Ionic liquids are a relatively novel class of compounds – interest in which has steadily climbed in the last decade. They have a number of useful properties e.g. negligible vapor pressure and excellent solvation and electrochemical stabilities. Ionic liquids consist usually of variable organic cations, and inorganic or organic anions and therefore ILs are referred to as designer compounds. Their high mobility in water and transparency in wide wavelength ranges makes them accessible to experimental observations not possible with e.g. metallic materials.

Here a variety of interesting phenomena like microphase separation, nanostructures and surface aggregation/interactions will be shown using experimental findings and thermodynamical fundamentals.