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The European Research Council at
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ERC speakers

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Prof. Dr. Helga Nowotny

Current position:
President of the European Research Council (ERC)
Professor em., Vienna Science and Technology Fund (WWTF)

Prof. Helga Nowotny is President of the European Research Council (ERC) and Chair of its Scientific Council since 1 March 2010.

She Professor em. of Social Studies of Science at ETH Zurich, and former Director of its Collegium Helveticum. She was Chair of EURAB, the European Research Advisory Board of the European Commission from 2001-2006. She is Chair of the Scientific Advisory Board of the University of Vienna and member of the Governing Board of the Science Center in Berlin. She was also Vice-Chair of the Governing Board of the University of Goettingen and continues to hold other advisory positions. Helga Nowotny has a doctorate in law from the University of Vienna and a Ph.D. in sociology from Columbia University, New York. Before moving to ETH Zurich she was professor at the University of Vienna and Permanent Fellow at Collegium Budapest/Institute of Advanced Study. She has held teaching and research positions at King's College, Cambridge, the University of Bielefeld, the Wissenschaftszentrum Berlin and at the Ecoles des Hautes Etudes en Sciences Sociales in Paris. She has been a Fellow at the Wissenschaftskolleg zu Berlin and is a former president of the International Society for the Study of Time. She is a member of the Academia Europaea and founding member of Euroscience. In 2003 she received the John Desmond Bernal Prize for life-long achievement in social studies of science and in 2002 the Arthur Burckhardt-Preis. Her main scientific interests are in social studies of science, science and society and social time. Among her many publications in social studies of science and technology are "The New Production of Knowledge" (co-authored) and its sequel "Re-thinking Science. Knowledge and the Public in an Age of Uncertainty" (with P. Scott, M. Gibbons). In 2005 "Unersättliche Neugier: Innovation in einer fragilen Zukunft" and "The Public Nature of Science under Assault: Politics, Markets, Science and the Law" (co-authored) were published and in 2006 "Cultures of Technology and the Quest for Innovation" (editor). in 2008 MIT Press will publish the English translation of "Unersättliche Neugier", "Insatiable Curiosity: Innovation in a Fragile Future".

Sir Tim Hunt

Current position:
Member of the ERC Scientific Council
Nobel Laureate for Physiology or Medicine (2001) and Principal scientist at Cancer Research UK

Dr. Tim Hunt serves as member of the ERC Scientific Council. He is the recipient, together with Leland H. Hartwell and Sir Paul M. Nurse, of the Nobel Prize for Physiology or Medicine in 2001 for discovering "Key regulators of the cell cycle". After receiving a Ph.D. from the University of Cambridge in 1968, Hunt went as a postdoctoral fellow to the Albert Einstein College of Medicine in New York. He returned to Cambridge in 1971, where he taught biochemistry and cell biology. In 1990 he moved to the Imperial Cancer Research Fund (now Cancer Research UK). Hunt's research centred on cyclins, activating subunits of the Cyclin-Dependent protein Kinases (CDKs), which control cell cycle transitions. Hunt's most recent work focused on the control of entry into and exit from mitosis. In addition to writing numerous scientific papers, he has served on editorial boards for several journals and was until recently Chairman of the Council of EMBO.

Sir Tim Hunt was also a speaker at the WEF meeting in Davos, January 2013. Listen to "An Insight, An Idea with Tim Hunt" here: http://www.youtube.com/watch?v=0gia9LI4-XU

Prof. Alain Peyraube

Current position:

Member of the ERC Scientific Council

Research Director at the Centre National de la Recherche Scientifique (CNRS, Paris)

Prof. Alain Peyraube serves as member of the ERC Scientific Council. He received his Ph.D. from Paris 8 University in 1976 and his Doctorat d'Etat from Paris 7 University in 1984. Research Fellow at the CNRS since 1975, he has been Director from 1984 to 1998 of the Institute of East Asian Linguistics (CNRS and EHESS). He served as President of the International Association of Chinese Linguistics and as President of the European Association of Chinese Studies. He has been Visiting Professor and Visiting Scholar at Cornell University (Hu Shih Chair), at the University of California at Santa Barbara, at the Hong Kong Baptist University, at the Chinese Academy of Social Sciences in Peking, at the Academia Sinica of Taiwan, at La Trobe University in Australia. He is distinguished member of the Chinese academy of social sciences, corresponding member of the academia Sinica of Taiwan, honorary professor at the University of Beijing, and adjunct professor at the Hong Kong university of science and technology. A specialist in Chinese historical syntax and linguistic typology of Sinitic languages, A. Peyraube has authored five books and more than a hundred of articles on Chinese studies and mainly on Chinese linguistics. His latest research has been done within a broadly functional and cognitive framework in a cross-linguistic perspective. Some of his recent publications are the chapter on Ancient Chinese in the Encyclopaedia of the World's Ancient Languages (Cambridge University Press), articles on Languages and Genes in China and on the cognitive approaches of the expression of Space in Medieval and Modern Chinese.

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Prof. Dr. Peter Zoller

Current position:
Wolf Prize winner in Physics (2013); Professor of Theoretical Physics at the University of Innsbruck (Austria); Research Director at the Institute of Quantum Optics and Quantum Information of the Austrian Academy of Sciences
ERC Synergy grant holder

Prof. Peter Zoller studied physics at the University of Innsbruck, Austria, obtained his doctorate there in 1977, and became a lecturer at the Institute of Theoretical Physics. In 1991, he was appointed Professor of Physics and JILA Fellow at JILA and at the Physics Department of the University of Colorado, Boulder. At the end of 1994, he accepted a chair at the University of Innsbruck, where he has worked ever since. Peter Zoller continues to keep in close touch with JILA as Adjoint Fellow. Numerous guest professorships have taken him to all major centers of physics throughout the world. He was Loeb lecturer in Harvard (2004) and Yan Jici chair professor at the University of Science and Technology of China, Hefei, chair professor at Tsinghua University, Beijing (2004), Lorentz professor at the University of Leiden (2005), Distinguished Lecturer at the Technion in Haifa (2007), Moore Distinguished Scholar at Caltech (2008/2010) and Arnold Sommerfeld Lecturer in Munich (2010). In 2012/13 he was Distinguished Fellow at the Max Planck Institute of Quantum Optics in Garching. Since 2003, Peter Zoller has also held the position of Research Director at the Institute of Quantum Optics and Quantum Information (IQOQI) of the Austrian Academy of Sciences. Peter Zoller has received numerous awards for his achievements. These include the Max Planck Medal (2005), the Dirac Medal (2006), the Benjamin Franklin Medal (2010), and the Wolf Prize (2013). He is member of several National Academies, including the United States National Academy of Sciences.

Peter Zoller holds an ERC Synergy Grant, which he received in 2012, together with Ehud Altman, Immanuel Bloch, and Jean Dalibard for their 'Ultracold Quantum Matter' project. The €9.8 million Synergy Grant will help them to establish an excellence network on quantum mechanics. Prof. Zoller works on quantum optics and quantum information and is best known for his pioneering research on quantum computing and quantum communication. As a theoretician, Peter Zoller has written major works on the interaction of laser light and atoms. In addition to fundamental developments in quantum optics he has succeeded in bridging quantum information and solid state physics. The model of a quantum computer, suggested by him and Ignacio Cirac in 1995, is based on the interaction of lasers with cold ions confined in an electromagnetic trap. The principles of this idea have been implemented in experiments over recent years and it is considered one of the most promising concepts for the development of a scalable quantum computer. Zoller and his researcher colleagues have also managed to link quantum physics with solid state physics. One of his suggestions has been to build a quantum simulator with cold atoms and use it to research hitherto unexplained phenomena in high temperature superconductors.

Prof. Nicole Grobert

Current position:
Professor of Nanomaterials at the University of Oxford (UK)
ERC Starting Grant holder

Prof. Nicole Grobert is a Professor of Nanomaterials and holds a Royal Society University Research Fellowship in the Department of Materials, Oxford University. She won an ERC Starting grant in 2009 and an ERC Proof of Concept grant in 2011. Prior to that, she was awarded the Royal Society Dorothy Hodgkin Fellowship and she received the international Pergamon Prize for her thesis on 'Novel Carbon Nanostructures'.

Her research is described in more than 140 papers in journals including Nature, Science, Advanced Materials, ACS Nano, Nanoletters, and Physical Review Letters resulting in an h-index of 43 and in 3 patents. Nicole Grobert holds an invited membership of the New York Academy of Sciences, is a member of the 21st Century's Centre of Excellence Programme on Bioscience and Nanotechnology, and has been a Visiting Professor at Toyo University in Japan since 2003. She is also a founding member and Chair of the Physical Science domain of the Young Academy of Europe.

Her research focuses on establishing 'growth systematics for the controlled generation of nanostructured materials' with a particular focus on novel carbon and non-carbon based nanomaterials, including nanoparticles, nanotubes, nanorods, graphene and other 2D nanomaterials. Close collaboration with internationally leading industries enables her to develop multifunctional hierarchical nanostructures for their implementation in the health-care sectors and for their use in energy and structural applications.

There has been tremendous academic output in the field of nanomaterials, and more specifically carbon nanomaterials, since the early 90s and with the award of the Nobel Prize in 2010 for graphene, basic research on carbon and other nanomaterials is continuing to grow rapidly.

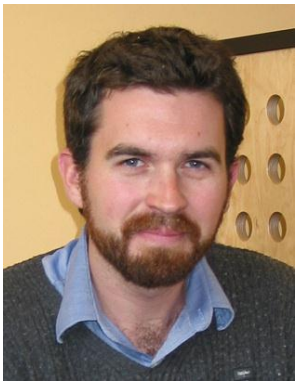
Applications are envisaged in key strategic areas world-wide and include light-weight structural materials, energy storage and harvesting, electronics, sensors, health care solutions. However, in order to fully unlock the potential of nanomaterials, the gap between academia and industry urgently needs to be addressed. Nicole Grobert looks at the manufacturing, characterisation, and applications of 0D, 1D, and 2D nanomaterials and the challenges that need to be overcome for the efficient up-scaling of nanomaterials production. The full potential of nanomaterials spans across several lengths scales and disciplines - a complex problem, that can only be solved by developing state-of-the-art in situ diagnostics coupled with high-throughput production, and rapid quality control mechanisms through synergistic collaborations between academia and industry.

Prof. Valeria Nicolosi

Current position:
ERC Research Professor, School of Chemistry, School of Physics & CRANN
ERC Starting Grant holder

Prof. Valeria Nicolosi is internationally regarded as a leading expert in the field of processing of low-dimensional nanostructures and high-end electron microscopy. She received a BSc with honours in Chemistry from the University of Catania (Italy) in 2001 and a Ph.D. in Physics in 2006 from the University of Dublin, Trinity College (TCD). In 2008 she moved to the University of Oxford with an EU Marie Curie IEF fellowship, and was also awarded a UK Royal Academy of Engineering/EPSRC Fellowship. In 2011, she was awarded an ERC Starting grant to expand her work in nanomaterials and energy storage. In 2012, she returned to Trinity College Dublin, becoming ERC Research Professor at the Schools of Chemistry and Physics and principal investigator in CRANN nanoscience centre. Prof. Nicolosi is currently one of the ten Principal Investigators in the newly founded Science Foundation Ireland Advanced Materials and BioEngineering Research Centre (AMBER) and she is director of the Irish National Centre for Advanced Electron Microscopy. In the past 10 years, Prof. Nicolosi has published more than 90 papers in high-profile international journals (h-index: 27, sum of Times Cited: 3673), such as Nature, Science, Nature Nanotechnology, Nature Materials, and delivered more than 40 invited and plenary presentations at major conferences and public understanding of science events. In September 2012, she was awarded the 2012 RDS/Intel Prize Lecture for Nanoscience in recognition of her contribution to the field. Her research is sponsored by the EU FP7 programme, the ERC, SFI, as well as several industrial partners amongst which Intel, Thales, Thomas Swan, Alcatel Lucent, etc.

Climate change and the decreasing availability of fossil fuels require society to move towards sustainable and renewable resources. Prof. Nicolosi's ERC Starting grant focuses on the development of more efficient energy storage devices. Her approach under this project uses a multidisciplinary approach, where novel one-atom-thick nanomaterials, existing knowledge on nano-scale processing and established expertise in device fabrication and testing is bridged, devoting efforts to create more efficient supercapacitor technologies. 2DNanoCaps exploits liquid phase exfoliated two-dimensional nanomaterials such as graphene and transition metal oxides, layered metal chalcogenides as electrode materials. Electrodes produced from these materials are ultra-thin, conductive, with prolonged life-time and resistant to extreme temperature ranges. Professor Nicolosi was also recently awarded an ERC Proof of Concept Grant to up-scale device fabrication.



Prof. Jeremy O'Brien

Current position:
Director of the Centre for Quantum Photonics, University of Bristol, UK
ERC Starting Grant holder

Jeremy O'Brien is professor of physics and electrical engineering and director of the Centre for Quantum Photonics (CQP), University of Bristol, UK. He received his Ph.D. in physics from the University of New South Wales in 2002 for experimental work on correlated and confined electrons in organic conductors, superconductors and semiconductor nanostructures, as well as progress towards the fabrication of a phosphorus in silicon quantum computer. As a research fellow at the University of Queensland (2001-2006), he worked on quantum optics and quantum information science with single photons. CQP's efforts are focused on the fundamental and applied quantum mechanics at the heart of quantum information science and technology, ranging from prototypes for scalable quantum computing to generalised quantum measurements, quantum control, and quantum metrology.

He was awarded an ERC Starting grant (2009) for a project that aims to develop safer mobile communications for consumers by ensuring they are safe from cyber-attacks and wiretapping. He also holds an ERC Proof of Concept grant.

Prof O'Brien aims to take quantum technologies out of the lab and engineer them in to useful devices. This vision encompasses taking theoretical predictions, building integrated photonic quantum devices and demonstrating previously unseen phenomenon and applying them to real scenarios. This has led to CQP building highly sophisticated robust quantum processors capable of tackling real world problems by harnessing the advantages gained through the control and manipulation of quantum systems. Prof O'Brien the current holder of the prestigious Royal Academy of Engineering Chair in Emerging Technologies. The breadth of his activities has resulted in the pioneering Integrated Quantum Photonics approach that is now the de-facto standard for research in photonic quantum systems.

The impact of quantum technology will be profound and far-reaching: secure communication networks for consumers, corporations and government; precision sensors for biomedical technology and environmental monitoring; ultra-powerful quantum computers for the design of new materials, pharmaceuticals and clean energy devices. As these technologies mature new applications will inevitably emerge in fields such as medical technology, defence and security. However, engineering quantum systems and controlling them is an immense technological challenge: they are inherently fragile; and information extracted from a quantum system necessarily disturbs the system itself. A small number of Quantum Technologies are now commercially available, however Prof O'Brien's engineering lead approach to quantum information science and industrial collaborations has enabled many breakthroughs that mean more devices and technologies will emerge in the very near future that ultimately promise to disrupt ICT as we know it.

Dr. Hele Savin

Current position:
Assistant Professor, Department of Micro and Nanosciences, Aalto University, Finland
ERC Starting Grant holder

Assistant Professor Hele Savin is heading a photovoltaic research group at Aalto University Department of Micro and Nanosciences, Finland. She got her Ph.D. degree from Helsinki University of Technology in 2005. In 2009-2010 she received a Alexander von Humboldt fellowship at Fraunhofer Institute of Solar Energy, Freiburg in Germany (2009-2010). She has also been a visiting scientist at University of California at Berkeley, Lawrence Berkeley National Laboratory (2002-2003) and Massachusetts Institute of Technology MIT (2013). Savin is currently coordinating several international photovoltaic projects including the low-cost PV consortium funded by the Academy of Finland. In 2012, she received an ERC Starting Grant to study nanoscale material effects in energy applications. She is an author in more than 70 peer-reviewed articles and she has given multiple invited talks at international conferences. Her main research interests are related to applying nanotechnology to photovoltaics and characterization of photovoltaic materials.

The sun provides enough energy in one minute to supply the world's energy needs for entire year. The grand challenge is to turn this enormous energy potential into electricity in a cost-efficient way. So far, silicon has been most successful at this – but we are still very far away from what is achievable. One of the major problems, which is currently limiting the state-of-the-art photovoltaic solar cells, is related to the material degradation under sun light. I address this issue from a novel perspective: I study the possibility that the root cause for the degradation is related to the interaction of light with copper ions. The idea came from my background studies in microelectronics, in which it is important to control copper behavior in silicon. My proposal is against the commonly accepted theory, however, it could unveil many mysteries related to the degradation phenomenon. Moreover, if successful, the approach could lead to a rather simple solution in avoiding power loss: implementing charge on the surface. This could allow stable yet cheap silicon solar cells having potential for more than 30% power increase.

Prof. Dr. Wilfried Weber

Current position:
Full Professor for Synthetic Biology, University of Freiburg, Germany
ERC Starting Grant holder

Prof. Wilfried Weber holds an engineering degree in Biotechnology and obtained his Ph.D. in 2003 from ETH Zurich, Switzerland. Prof. Weber was appointed as full professor of Synthetic Biology at the University of Freiburg, Germany. He is author of more than 80 scientific publications and co-inventor of 10 patents and patent applications. He is co-founder of BioVersys AG, a Swiss anti-infectives company.

His expertise and interest is the development of novel assays and materials for drug discovery and drug administration with a focus on anti-infective drugs and vaccines.

Prof. Wilfried Weber was awarded an ERC Starting grant in 2010 and also holds an ERC Proof of Concept grant.

Wilfried Weber is pioneering the development of computing biomaterials, a novel class of materials designed to increase efficacy and safety of biomedical therapy and of food safety. Computing biomaterials are materials that perceive information, process this information and trigger an appropriate response. The key advantage of these materials is that they are made from human use-compatible material, that they operate without an external energy supply and that they are degraded and excreted from the body after use. Prof. Weber will show two possible application areas for computing biomaterials. First, improving patient compliance and efficacy of vaccinations and second, very fast and sensitive analytical methods for ensuring food safety and quality.