Atomically-Resolved Oxide Surfaces: Lessons Learned, Surprises Encountered, Challenges Posed

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Our understanding of metal oxides has benefitted tremendously from the application of surface science techniques. Particularly useful has been Scanning Probe Microscopy, which allows to directly inspect, and even manipulate, atomic-size defects and defect-related surface chemistry. Equally important has been the development of suitable model systems, i.e., (ultra)thin films and well-prepared oxide single crystals that allow reliable experimental and theoretical modeling with crisp and unequivocal insights into fundamental processes and mechanisms.

In the talk, recent developments in the field will be illustrated by examples including our group's recent research results on binary and ternary metal oxides [1-4]. Emphasis will be laid on giving an overview of different aspects, such as the importance of the relationship between bulk and surface defects [5], and the opportunities and the challenges of extending surface science to more complex materials, as well as to high-pressure and aqueous environments.

References:

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