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Department of Physical and Macromolecular chemistry

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Department of Physical and Macromolecular Chemistry  
*invites you to a lecture*

## The Alchemy of Vacuum – Hybridizing Light and Matter –

Lecture hall CH 1, Faculty of Science, Hlavova 8, Praha 2  
on June 24<sup>th</sup>, 2022 at 9:00

**speaker: Prof. Thomas W. Ebbesen**

ISIS & USIAS, University of Strasbourg and CNRS, France



Light-matter interactions are not only fundamental for the existence of life, such as we know it, but play a key role in our culture and our technology. 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 quantum fluctuations, including electromagnetic fluctuations which affect for instance the forces between molecules. When such light-interactions become strong enough, a new regime arises characterized by the formation of hybrid light-matter states.

This is the so-called strong coupling regime which leads to fundamental changes in material properties. After introducing some of the basic concepts, examples of modified properties such as chemical reactivity, transport properties and self-assembly will be presented.

References (reviews):

- [1] F. J. Garcia Vidal, C. Ciuti, T. W. Ebbesen, *Science* 2021, 373, eabd336
- [2] K. Nagarajan, A. Thomas, T. W. Ebbesen, *J. Am. Chem. Soc.* 2021, 143, 16877.

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