# The Surface Potential of Water and Electrolytes: Bridging Experiments, Theory, and Simulations

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The electric surface potential of water and electrolyte interfaces plays a central role in colloid and interface science, governing surface interactions and electrokinetic phenomena. A wide range of experimental techniques — including vibrating-plate measurements, radioactive-probe methods, liquid-jet photoelectron spectroscopy, electrophoretic measurements, nonlinear optical spectroscopy, electron holography, and ion-scattering spectroscopy — have been interpreted in terms of surface potentials. However, these methods often yield conflicting results, even for the conceptually simple air–water interface. In this talk, I will explain the origins of these apparent discrepancies, show how the different measurements can be reconciled, and demonstrate how they provide complementary insights into the molecular structure of water and electrolytes at interfaces. In particular, I will show that the structural width of the pure air–water interface is only about 8 Å and is governed not only by dipolar ordering but also by biaxial molecular ordering.

**Keywords:**
Interfaces, Surface potential, Molecular structure, theory, simulations