bhattacharya, Peter Humphries, Michael Farrell</i> Diseases of the brain and retina are notoriously difficult to treat. An estimated 98% of EMEA/FDA-approved drugs that could have potential to treat conditions ranging from Alzheimer disease (AD) to Grade IV brain tumours that do not easily cross the blood vessels in the brain and retina. Moreover, as is the case in age-related macular degeneration (AMD), regular and costly injections of therapeutics directly into the globe of the eye carry risks of infection and serious adverse effects. Here, we will present information on the emerging therapies that are being developed here in Ireland, Europe and the US with regard to the treatment of debilitating diseases of the retina such as AMD and retinitis pigmentosa (RP). This session aims to inform the public on how emerging medicines are being developed and the promise that these medicines hold for diseases of the brain and retina.	Wicklow Hall 2A
1:15PM – 2:45PM	S Scientists say...' but how do they know? <i>Speakers: Juliet Stevens, Albert Yuan, Alaa Ibrahim, Tracey Brown</i> Every day we are confronted with scientific sounding claims; whether in advertising material, advice columns, campaign statements, public health schemes, common prejudice or celebrity health fads. How do we know what to believe? Giving people the tools to question pseudo-science and misleading claims, helps people to transcend noise in the debate around a scientific or medical issue. Building on a packed and lively ESOF 2010 session that discussed the role of 'myth-busting' as a way to share scientific reasoning, the panel will discuss the importance of communicating not only 'what do we know?' but also 'how do we know that?' How can we popularise the universal role of science as a public tool for truth-seeking? Can critical thinking play a role in emerging democracies by creating informed citizens?	The Liffey A
1:15PM – 2:45PM	S Water challenges for a changing world <i>Speakers: Enrique Playan, Luisa Prista, Laura Burke, Damia Barcelo, Durk Krol, Michael Depledge</i> The world's population is projected to grow from 6.1 billion in 2000 to 8.9 billion by 2050. Population increase will be dramatic in some urban areas, resulting in escalating demands for food, water supplies and sanitation services. This development implies a greater need for agricultural and urban water, and an increased capacity for treatment of pollutants. Climate change is projected to increase water shortages, with more frequent and severe droughts projected for many parts of Europe. Flood hazards are also projected to increase across much of Europe, particularly in its central, eastern and northern parts. These changes present a grand challenge that has outstanding economic, ecological, technological and societal implications. Consequently, action is needed at the European and World level to ensure sustainability of water use, to protect life and to fuel water technology markets. Multi-disciplinary research, development and innovation	Liffey Hall 2

are required to generate the knowledge required to address the challenge and to set it in sustainable action.

1:15PM – 2:45PM	N Partnership Driving Innovation <i>Speakers: Prof. Mark Ferguson, Michel Goldman, Prof Roger Whatmore, Christian Busch</i> Publicly funded research institutions have broad mandates. The Higher Education sector, in particular, is being asked to deliver education, research and now innovation. Will the sector only truly succeed in generating commercial opportunities through clever partnerships? A panel of speakers will discuss issues around partnerships with business, funding agencies and governments. Examples of public-private partnerships which have generated impact will be presented.	Wicklow Hall 1
1:15PM – 2:45PM	N The Invention Convention The Science to Business Programme at ESOF 2012 provides an unique opportunity for participants to show case creative excellence and ground breaking innovation at the 'Invention Convention', the first of its kind at such a conference. It is a competitive opportunity for 15 people (professionals, innovators, entrepreneurs, Masters students, PhD candidates or Post Docs) to stand on a platform and pitch their innovation in 3 minutes to a panel of distinguished judges comprising of experts from both the academic and business sectors. The objective of this session is to give delegates with wonderfully creative minds from across the world the opportunity to show case their innovation and for their work to be recognised as a ground breaking innovation at Europe's largest General Science conference. There are significant prizes available to the winners and outside of the session itself, the 15 finalists will get an opportunity to meet with a select group of successful entrepreneurs and business angels to discuss ways of commercialising their innovation. This will not only provide a platform for future mentoring but it will also introduce innovators to potential investors.	Wicklow Hall 2B
1:30PM – 2:30PM	E Alien Deep - premiere of National Geographic documentary Discovery of mid-Atlantic deep-sea Smokers The episode, part of a five-part series to be televised in the Autumn, shows the discovery of a rare system of deep sea smoking volcanic vents and three-story chimneys in the mid-Atlantic. A hotbed of evolution in overdrive, the programme shows a site teeming with strange animals that have been living there for thousands of years.	Auditorium
2:45PM – 3:45PM	K Keynote Address: Marcus du Sautoy "The Secret Mathematicians" <i>Speakers: Prof. Marcus du Sautoy</i> Artists are constantly on the hunt for interesting new structures to frame their creative process. From composers to painters, writers to choreographers, the mathematician's palette of shapes, patterns and numbers has proved a powerful inspiration. Often subconsciously artists are drawn to the same structures that fascinate mathematicians. Through the work of artists like Borges and Dali, Messiaen and Laban, Professor du Sautoy will explore the hidden mathematical ideas that underpin their creative output but will also reveal that the work of the mathematician is sometimes no less driven by strong aesthetic values. <i>Session Chair: Brian Trench, Dublin City University</i>	The Liffey A
2:45PM – 3:45PM	K Keynote Address: Peter Doherty (Nobel Laureate) "Influenza: immunity and other issues" <i>Speakers: Prof. Peter Doherty</i> <i>Session Chair: Prof. Cliona O'Farrelly, School of Biochemistry and Immunology, Trinity College Dublin</i>	Auditorium
2:45PM – 3:45PM	K Keynote Address: Renée Schroeder "RNA as a key molecule for the origin of Life" <i>Speakers: Prof. Renée Schroeder</i> RNA molecules display many different functions, from coding mRNAs, catalytic ribozymes to RNAs that regulate gene expression at all levels. I will present our attempts to identify regulatory RNAs that control their own transcription. Using genomic SELEX, we discovered a large number of RNA aptamers in E. coli, yeast and human genomes that function as cis-acting transcriptional silencers. <i>Session Chair: Prof. John Atkins, BioSciences Institute, University College Cork</i>	The Liffey B
4:00PM –	C Can outreach make you a better scientist?	Liffey Hall 1

5:30PM

Speakers: Claire Ainsworth, Jon Copley, Helen Goulding, Lena Raditsch

Although most funding agencies and research institutions now recognise the value of engaging the public about scientific research, performing outreach is often regarded as an add-on to a scientist's day job, rather than an integral part of it. Worse, scientists who communicate their work to the media or the public often encounter the view that these activities somehow make them second-class researchers, or that they are wasting valuable research time.

This workshop will explore the idea that engaging wider audiences should be part and parcel of doing science, and that scientists who do communicate improve not only their career prospects, but also enrich their research and boost their ability to collaborate, innovate and increase the impact of their work.

The workshop will include short talks illustrating how outreach can synergise with research, including a first-hand account from an academic who builds public engagement into his field work. There will also be a series of interactive exercises to help delegates identify outreach opportunities for their own research and to start developing the skills needed to realise them.

4:00PM –

C Engaging in a researcher's career in the 21st century

Wicklow Hall 2A

5:30PM

Speakers: Conor O'Carroll, Anil Kokaram, Maxime Durka, Suman-Lata Sahonta, Silvia Giordani, Dr. Daniel Funeriu

Research, especially in Europe, never offered so many opportunities as nowadays. However, the competition for rewarding careers has never been so fierce. The economic austerity is also affecting research funding and career opportunities in some countries. As a consequence, whereas it may be exciting to engage in a research career it carries risk like research itself.

In this session panellists will share their perception on the challenges for a scientist engaging in a research career nowadays. They will also provide clues on what they believe are the ingredients to a successful career (legal environment, education, international mobility, good networking opportunities, interdisciplinary, collaboration with businesses, pathways from academia to business, and passion for science...).

Through their experiences, the former Marie Curie fellows will explain how the mobility fellowship helped develop their career. Each of the panellists' profiles illustrates how mobility and training can contribute to a successful career.

4:00PM –

E Dr Paul Janssen Award for Biomedical Research

Wicklow Meeting Room 2

5:30PM

Speakers: Seema Kumar, Victor Ambros

The Dr. Paul Janssen Award for Biomedical Research aims to extend the legacy of Dr. Paul Janssen by honouring the work of an active scientist in academia, industry or a scientific institute.

The award was created in honour of **Dr Paul Janssen** by Johnson & Johnson in 2004 with the following goals:

To honour the memory of Dr. Paul, his dedication to excellence and his leadership of young scientists.

To promote, recognize and reward passion and creativity in biomedical research.

To underline Johnson & Johnson's commitment to scientific excellence in the advance of healthcare knowledge while fulfilling its responsibility in the community.

<http://www.pauljanssenaward.com>

4:00PM –

S A gallery of monsters: fractals in finance, biology and engineering

Ecocem Room

5:30PM

Speakers: Richard Hudson, Bernard Sapoval, Marc-Olivier Coppens, Richard Olsen

What is the shape of a mountain? A tree? The coast of Britain? A stock chart? A computer file? Thirty years ago, a book appeared that linked all these seemingly disparate phenomena by a common mathematics, called fractal geometry. It brought together a wide range of old and new mathematical phenomena previously regarded as, in the words of physicist Freeman Dyson, 'a gallery of monsters'. Since then, fractals have spread into nearly every field of research: geology, economics, biology, information technology, hydrology, and even cosmology.

This session, with some of the leading proponents of the field, explores the present and future development of fractals on the 30th anniversary of its founding. Mandelbrot died in October 2010, but research in the field continues. The panel includes some of the key students and colleagues of Mandelbrot, in an entertaining and provocative tour horizon of the discipline and its future prospects. A background briefing document on fractals, with links to more information, will be available for participants.

4:00PM –

S Is science journalism dead or does it just smell funny?

The Liffey B

5:30PM

Speakers: Brian Trench, Wolfgang Goede, Elisabetta Tola, Vesa Niinikangas

This round table debate on the current standing of science journalism includes a panel of experienced journalists, some with decades of specialist involvement in science journalism, and all with strong views and concerns on science journalism. Among the issues affecting the health of science journalism to be considered in this debate are:

Increasing direct communication to the public by scientific bodies that is tending to reduce the need for journalist intermediaries,

Proliferation and diversification of internet news and commentary blurring the distinctions between professional, independent reporting and amateur and partisan coverage,

Growing perception that the routines of established science journalism are worn-out and that science reporting is too vulnerable to claims of 'breakthrough' and 'world-first',

Reduction in specialist staff science journalists due to financial pressures on many media and the restructuring of employment as largely casual, desk-bound and generalist,

Increasing exposure of generalist journalists to topics with important scientific dimensions (e.g. epidemics, pandemics, ash clouds, extreme weather, water stress).

4:00PM –

S Sleep and depression

The Liffey A

5:30PM

Speakers: Axel Steiger, Peter Meerlo, Johannes Beck, Francesco Benedetti, Tarja Stenberg

Impaired sleep is both a major risk factor and a key symptom of depression, which is an increasing health problem. In Europe the number of depressed patients amounted to 21 million in 2004. Total costs of depression were estimated to be \$118 billion. Even modest improvements in the efficiency of treatment of depression would be beneficial.

Most antidepressants modulate sleep, particularly by suppressing REM sleep. Two studies have shown that poor sleep quality predisposes people to initiation of depression. In light of these results it is reasonable to hypothesise that by improving sleep we could also alleviate depression.

New studies suggest that physical activity is an intervention, which helps to moderate depressive symptoms by improving sleep. As a paradox sleep deprivation exerts antidepressive effects in many patients. In this session the complex relationships between sleep patterns and clinical depression are explored.

4:00PM –

S Turing's Legacy: From the Science of Computation to Machines that Think

Liffey Hall 2

5:30PM

Speakers: Prof. Marcus du Sautoy, Prof. Mark Keane, Dr Freddy Lecue, Prof. Dermot Moran

Alan Turing is widely regarded as the father of Computer Science. Working with the first electronic programmable computing device -- the *Colossus* -- at Bletchley Park in WWII, he was one of the code-breakers who cracked the *Engima* machine used by the German military. He was also responsible for informing the debate on how we could ever determine whether "Machines can Think". Turing's answer was the so-called Turing Test, that if the machine could pass itself off as a person in some extended interaction then we would have to admit that it was effectively indistinguishable from a person and, therefore, could think.

On the centenary of his birth it is fitting to re-assess Turing's Legacy. Given the major advances in computing technology from the 10¹⁶ factor increase in computational power, to the development of highly advanced software systems, to the assembly of vast repositories of information both on and off the internet, it is timely to ask how Turing's views have impacted our understanding of computation and human intelligence.

This session will assess this question from the perspectives of Computer Science, Mathematics, Cognitive Science and Philosophy.

From the Computer Science perspective, Dr. Freddy Lecue (IBM) will discuss one of the most advanced artificial intelligence systems --- the IBM Watson system -- relating its success on the Jeopardy! general knowledge TV-game show.

From the Mathematics perspective, Prof. Marcus du Sautoy (Oxford University) will relate the mathematical origins of Turing's conception of computation.

From the Cognitive Science perspective, Prof. Mark Keane (University College Dublin) will show how aspects of human decision making (in buying shares) and creativity (in drawing analogies in Science) can all be cast as varied forms of computation.

From the Philosophical perspective, Prof. Dermot Moran (University College Dublin) will discuss the conditions under which something like the Turing Test could ever be accepted.

4:00PM – **N What are the important criteria for successful open innovation?** Wicklow Hall 1
5:30PM *Speakers: Rick Wielens, Cynthia R. McIntyre, Gunnel Gustafsson, Rolf Annerberg, Michael Evan Goodsite, Bjørn-Ola Linnér, Tom Anders Stenbro*

How can research contribute to Open Innovation in business development?
The session gives an overview of Open Innovation with examples introduced by two main speakers.
A case study from the insurance industry will be presented. The industry is experiencing increased costs caused by increasingly unstable weather conditions, flooding and erosion. Contact with researchers resulted in a unique collaboration between insurance and research sectors using advanced climate modeling. A user-friendly online tool is being developed which homeowners, companies and municipalities can make use of in order to secure homes and plan for future building sites. The project is hosted by NORD-STAR, a Nordic Centre of Excellence on strategic adaptation research, and part of the Nordic Top-level Research Initiative, the largest research and innovation initiative to date within the framework of the Nordic collaboration.
A round table discussion with introductory speakers, invited participants and the audience will address various aspects of open innovation.

4:00PM – **P North America & Europe Symposium: The Atlantic - a Shared Resource** Auditorium
6:00PM *Speakers: Prof. Michael St John, Dr. Michael Crosby, Robert-Jan Smits, Dr Peter Heffernan*

The Atlantic Symposium will feature four keynote speakers, two from Europe and two from the USA, who will set the scene for an Expert Panel Discussion involving the keynote speakers and distinguished leaders in the field of marine sciences from Europe and United States. The Symposium will explore the historical, cultural and scientific links across the North Atlantic Ocean, our current knowledge of how the Atlantic ecosystem functions, the marine economic, social and environmental challenges and opportunities we face and the benefits of cooperation.

Keynote Presentations

The Atlantic Ocean - how it works: presenting our understanding of the Atlantic ecosystem, its evolution, hydrodynamics and ecology.
Keynote Speaker: Prof Michael St John, Technical University of Denmark.

The Atlantic Resource Base: describing the socio-economic and environmental resource base, including climate change impacts, which affect both today and likely future experiences of ordinary citizens.
Keynote Speaker: Dr Michael Crosby, MOTE Marine Laboratory, Florida, USA.

Opportunities for Scientific Collaboration: exploring the opportunities and benefits of co-operation across the Atlantic in the areas of science, technology and innovation.
Keynote Speaker: Mr Robert-Jan Smits, Director General, Research and Innovation, European Commission.

Panel Discussion
Chair: Dr Peter Heffernan, CEO, Marine Institute, Ireland.
The four Keynote Speakers will be joined by:
Dr David Conover, Director, Division of Ocean Sciences, National Science Foundation, USA.
Prof James J. McCarty, Alexander Agassiz Professor of Biological Oceanography, Harvard University, USA.
Dr Scott Glenn, Professor of Physical Oceanography, Rutgers University, Institute of Marine and Coastal Sciences, USA.
Dr Sybille van den Hove, Visiting Professor, University of Barcelona, member of the Scientific Committee of the European Environment Agency (EEA).

6:00PM – **K Keynote Address: Maj. Gen. Charles F. Bolden Jr. "NASA and a New Era of Space Exploration"**
7:00PM *Speakers: Maj. Gen. Charles F. Bolden, Jr* Auditorium
Session Chair: Dr. Peter Gallagher, Astrophysics Research Group, Trinity College Dublin

JULY 13 • FRIDAY

8:00AM – **C How to make a successful transition from academia to industry** Liffey Hall 1
9:30AM *Speakers: John Walsh, Anita Maguire, Patricia Reilly, Gregory Sorensen, Leonard Hobbs, Jacques*

Bittoun, Karen Power

As the number of PhD graduates worldwide continues to increase the percentage of graduates who can remain within the academic system has greatly reduced. As such, there is an increasing pool of highly qualified postdoctoral researchers looking towards alternative careers. It is envisaged that many of these positions will be in industry. However, the number of PhD graduates currently moving to industry appears to be very small. In order to increase this number and to facilitate easier transition from academia to industry there is a need for increased interaction and discussion between academic institutions and industry. This will inform potential employers of the transferrable skills acquired during a doctoral degree and also inform academic institutions as to how to build career development appropriate to the needs of industry into PhD programmes towards the needs of industry. There is also considerable scope for increased PhD programmes run jointly between academia and industry. This session will commence with contrasting perspectives from a number of stakeholders (academia, industry, policy and a PhD graduate) on their views of the problems as well as the potential opportunities in moving from academia to industry. The first part of the session will serve to frame the issue and will be followed by an interactive panel discussion of the issues highlighted with questions from attendees. Interactive discussion will help to highlight the potential value of PhD trained researchers to the industry sector while providing academic institutions and researchers with a more clearly defined focus on the additional skills or training that would make PhD graduates more suitable for industry. The list of proposed panellists will allow for discussion of the issues not only at a national level but also in Europe and the US.

8:00AM – **S Beyond the Arab Spring: science and innovation in the Islamic world** Wicklow Hall 2A
9:30AM *Speakers: Ehsan Masood, Michael Bond, Priya Shetty*

As the wider world watches the social and political shifts in the wake of the Arab Spring, the scientific community is looking to the rapid developments in the science, technology and innovation sectors in the Islamic countries of the Middle East and beyond. Countries such as Saudi Arabia and Qatar are pouring natural resource wealth into universities and technology parks. But it is not just hydrocarbon-rich countries that are striving to make the move towards knowledge-based economies. Pakistan established over 50 new universities between 2002 and 2008. In Egypt, the new Library of Alexandria is an example of a world-class teaching and research institution that has developed independently of the university system.

The Atlas of Islamic World Science and Innovation Project is being coordinated by a unique collection of international partners and is examining the past and future of the STI systems of Islamic countries. This is a time of rapid development in modern science and one that presents many opportunities to establish new and fruitful international collaborations for Europe and the rest of the world.

8:00AM – **S How can technology transfer drive innovation?** The Liffey A
9:30AM *Speakers: Richard Hudson, Giancarlo Caratti, Gernot Klotz, Salvatore Tatarella, Erik Arnold*

Despite the widespread rejection of the 'linear model' of innovation, policy often continues to build on linear thinking. Thus, the idea that 'making better use of publicly funded R&D is a significant problem' in Europe underpins aspects of the 'Innovation Union' flagship of the Europe 2020 Strategy.

The 'Technological Impacts of Knowledge Transfer from Public Research Organisations' project of the Science and Technology Options Assessment Panel of the European Parliament was conceived to deepen understanding of policy options for knowledge interchange. It explores the mechanisms of mutual influence and exchange that should underpin institutional 'knowledge transfer' strategies as well as trade-offs between formal technology transfer and other forms of research-industry cooperation.

8:00AM – **S Research Integrity: Developing codes of conduct for researchers** Wicklow Meeting Room 2
9:30AM *Speakers: Pieter Drenth, Melissa Anderson, Maura Hiney, Sabine Kleinert, Nicholas Steneck*

Research is a growing area for professional employment throughout the world and its continued growth of and respect as a profession rests first and foremost on its integrity. This session deals with the development of research standards in the form of codes of conduct and other best practice guidelines for researchers. Most researchers and research organisations believe that self-regulation is essential to the promotion of integrity in research, but self-regulation cannot succeed without common standards of behaviour. A number of codes have and are being developed.

The aim of the session is to provide the essential background for a vigorous debate within the audience about the desirability of regulation and self-regulation through the establishment of internationally accepted norms of behaviour.

8:00AM – **S Scientific advice for European policy** The Liffey B

9:30AM

Speakers: Tracey Brown, Dr Milagros Candela, Prof. Nils Stenseth, Prof. Patrick Cunningham, Prof. Anne Glover, Prof. Sir Peter Gluckman

Global challenges call for sound scientific advice at the highest level and often at the cutting edge. In 2009 President Barroso announced the creation of the role of an EU Chief Scientist and Professor Anne Glover was appointed to the role in November 2011. An audience, including invited questioners, will ask this experienced panel of scientific advisors and policy-makers to discuss the role of scientific advice for Europe and debate its challenges: what opportunities does the existence of an European Chief Scientist provide for the coordination of scientific advice and improving its effectiveness, in the face of urgent and emerging situations - from flu outbreaks to food safety, and volcanic ash to radiation? How can scientific scrutiny of new legislation be improved? What can member states do to contribute to the evidence base for European policy making? Audience and panellists will set out what the next steps should be.

8:00AM –

S The Future of Innovation Policy – Forging Policy in Uncertain Times

Liffey Hall 2

9:30AM

Speakers: John Bell, Martin Shanahan, Sean Sherlock T.D., Ken Guy, Brian MacCraith

A paradigm shift is underway on the part of many governments around the world as to the proper balance between government and the market. The 2008 Financial Crisis has acted as a catalyst for challenging the consensus among western policymakers that markets lead while governments follow. Internationally, governments are also realising that a hands-off approach will simply not be sufficient to address some of the world challenges (climate, energy, food etc.) that face us and that much more interventionist measures will be needed. One area in which the switch to a more hands-on approach from governments can be seen most clearly is in the area of innovation policy where the search is on for ways in which governments can more effectively prioritise support for research, development and innovation (RDI). Such so-called 'smart specialisation' strategies encourage each country or region to identify its best assets and potential in order to concentrate its resources on a limited number of priorities where it can really develop excellence, generate economic returns, and compete in the global economy. This session will examine the current state of play in Ireland's RDI policy, including the recent Irish prioritisation exercise around State investment in research and development and the challenges and opportunities that this new paradigm presents.

8:00AM –

S The Young Academy movement

Wicklow Meeting Room 1

9:30AM

Speakers: Anna Sjöström Douagi, Nitsara Karoonuthaisiri, Martin Wilmsking, Prof. Torsten Nils Wiesel, Helene Andersson Svahn

Young academies are currently formed all over the world. These are groups of excellent young scientists who get together in order to act across disciplinary borders and create voices of young researchers. This creates dynamic and creative groups with great potential, which may be well suited to help finding possible solutions to the future grand challenges which badly needs new ways of thinking and real multidisciplinary collaborations. Die Junge Akademie in Germany was established in 2000 and has been a source of inspiration for other young academies to be established worldwide. In 2010 a Global Young Academy was started and in 2011 a Young Academy was established in Sweden.

This session will put the movement of young academies in a global perspective and discuss if the young academies are filling an existing gap and what should be their role and function in the future? What can the Young Academies contribute with and what is their unique role?

8:00AM –

S Urban sustainability: Homo urbanis and crucibles of the future

Ecocem Room

9:30AM

Speakers: Brian Donnellan, John Tierney, Rob Kitchin, Lisa Wälitalo, David Boundy

For the first time we have entered an urban age in which most of our species now live in cities. By 2050 it is predicted that 75% of us will live in cities. These cities are home to 'homo urbanis' and are the crucibles of the future. The number of 'smart cities' that seek to address sustainability goals is increasing, but what can be missing is a comprehensive, systematic and holistic approach to the challenge. The focus of this session will be on climate change and resource depletion. We will review what we have learned about the challenges associated with urban sustainability to-date and apply that learning to the sustainability challenges facing us.

Participants will be challenged to focus on the practical implementation issues surrounding urban sustainability initiatives, the challenges associated with diverse stakeholder engagement and the emerging technologies that hold the promise of breakthroughs in sustainability and better quality lives for all.

8:00AM – 9:30AM	N Master Class: Bringing Research to Market <i>Speakers: Brian Kelly, Jean-David Malo, Elisabet Litsmark Nordenstam</i>	Wicklow Hall 1
	<p>Workshop theme: "A 90 minutes guide on everything you should consider when starting a business"</p> <p>To stay competitive globally and improve the quality of life of the citizens, Europe needs rapidly to improve the capacity to turn research into new and better products and services. We need to foster a culture of innovation and entrepreneurship and support the transfer on know ledge and skills.</p> <p>This w orkshop w ill build on the philosophy of a Master Class, having talented pupils being coached by experienced Masters in front of an audience. Here, tw o successful entrepreneurs acting as Masters w ill coach four Marie Curie grantees having exciting research results for w hich they w ant to explore business opportunities. On stage, "pupils" w ill present their story and issues they w ant to get feedback on. This could include <i>"how to attract venture capitalists; how should I proceed to bring my idea to the market"</i> or <i>"how do I best market my product?"</i> The Masters w ill share their experiences and give concrete advice aiming at improving the business opportunities.</p> <p>The audience w ill be encouraged to actively intervene w ith questions. After the w orkshop each participant w ill leave w ith new know ledge how to start and develop business, an increased netw ork and, maybe most important, the courage to continue exploring possibilities to bring research to market!</p>	
8:00AM – 6:00PM	E "Eye of the Sky" Photographic Exhibition	3rd Floor Foyer
	<p>As a contribution to the ASEAN-EU Year of Science, Technology and Innovation 2012, the photographic exhibition "Eye of the Sky" show dramatic satellite images of Southeast Asia from the German Aerospace Center (DLR). The pictures illustrate the fast pace of transformation of natural landscapes by human activity.</p> <p>Science addresses the challenges posed by this transformation by developing sustainable land use systems, efficient w ater technologies, risk and disaster management concepts, exploring renew able energy sources and planning the city of tomorrow . To highlight the ever closer cooperation betw een Southeast Asia and Europe, all images are linked to actual joint research projects, funded by either the Federal Ministry of Education and Research (BMBF) in Germany or the EU-FP7-programme.</p> <p>"Eye of the Sky" w as created so that the w ider public could enjoy the beauty of nature and be informed about the advancement of scientific collaboration betw een Southeast Asia and Europe.</p>	
9:30AM – 10:30AM	K Keynote Address: Máire Geoghegan-Quinn "Collaboration, competition, connection - evidence of intelligent design in European science policy?"	Auditorium
	<i>Speakers: Máire Geoghegan-Quinn, Prof. Torsten Nils Wiesel, Dr. Subra Suresh, John Herlihy</i>	
10:45AM – 12:15AM	N How can more SMEs engage in Horizon 2020 projects?	Wicklow Hall 1
	<p><i>Speakers: Bernd Reichart, Thomas Cooney, Sean Burke, Mazhar Bari</i></p> <p>The aim of this w orkshop is to examine the manner in w hich SMEs access funding through EU projects, and the lessons that can be learned by support agencies and ow ner-managers. The w orkshop w ill feature a range of discussions w hich w ill include an exploration of current and future funding opportunities for SMEs from an EC perspective, potential strategies from a support agency perspective (w ith Ireland used as a reference point), and lessons learned from an SME ow ner-manager w ho w ill discuss his experiences from a practitioner perspective. The w orkshop w ill incorporate a holistic view of engaging w ith EC funding opportunities and w ill conclude w ith a talk about Horizon 2020.</p>	
10:45AM – 12:15PM	C What is the future of the PhD in the 21st century?	Liffey Hall 1
	<p><i>Speakers: Gene Russo, Maresi Nerad, Mary McNamara, Michael Lenardo, Beate Scholz</i></p> <p>The number of science PhDs produced globally each year is grow ing fast. Yet the PhD's oft-intended aim – to prepare students for a life in academia – is an outdated one. In some countries, people w ho have trained at great effort, length and expense to be researchers confront a dw indling number of academic jobs. Is the PhD in dire need of reform?</p> <p>This session w ill discuss current challenges to the PhD system and explore how it is changing at some institutions, and should be changed more broadly in the European Union and beyond. Panellists in doctoral education w ill present their visions for the science PhD of the future – and offer advice to research leaders, policy makers and students on how to best equip students for the 21st-century science w orkplace, based on their view s, research and specific programmes that might serve as models.</p>	
10:45AM –	E Hot Science 2: Shale gas fracking: Global problem or a global solution?	Wicklow Meeting Room 1

12:15PM

Speakers: Zoe Shipton, Ivan Pearson, Olive Heffernan, Peter Styles

The extraction of shale gas is the subject of global debate, with many concerned over potential risks associated with the process. Very little is known about the geological, environmental and health impacts. The scientific and engineering communities are starting to contribute to the debate on the future of shale gas extraction.

Fracking is not new, but the method has recently spread across the globe. Many nations view it as a replacement to traditional fossil fuels, or a means to avoid relying on others for their fuel needs.

The Royal Society and Royal Academy of Engineering in the UK have launched a review into the geological, environmental and technical risks associated with hydraulic fracturing, and the National Academy of Sciences has hosted workshops on the public health impacts, with a report into the seismicity imminent.

The debate is not driven by science, but by the spread of the practice, particularly into populated areas, but science is responding. This session will explore the issues that are arising.

10:45AM –

S Can Responsible Research and Innovation expedite Europe's economic renewal?

Liffey Hall 2

12:15PM

Speakers: Waldemar Kütt, Uffe Toudal Pedersen, Graham Love, crazyhorse_1980

In this session a high-level panel will discuss the role that Responsible Research and Innovation (RRI) can play in setting Europe on a growth trajectory that is economically, environmentally and socially sustainable.

The panel will explore how the ideas and concepts of RRI can advance the Innovation Union initiative. In simple terms, the Innovation Union, a flagship initiative of the Europe 2020 strategy, aims to turn ideas into jobs, to generate green growth and to stimulate social progress.

The following questions will be addressed during the discussion:

How can the principles of RRI be incorporated into real policy instruments?

What are the implications of RRI for industry: SMEs and multinationals?

What opportunities or competitive advantage does RRI open up for industry?

What are the implications if our global trading partners do not adhere to the same standards of RRI?

10:45AM –

S Exploring promises and timescales in research and policy

Ecocem Room

12:15PM

Speakers: Claudia Schwarz, Ulrike Felt, Albert H. Teich, Prof. Helga Nowotny, Daniel Barben, Simone Schumann

Research and innovation policy today strongly relies on promises of a better future created through new technological developments in areas such as genomics and nanotechnology. To succeed in competitive funding, scientists have to envision how their research might contribute to socio-economic goals.

This session will explore what characterises contemporary technological promises and how they are linked with normative imaginations of the future. This also includes reflecting on who should participate in defining these futures and how they might be reached.

Secondly, the session addresses the question of how time horizons of promises impinge on the science system itself. Temporalities of scientists' current work structures often do not match with far-reaching promises, e.g. projects need to be completed in short time frames, careers are fragmented and even funding schemes shift their focus continually. We thus aim to discuss how scientists and policy makers experience and engage with promissory rhetoric, diverging temporalities and time horizons.

10:45AM –

S Modelling the impacts of innovation and knowledge

Wicklow Meeting Room 2

12:15PM

Speakers: Xabier Goenaga, Andries Brandsma, Werner Roeger, Paul Zagamé, Raffaele Paci

High productivity and competitiveness are necessary conditions for economic success in a globalised world.

They have been proved to be even more important in the scenario created by the current financial crisis. Among the factors that exert a strongest influence on productivity, it has been suggested that R&D, innovation and, broadly speaking, knowledge capital have a prominent role.

The focus of this session will be on the most appropriate way of modelling the impact of policies aiming at stimulating knowledge accumulation, considering both their direct and their indirect effects on the most important socio-economic magnitudes, such as productivity, income, labour demand and supply, and well-being.

10:45AM –

S Science without borders

Wicklow Hall 2A

12:15PM

Speakers: Dominique Ristori, Grace Naledi Mandisa Pandor, Alan Leshner, Prof. Sir Peter Gluckman, Prof John Wood

This session is designed to identify best practices and pitfalls encountered by different countries when practicing science without borders. The high-level international speakers will bring unique insights into the science behind science policy making, implementation and evaluation. Climate change, energy and resource efficiency, health and demographic change, food security and the digital divide, are opportunities for research and innovation, which will help us to create the necessary jobs and wealth to take the developed and developing world out of the current economic crisis, achieving sustainable development and alleviating poverty.

An important focus will be on Africa's determination to not only harness science and technology for the continent's development, but to become a full and active partner in global knowledge partnerships. Progress on the roadmap towards a true European Innovation Union with dynamic international cooperation links will be assessed. The imperative of re-focusing R&D and innovation policy on the challenges facing our global society from the American and Asian perspectives will also be tackled.

10:45AM –

S Soil, land and food security: the challenges for science, economics and policy

The Liffey B

12:15PM

Speakers: Joachim von Braun, Rattan Lal, Ephraim Nkonya, Nicolas Gerber, Gretchen Daily

Food security depends to a considerable extent on the use of land, water, and soils. The risk for food security due to unsustainable land use and soils is under-researched and under-valued. Food security will remain a problem for the world, increasingly so due to the existing drivers of change on the demand and supply side: increasing world population with changing tastes, increasing demand for biofuel and an increasing purchasing power for resource-intensive food products on one side, decreasing growth in agricultural productivity and decreasing opportunities for further land conversion (to agriculture) on the other side.

Climate change affects the complex and fragile relationships between drivers and adds further feedback effects, risks and volatility elements to them. The overall impact of these changes is an increasing competition for land. The role of soils in the process of climate change has been under-valued in comparison to other elements of the human-climate relationship, despite the large potential of soils as biological carbon sinks.

Scientists, economists, and policy analysts must come together to achieve a comprehensive assessment of the costs of soil and land degradation at the global scale.

10:45AM –

S The Emerging Arctic: a Challenge for Humankind

The Liffey A

12:15PM

Speakers: Prof. Dr. Hans-Wolfgang Hubberten, Prof. Dr. Terry Callaghan, Prof. Dr. Gail Fondahl, Prof. Paula Kankaanpää

The thawing of permafrost and northern sea ice as a result of global temperature rise has become an increased focus of world attention. The Arctic Ocean and Arctic coasts are rapidly changing from being an expanse of largely impenetrable ice fields into navigable sea. The resulting increased interest in the potential mineral and energy reserves when combined with the needs and livelihoods of the Arctic people poses huge challenges in governance, environmental management and cultural ethics.

In this session we will introduce and discuss the major issues of the emerging Arctic regions. The physical and hydrographic shifts will be elucidated. The clear habitat and ecosystem shifts on many different scales ranging from increased bacterial activity to shifting tree lines will be discussed. Building on this, the reshaping of human needs and ways of life, not only as a direct consequence of shifting geography and ecosystems but via the great pressure for resource utilisation in these regions is one of the most important issues. The combination of, for example mining and cultural values, represents one of the major challenges to human communication, peaceful interaction and ethical intercultural confluence. Innovative and integrative governance and management strategies are indispensable for the adaptation and survival of the Peoples of the Arctic and the unique Arctic system.

Speakers:

Arctic warming and its impact on glaciers, sea ice and permafrost (Prof. Dr. Hans-Wolfgang Hubberten),

Ecosystem Challenges in the Arctic (Prof. Dr. Terry Callaghan),

Arctic Socio-Economic systems -impact of changes on Arctic people (Prof. Dr. Gail Fondahl),

Arctic political systems - governance and adaptation (Professor Paula Kankaanpää).

10:45AM – 12:45PM	P ASEAN - EU Partnership Symposium: A Year of Science	Auditorium
	<p><i>Speakers: Máire Geoghegan-Quinn, Robert-Jan Smits, Dr. Yongyuth Yuthavong, Prof. Patrick Sorgeloos, Prof. Stephen Smith, Dr. Rudie Trienes, Yi Ling Hwong</i></p> <p>In the context of the 'EU-ASEAN Year of Science, Technology and Innovation 2012*', the main objectives of this symposium are to:</p> <ul style="list-style-type: none"> Promote bi-regional cooperation between the EU and ASEAN by highlighting good practices of mutual benefit; Facilitate an exchange of ideas and information on national and bi-lateral science, technology and innovation (STI) policies and programmes; Discuss global societal issues with ASEAN and EU stakeholders with a view to identifying priorities for future EU-ASEAN STI cooperation. <p>* The EU-ASEAN Year of Science, Technology and Innovation consists of a series of events and initiatives such as conferences and workshops aiming at fostering EU-ASEAN STI cooperation. The EU and ASEAN are working on a detailed programme, with the support of the SEA-EU-NET FP7 project. The ASEAN-EU Year also contributes to strengthen the political dialogue between the two regions in support of STI cooperation, and to increase awareness of funding opportunities, especially among young scientists.</p>	
12:15PM – 1:15PM	C The perennial career dilemma: academia or industry - is there a third way?	Liffey Hall 1
	<p><i>Speakers: Conor O'Carroll, Jana Ognjenovic, Carole van der Donckt, Cédéric Michiels, Marijke van der Auwera, Daniela Calciu</i></p> <p>It is a fact well-known to HR professionals and educators worldwide: young people who wish to build a long-lasting career in life sciences always end-up facing a dilemma. Will they build a career in the academic world, or will they go into industry (big pharma or biotech alike)?</p> <p>What if this dilemma didn't exist and a flexible career-structure was possible in which researchers could move back and forth between academia and industry?</p> <p>Can we capitalize on the best of both worlds, facilitate cross-fertilization and make life-long learning a reality? Is this a model in which we should invest?</p> <p>We have asked five young researchers to discuss this in a lunchtime session starting from their own personal perspective – in interaction with the delegates with the aim of sparking some original thinking.</p>	
12:15PM – 1:15PM	K Keynote Address: Brian Greene "The State of String Theory"	The Liffey B
	<p><i>Speakers: Prof. Brian Greene</i></p> <p>Professor Greene will review the motivation for string theory and discuss a number of essential developments during its 40 year history. He will then provide a status report in a variety of key areas, from phenomenology and cosmology to mathematics, focusing on issues of dark energy, the string landscape and the multiverse.</p> <p><i>Session Chair: Dr. Jiri Vala, Department of Mathematical Physics, National University of Ireland Maynooth</i></p> <p>With the support of the US Embassy Dublin</p>	
12:15PM – 1:15PM	S An educational revolution to reveal scientific talent in Africa	The Liffey A
	<p><i>Speakers: Thierry Zomahoun, Barry Green, Sarah Jackson</i></p> <p>This session introduces and discusses The African Institute for Mathematical Sciences (AIMS), an innovative institute providing world-class postgraduate education in the mathematical sciences to young talented Africans. The institute has a pan-African student body of which a third are women, and an international body of lecturers coming from the best universities around the world.</p> <p>The AIMS Postgraduate Diploma course equips students with critical scientific skills, exposes them to a variety of mathematical sciences (including physics, computer sciences, pure and applied mathematics), and teaches them to carry out research.</p> <p>AIMS graduates pursue successful careers in the sciences, completing PhDs in areas such as pure and applied science, business, health or environmental sciences. About 80% of the 360 AIMS graduates are still in Africa.</p>	

1:15PM – **C Role Models for Mobility: Portraits of Women from the Marie Curie Fellows Association** Liffey Hall 1
2:45PM *Speakers: Antonella Di Trapani, Giovanna Avellis, Maria Bostenaru Dan, Silvia Giordani, Natalia Balcazar*

It is more recognised and accepted nowadays that mobility is a key-factor in achieving a successful scientific career. The benefits gained from the mobility experience range from acquiring new skills, being exposed to new cultures, opening of new horizons, exchanging of information, getting access to better research facilities etc.. For almost 20 years the Marie Curie Fellowships have been one of the main instruments to promote a culture of 'mobility' in the European Union and beyond. However the numbers of women who leave their country to go and spend a period 'abroad' is still limited and even less is still the number of women who reach the top level in their career.

It can be difficult to fulfil the needs of a couple, what is called dual-career or even more settling down to have a family. Quite often the 'mobility' is seen as an obstacle rather than a mean to achieve both. In addition 'mobility' can be daunting as there is no guarantee to find a place in the previous Host Institution or country once the 'mobility' period is over.

The Women in Science Working Group of the Marie Curie Fellows Association (MCFA) will present the experiences of women who have been 'mobile' and also been successful in their career without losing the focus of having a life-work balance.

1:15PM – **S Building an economy on good ideas** The Liffey A
2:45PM *Speakers: Dominique Ristori, Frank Ryan, Clive Cookson, Julia Lane*

Innovation is all about getting good ideas to market and bridging the gap between discovery and delivery. In this session, three distinguished speakers will deal with the challenges faced when driving and supporting economic and social progress through science. More precisely, they will explore the latest thinking on the value of indicators while providing the latest insights into Irish, European and US developments, plus their global implications.

The first case study will highlight the experience of the Irish Celtic Tiger and lessons learnt from the perspective of a knowledge based economy. The science behind the compilation of the annual investment in industrial R&D scoreboard will be explained. Finally, the lessons learned into a wider context, while advocating the importance of advancing the scientific basis of science and innovation policy through developing, improving and expanding models, analytical tools, data and metrics.

1:15PM – **S How do European RIs contribute to tackling grand societal challenges?** Wicklow Meeting Room 2
2:45PM *Speakers: Milena Žic Fuchs, Pär Omling, Martin Hrabé de Angelis*

The challenges that society faces are both global and complex. To name a few examples; the prospect of doubling the current world population by 2050 and an envisaged reduction of arable land our food-systems will need to be improved to be able to feed the world in future. The increasing average age of humans brings new health risks that need to be detected, acknowledged and mitigated in order to maintain an acceptable quality of life for future generations. With a looming exhaustion of fossil fuels within a few generations time, there is a strong need to investigate alternative sources of energy to find the supply to the growing demands of modern society. Another challenge is how do we address the preservation of the cultural heritage, that made human beings to what they are today and will determine part of their future evolution.

If solutions to these challenges are to be found, investment in excellent interdisciplinary research is key. Research Infrastructures have been playing a central role in fostering excellent multi-disciplinary research, with examples like CERN, EMBL, ESRF and ESO. This trend is rapidly expanding into all fields of science.

1:15PM – **S Innovative Medicines Initiative: How European cohesion will help to promote IMI's education and training programmes** Liffey Hall 2
2:45PM *Speakers: Frederik Wittock, Michel Goldman, Dimitri Corpakis, Tony Payton*

The Innovative Medicines Initiative (IMI) was launched in 2008 as a large-scale public-private partnership between the European Commission and the European Federation of Pharmaceutical Industries and Associations (EFPIA) to boost the development of new medicines across Europe. The IMI education and training pillar has been developed to ensure that Europe's biomedical education landscape is enhanced to allow for innovation and Europe's global leadership in future medicines research. The European Medicines Research Training Network (EMTRAIN) is tasked with establishing a pan-European platform for education and training that covers the whole life-cycle of medicines development. A large part of this work has been the development of a free post-graduate biomedical course catalogue called on-course®. Harmonizing European training programmes by expanding the network in all European member states and associated countries is aimed for minimal bureaucracy to allow maximum flexibility and mobility between countries. Emerging challenge occurred in the development of a strategic plan to ensure

sustainability of education and training projects from IMI and its positioning in future funded frameworks offered by Horizon 2020.

Session Topics:

IMI: opportunities and challenges (Prof. Michel Goldman),
Balancing act between European and nationally-funded projects with regard to training and Horizon 2020 (Dr. Dimitri Corpakis),
IMI Education and Training expansion plan (Frederik Wittock),
On-course: expected impact on Europe's landscape of training in medicines development (Dr. Tony Payton).

1:15PM – 2:45PM	S Is collaboration with Russia vitally important for Europe?	Wicklow Hall 2A
	<i>Speakers: Alik Izmail-Zadeh, Peter Tindemans, Vanessa Campo-Ruiz, Vladimir Burdyuzha</i> With Russia investing in research and encouraging expatriate scientists to return, what can be done to foster positive relations and harness expertise in the sciences as well as humanities? Both Russia and the EU stand to gain by increasing levels of collaboration in areas of strength such as space and social sciences. What is the balance between basic and applied research in Russia, and how is the EU perceived in Russian scientific institutions?	
1:15PM – 2:45PM	S Responsible Research and Innovation	Ecocem Room
	<i>Speakers: René von Schomberg, Jack Stilgoe, Richard Owen, Dave Guston, Jeroen van der Hoven, Fern Wickson</i> Responsible Research and Innovation is an emergent policy discourse with potentially widespread implications for the practices, norms and cultures of science. This session will explore what responsible innovation is, how it is being defined in different contexts and for different audiences, and the ways in which the issue is being differentially configured and implemented across European, UK and US contexts. How are societal and ethical goals and concerns to be defined? What role should public and stakeholder engagement play in this process? How should responsibilities and accountabilities be organised between researchers, universities and funders of research and innovation?	
1:15PM – 2:45PM	S The European Research Area: translating the aspiration into reality	The Liffey B
	<i>Speakers: Octavi Quintana Trias, Conor O'Carroll, Dr. Alma Swan, Stefan Kuhlmann, Elisabeth Monard, Inés Sánchez de Madariaga</i> The European Commission's 2012 policy Communication on the European Research Area (ERA) should lead to a significant improvement in Europe's research performance to promote growth and job creation. The measures in the Communication will have to be implemented by EU Member States, the Commission and Research Organisations to ensure the completion of ERA by 2014 as called for by the European Council. To complete ERA and maximise the return on research investment, Europe must increase the efficiency and effectiveness of its public research system. This requires more cooperation so that the brightest minds work together to make greater impact on grand challenges (e.g. demographic-ageing, energy security, mobility, environmental degradation), and to avoid unnecessary duplication of research and infrastructure investment at national level. It also requires more competition to ensure that the best researchers and research teams receive funding - those able to compete in the increasingly-globalised and competitive research landscape. With the explicit objective of opening up and connecting EU research systems, the ERA reform agenda focuses on five key priorities, which will be presented and discussed. They include optimizing Europe-wide research competition and cooperation, the interoperability of national research systems, promoting gender equality, opening the access to scientific knowledge, and opening the labour market for researchers. In other words: removing barriers to the free circulation of researchers and knowledge in Europe. "A Reinforced European Research Area Partnership for Excellence and Growth" (Dr. Octavi Quintana); "Increasing effectiveness of national research systems" (Prof. Stefan Kuhlmann); "Co-operating and competing at a European-wide level" (Dr. Elisabeth Monard); "An open labour market for researchers" (Dr. Conor O'Carroll); "Promoting gender equality in research institutions" (Prof. Inés Sánchez de Madariaga); "Optimal circulation and transfer of scientific knowledge" (Dr. Alma Swan).	

1:15PM – **S The Great Debate on the battle to feed a changing planet** Auditorium
2:45PM *Speakers: Prof Louise Fresco, Prof Lynn Frewer, Leo Enright, Edward Ouko, Prof Rajendra K. Pachauri, Prof Sir John Beddington, Prof Pamela C. Ronald*

Climate change is a global problem that threatens the well being of future generations. The latest IPCC report suggests that global greenhouse gas emissions must be reduced by 50% by 2050 in order to avoid irreversible climate change. Hunger is a global problem that already affects 1 billion people. The UN estimates that food production, a significant component of GHG emissions, will need to increase by 70% by 2050. How can we curb emissions from food production and provide access to affordable food for everyone? Achieving both goals simultaneously will require hard and controversial choices; how can we be sure we make the right ones? A panel of high profile international speakers will explore questions such as "Will we starve or will we burn?" and "Can the world grow food at affordable prices and deal with climate change?". The legacy of this event will be joint global research actions arising from the meeting of the EU Joint Programme Initiative on Agriculture, Food Security and Climate Change, the Global Research Alliance and the Consultative Group on International Agricultural Research.

1:15PM – **N The Power of the Purse - How innovative companies can take-off with public procurement**
2:45PM *Speakers: Britta Thomsen, Maria da Graça Carvalho, Malcolm Harbour, Teresa Riera* Wicklow Hall 1
Madurell, Luke Georghiou, Marion Dewar, Jennifer Cassingena Harper, David Connell

A contract from a lead customer is one of the most valuable assets that an innovative company can possess. It significantly reduces the risks involved in rolling out a new product or service. It makes the company much more attractive for a prospective investor.

Public authorities are extremely valuable as lead customers. Project Scales can be very significant, and a public organisation can offer great opportunities for product or service development. An innovative solution supplied to a lead public customer can go on to become a product in global demand, securing a company's long term future. The US experience is significant in this respect

Public procurement of innovative solutions is now a mainstream European Union policy. In the Horizon 2020 strategy, new legal frameworks and funding programmes will create valuable opportunities. However, innovative procurement solutions are already growing fast under existing rules. This is the right time for innovative companies to move into the public market.

This interactive workshop will bring together policy makers, research organisations, public buyers and suppliers to explain current and future programmes, and present case studies of successful customers. It will be an "unmissable" session for researchers and companies who want to turbo charge their innovations through to market.

2:45PM – **K Keynote Address: Bob Geldof "Making a Difference"** Auditorium
3:45PM *Speakers: Sir Bob Geldof*
Session Chair: Tom Arnold, CEO Concern Worldwide

2:45PM – **K Keynote Address: Brian David Johnson "Mechanical ducks, tea-cup robots & Frankenstein's monster: imagining a new future for computing "** The Liffey B
3:45PM *Speakers: Brian David Johnson*

Session chair: Prof. Lizbeth Goodman, Chair of Creative Technology Innovation and Professor of Inclusive Design at University College Dublin

2:45PM – **K Keynote Address: Helga Nowotny "The Usefulness of Useless Knowledge – and how to find uses and users"** The Liffey A
3:45PM *Speakers: Prof. Helga Nowotny*

What future does Europe have at a time beset by a fear of the future? The optimistic outlook which prevailed only a few years ago has yielded to gloomy doubts. Science and technology have always played a role as a gigantic, if unstable projection screen for public and private imaginaries alike, coloured with utopian or dystopian meaning. Where do we stand today? What are some of the emerging imaginaries that uneasily float across policy discourse, corporate boards, the social media interconnecting the younger generation?

I will then turn to the ERC and what appears to be the seemingly useless knowledge it generates. I will argue that it is precisely its seeming uselessness that permits new uses and new users to emerge, take shape, become embedded in already existing systems, structures and practices or carve out new spaces for themselves. Historical examples abound, showing that solutions were readily offered, but yet had to find and define the

problem which they were uniquely suited to address. As always, to jump from lessons offered by history to a complex and messy present is risky. Nevertheless, I will attempt to offer a few guidelines on how useless knowledge is transformed into uses and how users are constituted by using what science and technology have to offer.

Session Chair: Martin D. Shanahan, Chief Executive of Forfás, Ireland

4:00PM –	C How should Europe re-invent doctoral training?	Liffey Hall 1
5:30PM	<p><i>Speakers: Conor O'Carroll, Maria-Christina Georgiadou, Miguel Jorge, Dries Maes, Suzanne Miller-Delaney</i></p> <p>Europe's universities play a key role in the economic recovery, implementing the Europe 2020 Strategy for smart, sustainable and inclusive growth.</p> <p>Developed economies rely on new knowledge and highly skilled knowledge workers to feed a process of continuous innovation. Over the last five to seven years many Member States have modernised their system of doctoral training with a Europe-wide trend to move from the traditional model of a "master-apprentice relationship" towards doctoral training delivered in structured programmes for cohorts of candidates.</p> <p>Our economy needs better matching of supply (training of researchers) and demand (recruitment of researchers) and the Innovation Union acknowledges this in its commitments.</p> <p>In line with the Europe 2020 objectives, doctoral training is key to creating more and better jobs as it provides young high potentials with the right qualification to move into a wide range of employment sectors. More structured forms of doctoral training, following common Principles for Innovative Doctoral Training in Europe are vital for realising these commitments.</p> <p>The Principles refer to:</p> <ol style="list-style-type: none">1) Research excellence,2) Attractive institutional environment (in line with the Charter & Code),3) Interdisciplinary research options,4) Exposure to industry and other relevant employment sectors5) International networking,6) Transferable skills training,7) Quality assurance. <p>The Commission launched a pilot scheme for 2012-2014 in order to test a small series of Innovative Doctoral Programmes, including European Industrial Doctorates. This pilot could be a precursor for funding under Horizon 2020 and could set an example for other funding instruments at national and EU levels. July-December 2012 a team of experts will visit 36 doctoral programmes and interview 36 more to check the feasibility of the Principles for Innovative Doctoral Training. The checking starts in Dublin!</p>	

4:00PM –	S Are university rankings real indicators of global competitiveness?	The Liffey A
5:30PM	<p><i>Speakers: Tony Mayer, Ben Sowter, Ellen Hazelkorn, Frank Ziegele, Bertil Andersson, John Wood</i></p> <p>The world is increasingly one of Key Performance Indicators, Rankings and League Tables and the universities are no exception. Yet universities should be the repositories of academic freedom. Can these two issues be reconciled? What do League Tables really measure? What makes a good ranking? Are they measuring what's important or excellent? Are they a guide to global competitiveness? Can European universities compete in the new global environment? Should government policy and or institutional strategy focus on its position in a ranking or on improving the quality of higher education? How should rankings develop in the future?</p>	

4:00PM –	S Debating the financial crisis: guessing or modelling?	The Liffey B
5:30PM	<p><i>Speakers: Francesca Campolongo, Wim Schoutens, Alex Kuczynski, Stephan Lechner</i></p> <p>This session discusses how science can help even on issues such as the financial crisis. It advocates the use of economic and financial models as valuable tools to gauge the collective impact of the proposed banking regulatory changes, and to ensure the overall consistency and thus efficacy of the complete package of measures.</p> <p>Financial models have been too often labelled as 'bad' tools, as they are associated with the idea of tools in the hands of speculators. But financial models, in proper hands, become a valuable tool for robust policy making.</p> <p>This session will contribute to the debate on the use of models for the reform of the banking system by presenting the point of views of the academic financial modellers, of the European Commission scientists who deploy models for policy impact assessment, and of practitioners from the banking industry.</p>	

4:00PM –	S Is science driven policy making an achievable goal?	Wicklow Hall 2A
5:30PM	<p><i>Speakers: Paul Rübig, Malcolm Harbour, Dominique Ristori, Jan Staman, Timothy M.</i></p> <p><i>Persons</i></p> <p>Evidence based policy making is increasingly important, as policy makers are faced with policy dilemmas and need</p>	

scientific input for policy development. Recent emergencies with a serious public impact (volcanic eruptions in Europe, earthquake and tsunami in Japan etc.) have shown that we need to speed up the interaction between science and politics in urgent situations. The purpose of the session would be to address via interactive discussions how to bring science even closer to policy making, what are the main challenges, and to share experiences and compare different systems in the EU and the US.

4:00PM – 5:30PM	S Saving science education	Liffey Hall 2
	<i>Speakers: John Meadows, Christine Horner, Eugenio Torracca, Michela Mayer, Nadia Prauhart</i> This interactive workshop aims to identify common challenges and success stories about engaging children in science. The session organisers have set up an electronic forum in advance of ESOF 2012 and are keen for participants to join the debate on the issues facing science education globally, as well as asking their own questions. The workshop will present a summary of these discussions and details of initiatives already underway. Participants will be encouraged to remain connected through the electronic forum after the conference to form new consortia and share best practice.	
4:00PM – 5:30PM	S Science crossing boundaries: the Nordic e-Science initiative	Wicklow Hall 2B
	<i>Speakers: Sverker Holmgren, Lars Börjesson, Quentin Cooper, Cherri Pancake, Dr. Beatrix Vierkorn-Rudolph</i> To meet the current challenges in e.g. health and human environment, extensive efforts in science and technology are needed. In such endeavours, e-science research and a highly advanced information and communication technology (ICT) infrastructure are crucial facilitators. In 2011, the Nordic eScience Initiative has been initiated, providing a framework for Nordic, European and global collaboration within key areas of science and development of the next generation of ICT infrastructure. The goal of the initiative is to enable cross-national, cross-disciplinary research efforts in areas that have been pointed out to be of critical importance both to the Nordic countries and to the global community. To make the discussion on how to remove obstacles to science crossing boundaries more concrete, examples will be provided from the focus areas of the Nordic e-science initiative with particular emphasis on research on health registers, biobanks and climate.	
4:00PM – 5:30PM	S Scientists and advocacy	Wicklow Meeting Room 1
	<i>Speakers: Kevin Finneman, David Guston, Albert Teich</i> A panel of active participants in U.S. policymaking will discuss how scientists can play an effective and constructive role in the policy process. The discussion will address the potential and limitations of scientific expertise and the relationship of scientific values to other value systems.	
4:00PM – 5:30PM	S Time to simplify the representation of European research	Ecocem Room
	<i>Speakers: Peter Tindemans, Prof. Paul Boyle, Prof. Enric Banda, Octavi Quintana Trias</i> European countries invest less than America and Asia; organising and funding research at the European level is clumsy and complex. National funding agencies look for a higher profile in European policy discussions as the biggest providers of flexible money, but face challenges: position vis-à-vis the ERC; joint responsibilities e.g. in providing mid-level European research infrastructures. Key performing agencies are central in defining major European research efforts: easy for big players (e.g. CNRS, MPG, TNO, major aerospace labs), but the tens of thousands universities and research institutions, or individual enterprises? At grass-roots level Euroscience aims to provide a platform and shared services for individual scientists and institutions. ScienceEurope defines itself as new European lobbyist representing many national funding agencies and some performing organisations. The European Science Foundation looks for its most effective added value. Horizon2020 presents major organisational and funding challenges: research and funding institutions must position themselves to ensure that solutions for major European research and innovation efforts are not largely politically inspired. European researchers and institutions need to unite to make their voice better heard and help find structures fit for purpose in the 21st century.	
4:00PM – 5:30PM	N Paradigms of innovation that transform economies	Wicklow Hall 1
	<i>Speakers: Dr. Michael John Gorman, Prof. John Hegarty, Dr. Jouni Partanen, Dr. William Harris, Dr. Mary Walshok, Dr. Mats Nordlund</i> This session will present four landmark cases of innovation capacity building drawn from the EU, the Russian Federation, and the US. Senior leaders from these initiatives will describe their strategies, experience and results to date. Attendees will also have the opportunity to ask questions and interact informally with the participants from these key initiatives to share learning and explore opportunities.	

The participants come from

The Business, Innovation and Technology (BIT) Research Centre of Aalto University - a significant driver of innovation in Finland, already an innovation leader in the EU.

Science Foundation Ireland - a paradigm setter in creating innovation systems. The model employed in Ireland has been repeated in Arizona.

The San Diego CONNECT program - an early and very successful innovation flagship development in the US.

The session will culminate in the announcement of plans and opportunities in Russia following the establishment of the largest and most ambitious innovation project on continental Europe for many years: the Skolkovo Institute of Science and Technology which is being established in collaboration with MIT.

After the formal session, there is an opportunity for further discussions with the participants.

5:30PM – **K Debate on Scientific Publishing and Open Access** Auditorium
6:30PM

Speakers: Dr. Philip Campbell, Prof. Luke O'Neill, Dr. Alma Swan, Prof. Jos Engelen, Prof. Maria Leptin

This session will consider the issue of Quality Control in Scientific Publishing, both in the context of publication in for-profit journals and also in the context of a future move to Open Access journals. Against the backdrop of: The proliferation of journals and the burgeoning of scientific publications,

Recent controversies over publication and subsequent corrections and retractions of flawed and fraudulent papers,

On-going community and political agitation for Open Access (OA),

the following questions will be posed:

Is the transition to full and immediate open access to research papers inevitable?

Does the growth of open access threaten the quality of research papers?

How will the science literature evolve over the foreseeable future, and how will the roles and funds of researchers, publishers, research councils and universities need to evolve with it?

How will the achievements of researchers be documented, accredited and judged in the future?

7:00PM – **E Media Networking and Social gathering** venue to be confirmed
9:30PM

Open to accredited Media delegates only. **Exact time to be confirmed.**

7:00PM – **E Presidents' Dinner** Trinity College, Dublin
10:00PM

Speakers: Prof. Patrick Cunningham, Prof. Enric Banda

NOTE: By invitation only.

NOTE: Exact time to be confirmed.

JULY 14 • SATURDAY

8:00AM – **C How to get a job in industry: straight-talking from leading research managers** Liffey Hall 1
9:30AM

Speakers: Leonard Hobbs, Dr. Lisa Amini, Mary Shire, Ian Jones, Mazhar Bari, Brian Caffrey, Shane Comer, Lovelyne Ni Mhaonaigh

As work becomes increasingly more global and the pace of change drives greater levels of innovation, the need for employers to find people with the right technical skills, who can adapt to the competitive landscape and work on an international level across cultures and time zones becomes critical to the success of the individual businesses. Representatives from some of Ireland's leading technology companies will describe what they are looking for when it comes to hiring college graduates in today's business climate. These representatives will come from large multinational companies and small to medium size enterprises, as well as from representatives who have worked both in academia and industry.

The session will begin with 4*10 minute presentations (verbal only) from each of the panellists outlining their companies/organisations and describing what they would be looking for in a candidate. The final 40 minutes of a 'fish bowl' session will be used to do 3 mock-up interviews, on stage, with some brave candidates selected ahead of time and the speakers acting as an interview panel. Each of the students will be asked a question from 3 of the panellists, with the 4th panellist providing input on how the interview went. The interviewee will get some brief feedback from the panel post the interview.

8:00AM – **S The virtual future of healthcare** Ecoem Room

9:30AM *Speakers: Carl Johan Sundberg, Robin Teigland, Parvati Dev, Christopher Welch*

A virtual world (VW) is a 3D immersive, computer-simulated environment where users are represented by avatars through which they interact in real time with other avatars, objects and the environment. Due to the fast growth of broadband internet access and computing power, individuals and organizations throughout the healthcare ecosystem are 'stepping into the internet' and using VWs in areas such as research and development, hospital construction, medical training, sales and marketing, and patient care. The objective of this panel is to introduce VWs and showcase a variety of healthcare applications with the purpose of engaging the audience in a discussion of how VWs can be used in a meaningful manner.

In an effort to generate lively debate with the audience and to facilitate an understanding of the topic, the panel will be a mixed reality event, i.e. the panellists will be located physically in the US and Europe and will present through their avatars in the VW of Second Life. Additionally, we will take the audience on a guided tour of relevant sites in Second Life and other VWs, thus providing a live demonstration of immersive virtual worlds.

8:00AM – **S Tomorrow's vaccines today** Wicklow Hall 2A

9:30AM *Speakers: David Klatzmann, André Habel, Odile Leroy, Danilo R. Casimiro*

The world in the 21st century is faced with a myriad of global health problems which can only be solved by scientific cooperation and subsequent breakthroughs. It is therefore crucial to coordinate efforts in research, education and funding to foster an enabling environment in which out-of-the-box thinking is encouraged and innovation can deliver products.

The European vaccine research field serves as the ultimate example. The main knowledge gap within vaccine research is the lack of understanding of the immunological mechanisms mediating protection. In order to deliver the vaccines of tomorrow, the field needs to re-engineer its thinking and endorse an innovation fostering, long term vision for vaccine design and immunology.

The interdependencies of the policy areas for vaccinology are a general example of how inter-agency cooperation must be promoted to achieve success, which will guarantee access to knowledge, and will ultimately contribute to efficiency, better jobs and new products, such as innovative vaccines.

8:00AM – **S Volcanic eruptions and global fallout** The Liffey A

9:30AM *Speakers: Aoife Braiden, Massimo Cocco, Christopher Bean, Freysteinn Sigmundsson, Andreas Petzold, Ulrich Küppers*

Since Pliny's description of Mt Vesuvius erupting in 79AD, there have been countless individual historical, archaeological and geological investigations of volcanic eruptions. More recently, studies of the impact of volcanic hazards on local communities, and improvements in infrastructure and engineering, have tried to mitigate major volcanic risks to local communities. However, recent eruptions in Iceland and Chile have shown that social and economic effects of such eruptions can also be felt globally. Although the eruptions mentioned are not considered large in scale, they influence communities thousands of kilometres away from the volcano; the impact on societies and multibillion Euro industries (such as tourism and agriculture) is acute.

This panel discussion will bring together the scientific community and end-users such as the aviation industry and policy makers, to highlight the progress made using a multidisciplinary, multinational approach to such scientific problems. The goal is to show what efforts are being made to fully understand and forecast the effects of these elements of our dynamic planet and how we aim to mitigate against future risks to our global community.

8:00AM – **S What should Europeans eat?** Liffey Hall 2

9:30AM *Speakers: Iris Erlund, Demosthenes B. Panagiotakos, Mikael Fogelholm, Toni Steer*

From a food-cultural view point, Europe is far away from being a homogenous area. Some regions in Europe (e.g. the Mediterranean countries) have really long cultural traditions, and some are much younger (e.g. the Nordic countries). National and regional diets may be approached from a cultural view point, but diet is also an essential part of our health. Besides having really strong and cultural roots, the Mediterranean diet has also repeatedly been connected to good health.

Other European regions are clearly less famous for their diets. However, some areas could perhaps challenge the Mediterranean diet. The Nordic countries have some dietary specialties with potentially great health effects: wild berries (e.g. blueberries, lingonberries and cranberries), rye and rapeseed oil. This session will address the following questions:

What and how are we eating in different parts of Europe?

What are the regional strengths and weaknesses regarding health effects?

Where do Northern, Western and Southern Europe meet, do we have a common intersection for improved diet and health in Europe?

8:00AM – **S Why is the Universe so massive? The hunt for the Higgs at the LHC** The Liffey B
9:30AM *Speakers: Frank Close, Stephen Myers, Themis Bowcock, Tony Scott*

The Large Hadron Collider, the biggest scientific experiment in history, has captured the public imagination as much as it excites the scientists involved. But what is all the fuss about? Why are we so desperate to find the Higgs boson?

Stephen Myers, the scientist in charge of the massive accelerator rings at CERN, will explain how the LHC creates such colossal energies that it is able to recreate conditions last seen during the Big Bang. He will show how the LHC is furthering our knowledge of the origin of the universe and the ultimate nature of matter.

A panel of leading scientists will present the latest news and images from the LHC. They will explain how physicists know that they have (or have not?) found the Higgs, and discuss the implications that its (non?) existence has for our understanding of the universe, what are the even more exotic alternatives to the Higgs, and what possible discoveries lie ahead?

8:00AM – **N How can you turn Astronomy into Business Clusters?** Wicklow Hall 1
9:30AM *Speakers: Grace Naledi Mandisa Pandor, Pallab Ghosh, Robert-Jan Smits, Gerlinde Bedoe, Johan Eksteen, Ronald Stark*

Astronomy is big business. South Africa, allied with the African Union and eight other African countries, is making major investments in radio astronomy in partnership with the European scientific community and industry. This includes a bid to host the world's most powerful radio telescope - an instrument 50-100 times more sensitive and 10,000 times faster than any radio imaging telescope ever built. More than 70 institutes in 20 countries, together with industry partners such as Intel, Nokia, Siemens, Microsoft and Cisco are participating in the scientific and technical design. South Africa has already constructed a pathfinder telescope and with African partners are developing plans for an African VLBI Network. This science to business project is truly of transformational scientific significance. The design, construction and operation of the telescope will have a potentially global impact on skills development in science, engineering and associated industries around the world. This interactive round table complements the EU-Africa Partnership Programme with demonstrable science to business.

It will bring together top researchers, business leaders and policy-makers to spotlight the latest advances and opportunities in world-leading science instrumentation. Via a flexible format of brief presentations led by an experienced moderator with ample space for questions, answers and reactions, speakers will shed new light on just what goes into making radio telescopes from the factory floor to the field. The outcome will be a sharpened understanding of what it means for diverse enterprises and regions. In particular, technology development in antennas, fibre networks, signal processing, and software and computing, with spin-off innovations in these areas set to benefit other systems that process large volumes of data, will be spotlighted. The session will be highly visual with a focus on tech transfer, business and recruitment opportunities. It will specifically give valuable insights into the dynamics of strategic international business partnerships such as Africa and Europe.

9:30AM – **E Gathering of Euroscience Travel Grant recipients** Wicklow Meeting Room 4
10:15AM *Speakers: Pauline Mattsson, Klaus Bock, Dorthe B. Ravnsbæk, Eamonn O'Brien*

A number of organisations, including the **Embassy of Switzerland in Ireland**, the **Swedish Research Council (VR)**, the **Centre National de la Recherche Scientifique (CNRS)**, the **Danish Agency for Science, Technology and Innovation (DASTI)** and the **Research Foundation Flanders (FWO)**, in cooperation with **Euroscience** offered travel grants through open calls to help young researchers who wished to attend ESOF2012.

A special get-together is being organised by Euroscience for the recipients of these grants.

Pauline Mattsson, Euroscience Governing Board member, will introduce the session (10 min), **Eamonn O'Brien**, the Founder and CEO of The Reluctant Speakers Club and also a long time member of ESOMAR, the world association of research professionals, will advise on effective networking (20min), The European Young Researchers' Award (EYRA) winner for 2011 **Dorthe B. Ravnsbæk** will present her own career as inspiration (5 min)

ESOF 2014 Champion professor **Klaus Bock**, Chairman of the Danish National Research Foundation (DNRF), will look already ahead to ESOF in Copenhagen (5 min).

Please note that this is a closed session and the attendance is by personal invitation only.

9:30AM – 10:30AM	K Keynote Address: Christian Keysers "The empathic brain" <i>Speakers: Prof. Christian Keysers</i> The empathic brain Most of us can effortlessly feel what goes on in other people. When we watch the scene in Dr. No where a tarantula walks on James Bond's chest, we need no conscious deliberation to understand his intentions to kill the spider or to guess what the tingling of the spider's legs feel like on his chest. Instead, we seem to empathically feel what he goes through. Our hands start sweating and our heart beats faster – as if we were in his stead. Why are we so empathic? In this talk, I will review research that shows that our motor system, normally involved in programming our own actions, becomes automatically activated when we see the actions of others. I will show how our somatosensory system, that normally responds when we are touched, becomes activated when we see the skin of other people be touched. Finally, I will show how regions of the brain involved in experiencing emotions such as disgust, pain and pleasure become activated when we see or read about others experience similar emotions. Together, this data shows why we do not need our intellect to understand other people. Our brain transforms what others do and feel into our own actions and feelings. We then feel what they feel, and intuitively adapt to their actions and emotions. Biology has equipped us with an empathic brain that endows us with an intuitive understanding of others and an intuitive sense of ethics. Short Bio Christian Keysers (1973) leads the Social Brain Lab at the Netherlands Institute for Neuroscience in Amsterdam and is Professor for the Social Brain at the University Medical Center Groningen. Together with his laboratory, he investigates how the brain allows us to understand other individuals. He is French and German, studied Psychology and Biology in Germany and the USA and received his PhD from the University of St. Andrews (Scotland). Thereafter he worked in Parma, Italy, in the group that discovered Mirror Neurons, and lives in the Netherlands since 2004. He wrote a book, 'The Empathic Brain', in which he shows how his discoveries change the way we think about social interactions and human nature. Further Reading: The Empathic Brain by Christian Keysers, available from amazon (http://www.amazon.co.uk/dp/9081829203/) <i>Session Chair: Prof. Orla Hardiman, Consultant Neurologist, Beaumont Hospital Dublin</i>	The Liffey B
9:30AM – 10:30AM	K Keynote Address: Lisa Randall "High Energies and Short Distances" <i>Speakers: Prof. Lisa Randall</i> Frank B. Baird, Jr., Professor of Science, Harvard University <i>Session Chair: Prof. Siddhartha Sen, CRANN, Trinity College Dublin</i>	Auditorium
9:30AM – 10:30AM	K Keynote Address: Regina Palkovits "Biomass – a valuable feedstock of the future" <i>Speakers: Prof. Regina Palkovits</i> University of Aachen <i>Session Chair: Dr. Jerry D Murphy, Sustainable Energy Research Group, University College Cork</i>	The Liffey A
9:30AM – 10:45AM	S Can Europe save the pharma industry? <i>Speakers: Prof. Mark Ferguson, Patricia Reilly, Prof. Luke O'Neill, Jaak Peeters</i> The combination of greater longevity and some bad lifestyle choices in the developed world are resulting in an increasing incidence of a wide range of chronic ailments including diabetes, cancer and neuro-degenerative diseases. This results in a growing demand for drugs as well as presenting new targets for drug development. Yet despite this positive market outlook the global pharma industry is facing an existential crisis. The causes/symptoms of this crisis have been well-rehearsed: expiration of patents for blockbuster drugs, escalating development costs and shrinking development pipeline; these factors are exacerbated by governmental pressure to reduce expenditure on public drug purchase schemes. This session will explore how to rekindle innovation in the pharma industry and in particular how Europe can take the lead in getting the industry on a viable path? Specific questions to be addressed include: What actions are required of industry, universities, funding agencies and the European Commission? To what extent will new technologies (genomics, proteomics, in silico development, personalised medicine and diagnostics) help? Who should pay the associated costs? Can new ways of collaboration be a solution? How can regulatory burden be minimised without compromising patient safety (up to 45,000 patients in phase III trial)? Is IML a solution/a path forward?	Wicklow Hall 2A

9:30AM –

S Can we feed 9 billion people or will we starve?

Liffey Hall 2

10:45AM

Speakers: Bruce Osborne, Chris Leaver, Tom Arnold, Bill Davies, Jonathan Jones, Karin Metzloff

By 2050 the global population is expected to reach 9 billion, with the majority of this increase in the developing world. In order to feed these people it is estimated that a historically-unprecedented rise in food production of at least 50% will be needed. The question is how can we do this, when we cannot adequately feed the ~1 billion people who are starving today?

This session will assemble some of the foremost experts involved in meeting the challenge of tackling global hunger. Two internationally renowned scientists - Bill Davies and Jonathan Jones - will address the key challenges of how to enhance food production in the face of limiting water supplies and the increased threats of pests and diseases. Bill Davies is an expert in water use by crops and Jonathan Jones is a key player in the development of disease resistance in plants. Chris Leaver, is Emeritus Professor at Oxford University and currently engages in public understanding of science, particularly issues associated with food security. Tom Arnold, CEO of Concern, will talk on hunger and poverty in developing countries.

9:30AM –

E Science meets Poetry III

Trinity College, Dublin

1:00PM

Speakers: Jean-Patrick Connerade, Iggy McGovern, Maurice Riordan, Christophe Goarant Correa de Sá

Venue: The Schrödinger Theatre, Fitzgerald Building, Trinity College, Dublin

Map: <http://goo.gl/vB4jQ>

<http://sciencemeetspoetry.eventbrite.ie>

"Science meets Poetry" is a unique feature of the ESOF meetings: it was born in Munich, was considerably extended in Barcelona (2008) and came to maturity in Turin (2010). It aims to bring contemporary creative poets into the midst of a scientific meeting to discuss the two-way relationship of poetry to science and how each benefits the other. Both of the previous meetings led to the publication of a book of proceedings by Euroscience. The event is NOT an occasion for all and sundry (even the invited speakers) to read selections of their own poems. Rather, it focuses on general themes, of interest to both scientists and poets, and in particular, to ESOF delegates. Distinguished poets from all over the world have participated in the previous meetings. The Science meets Poetry session of ESOF is now well-regarded in many literary circles and enhances the reputation of science.

This third incarnation of the event will feature four evocative and provocative talks:

Dublin: a European capital of Poetry

Dublin can claim, through such household names as James Joyce, William Butler Yeats and Oscar Wilde, to be one of the major haunts of poets on the planet. Further to this glorious history, what is the literary landscape around Dublin today?

Maurice Riordan (contemporary Irish Poet)

The Two Williams: Hamilton and Wordsworth

Can the scientist be a poet, or the poet come to terms with science? A physicist and poet analyses the epistolary exchanges between two lifelong friends: a great scientist who longed to be a poet and a poet who rejected the technology of his time.

Iggy McGovern (Professor of Physics and Poet, Trinity College Dublin)

The Gothic myths, Romanticism and the birth of Ecology

From the amateur scientists Johann Wolfgang Goethe and Percy Bysshe Shelley, via Lord Byron and Mary Shelley's gothic fantasies to Wordsworth, is Romanticism the source of the 'Green Movement', and how does the love-hate relationship between science and poetry feed into poetry today? As seen by a contemporary French poet.

Chaunes (poet) alias Jean-Patrick Connerade (Emeritus Professor Imperial College London, President European Academy of Sciences Arts and Letters)*

The Science of Love and the Love of Science

How much of love is molecular, determined by genes and laws of selection, as argued by some biologists today, and how much is it unique, nurtured by the human species through its artists and (especially) its poets? A young contemporary poet, author of a recent play centred on the myth of Dom Juan, takes up the challenge posed by

modern biologists on behalf of the poets.

Christophe Goarant Correa de Sà (Poet, teacher, Société des Poètes Français)

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10:45AM –	S Frontier Research: An extravagance or a necessity in times of recession?	The Liffey A
12:15AM	<i>Speakers: Thomas Sinkjaer, Ernst-Ludwig Winnacker, Dennis McKearin, Wilhelm Krull</i> In many parts of the world, science, technology and innovation are seen as critical drivers of economic growth and national well-being. We look towards research hoping to find the solution of many of the problems – current and future ones- we face and which cannot be solved without major breakthroughs. The challenges created by poverty, climate change, infectious diseases, health challenges across the years of the human lifespan produce a sense of urgency to find solutions. Hence, as tools become available and financial resources become more limiting, research funding is increasingly viewed as an end to a means. Because this view assumes it can recognise the appropriate endpoint, it ignores the role that research directed by the need to understand basic processes has played as the engine of new discoveries to fuel new technologies and combat challenges not yet imagined. The speakers of this session all agree that it is necessary and natural for a nation to set aside specific means to address major challenges or to explore already acknowledged promising areas. However, they also share the view that a nation should commit itself to support what might be described as frontier research that push the boundaries of knowledge and hold the potential to transform science itself and ultimately change the way we live and think. In order to push the frontiers one must enter new fields and leave the beaten track. This demands that not only researchers but also funders are courageous and adventurous and ready to take risks. Forging new paths in barely known territory often takes longer than the usual length of project funding. Mistakes must be allowed as well as change of direction. The session will discuss why it is necessary to trust the best researcher's talent and how transformative research is best identified and supported by addressing questions such as What is frontier research and how do we detect it? Is it a necessity or an extravaganza? – Why? What are the benefits for society? How is frontier research and creativity sustained, developed, nurtured?	

10:45AM –	C Ethics in research – why is it important to me?	Liffey Hall 1
12:15PM	<i>Speakers: Nicholas Steneck, Frank Cunningham, Maria Leptin, Snežana Krstić, Zaza Nadja Lee Hansen, Gemma Moore</i> Research ethics is an important part of professional life of every researcher and it influences society in multiple ways. However, perception of ethics, its principles and its importance may significantly vary between individuals, disciplines, and countries. Different perceptions and lack of awareness have led to controversial debates about the benefits of science, innovation and new technologies, as well as the societal responsibility of researchers. Younger researchers may be particularly affected, as they rarely have the opportunity to discuss relevant issues. In an era of digital science, where information communication technologies (ICT) are both the subject of and a tool for research, communication and collaboration, ethical issues are gaining increasingly in importance. The aim of this interactive round table is to raise awareness and discuss the importance of ethical principles in research and science from different perspectives. Aside from discipline-oriented considerations (such as ICT, life and bio science), the focus will also be on factors influencing researchers' careers, including different ways of providing training on the responsible conduct of research and research ethics. This roundtable aims to trigger an exchange of views from prominent contributors and the audience on this most fundamental, yet too often overlooked, area of research practice.	

10:45AM –	E Hot Science 3	Wicklow Meeting Room 1
12:15PM	Late-breaking science	

10:45AM –	S Culture lab: the application of science to art and artefacts	The Liffey B
12:15PM	<i>Speakers: Sarah Everts, Costanza Miliani, Matija Strlic, Philippe Walter, Leo Konstantelos</i> When you mention art or cultural heritage science, most people think about authentication of a priceless masterpiece or identification of a pigment on a Picasso painting. But cultural heritage scientists are doing much more. They're helping to conserve and restore everything from spacesuits to plastic sculptures. They're developing tools to study artworks and artefacts without actually touching them. They're looking through paintings to see initial drawings on the canvas below. They're even getting into the minds of ancient cultures by recreating their recipes for everything from hair dye to incense and then studying the products with modern analytic	

technology. This panel session will explore the new trends in cultural conservation science as well as guide conference attendees through fascinating recent projects at museums, galleries and archives.

10:45AM – **S Open science - best practice in sharing the research process with the public** Wicklow Hall 2A

12:15PM *Speakers: Michael Kobel, Paul Hix, Tom McCauley, Lynn Scarff, Marianne Fokkens*

More than ever it is important for society to comprehend the processes of science. Science is all around us, and our communal past is being studied and our future developed in research laboratories. It is vital that the general public be given the opportunity to comprehend the aspects of science and technology that affect our daily lives. But how is it possible to give lay people an insight into the processes and methods of today's research? How much of scientific content and concepts can be conveyed? How can the public be enabled to participate in the scientific process?

In this session five speakers will introduce their institutions' individual approach for bringing science to the public. They come from museums and science centres as well as from the research community and share a wide experience of effective and innovative methods of communicating science in their fields and providing the public access even to cutting edge research. Speakers will define their positions on boundary conditions for developing an effective dialogue on science between public and researchers and also the limits of this endeavour. In addition, they will discuss the degree of scientific literacy that can be developed in the dialogue between researchers and the public and how scientific culture in society can be promoted.

10:45AM – **S What is the impact of sustainable energy technologies?** Wicklow Hall 2B

12:15PM *Speakers: Samuela Vercelli, Salvatore Lombardi, David Jones, Jonathan Pearce, Sergio Persoglia, Camilla Svendsen Skriung, Cinzia De Vittor, Martin Krüger, Vassiliki Gemeni, Nick Riley, Brian McConnell, Carmen Franzese*

In recent years it has become clear that we need to develop a sustainable energy system, producing and using energy in a more respectful relationship with the environment. Nevertheless the public, and even specialized stakeholders, often find it difficult to evaluate the impacts of different technological options. All technologies, however sustainable, will have some impact, but what exactly is that impact? RISCs – 'Research into Impacts and Safety in CO₂ Storage' is a European project exploring the potential environmental impacts of the geological storage of CO₂, the only technology available for abating CO₂ emissions from fossil fuel power plants. The session will introduce the participants to the information produced within the RISCs project on possible impacts of CO₂ on onshore and offshore ecosystems and human population. It will start with a short film describing geological storage of CO₂, which might be new to many. Participants will then be divided into groups. The facilitator in each group will invite the participants to take part in an interactive exercise in the form of a game, in which they are invited to imagine the types of environmental impacts from CO₂ storage and how they might occur. They will then be encouraged to discover together information about the impacts and to jointly consider their likelihood. Experts will be available to answer questions and support the groups searching information and will help them reach conclusions which will be shared in general discussion at the end of the session. The objective is to experiment with a process for facilitating, through dialogue and self discovery, an understanding of the issues at stake.

10:45AM – **N How to overcome the challenges facing the European IPR system?** Wicklow Hall 1

12:15PM *Speakers: Alfred Radauer, Victor Rodriguez, Jeremy Philpott, Paul Rübiger, Michael Wurst*

The instruments of the IPR system – e.g., patents, copyrights, trademarks or designs – have become important building blocks for creating business models. The management of IPRs and their integration into a business strategy can make the difference between failure and success stories like Apple or Google. An innovation-friendly IPR environment – in terms of effective IP laws, adequate support services for firms and, ultimately, firms "fit" in IPR – is, hence, a necessity in Europe.

Several changes in the European IPR system are being implemented in this context. In particular, this concerns the path towards a unitary patent, reform in the copyright system, improved IP enforcement and better services for entrepreneurs to manage IP. With presentations of studies executed for the Scientific Technology Option Assessment Board (STOA) of the European Parliament, this workshop presents the path towards the unitary patent, the fight against counterfeiting/piracy reforms in the European copyright system. Significant advancements in services like automatic machine translation of foreign language patent documents and in educational programmes will be outlined by an EPO speaker. A speaker from IBM will elaborate on IPR challenges from a practitioner's point of view. An interactive discussion with the audience after the presentations highlights implications for entrepreneurs.

10:45AM – **E Euroscience General Assembly and presentation of Rammal Award** Liffey Hall 2

12:45PM

Speakers: Peter Tindemans, Prof. Anne Glover, Prof. Enric Banda, Prof. Sir Chris Llewellyn-Smith

The formal business of the General Assembly will be followed by addresses from two distinguished speakers, the award ceremony and a reception. These events are open to all conference participants:

*The importance of European Science and Science-based Policy Making (Prof. Anne Glover),
The importance of SESAME for scientific and political cooperation in the Middle East and the
Mediterranean (Prof. Sir Chris Llewellyn-Smith),
Rammal Award Ceremony,
Reception (Wicklow Room 4).*

Euroscience has been responsible since 1999 for the attribution of the **Rammal Award** created in memory of the great Lebanese physicist, Rammal RAMMAL (1951-1991). The medal is awarded each year to an outstanding personality of strong scientific stature from one of the Mediterranean countries, who, through his life and activity (whether in fundamental or applied research, teaching, or the integration of knowledge), has elevated scientific exchanges in this part of the world, rich with ancient tradition. The Award can also be shared by several recipients, and/or awarded to an organisation.

10:45AM –

E International Consortium of Research Staff Associations

Ecocem Room

12:45PM

Speakers: Gordon Dalton

The public ESOF2012 session will provide a platform for discussion of challenges shared in common by a mobile, international research workforce, best practices for addressing these common challenges, and the effects that these challenges have upon the global research enterprise. Until recently, national associations were relatively isolated and rarely communicated with one another. The past two years have seen increasing communication between national associations in Ireland (IRSA www.irsa.ie), the United Kingdom (UKRSA www.ukrsa.org.uk), the United States (NPA www.nationalpostdoc.org/), Canada, and South Africa, ultimately leading to the development of an international consortium. The international consortiums will be collaboration between national associations and include reciprocal arrangements with other researcher associations such as the Global Young Academy (GYA), Eurodoc, and the World Association of Young Scientists (WAYS).

The session will discuss plans for making the nascent European Research Staff Association (EURSA) and the International Consortium of Research Staff Associations (ICORSA).

Two core themes will be addressed:

Panel 1: What are research staff associations and their value to their countries? What are researchers and their value to the community?

Panel 2: What are the policy issues that research staff associations address? How can ICORSA offer guidance to international policy bodies?

10:45AM –

P Africa & Europe Partnership Symposium: Science for Economic Development

Auditorium

12:45PM

Speakers: Grace Naledi Mandisa Pandor, Dr. Ismail Serageldin, Robert-Jan Smits, Dr. Lidia Brito, Dr. Romain Murenzi

In the 21st century, Africa and Europe have moved into a new relationship, with the 54 states in Africa and the 50 in Europe each responsible for their own social and economic development. Sharing experience in the progress and use of science, and in delivering its benefits to society, are a common goal.

This symposium will be chaired by Dr. Ismail Serageldin, with a distinguished record of promoting science for development at a global level. Ministers of Science from South Africa, Mozambique and Rwanda will draw on their experience in diverse political and economic environments, and the Director General of the European Commission's Research and Innovation programmes will also speak.

The focus will be on lessons learned, and on opportunities and mechanisms for effective cooperation.

12:15PM –

S What does art bring to science?

The Liffey A

1:15PM

Speakers: Dr. Michael John Gorman, Andrea Bandelli, Clare Matterson, Josep Perelló

Historically, discussions of the interface between art and science have tended to focus on artists representing or illustrating some aspect of science, while leaving the science intact and unquestioned. In this visually engaging session, we will explore how interactions between art and science lead to the generation of new ideas, including original scientific concepts but also ideas for social, commercial and cultural innovations, products and services. We will discuss innovative approaches to bridging art and science around Europe and the world, and report on the first results of the European Framework 7 StudioLab project focussed on developing innovations through collaborations between scientists, artists and experimental designers. Is there genuine value to scientists from interactions with artists and designers? How can the public benefit from collaborations between art and science,

and does this provide a way to engage new audiences with science and technology?

1:15PM – 2:45PM	C All-aboard the Brain Train! Experiences of Europe's global scientific diaspora <i>Speakers: Patrick O'Shea, Izabella Zandberg, William Gallagher, Julie McEnery, Isabel Otero</i> This session will leverage the collective experience of the Wild Geese Network of Irish Scientists (WGN) and the European EURAXESS network to explore how engaging diaspora contributes to the enrichment of scientific careers. The session begins with a 5-minute, audio-visual presentation of "Postcards from Abroad", featuring WGN members presenting short vignettes of their research careers. The session continues with four, 10-minute presentations from internationally renowned members who will discuss Diaspora in Science and examine broad perspectives of their experiences as global researchers. Approaches to maintaining collaborations at home, while simultaneously forging successful partnerships abroad, will be described. Two researchers will then join the panel to discuss, with audience interaction, the value of leveraging the global scientific diaspora in maintaining international collaborations and advancing research mobility and give examples of the benefits of trilateral research programs in enabling European scientists to study abroad. The session serves as a preamble to the WGN 'Breakfast with Champions', where ESOF participants will engage directly with representatives from industry and academia, as well as science communicators and policy makers. The benefits of professional networking, both virtual and in-person, will be shown during these two events. The WGN serves as an instructive template for the development and maintenance of connections, both at home and abroad, demonstrating that today's internationally mobile researchers are indeed aboard the 'brain train', rather than contributors to a 'brain drain'.	Liffey Hall 1
1:15PM – 2:45PM	C Boosting Frontier Research in Europe <i>Speakers: Carl Johan Sundberg, Simone Turchetti, Thomas Schäfer, Leif Schroeder, André Mischke</i> ERC grantees represent the seed for future European leading research activities in all fields of scientific knowledge. Due to the diversity of European research funding they conduct their work in a great variety of situations. The speakers will highlight in the first place the exciting science they are carrying out. They will share their motivation and respond to the 'what for' question, illustrating that mixture of curiosity and drive arising from issues challenging society. They will make the case for Europe as a fertile breeding ground for the highest quality research and attracting the best minds from all over the world if only the right conditions are put in place. Then this will strongly help to establish a European (ERC) spirit among those engaged in the scientific community. The launching of the Young Academy of Europe exemplifies this.	Wicklow Meeting Room 3
1:15PM – 2:45PM	E Lost Down Memory Lane <i>Speakers: Dr. Husseini Manji</i> Documentary film on Alzheimer's Disease, with an introduction by Dr Husseini Manji. http://www.lostdownmemorylane.com	Wicklow Meeting Room 1
1:15PM – 2:45PM	S Are there realistic alternatives to animal testing? <i>Speakers: Andrea Haase, David Basketter, Roel Schins, Maurice Whelan, Mark Cronin</i> Current toxicology testing practice has to change – the paradigm is outdated and needs to shift to meet the needs of modern society. Raised social and political expectations for a safer environment and a healthier life, an economic situation that needs innovation rather than strangulation, the emergence of completely new classes of substances such as nanomaterials, and heightened public concerns about animal testing, have created a strong impetus to break with traditional methods. There are considerable regulatory pressures too. From 2013, any type of animal testing on cosmetic products and ingredients will be banned in the EU. In the industrial chemicals sector, legislation (REACH) clearly discourages animal testing and promotes the use of data from alternative methods, if available and sufficient to satisfy hazard information requirements. To date, almost 140 million Euro has been invested by the Commission to advance the development and validation of methods supporting the 3Rs (replacement, reduction, refinement of animal testing) but it has advised in recent communications that current science and tools are far from facilitating a transition to animal-free toxicity assessment. What does this mean for industry and their ability to innovate? What does it mean for the development of new materials and technologies? How for example will we be able to fully exploit nanotechnologies in sectors such as food, textiles and cosmetics if we lack validated and harmonised methods to test their safety to human health and the environment? These are significant challenges that only science can address. But where should scientists focus their efforts, and what research strategies might deliver success where we have failed in the past?	Liffey Hall 2
1:15PM –	S Conversations about science: the role of 'social media'	The Liffey B

2:45PM

Speakers: Bora Zivkovic, Brian Trench, Martin Robbins, Ulrike Brandt-Bohne, Felix Bohne

Science blogging has become a significant part of professional and public communication of science in certain sectors. In physics, for example, some discussions about new developments have been played out in the blogosphere. Bloggers were influential in forcing retraction of the claimed finding that certain bacteria live off arsenic. In climate science, bloggers played a crucial part in the disclosure of the hacked emails from the Climatic Research Unit at University of East Anglia and in the debates around these documents. Blogs are widely used as add-ons to scientific institutions' web sites to provide supplementary information on published findings, conferences and other events.

But blogs and related online media forms also open up possibilities for informal exchanges among scientists and between scientists, communicators and lay publics. At a time when much of the emphasis in public communication of science is on interactivity, dialogue and engagement, this panel explores how 'social media' are contributing to this kind of exchange. It asks what role 'social media' play in facilitating and promoting conversations about science that are open and inclusive.

The panellists are scientists and bloggers:

Ulrike Brandt-Bohne (Germany) blogs with her husband and fellow scientist Felix Bohne at Science Meets Society and has been publishing a series of scientists' self-written profiles Under the banner, A Scientist A Day; Martin Robbins (UK) blogs as The Lay Scientist and often stimulates many and strong comments with his observations on issues in science; Bora Zivkovic (USA, though Serbian-born) writes A Blog Around The Clock, is chief editor of the Scientific American blog network and a committed advocate of the large potential of blogs in science communication.

The panel's moderator / organiser is Brian Trench (Ireland), a lecturer and researcher in science communication, who recently published 'Scientists' blogs: glimpses behind the scenes' in the Sociology of the Sciences Yearbook.

1:15PM –

S Mind the gap: connecting brain research to educational policy

Wicklow Hall 2B

2:45PM

Speakers: Quentin Cooper, Elisabet Nihlfors, Maria Slowey, Bruno della Chiesa, Catherine Odora Hoppers, Kenneth Abrahamsson, Asa Makitalo, Paul Howard-Jones

How can brain science influence teaching strategies and improve education? Significant advances have been made in understanding how the brain works but this is yet to be reflected in current education practice, including social and gender equality. This has produced a mind gap that must be bridged if we are to reap the benefits of European investment in neuroscience research. This session will address how to promote learning and cognitive skills, and merge theories of learning with hard scientific evidence.

1:15PM –

S Particles, light and antimatter: new ways to battle cancer

The Liffey A

2:45PM

Speakers: Carsten Welsch, Sara Tegami, José M. Espino

In the last few years several new ways of treating cancer have emerged, using different particle species, intense light or even antimatter - all pushing the boundaries of science and technology significantly beyond the previous state of the art.

This session will give a brief overview of the history of cancer therapy before tackling a number of key questions: What are the distinct advantages of hadron therapy when compared to more traditional methods and how can highest quality treatment beams be produced? Can THz radiation serve as a diagnostics tool to detect cancer cells at their very early stages? Could antimatter-ions be the ultimate tool to treat specific cancer types? An outlook on future research programs will also be given - all of this in an active dialogue with the audience.

1:15PM –

S Quantum computing: the final frontier?

Wicklow Meeting Room 2

2:45PM

Speakers: Antonella Di Trapani, Antonio Acin, Szabolcs Csonka, Jeremy O'Brien, Jose Labastida

Quantum computing research is at the very frontier of what's possible. So what's next? Are these machines really the final frontier for data processing? How can quantum computers be built? And what is the timescale? What are the limits of quantum computing? How will quantum computers change information processing? How can we protect cryptography?

Leading researchers will present cutting edge projects on one of the most intriguing scientific questions facing us today.

1:15PM –

S Science and the protection of cultural heritage

Ecocem Room

2:45PM

Speakers: Susan Bioletti, Cristina Sabbioni, Sharon Cather, Debra Norris, Joyce Townsend, Prof. Ralph Mitchell

Human activities, including industrialisation, urbanisation, war and tourism are major causes of deterioration of heritage materials. Examples include the deterioration of the Lascaux caves in France, the Mayan archaeological sites in Mexico, and Leonardo da Vinci's Atlantic Codex in Milan, Italy.

In recent years the application of modern scientific analysis has led to major advances in both our understanding of deterioration processes, and in the development of methods used for the conservation of heritage materials. These materials have benefited from the interface with modern physical, chemical, and biological analytic techniques.

Conservation scientists are using molecular methods in the early detection of mould in ancient wall paintings and manuscripts, modern chemical analysis to detect the effect of pollution on historic buildings and archaeological sites, and non-destructive methods to detect degradation of easel paintings.

In this session the panel will discuss the role of modern scientific techniques to both analyze and preserve the world's important cultural heritage materials.

1:15PM –

S Stem cells in personalised medicine

Wicklow Hall 2A

2:45PM

Speakers: Balazs Sarkadi, Gerald Schatten, Thierry Vandeniessche, Ludovic Vallier

The International Cell Research Organization (ICRO-UNESCO) is promoting high level education especially in the developing world. This workshop intends to review promising human stem cell applications in medical therapy as well as in pharmacological and toxicological screenings, focusing on implications in personalised medicine.

Human stem cells provide an important novel tool for personalized medical treatments and for generating pharmacological and toxicological test systems. In the development of new targeted therapies, as well as in critical safety issues, animal based tests are mostly unsatisfactory, whereas the use of in vitro model systems is limited by the unavailability of relevant human tissues. Human embryonic stem cell lines may fill this gap, and offer an advantage over primary cultures as well as tissue-derived (adult) stem cells.

1:15PM –

N Impact of Open Innovation in PROs and Universities

Wicklow Hall 1

2:45PM

Speakers: Alberto Di Minin, Ronald M. Wolf, Erik Arnold, Pat Frain, Salvatore Amico Roxas

The Open Innovation paradigm triggers new challenges and opportunities for the research industry. Current trends characterising the knowledge economy (namely, inter alia, the globalisation of research, competitive pressure which reduce the companies' commitment to long-term and basic research; growing convergence of technologies) call for an evolution of the role played by research institutions: from a role focused on education and creation of public domain scientific results to a "knowledge hub" role. In particular, the need to deepen the relationship with industry requires research institutions to engage more in the development of "joint knowledge" (or co-creation of knowledge) with industry (and relevant stakeholders) via collaborating to establish, develop and manage "knowledge platforms", in order to attract, share and recombine the various contributions coming from the research, industrial and societal ecosystem. The round table will be opened by an introduction on Open Innovation and its relevance for the business and research world. The discussion will investigate the expectations industry has on the role PROs (Public Research Organisations) and Universities should play within the new emerging context. Furthermore, room will be devoted to discussing about the main "exogenous" hurdles (e.g. structural, cultural, institutional, regulatory...) that research institutions have to overcome in Europe in order to speed up this transition and how research institutions should concretely engage in shaping their business model in order to improve the relationship with industry. The round table will be closed by a practical presentation on concrete examples of "open innovation" business models adopted by research institutions in Europe.

2:45PM –

K Keynote Address: Kári Stefánsson "Understanding the Heel of Achilles"

Liffey Hall 2

3:45PM

Speakers: Prof. Kári Stefánsson

Chair: Dr. Ruth Freeman, Science Foundation Ireland

2:45PM –

K Keynote Address: Rolf-Dieter Heuer "The search for a deeper understanding of our universe at the Large Hadron Collider: the World's Largest Particle Accelerator"

Auditorium

3:45PM

Speakers: Prof. Rolf-Dieter Heuer

With the start of the Large Hadron Collider (LHC) at CERN, particle physics entered a new era. The LHC will

provide a deeper understanding of the universe and the insights gained could change our view of the world, and the talk will present some of the reasons for the excitement surrounding the LHC. The LHC is expected to yield insights into the origin of mass, the nature of dark matter and the existence of hidden extra dimensions. This talk will address the exciting physics prospects offered by the LHC, present latest results and also a look forward.

Session Chair: Dr. Ronan McNulty, School of Physics, University College Dublin

4:00PM –	C Research Careers in Europe: make your voice heard!	Liffey Hall 1
5:30PM	<p><i>Speakers: Kitty Fehringer, Anna Karaoglou, Stefania Bettini, Ellen Pearce, Jean-Claude Burgelman</i></p> <p>Give a voice to researchers on European research careers</p> <p>The Innovation Union flagship initiative of October 2010 underlined the importance of human resources and called for a European Research Area (ERA) to be established by 2014 and to be at the heart of the Europe 2020 strategy. This was endorsed by the European Council in February 2011.</p> <p>The Commission has already taken a series of initiatives to strengthen the research profession in Europe in close cooperation with the Member States.</p> <p>Initiatives include:</p> <p>EURAXESS - Researchers in Motion</p> <p>The Institutional Human Resources Strategy (HRS4R)</p> <p>Principles for Innovative Doctoral Training</p> <p>European Framework for Research Careers</p> <p>Pan-European Pension Fund for Researchers</p> <p>The session aims at both giving an overview of European initiatives for researcher careers (e.g. open labour market for researchers, gender balance, excellence in research....) and mobility, and setting up an on-going dialogue with European researchers, including those not present at the workshop. The objective is to empower researchers by providing them with constant opportunities to voice their ideas, insight and expectations regarding research careers and their mobility experience in Europe. In turn, this will enable the Commission to better take into account their concerns and feed them back into EU strategies and initiatives, which will also bring more transparency and openness to the overall policy-making process.</p> <p>At the beginning of the session, the audience will be updated on existing initiatives of the European Commission (e.g. EURAXESS) and the "ideal" career path of a researcher. Keynote will be given by Ellen Pearce.</p> <p>During the session, the European Commission, researchers and the audience will discuss topics related to career development and mobility of researchers. To further feed discussions, during the session participants will be invited to post additional ideas on a specific on-line forum conceived to voice their ideas and opinions. A summary of the main input will be published at the EURAXESS portal.</p>	

4:00PM –	C South Eastern Europe Facing the Knowledge Society	Ecocem Room
5:30PM	<p><i>Speakers: Raymond Seltz, Daniela Calciu, Jana Ognjenovic, Jean-Pierre Alix</i></p> <p>The main goal of this session is to initiate discussions among different generations of researchers on the challenges of transforming economies and societies in Southeast-European countries.</p> <p>In this context, two challenging domains will be particularly discussed:</p> <p style="padding-left: 40px;">Perspectives for career development within Science and Technology (S&T)</p> <p style="padding-left: 40px;">Intra- and interregional collaborations.</p> <p>The expected results are to:</p> <p style="padding-left: 40px;">Challenge the Governments in Southeast Europe to respond with more clear and concrete statements on their policies in the field of S&T;</p> <p style="padding-left: 40px;">Open new vistas for scientific and technological co-operations in the European Research Area.</p> <p>The session will include short reports (5 min.) of pre-ESOF meetings in different countries followed by a discussion.</p>	

4:00PM –	S Are science journalists doing their job?	Wicklow Hall 2A
5:30PM	<p><i>Speakers: Pallab Ghosh, Pallava Bagla, Veronique Morin, Natasha Mitchell</i></p> <p>Across the world governments are investing heavily in science and technology to increase prosperity and benefit their societies. But this capacity building needs proper scrutiny to ensure that public and private money is spent well and to enhance rather than diminish our quality of life. We bring together three of the world's leading science journalists to discuss how they stopped science going wrong in their countries. They are Pallava Bagla from India who exposed the grey literature used in climate change and Veronique Morin a documentary maker and TV presenter on the exploitation of native Canadians for scientific research.</p>	

4:00PM – 5:30PM	S Revealing the past: remote sensing techniques in archaeology <i>Speakers: Anthony Corns, Robert Shaw, Axel Posluschny, Jörg Bofinger, Christoph Steffen</i>	Wicklow Meeting Room 1
	<p>Archaeological air photography has now been joined by satellite imagery, airborne laser scanning and a variety of airborne and ground-based survey techniques known jointly as 'remote sensing', since they explore what is on or beneath the earth or ocean without disturbing its surface or damaging what lies below.</p>	
	<p>These new technologies have had a dramatic impact illustrating to the general public the character and importance of heritage sites and of the evolving landscapes within which they lie. Improved public understanding and appreciation of these visual and material links with the past can lead to greater enjoyment and interest in such sites, advancing the case for heritage conservation and the continuing enjoyment for future generations. This session aims to highlight the interdisciplinary range of techniques available and specifically illustrate the most recent developments in this field.</p>	
4:00PM – 5:30PM	S The emerging role of inflammation in diverse human diseases <i>Speakers: Kingston Mills, Kate Fitzgerald, Prof. Luke O'Neill, John O'Shea, Michael Lenardo</i>	Liffey Hall 2
	<p>Increasingly, the role of inflammation is being recognised as a critical driver of disease. Inflammatory mechanisms are now known to underlie not just classical autoimmune diseases like rheumatoid arthritis and multiple sclerosis, but also cardiovascular disease and cancer. Even obesity is recognised to have an inflammatory component. Equally, there have been enormous advances in our understanding the biochemistry of inflammation and how cells respond to stimuli that evoke this response.</p>	
4:00PM – 5:30PM	S The personal genome and the future of medicine <i>Speakers: Halldor Stefansson, Dr. Lars Steinmetz, Christof von Kalle, Barbara Janssens, Richard Tutton</i>	Auditorium
	<p>Remarkable technological advances have decreased DNA sequencing costs and made it practical to undertake complete human genome sequencing on a large scale for the first time. The dramatic price decline is expected to give rise to widespread personal genome sequencing that should radically advance biomedical research, facilitate drug development, and lead to reduced health care costs.</p>	
	<p>Key to realising these benefits will be biology's success in providing contextual interpretation of the biological and medical relevance of the detected sequence variants in a genome.</p>	
	<p>The rationale for this session is to contribute to the important task of informing and engaging the public in reflections about the benefits and risks they can realistically expect of personal genome analysis, to prevent over-interpretation and misunderstanding of such information.</p>	
4:00PM – 5:30PM	S What is inquiry-based science education? <i>Speakers: Eilish McLoughlin, Tina Jarvis, Odilla Finlayson, Kara McGann, Margaret Farren</i>	Wicklow Hall 2B
	<p>Inquiry based teaching methodologies have been suggested as a way to encourage and engage students in science and mathematics by increasing their interest and also by stimulating teacher motivation. This is backed up by input from employers in industry who have identified the need for graduates to have transferable skills in addition to subject knowledge. An overview of inquiry based teaching methodologies will be presented with examples from four European projects. The impact of the outcomes of these projects on informing national policies will be discussed.</p>	
4:00PM – 5:30PM	S What's so captivating about black holes? <i>Speakers: Thomas Mohaupt, Elizabeth Winstanley, Luke Drury, Andrea Merloni</i>	Wicklow Meeting Room 2
	<p>Black holes are regions of space where gravitational forces are so strong that nothing, not even light, can escape. Black holes have captured the imagination of the public like no other astrophysical entity and been readily absorbed into science fiction. However, despite endless conjecture, they still remain mysterious objects. So what do we really know about black holes? What have we actually observed? This session will uncover the current research in both experimental and theoretical physics, and how, together, they can build a picture of the modern black hole, and help us to gain a better understanding of the Universe.</p>	
4:00PM – 5:30PM	N What do investors look for in business propositions? <i>Speakers: Brigitte Baumann, Michael Culligan, Thierry Baujard, Joe Greaney</i>	Wicklow Hall 1

In the current economic environment, securing investment finance is more challenging than ever. It is essential that nascent and existing entrepreneurs from a scientific background fully understand investment models and how to optimise their chances of investment success.

This session provides entrepreneurs or would-be entrepreneurs with a taste of what it is like in the real world to secure investment funding. An international panel of investors will discuss different financing options available to entrepreneurs and share their views on what they are looking for in new business ideas. Three companies at different stages of the development lifecycle will present business propositions and the investors will share with the audience their process of evaluating each proposition.

The audience are invited to get involved through an interactive voting approach, evaluating business propositions from an investor's perspective and voting for their preferred investment opportunity.

If you would like to directly benefit from this session and secure feedback from the international panel of investors on your business proposition, we invite you to submit an investment idea for evaluation before 14th June 2012.

For more information, please email us directly at info@dbic.ie.

5:30PM –	K Keynote Address: Craig Venter "From Reading to Writing the Genetic Code"	Auditorium
6:30PM	<i>Speakers: Dr. Craig Venter</i>	
	<i>Session Chair: Prof. Mark Ferguson, Director General, Science Foundation Ireland</i>	

5:45PM –	E Euroscience Science Writers Award Ceremony	Wicklow Meeting Room 4
6:30PM	<i>Speakers: Prof. Enric Banda, Katja Ebeling</i>	

6:30PM –	E ESOF Party	Liffey Suite
8:00PM	NOTE: Exact time to be confirmed	

JULY 15 • SUNDAY

8:00AM –	S Ageing: from genome to sex	Liffey Hall 2
9:30AM	<i>Speakers: Carmen Garcia Fernandez, Schumacher Björn, Paul Stewart, Alexei Maklakov, Eleni Zika, Virpi Lummaa</i>	

According to the WHO, in almost every country the proportion of people aged over 60 is growing faster than any other age group. Old age is increasingly associated with many chronic diseases including cancer and cardiovascular disorders, thus presenting an important socioeconomic burden. It is therefore crucial to identify appropriate interventions to keep the aging population healthy.

In this interactive session four prominent scientists join forces to shed light on different aspects of the underlying causes of ageing from the genomic level to other contributing factors such as metabolism, hormones and 'sex'. Throughout the session, they will debate on key questions such as: 'how do our genes contribute to aging?', 'what is the contribution of hormones and other factors to the development of aging?', 'what are the differences in the development of aging at the level of the population and in particular between the two sexes?'

8:00AM –	S From smart homes to intelligent electrical grids	Ecocem Room
9:30AM	<i>Speakers: Heinz Wilkening, Thomas Wolski, Joseph Durkan, Pedro Godinho Matos</i>	

Energy production and consumption must always be in precise balance to maintain a stable electrical grid. Today this is mainly done by letting the energy production follow the energy demand. This is becoming an increasingly inefficient solution as renewable energy becomes more widely used. Energy production from renewables cannot be influenced, and future energy consumption will have to adapt to energy production. This is very challenging because demand is often very distributed and unlinked.

Currently smart meters are being installed in private homes within Europe. This will help people to have a better overview about their energy consumption but it won't help to let energy demand follow energy production. This might be achieved by smart homes, which are thinking houses integrating control functions overseeing devices and appliances.

The workshop will discuss the potential of smart homes for load following. Furthermore it will present the conditions (technical, economical and administrative) for smart homes to become integrated into a smart and intelligent electric grid, which can efficiently incorporate a high amount of renewable energy at acceptable cost.

8:00AM –	S Probiotics: alternative medicine or an evidence-based alternative?	Wicklow Hall 2A
9:30AM	<i>Speakers: Paul Ross, Fergus Shanahan, Ted Dinan, Michiel Kleerebezem</i>	

From a scientific standpoint, probiotics are defined as bacteria which, when consumed in adequate amounts, confer a health benefit on the host. But 'probiotic' is also a marketing term which has become very familiar to the general public as a result of polished advertising campaigns, which are all too often littered with vague health claims based on anecdotal or poorly conducted research, if indeed, any research at all.

It is difficult for any consumer to discriminate between those few probiotic strains for which there is rigorous scientific data supporting specific health benefits in humans, and those which are simply members of a 'probiotic' genus such as Bifidobacterium or Lactobacillus.

This workshop will involve scientists highlighting some of the best evidence to support a role for probiotics in human health, detaching scientific rigour from marketing hype.

8:00AM –

S The third mission of the University

Wicklow Meeting Room 1

9:30AM

Speakers: Andrea De Bortoli, Enrico Predazzi, Ginger Pinholster, Klaus Bock, Sophie Duncan

Since the times of the first scientific revolution in the XVII Century, the traditional role of the University has been twofold: Teaching and Higher Formation on the one hand and Research on the other hand. In modern times, however, the progressive strategic increase of the role of scientific research in the growth not only cultural but economic of a modern country and the very perception of this new role has brought about the awareness that the two above mentioned missions were no longer adequate.

It is now felt that a third mission besides research and formation and higher teaching qualifies a modern University. This has come to be broadly referred to as "The third mission of the University" and refers to the need for the University to provide a bridge between higher knowledge and the entity which commissions and supports research, society.

It is, thus, more and more widely recognised that the University should not just equip the young with the necessary knowledge and know-how to teach and make research but make them aware of the necessary ties between science and society. The researcher must learn not only to communicate his research to his peers (this he has always done) but make clear the reasons for doing it to the layman and the society at large. This is all the more necessary since most scientists that ever lived are still alive today and, in addition, since the large majority of them operates within or with the University system.

Several examples and good practices will be illustrated with the final aim of bringing the scientific community to understand that the ultimate goal is what could be termed RESP (Researcher's Engagement with Society and Public).

9:30AM –

K Keynote Address: Huanming Yang "Genomics and 'the Century of Biology' "

Auditorium

10:30AM

Speakers: Prof. Huanming Yang

The Year of 2013 will see global celebrations for the 10th anniversary of the official completion of the Human Genome Project (HGP). The most significant impact by the HGP on life sciences is the "-omics-ization". As the core technology of genomics, sequencing has provided "a starting point to orient and enable hypothesis-driven research" and has laid "the digital foundation onto which the systems approaches of the future will be built". With the further strengthened belief and vision, BGI has taken opportunities of the 3 breakthroughs in sequencing technology, and, together with its global collaborators, has sequenced and analyzed numerous genomes of humans, other animals, plants and microorganisms, releasing approximately 650, 000 Gb sequence data as of the end of 2011. Sequencing is at a new era of providing "reference genome sequence" for every species, many individual genomes for "genome diversity/variations of a species" and those with identified traits for "phenotypic sequencing", as well as for "applied genomics" in agriculture and health. A combination of molecular biology techniques, SC/IPC, animal cloning, synthetic biology and genomics, as well as other future emerging techs, will make the 21 century a real "Century of Biology".

Session Chair: Prof. David J. McConnell, Professor of Genetics, Trinity College Dublin

9:30AM –

K Keynote Address: Jocelyn Bell Burnell "We are made of star stuff"

The Liffey B

10:30AM

Speakers: Prof. Jocelyn Bell Burnell

Is there really star dust in our veins? Where did the atoms in our bodies come from originally and how did they get to be here? What has the birth, death and life of stars to do with us?

This talk will answer these and similar questions and show how we are made of star stuff.

10:45AM – 12:15PM	C Transferable skills for the commercial world: Would Einstein get hired today?	Liffey Hall 1
	<i>Speakers: Barbara Diehl, Dominic McDonald, Diane Scherzler M. A.</i>	
	<p>Across Europe, researchers are increasingly being asked to take their research out of the lab and bring it into the "real" world. Sometimes that means commercialising an innovative technology, communicating their research or inserting it into government policy, but it is never easy. People who are very skilled at operating within an academic environment suddenly find themselves forced to come to terms with different skill-sets required to operate in a non-academic environment, such as networking or business plan writing.</p> <p>The organisers will give two very brief introductions, highlighting issues which we have come across in their work with researchers exploring employment opportunities in non-academic contexts. Barbara will discuss the questions from her perspective of someone advising and training academic entrepreneurs, while Dom, whose expertise lies in the science communication/education sector, will look at things from the point of view of an employer.</p> <p>The introductory remarks will lead into a moderated group discussion which will take up the bulk of the session. Participants will share their experiences of situations where they or colleagues have entered into the commercial world successfully and unsuccessfully.</p> <p>The organisers together with the participants will develop some "rules" for researchers who are looking for employment in non-academic fields, be it business, science communication or the public sector. And at the end of the session, these will be brought together to create a whole group "wiki" set of guidelines.</p>	
10:45AM – 12:15PM	S Adaptation or extinction? Responses to radical climate changes	Liffey Hall 2
	<i>Speakers: Carmen Garcia Fernandez, Siwan Davies, Heather M. Stoll, Valentina Bosetti, Claudia Jesus-Rydin</i>	
	<p>Climate Change is already transforming life on Earth. Around the globe, seasons are shifting, temperatures are climbing and sea levels are rising. We face widespread species extinctions, ocean acidification, and other large-scale shifts. Few topics have attracted more attention, polemic and debate than finding a common agreement on what are the events that trigger these changes and what are the responses in this rapidly changing world. How will the Earth respond to these changes? What have we learned from the past and how can technology help us in the future? Join three outstanding scientists funded by the European Research Council (ERC) to debate the answers to these questions.</p>	
10:45AM – 12:15PM	S How to motivate scientists to engage with the public	Wicklow Hall 2B
	<i>Speakers: Carl Johan Sundberg, Sophie Duncan, Camilla Mod�er, Cissi Askwall, Giuseppe Pellegrini, Karin Larsdotter</i>	
	<p>Science works for society. Much of it is funded by society. A failure to listen to the fears and concerns of society endangers the trust people have in scientists and the success of research itself. Therefore, public engagement must become an intrinsic part of research and fully integrated into the work of universities. To meet this challenge, there needs to be a change in both the processes and culture of research organisations. Scientists and policy makers in the main do not recognise how vital public engagement is to research success. How do we make researchers themselves believe in and initiate engagement activities?</p> <p>An expert panel will present current research and sociological thinking. There will also be round table discussions between experts and the audience on the issues involved, and the potential impact this wider and deeper dialogue between science and society could have on the culture of our universities.</p>	
10:45AM – 12:15PM	S The impact of ice sheet and ocean interactions on climate change	The Liffey A
	<i>Speakers: Paul Dunlop, Sara Benetti, Stephen McCarron, Hans Petter Sejrup, Colm O'Cofoigh</i>	
	<p>Ice-sheets are dynamic systems that form an integral part of the global climate system. They are both sensitive to and drivers of climate change and therefore provide a unique opportunity to investigate climatic change. As ice sheets grow and decay they leave a rich geological record of ice sheet behaviour that can help to unravel the timing and driving mechanisms of major climatic events. A decade of scientific investigation of Irish submarine territory in the NE Atlantic has uncovered a fascinating picture of a perfectly preserved ice age landscape across the width of the Irish continental shelf.</p> <p>This session will explore how research in the North Atlantic region shows that the Irish continental shelf is a critical area for climatic research and will discuss in this context the potential that a rapidly melting Greenland Ice Sheet could force unexpected and rapid climatic change in the North Atlantic region.</p>	

10:45AM – **N Action-based Entrepreneurship education: the way forward for SET students?** Wicklow Hall 1
12:15PM *Speakers: Frances Mitchell, Margaret Ledwith, Suzi Jarvis, Victor Scholten, Dap Hartmann, Ailistair J. Fee, Michael Gilchrist, Patrick van der Duin, Martin Gilmore, Basil McCrea*

This session advances thought leadership in entrepreneurship education and proposes a new model of "action-based, entrepreneurship education" as the way forward for SET (Science, Engineering, Technology) students. Led by the Innovation Academy UCD, this highly-interactive session brings together a multi-disciplinary team of academics and practitioners, from across Europe, to identify, debate and develop best-practice in entrepreneurship education for SET students. Speakers include representatives from: Innovation Academy UCD; UCD College of Engineering & Architecture; TU Delft; Lancaster University (UK); KARIM Network (Interreg IVB NWE); Paris Region Innovation Centre (PRICE); CAL4INO

During this session speakers and delegates will:

Deconstruct conventional definitions of entrepreneurial activity and education, focusing on the potential of innovative, action-based learning models to promote students' ability to think and act entrepreneurially. This approach will be demonstrated through delegate participation in a team-based, action-learning challenge.

Identify best-practice in entrepreneurship education, drawing on the practices of leading European institutions, from undergraduate to PhD level. The emphasis is on innovative methods, student feedback and the associated entrepreneurial activities and outputs.

Consider the challenges of action-based, entrepreneurial education models, focusing particularly on localized delivery/context, metrics and relevance to industry employers, particularly SMEs. Delegate participation via a round table discussion is invited with a particular emphasis on identifying solutions.

10:45AM – **P China & Europe Partnership Symposium: Science and the City of the Future** Auditorium
12:45PM *Speakers: Dr. Lisa Amini, Dr. Shi Nan, Dr. Rusong Wang, Prof. Denise Pumain, Duncan Stewart*

Since 2006, more than half of global humanity lives in cities. Within a few generations, this figure will exceed 80%. Now here is the challenge of rapid urbanisation of society proceeding faster than in China. The China-Europe partnership symposium on *Science and the City of the Future* will bring together leading scientists from both regions to examine the challenges and opportunities for applying science to develop sustainable, efficient and liveable cities fit for the 21st century and beyond. We will be joined by experts in urban planning, city ecology, embedded information and communication technologies, and the application of the emerging sciences of complexity to understanding the deep dynamics of city living. The challenges ahead are immense; but we look forward to welcoming ESOF2010 delegates, and our partner audiences in China, and around the world, to engage together in a timely and critical reflection on science, technology and the city of the future.

12:15PM – **S Mathematics you can hear** The Liffey B
1:15PM *Speakers: Robin Wilson, Ehrhard Behrends*

There are many interesting connections between mathematics and music, and in this lecture some of these connections will be explored. For example, it is not widely known that our European musical scales are built up by using mathematical principles. There are many hidden symmetries in all kinds of music and many modern composers employ mathematical ideas in their compositions.

How 'simple' sounds are used to construct almost arbitrary ones is discussed. This 'Fourier analysis' is of great importance in many applied sciences. The most complex part of our talk will be the discussion of a rather recent mathematical problem; 'Can you hear the shape of a drum?' The question is whether or not it is possible to deduce the shape of a plane figure by merely listening to the sounds it can produce.

1:15PM – **C Opportunities and challenges for the next generation of European scholars** Liffey Hall 1
2:45PM *Speakers: Pauline Mattsson, Niki Vermeulen, Ruth Müller, Dorthe Bomholdt Ravnsbaek, David Feltz*

The future of European science is in the hands of the next generation of researchers. However, policy makers are not paying enough attention to supporting the next generation and the voice of young scientists is not always taken into account. In this session the microphone will be given to the next generation of researchers and issues of importance for young researchers will be discussed. The issues have been selected based on the results of a European large scale survey and by the speakers' experiences.

To set the scene, the results of a survey that Euroscience is currently carrying out among more than 30,000 young researchers in Europe will be presented. The findings will be commented on by Ruth Muller whom has taken the career of young scientists as a topic of her research. Further, Dorthe Bomholdt Ravnsbæk, the winner of the European Young Researchers Award 2010, will share her experience doing research in an interdisciplinary environment. Finally, Natalia Borkowska will talk about how the Young European Biotech Network communicates the interests of young researchers to policy makers.

The session will conclude with a discussion about the working conditions of young researchers, more

specifically about mobility seen from three different perspectives: geographic (moving between countries); sectoral (moving between academia and industry); field (moving between scientific fields). Finally, the main barriers to successfully pursuing an academic research career will be discussed and the audience will be encouraged to suggest practical remedies.

1:15PM – **S Ageing in Europe: Abyss or opportunity?** Wicklow Hall 2A
2:45PM *Speakers: Mikael Fogelholm, Jaanus Harro, David Nutt, Laura Fratiglioni*

Health and welfare varies enormously between European nations and nations globally. Simultaneously, common challenges are easily identified. From a public health perspective, aging is an overarching phenomenon in many countries. Welfare systems, to the extent they at all exist, should be robust enough to provide sustainable solutions to create a balance between generations. A healthier population seems imperative if a postponed retirement age is required.

In this panel discussion, research in demography, public health, prevention, harm reduction, harm assessment, and policy will be discussed. A pressing general societal issue is the distribution of health and welfare, which tend to exhibit a social gradient. Health and welfare as critical features of societal cohesion and as potential sources of severe threats to cohesion are evident in the perspective of their distribution in populations. The discussion will be focused on questions such as 'How can basic research in different fields serve as a basis for policy and politics?' and 'How can advances in research contribute to individual and societal benefits?'

1:15PM – **S Can we survive a day without satellite navigation?** The Liffey A
2:45PM *Speakers: Stephan Lechner, Mike Hapgood, Juha-Pekka Luntama, Peter Gallagher, William Murtagh, David Perez-Suarez*

Satellite navigation (SatNav) technology is more than route planning for a motorist. Most critical services depend on precise timing to the nanosecond scale, derived from the GNSS (global navigation satellite systems) clock: banking, power systems, and telecommunication networks. Can we imagine what life would be like in the event of a GNSS blackout?

Extreme events of space weather such as solar storms are part of natural phenomena that impact the earth. With our increasing reliance on space-based technologies (satellite-based communications, broadcasting, SatNav etc) society today is ever more vulnerable to space weather than even 50 years ago.

This session will help us reflect on our everyday dependence on SatNav, the fragility of SatNav infrastructure to natural threats, and current research to ensure it works reliably 24/7, no matter what.

1:15PM – **S Lost in translation** Liffey Hall 2
2:45PM *Speakers: John Finney, Chris Rapley, Karen Hallberg, Rosemary Randall*

Scientists are often at the forefront of raising public awareness of difficult and complex issues. They frequently fail to get their message across effectively. How can they frame their messages so that they create resonance with the intended audience?

Social scientists, psychologists and scientists attempt to answer these questions and explain why communicating science is difficult.

This session will tackle a critical problem head on with a panel who will explore how to communicate effectively, using the very difficult examples of climate change and nuclear weapons as case studies.

1:15PM – **S Sustainable green infrastructure: in seas and forests, from fields to cities** Ecocem Room
2:45PM *Speakers: Eeva Rebekka Furman, Isabel Sousa Pinto, Ilkka Hanski, Lawrence Jones-Walters, Shane Colgan, Maria-Luisa Paracchini, Sirpa Pietikäinen*

Green infrastructure links natural, semi-natural and urban features, areas and spaces together. It provides both ecological as well as societal well being, and resilience against dramatic changes. It provides us with cultural ecosystem services such as possibilities for recreation, inspiration, learning and spiritual gains.

But where can we find green infrastructure that supports sustainability and maintains its cultural ecosystem services? Can energy production from forests be sustainable and support recreational purposes? Which green infrastructure tolerates climate change and helps to forward positive transformations to cultural ecosystem services?

Through contributions debate from different disciplinary angles, this session will introduce novel ways of conceptualising the nature-human relationship by linking ecological theories of sustainability into everyday life of human societies. The session elucidates the future's orientation of conservation and sustainability research and provides food for thought to the policy forum on the governance of European green infrastructure.

1:15PM – 2:45PM	<p>S The true cost of personalised cancer medicine</p> <p><i>Speakers: William Gallagher, Iris Simon, Catherine Kelly, Prof. Nils Wilking</i></p> <p>Wicklow Meeting Room 1</p> <p>We are experiencing a revolution in the development of targeted anti-cancer agents that are focused against particular defects in tumours. These successes, however, bring their own challenges, such as the high cost associated with the use of contemporary therapeutics to treat cancer. Moreover, the true benefit of such 'targeted drugs' is often quite limited due to poor trial design, notably the lack of enrichment of patients for the relevant molecular lesion concerned.</p> <p>To tackle this, there have been considerable efforts to develop companion diagnostic approaches that can be utilised alongside such molecular therapies to sub-stratify patients into different groupings based on predicted drug response. While there has been classically some inertia on behalf of the pharmaceutical/biotech industry to delve into this arena, the health economic argument is coming to the fore.</p> <p>This session will explore the complex interplay and driving forces behind advancement in development of anti-cancer agents and associated companion diagnostics, as well as the health economic, ethical and social issues that these developments engender.</p> <p>The format will comprise of a panel discussion, with 3 speakers covering different perspectives (twenty minutes each), followed by extended discussion with audience.</p> <p>What Drugs Should we Give to Which Patients? – An Oncologist's Perspective (Dr. Catherine Kelly) Development of Personalised Molecular Diagnostics for Cancer Patients – An Industry Perspective (Dr. Iris Simon) What is the Economic Cost of Personalised Cancer Medicine? (Prof. Nils Wilking)</p>
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1:15PM – 2:45PM	<p>S What will power Europe's future?</p> <p>Wicklow Hall 2B</p> <p><i>Speakers: Wolfgang Goede, Barbara Drillsma, Mariko Takahashi, Jim Cornell, Fumio Arakawa, Viola Egikova, Edward Sykes</i></p> <p>The catastrophic failure of the Japanese power plant in Fukushima has divided Europe over the future use of nuclear energy. In almost every country, there have been calls to reassess the risks and benefits of nuclear power and to slow down the construction of new power plants.</p> <p>The European debate raises some critical, and difficult, questions. This workshop will explore the societal, cultural and journalistic concerns. It will look at science journalism coverage of the tensions between science/technology, economical constraints and political purposes using the example of nuclear power and energy in general.</p> <p>Debaters will trigger an audience discussion about old and new roles for science journalism in democratic processes using the example of nuclear power and energy in general. A final summary may eventually lead to an action plan for a new role for science journalists in societal, scientific and political debates.</p>
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1:15PM – 2:45PM	<p>N What should universities do to encourage more spin-outs and licensing arrangements?</p> <p>Wicklow Hall 1</p> <p><i>Speakers: Burton Lee, Kees Eijkel, Brian MacCraith, John Minnick</i></p> <p>Universities have embraced their role in strengthening the regional economy. Breaking new ground in policy, strategy and operations, they are confronted with new challenges. One of them is how to measure, improve and communicate their economic impact. This is particularly relevant to the technology transfer agenda. Led by Invent - Dublin City University's Technology Transfer Office, this highly interactive session brings together world leaders in the area of innovation, entrepreneurship and commercialisation to give their unique perspectives on how universities can increase the number of spin-out companies and licensing deals.</p> <p>During this session the speakers will explore the following issues:</p> <p>What are the conditions that facilitate successful technology transfer and how can we increase activity levels in this area?</p> <p>How do universities conduct the necessary de-risking (both financial and technological) to drive value in their start-ups until they can either thrive on their own or are investment ready?</p> <p>How can we encourage researchers to critically examine the technologies they are developing and to assess their commercial potential?</p> <p>How do we incentivise researchers to be part of a team which takes a new technology to the marketplace?</p> <p>How do we open the dialogue with industry to develop collaborative research projects resulting in commercially exploitable technologies?</p> <p>In order to encourage more spin-outs and licensing arrangements, is there too much focus on metrics and is there a quality issue to be addressed?</p> <p>What role must technology transfer office now play given the complexity of the technologies and the needs of the marketplace?</p> <p>How do we develop hubs and clusters for innovation that draw in both intellectual property and the resources to</p>
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exploit new technologies.

2:45PM – **K Keynote Address: Lars Steinmetz "The road from genomics to personalised medicine"** The Liffey B
3:45PM *Speakers: Dr. Lars Steinmetz*

Genomics has already begun to foster a more personalised, predictive and preventive medicine. In particular, the rapid increases in high-throughput sequencing and our ability to interrogate numerous molecular mechanisms at a genome-wide scale has informed the understanding, diagnosis, and treatment of genetic diseases. In my presentation, I will demonstrate how work in my laboratory bridges diverse domains of genome science, from research aimed at gaining a fundamental understanding of the structure and function of genomes, to the application of these insights towards improving our understanding of diseases and advancing the effectiveness of treatments. We use multiple model organisms as platforms for developing technologies that enable us to dissect the genetics underlying complex traits, aiming at a systematic understanding of the molecular events that lead from genotype to phenotype. We work extensively on functional and mechanistic characterisations of transcription, the first manifestation of genetic variation; in addition, we study multiple diseases in model systems in order to profile the underlying networks and predict effective therapeutic strategies. Our overall goal is to establish approaches and discover biological principles that will enable the prediction and prevention of genetic diseases.

Session Chair: Dr. Aoife McLysaght, Smurfit Institute of Genetics, Trinity College Dublin

2:45PM – **K Science-2-Business Keynote Address: Pearse Lyons "Building a Billion-Dollar Business – a real life story"** The Liffey A
3:45PM *Speakers: Dr. Pearse Lyons*

How did a scientist with \$10,000 build a multi-billion dollar company? How did this private company, with no outside investors, rise to become no. 7 in the world of animal health? What does the future hold for Alltech as it heads for a target of \$4 billion in sales?

Listen to the story of Dr. Pearse Lyons, founder and president of Alltech, a global animal health company that employs more than 2,800 people and conducts business in 128 countries throughout the world. Born in Dundalk, he received his bachelor's degree from University College Dublin, Ireland and obtained his master's and doctoral degrees at the University of Birmingham, England. He later worked as a biochemist for Irish Distillers before founding Alltech in 1980.

Today Dr. Lyons is widely recognised as an entrepreneur and innovative industry leader in both biotechnology and agriculture. His scientific expertise, combined with an acute business sense, helped revolutionise the animal feed industry through the introduction of yeast-based ingredients to feed. Now, as the company enters its fourth decade of business, its solid base will enable it to extend products, core values and nutritional solutions to an ever-expanding market. At the same time, its commitment to the primacy of science, a commitment responsible for the company's success, remains steadfast.

Session Chair: Prof. Gerry Boyle, Director, Teagasc

4:00PM – **E Closing / Handover Ceremony** 3rd Floor Foyer
5:00PM
