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PRAGUE

SOUNDS OF SCIENCE

FRANCE22
FRENCH PRESIDENCY OF THE COUNCIL OF THE EUROPEAN UNION

INSTITUT FRANÇAIS
Prague

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CONGRESS BUSINESS TRAVEL

Programme in Prague

17:00 – 17:15 **Welcome speech**

- **Mr Alexis Dutertre**, Ambassador of France to the Czech Republic

Introduction of the scientific partners

- **Ms Eva Zažímalová**, President of the Czech Academy of Sciences
- **Ms Milena Králíčková**, Rector of the Charles University
- **Mr Pavel Matějka**, Rector of the University of Chemistry and Technology

17:15 – 17:50 **Prof. Jean-Marie Lehn | Nobel Prize in Chemistry 1987**

"Steps Towards Life: Chemistry plays the score!"

Q&A Session

17:50 – 17:55 **Musical performance by Karol Beffa**

17:55 – 18:25 **Prof. Jean Tirole | Nobel Memorial Prize in Economic Sciences 2014**

"Economics for the Common Good"

Q&A Session

18:25 – 18:30 **Musical performance by Karol Beffa**

18:30 – 19:00 **Break**

19:00 – 19:30 **Third speech**

Prof. Thomas Ebbesen | Kavli Prize 2014

"The Alchemy of Vacuum"

Q&A Session

19:30 – 20:30 **Screening of the French silent science fiction comedy**

"Paris qui dort / The Crazy Ray"; directed by René Clair, with improvised piano accompaniment by Karol Beffa.

Moderation: ***Daniel Stach****, Česká televize*

Invite top level scientists and musicians and have them engage in a creative dialogue between science and the arts: this is the simple and yet powerful recipe behind “Sounds of Science”. Building on the knowledge of the long history of successful relationships between music and science, the project was born in the mind of Professor Jean-Marie Lehn and came to life for the first time in 2018.

The event will this year give us a chance to celebrate in full the creative force behind every great scientist and artist. Along with Professor Jean-Marie Lehn, a long-time friend of the Czech Republic where he has been faithfully returning to every year for almost 30 years, Professor Jean Tirole and Professor Thomas Ebbesen will lead our scientific programme, from the mysteries of the universe’s physical and chemical organization to the role of economic sciences in achieving the general interest.

Dr Karol Beffa, pianist, composer and scholar, will share with us, through his improvisations, his artistic approach to those scientific challenges. His improvised accompaniment of the French silent comedy “Paris qui dort” will then take us on a poetic stroll in the streets of Paris, fallen asleep as a result of a scientific experiment.

Taking place a few days before the handover between the French and Czech presidencies of the Council of the European Union, this event is part of a large-scale cultural programme offered by the French Embassy, closely linked to our European priorities. It is an opportunity to recall the attachment of our two countries to science, music and more generally the arts, as fundamental values for Europe and a cement of our European identity.

Thanks to the unfaltering support of our sponsors and scientific partners, we are happy and proud to bring to you the best of the two worlds in this new edition of “Sounds of Science”.

Alexis Dutertre,
Ambassador of France to the Czech Republic

Science ...

Jean-Marie Lehn

Nobel Prize in Chemistry | 1987

Jean-Marie Lehn was born in Rosheim, France in 1939. In 1970 he became Professor of Chemistry at the Louis Pasteur University in Strasbourg and from 1979 to 2010, he was Professor at the Collège de France in Paris. He is currently Professor at the University of Strasbourg, Institute for Advanced Study (USIAS).

He shared the Nobel Prize in Chemistry in 1987, alongside Donald Cram and Charles Pedersen, for his studies on the chemical basis of "molecular recognition" (i.e. the way in which a receptor molecule recognizes and selectively binds a substrate), which also plays a fundamental role in biological processes.

Over the years his work led him to the definition of a new field of chemistry, which he has proposed calling "supramolecular chemistry" as it deals with the complex entities formed by the association of two or more chemical species held together by non-covalent intermolecular forces, whereas molecular chemistry concerns the entities constructed from atoms linked by covalent bonds. Subsequently, the area developed into the chemistry of "self-organization" processes and more recently towards "adaptive chemistry", dynamic networks and complex systems. Author of more than 1000 scientific publications, Professor Lehn is a member of many academies and institutions. He has received numerous international honours and awards.

Steps Towards Life: Chemistry!

The evolution of the universe has generated more and more complex forms of matter through self-organization, from particles up to living and thinking matter. Mankind has created science to unravel the ways and means by which matter has become organized up to a thinking organism in particular on our planet earth. Self-organization is the process by which steps towards life and thought have emerged. Animate as well as inanimate matter, living organisms as well as materials, are formed of molecules and of the organized entities resulting from the interaction of molecules with each other.

Chemistry provides the bridge and unravels the steps from the molecules of inanimate matter and the highly complex molecular architectures and systems which make up living and thinking organisms. Molecular chemistry has developed very powerful methods for constructing ever more complex molecules from atoms. **Supramolecular chemistry** seeks to understand and control the formation and behaviour of complex molecular assemblies. The field of chemistry is the universe of all possible structures and transformations of molecular matter, of which those actually realized in nature represent just one world among all the worlds that await to be created. Conceptual considerations on science in general will be presented. Science shapes the future of humanity!

Jean Tirole

Nobel Memorial Prize in Economic Sciences | 2014

Jean Tirole is honorary chairman of the Foundation JJ Laffont--Toulouse School of Economics (TSE), and scientific director of TSE-Partnership; he is also founding member of the Institute for Advanced Study in Toulouse (IAST). He is affiliated with MIT, where he holds a visiting position. Before moving to Toulouse in 1991, he was professor of economics at MIT. He was president of the Econometric Society in 1998 and of the European Economic Association in 2001. Jean Tirole has given over a hundred distinguished lectures and has published about two hundred articles in economics and finance, as well as 12 books. He received his PhD in economics from MIT in 1981, engineering degrees from Ecole Polytechnique, Paris (1976) and from Ecole Nationale des Ponts et Chaussées, Paris (1978) and a "Doctorat de 3e cycle" in decision mathematics from the University Paris IX (1978). He holds Honorary Doctorate degrees from a number of universities around the world. Among other prizes and honors, he received the Yrjö Jahnsson prize of the European Economic Association (granted every other year to an economist under the age of 45 who has made a contribution in theoretical and applied research that is significant to economics in Europe) in 1993, the Gold medal of the CNRS in 2007 (the second economist, after Allais in 1978, to receive this medal, attributed to one researcher every year since 1954), and was the inaugural winner of the BBVA Frontiers of Knowledge Awards in economics, finance and management in 2008. He received the CME-MSRI award and the Levi-Strauss prize in 2010 and the Ross prize in 2013. He is the laureate of the 2014 Nemmers prize in economics and received the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel in the same year. He is a foreign honorary member of the American Academy of Arts, the American Economic Association, of the United States National Academy of Sciences, of the British Academy and several other learned societies.

Economics for the Common Good

Our thinking about the organization of society is once more at a crossroads. Social scientists must confront a discomfort with our model of liberal democracy and a call for alternative organizations of economic life. The latter, the widespread distrust toward the market, may seem surprising as almost all economies in the world are now market economies; but many feel that the world is prey to private interests with neither pity nor compassion; they lament the disintegration of the social contract and the loss of human dignity, the decline of politics and public service, the environmental unsustainability.

These views have spread more widely lately with the rise of the populist movements across the world which exploit these fears as well as the ignorance and prejudice of voters. Everywhere, people with expert knowledge are

dismissed whenever that knowledge has a clear interface with public policy: medicine, genetics, evolution, climate change, and economics to name a few.

Perceptions and policies reflect our cognitive biases: we succumb to motivated beliefs when we believe what we want to believe; we tend to look at the direct effects of policies and ignore its more indirect but equally important effects; we often find narratives much more convincing than statistical facts.

Economics can nonetheless be a force for the common good, one that helps our institutions serve the general interest. Provided it attempts to understand perceptions, economics has the potential to solve the important challenges of our time, such as climate change, unemployment, inequality, financial regulation, the future of Europe, the digital challenge and regulation. Public policy should be grounded in this perspective, making economics a moral and philosophical science.

Thomas Ebbesen

Kavli Prize | 2014

Thomas W. Ebbesen is a physical chemist born in Oslo, Norway. He was educated in the United States and France, receiving his bachelor degree from Oberlin College (USA) and his PhD from the Curie University in Paris. He then did research in both the US and Japan, most notably at NEC Corporation, before returning to France in 1999 to help build a new institute (ISIS) at the University of Strasbourg. He is currently the head of the Center for Frontier Research in Chemistry and the Strasbourg Institute for Advanced Studies (www.usias.fr). He holds the chair of physical chemistry of light-matter interactions. The author of many papers and patents, Ebbesen has received numerous awards for his pioneering research including the 2014 Kavli Prize in Nanoscience for his transformative contributions to nano-optics and the highest French award, the Gold Medal of the CNRS, given to one person a year all fields confounded. He is a member of the Norwegian Academy of Science and Letters and the French Academy of Science.

The Alchemy of Vacuum

Light-matter interactions are fundamental for the existence of life, such as we know it, for instance by capturing the sunlight and storing its energy. These also play a key role in our culture, in the exchange of information via optical fibers and in tools such as lasers used in surgery and in assembling cars. What is perhaps more surprising, is that light-matter interactions occur even in total darkness. This is because vacuum, the three-dimensional space in which we exist, is not a void but is full of electromagnetic fluctuations that pervade the Universe. As I will discuss, matter can be made to interact with such fluctuations so strongly that it leads to fundamental changes in chemical, biological and material properties.

Daniel Stach

Česká televize

Daniel Stach is a leading Czech journalist covering science. He hosts a science program called Hyde Park Civilization produced by the Czech Television.

The show explores the world of science and the current issues of modern society and is broadcast live on Saturdays prime time on the ČT 24 channel. In the ten-year history of Hyde Park Civilization he interviewed among others 31 Nobel Prize laureates and many other leading figures from the world of science and society in general.

He is the laureate of the Václav Havel Prize and the Týtý Award (an audience prize awarded by popular vote). He has also been awarded the Vojtěch Náprstek Medal for achievements in popularizing science from the Czech Academy of Sciences. He received the 2016 Journalism Prize in the Best Interview category for the episode about the genocide in Rwanda, as well as the Novinářská Křepelka prize for journalists under the age of 33. Forbes Czech Republic included Daniel on its list of the 30 most talented young Czechs, the “30 under 30”. Hyde Park Civilization has also been recognized by the Czech Physics Society as a “significant achievement in the popularization of physics”. The International Astronomical Union named a minor planet after Daniel: the 93256 Stach.

... and Music

Karol Beffa

Karol Beffa had a general education along with music studies after having been a child actor between the ages of 7 and 12, appearing in more than 15 films. Top of his class at the Ecole Normale Supérieure in Paris, he read history, English, philosophy and mathematics, graduating from ENSAE (Graduate School of Economics, Statistics and Finance). In 2003, he earned his doctorate in musicology with a thesis on György Ligeti's Piano Etudes. Since 2004, he is a senior lecturer at the Ecole Normale Supérieure.

Pianist and improviser, Karol Beffa is a composer whose works have been performed by such well-known ensembles as Maîtrise de Radio France, Cambridge Voices, and leading orchestras (Orchestre Philharmonique de Radio France, Orchestre National de France, Orchestre National de France, Saint Petersburg Philharmonic, London Symphony Orchestra, The Deutsche Kammerphilharmonie Bremen…).

Karol Beffa is a fellow of the Institut de France in composition and won fellowships from the Lili and Nadia Boulanger Foundation (2001), the Music Academy of Villecroze, Natexis Foundation (2002) and Les Muses fellowship (2004). Finalist of the Prades International Composition Competition (2005, 2007), he has won the Charles Oulmont Prize (2005), the SACEM Young Composer Competition and the Chartier Prize of the Académie des Beaux-Arts (2008). In 2013 and in 2018, he won a Victoires de la musique award in the Best Composer category. In 2017, he was awarded the Grand Prix de la musique symphonique de la SACEM. Finally, he was named a Commander des Arts et des Lettres.

His publications include György Ligeti (Fayard, 2016), *Parler, Composer, Jouer. Sept leçons sur la musique* (2017), *Diabolus in opéra. Composer avec la voix* (2018), *L'autre XX^e Siècle musical* (2022) and, with Cédric Villani, *Les Coulisses de la création* (2015).

Paris qui dort

Directed by René Clair | 1925,
France | Duration: 60 minutes

The silent science-fiction comedy *Paris qui dort*, also known internationally as *The Crazy Ray* or *Paris Asleep*, is an early experimental film released in the mid-twenties. The idea of *Paris qui dort* is simple, but innovative, the result of the inspiration of a young man of 25, René Chomette, soon to be Clair, one night in November 1922. Shot the following summer, *Paris qui dort* produced surprising visual effects and already revealed the singular and enchanting talent of the filmmaker. Henri Diamant-Berger financed the film, providing the young Clair with an artistic and technical team, but with few resources. Once edited, the work remained on a shelf, for lack of a distributor. The success of *Entr'acte*, presented at the Théâtre des Champs-Elysées in December 1924, allowed the film to be released in February 1925.

Paris qui dort tells the story of a crazy scientist who accidentally freezes the entire city of Paris into a split-second of time with an invisible ray, like if time has stopped right across the sprawling metropolis. With magical and wonderful shots of a Paris long gone, this silent comedy is about the adventure of a small group of people who escaped the ray, taking advantage of the situation to break out of their social roles. They then meet a young man working as a night watchman on the Eiffel Tower who persuades the group to seek out the source of the problem and put it right.

With a narrative that sways toward a moralistic stance on the principles of fair play and responsibility, this little science fiction fable can still be poignant today as when the magnificent views were first shot from the dizzy heights of the Eiffel Tower.

Cast:
Henri Rollan – Albert
Charles Martinelli – The scientist
Louis Pré Fils – The detective
Albert Préjean – The pilot
Madeleine Rodrigue – Hesta, the airline passenger
Myla Seller – The niece of the scientist
Antoine Stacquet – The billionaire
Marcel Vallée – The thief

Musical accompaniment:
Improvised piano accompaniment by the musicologist and composer Karol Beffa.

Paris qui dort (René Clair) © 1923
Fondation Jérôme Seydoux-Pathé
Succession René Clair

Organizers

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