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**Tunable Soft Structure in Charged Fluids confined by Dielectric Interfaces** JOS ZWANIKKEN, MONICA OLVERA DE LA CRUZ, Department of Materials Science and Engineering, Northwestern University, 2220 Campus Drive, 60208 Evanston, Illinois, United States — We study the deformation of the local structure in an electrolytic background by micro- and nanoscopic polarizable surfaces, and vice versa, the emergence of induced forces between two surfaces due to the cohesive properties of the background. The range and strength of these forces depend sensitively on the material properties of the charged fluid, and can be varied over decades, offering high tunability and, aided by accurate theory, control in experiments and applications. The attention is directed towards the electrolyte-induced forces between neutral boundaries, to distinguish correlational effects from simple ionic screening. The interplay of thermal motion, short range repulsions, and electrostatic forces is responsible for a typical ordered fluid state, a soft structure, that changes near polarizable interfaces and causes diverse attractions between fluctuation-confining walls that seem well exploited by microbiological systems. We use liquid state theory and classical density functional theory to accurately calculate these interactions and nuance the understanding of double-layer forces, relevant for colloid and emulsion stability, phase-transfer catalysis, and (interface-directed) self-assembly of nanomaterials.

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