

Fórum do Futuro 2016

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Clima e consumo (ou o preço a pagar pela energia)

Climate and consumption (or the price to be paid for energy)

Sir Chris Llewellyn Smith

The recent ratification of the Paris Agreement by China and the United States implies that two of the most polluting countries will have to implement measures to reduce carbon dioxide emissions from 2020 onwards. This ratification will have to be met while, at the developing countries, energy consumption and the ensued rise in living standards are continuously growing. How can the world economy be de-carbonised within the prevailing economic and political conditions? How can sustainable growth for the whole planet be achieved? These and other interconnected issues will be the focal point of the talk of Professor Sir Chris Llewellyn Smith.

Sir Chris Llewellyn Smith is the Director of Energy Research, at Oxford University, and President of the Council of SESAME (Synchrotron-light for Experimental Science and Applications in the Middle East). He is interested in all aspects of energy supply and demand, on de-carbonising processes of energy transformation, and on adapting non-continuous sources of electricity to the existing patterns of demand.

Chris completed his D. Phil. in theoretical physics at New College, Oxford 1967. Thereafter he worked at the Lebedev Physical Institute in Moscow, CERN (European Centre for Nuclear Research, the largest scientific laboratory in the world) and at the Stanford Linear Accelerator in US. He was elected Fellow of the Royal Society in 1984. He was regarded as a world-class expert on electroweak and strong interactions. His name is associated, for instance, to the so-called Gross-Llewellyn Smith sum rule, which allows computing the scattering of neutrinos by nucleons next to leading order in QCD.

From mid 1980s onwards he led the movement to keep Britain at CERN. From 1987 to 1992 he was responsible for the merging of five different departments related to physics in Oxford into a single Physics Department. From 1989 to 1992 Chris was a member of UK Prime Minister's Advisory Council on Science and Technology. He was Director General of CERN from 1994 to 1998, the crucial period of approval of the Large Hadron Collider and the beginning of its construction. Thereafter he served as Provost and President of University College (1999–2002).

Chris received the Glazebrook Medal of the Institute of Physics (UK) in 1999 and was knighted in 2001. In 2004 he became Chairman of the Consultative Committee for Euratom on Fusion (CCE-FU), responsible for the world fusion energy project ITER (International Thermonuclear Experimental Reactor, whose members are EU, USA, China, Russia, South Korea, India and Japan). Until 2009 he was Director of the United Kingdom's nuclear fusion programme and of the operation of the Joint European Torus (JET). He is a member of the Advisory Council for the Campaign for Science and Engineering, a UK non-profit organization for promoting a high-tech and knowledge-based economy. Sir Chris Llewellyn Smith has received awards and honours worldwide. In 2015, he was awarded the Royal Medal of the Royal Society.

Arte e ciência: fios condutores e curtos-circuitos

Art and science: conducting wires and short circuits

In the Renaissance, men like Leonardo da Vinci embodied the creative spirit of both science and art. Nowadays, a Renaissance man is not possible. In fact, in 1959, at the Rede Lecture at Cambridge, British scientist and novelist C. P. Snow pointed out that there is a split in whole western society between sciences and humanities, to the point of calling these poles of two cultures. His views were expressed in his well-known book “Two Cultures” which appeared in 1963 with some after thoughts.

According to C. P. Snow, the gap between these Two Cultures was due to the premature specialization of the educational curricula in western countries. Furthermore, he argued that misunderstandings between these two cultures prevented encompassing and more effective solutions to the world’s problems. In rough terms the difficulty could be posed as follows: science can provide the means to resolve and to mitigate many problems such as famine, diseases and poverty, while their implementation is a task chiefly led by politicians and people with humanistic background. Misunderstandings would lead to mistrust on the solutions and on their implementation.

I believe that more than a half century later, we are much better off and that the gap is not so wide. The value of hard sciences and of the humanistic culture is recognized worldwide. I think that any of us could come up with examples of interaction and creative collaboration between science, art and humanities. Let me mention just one as it took place at this very theater earlier this year. I am referring to the creation of the Swiss choreographer Gilles Jobin, “Quantum”, that was performed by his ballet ensemble on April 8th. “Quantum” was created by Gilles Jobin after his stay as an artist in residence at CERN. Interestingly, Gilles Jobin was very keen on visiting our Physics and Astronomy Department during his stay in Porto and he has indeed done so.

To discuss these issues and to share their views, opinions and experiences, we have with us three distinguished guests. Let me introduce them.

Carl Edward Schoonover

Carl Schoonover (1983, USA) is a postdoctoral fellow at Columbia University in New York where he researches on the neural circuitry of odor-driven behaviour (his doctoral work at Columbia University focused on microanatomy and electrophysiology of rodent somatosensory cortex). He is the author of “Portraits of the Mind”, a journey throughout the history of the exploration of the brain through images, from medieval sketches and 19th-century drawings by the founders of modern neuroscience to images produced by state-of-the-art techniques.

He has written for The New York Times, Le Figaro and Scientific American, and co-founded NeuWrite, a collaborative working group for scientists, writers, and those in between. His radio program on WKCR 89.9 FM focuses on opera, post-war classical music, and on their relationship to the brain.

Sir Chris Llewellyn Smith

Jem Finer

Jem Finer (1955, United Kingdom) is a musician, artist and composer. He was one of the founding members of “The Pogues”, the well-known Celtic punk band. His artistic practice is strongly interconnected with scientific research. This is highlighted at his musical creation of 2000, “Longplayer”, a computer generated musical composition designed to play for 1000 years and meant to illustrate the fleeting and expansive nature of time. His most recent work, “Supercomputer”, is a functioning computer made from a series pipes, enclosed in a glass pavilion, likewise a mainframe computer of the 1970’s. *It is* designed to play percussive instruments, turning the computer into a composing calculator creating new compositions over a period of 179 years.

Orfeu Bertolami

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Professor Orfeu Bertolami (1959, Brazil) graduated in physics at University of São Paulo, Brazil, in 1980. He acquired his Master Degree in Science in 1983 at Instituto de Física Teórica in São Paulo. In 1984, he earned the Advanced Degree in Theoretical Physics and Applied Mathematics at Cambridge University in UK and was awarded a Ph. D. at the University of Oxford in 1987. He worked on the Theoretische Physik Institut in Heidelberg, at CERN, at the Dipartimento de Fisica Teorica in Turin and at the Physics Department of Physics of the New York University. He was a professor of physics in Instituto Superior Técnico in Lisbon from 1991 to 2010. Since 2010, he holds a full professorship at the University of Porto, Portugal.

His research interests range from Astrophysics to Classical and Quantum Gravity, on Cosmology and implications of Quantum Field Theory and Superstring Theory, on fundamental physics in space and on studies of dark energy, dark matter and alternative theories of gravity. He has published extensively (about 300 papers) in the most prestigious specialized physics and astronomy journals.