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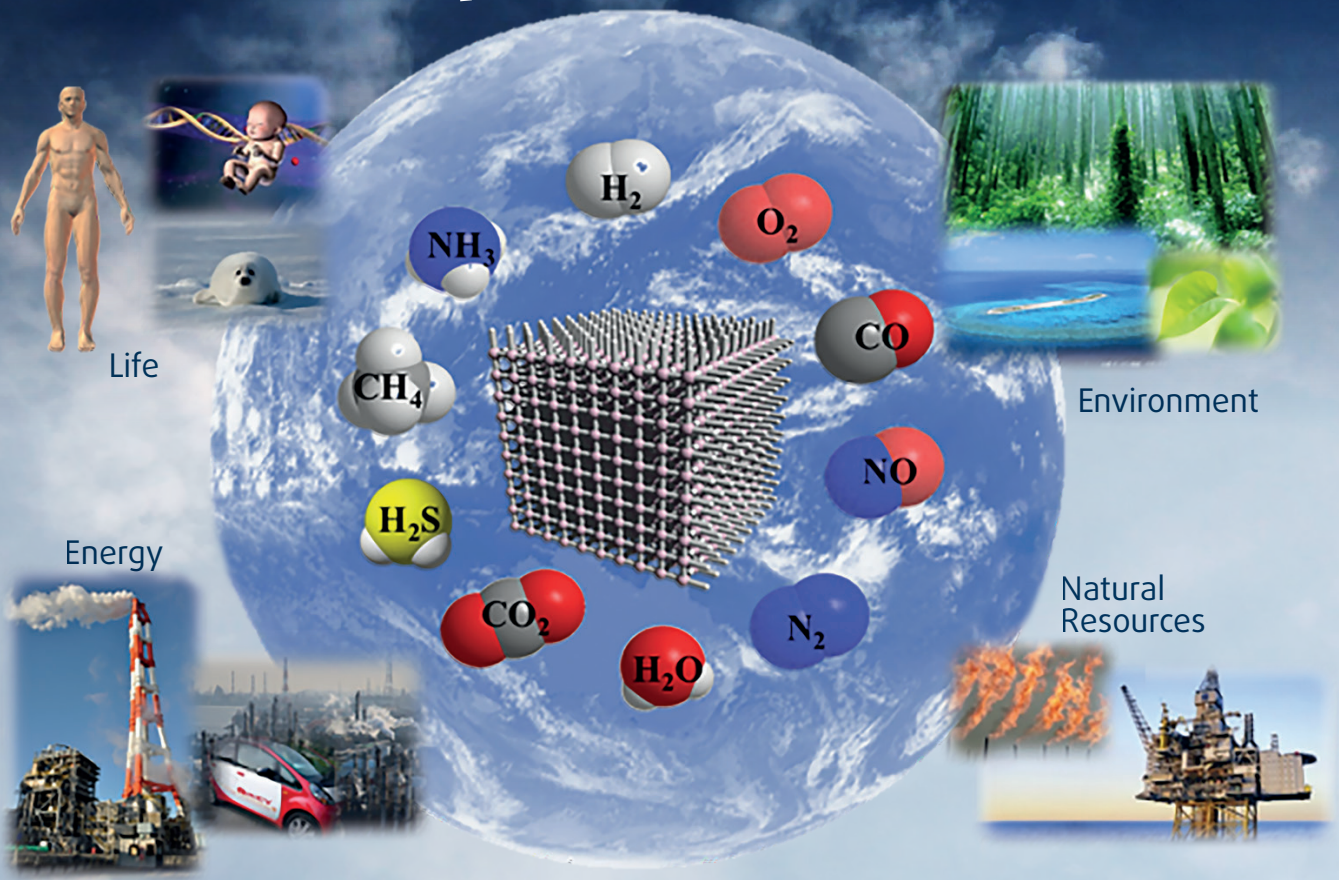
Kyoto lecture

Welcome to Small Spaces
Gas Science and Technology for a Sustainable Future



Monday
25 September 2017, 16h30

ISIS, Salle de Conférence
8 allée Gaspard-Monge, Strasbourg

Susumu Kitagawa
Kyoto University Institute for Advanced Study

With an introduction by
Jean-Marie Lehn, USIAS

Université de Strasbourg

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Programme

16:30 **Welcome** by **Christelle Roy**, Vice-President of Strategy and Development, University of Strasbourg

16:35 **Introduction** by **Jean-Marie Lehn**, ISIS, USIAS Chair of Chemistry of Complex Systems, University of Strasbourg

16:40 **Lecture** "Welcome to Small Spaces. Gas Science and Technology for a Sustainable Future", by **Susumu Kitagawa**, Kyoto University Institute for Advanced Study

17:40 **Discussion**, moderated by **Thomas Ebbesen**, ISIS, Chair of Physical Chemistry of Light-Matter Interactions, Director of USIAS

18:00 **Reception**

Abstract

Welcome to Small Spaces
Gas Science and Technology for a Sustainable Future

With the Industrial Revolution in the 19th century, humans began to create technologies that consumed huge amounts of energy. Initially, people used coal (solid) as an energy resource, but the 20th century ushered in the age of petroleum (liquid). In the 21st century, where the depletion of petroleum has become a concern, gas (e.g., natural gas, biogas and even air) should play an important role. Hence, there will be a shift from solid to liquid to gas. The future should realize the "age of gas", which will eventually utilize ubiquitous gas such as air.

In this context, porous materials with nanosized spaces will significantly contribute to the science and technology that handle gases ad arbitrium. Materials with nanosized spaces are abundant in everyday modern life; they are used for gas storage, separation, and catalysis. The discovery of novel materials with functions superior to activated carbon and zeolite can drastically change human life. However, the synthesis of new porous materials has remained stagnant until the early 1990s, when interest in the field first became widespread.

Based on the revolutionary concept of bottom-up synthesis, we are now able to successfully develop novel porous materials, involving everything from serendipitous findings to tailor-made synthesis. These are called "porous coordination polymers" (PCPs) or "metal-organic frameworks" (MOFs), which are comprised of organic and inorganic materials. MOFs have great potential in applications in a wide variety of fields, such as the global environment, natural resources, development of outer space, life sciences, and energy, demonstrating their high value for science, industry and society.

Susumu Kitagawa

Susumu Kitagawa is Distinguished Professor and Deputy Director-General at the Kyoto University Institute for Advanced Study (KUIAS); Director of the Institute for Integrated Cell-Material Sciences (iCeMS), at Kyoto University, Japan. His research is focused on the design and synthesis of functional porous materials. He was the first to discover and demonstrate porosity in solid coordination networks with gas sorption experiments - materials which are now known as porous coordination polymers (PCPs) or metal-organic frameworks (MOFs).

This is the third "Kyoto in Strasbourg" Lecture, organized by the University of Strasbourg Institute for Advanced Study (USIAS) to commemorate 25 years of close ties between Kyoto University and the University of Strasbourg.