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Electrostatics and Soft Matter: a Themed Collection in memory of Per Linse

Christos N. Likos^a and Joakim Stenhammar^b

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The fields of colloidal science and electrostatics have been very closely connected since the beginning of the former. Any dielectric discontinuity between suspended colloidal particles and the solvent will lead to electrostatic interactions between fluctuating dipoles (dispersion forces), even in the absence of net charges on the colloids. For aqueous solvents, which dominate in Nature, the polar nature of the solvent molecules causes ion dissociation on colloidal surfaces, giving rise to charged colloids and their suspensions, which have been the focus of soft matter scientists for decades. Polyelectrolytes, polyampholytes and charged cross-linked polymers (ionic microgels) continue to attract the interest of scientists across the disciplines, fundamental and applied ones alike, confronting them with new questions. Charged, biologically relevant molecules of various sizes and architectures, ranging from DNA to proteins, have entered the stage of soft matter research introducing novel, multi-scale challenges in which electrostatic interactions play a major role. In the out-of-equilibrium realm, phenomena related to the nanofluidic transport of charged entities, electroosmosis or DNA translocation fascinate researchers across the disciplines. Electrostatics and soft matter continue to form a tightly bound entity, stimulating active, ongoing research, and a

Themed Collection on the combination of the two is thus as timely as ever.

In addition to the scientific reasons, a recent sad event has motivated us to put together this Themed Collection on the topic of *Electrostatics and Soft Matter*. The collection is dedicated to the memory of Professor Per Linse, who tragically passed away in March 2017 at the age of 61. Per spent most of his scientific career at Lund University, Sweden, where he also received his PhD in 1984. Starting his PhD research with experimental NMR studies of ion binding to macromolecules, Per soon moved into the field of statistical-mechanical theory and simulations, where he quickly became one of the pioneers. After a postdoctoral stay at Stanford University, he returned to Lund where he set up a research program largely focusing on the fundamental and applied aspects of electrostatics in soft matter systems. His many important contributions to the soft matter field over the following decades encompassed studies of the structural properties of liquid and solid benzene, highly charged colloidal suspensions, structural properties of polyelectrolytes and their complexes, block copolymer self-assembly, polymer adsorption at surfaces, self-assembly of anisotropic colloids, and the role of dielectric discontinuities in colloidal systems. Over the course of his career, Per also developed a large software base for scientific computing, most notably the integrated Monte Carlo and molecular dynamics code MOLSIM, which is used by many scientists worldwide. During this software

development, Per contributed significantly to the technical development of molecular simulations, in particular with respect to the Ewald summation technique as used when simulating charged, dipolar and polarizable systems.

Per was a leading scientist and a very kind, generous and patient mentor for a large number of younger scientists. We will remember him not only for his pioneering contributions to science, but also for his scientific integrity and generosity, and for his unparalleled human qualities as a colleague and friend, all clearly visible through his large number of scientific collaborations. To honour the memory and scientific legacy of Per Linse, we are pleased to present this Themed Collection on *Electrostatics and Soft Matter*. It contains a broad collection of high-quality papers from leaders within the field, several of which are previous collaborators and colleagues of Per.



Professor Per Linse. Photograph used with permission from Per Linse's family.

^a Faculty of Physics, University of Vienna, Vienna, Austria

^b Division of Physical Chemistry, Lund University, Lund, Sweden