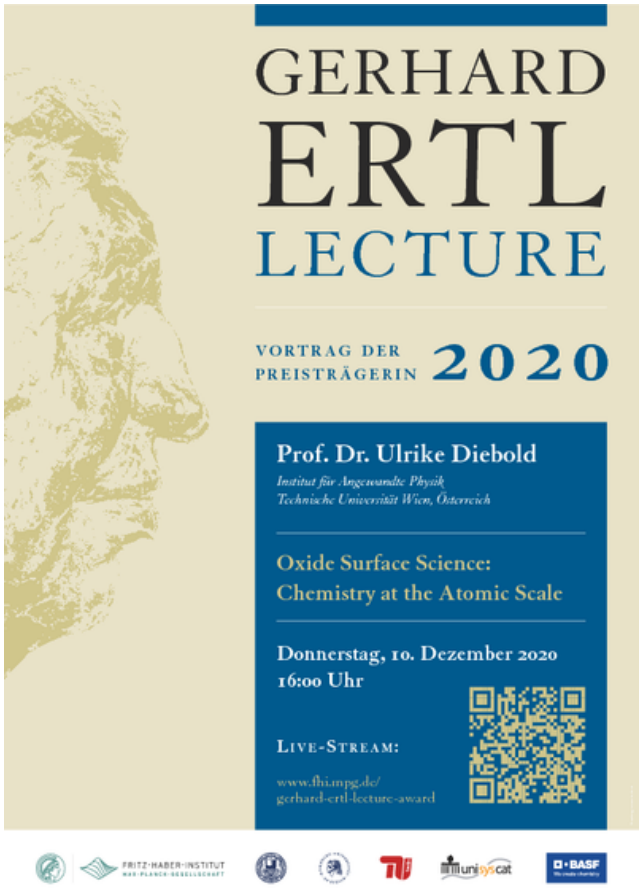
Gerhard Ertl Lecture 2020: Oxide Surface Science, Chemistry at the Atomic Scale

Prof. Dr. Ulrike Diebold

Fritz Haber Institute

Start Time: Thursday, December 10, 2020

End Time: Thursday, December 10, 2020



The surface science approach, pioneered by Gerhard Ertl and others, has proven to be most powerful to understand surface chemical reactions at the molecular scale. By applying tightly controlled conditions – well-defined samples of increasing complexity, and the pristine environment provided by ultrahigh vacuum – the interaction between molecules and surface can be probed with exquisite detail. Such experiments are an ideal counterpart for theoretical modelling. In the past two decades, the interest has been expanded to an important yet notoriously complex class of materials, metal oxides. Oxides are used as inexpensive and robust support material in catalysis, where they are by no means innocent bystanders, and play a major role in current and emerging energy conversion schemes. In each case, reactions at their surfaces are central, and insights into mechanistic processes are sought after. The talk will describe recent advances and successes in the surface science of metal oxides, including novel techniques to acquire quantitative information of fundamental parameters at the atomic scale;

tactics to tackle structural complexity; and the push towards expanding towards more ‘realistic’ environments without losing atomic-level control.

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