## *Ion at Interfaces and the Hofmeister effect*

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Availability of highly reactive halogen ions at the surface of aerosols has tremendous implications for the atmospheric chemistry. Yet neither simulations, experiments, nor existing theories are able to provide a fully consistent description of the electrolyte-air interface. In this talk a new theory will be presented which allows us to explicitly calculate the ionic density profiles, the surface tension, and the electrostatic potential difference across the solution-air interface [1]. The theory takes into account both ionic hydration and polarizability. The theoretical predictions are compared to experiments and are found to be in excellent agreement. The implications of the theory for stability of lyotropic colloidal suspensions and for adsorption of polyelectrolytes to hydrophobic surfaces will be considered [2], shedding new light on one of the oldest puzzles of physical chemistry – the Hofmeister effect [3]. Finally, we will explore the reasons for the failure of the polarizable force field simulations to accurately describe the behavior of chaotropic ions near hydrophobic interfaces [4].

[1] Y. Levin, Phys. Rev. Lett. 102, 147803 (2009); Y. Levin, A.P. dos Santos, and A. Diehl, Phys. Rev. Lett. 103, 257802 (2009);

[2] A. P. dos Santos and Y. Levin, Phys. Rev. Lett. 106, 167801 (2011)

[3] A. P. dos Santos and Y. Levin, Faraday Discuss. 160, 75 (2013); D. J. Tobias, A. C. Stern, M. D. Baer, Y. Levin, and C. J. Mundy, Annu. Rev. Phys. Chem. 64, 339 (2013).

[4] Y. Levin and A. P. dos Santos, J. Physics: Condensed Matter, 26 203101 (2014).