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# Analysis and PDE Seminar

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TITLE: Poisson-Boltzmann equations with steric effects

*Date* : Nov 10th, 2022 (Thursday)

*Time* : 10am-11am (Hong Kong time)

11am-12noon (Korea time)



*Link to ZOOM* : <https://unist-kr.zoom.us/j/3170659442>

Meeting ID : 317 065 9442

Password : APDE21

**Abstract.** When ions are crowded, the effect of steric repulsion between ions becomes significant and the conventional Poisson-Boltzmann (PB) equation (without steric effect) should be modified. Several modified PB equations had been developed before. In this lecture, a general model of PB equations called Poisson-Boltzmann equations with steric effects (PB-steric equations) will be introduced. The concentrations of ions and solvent molecules are determined by the Lambert type functions under the assumptions of steric effects and chemical potentials. Theorems of the asymptotic limit of PB-steric equations with the Robin boundary condition may show the approach of previous modified PB equations. Moreover, we find non-monotonic concentration functions (which cannot be obtained in the conventional and modified PB equations) under the assumptions of steric effects and chemical potentials.

*All are welcome*

This is a joint activity organized by Department of Mathematics, The Chinese University of Hong Kong, Hong Kong; Department of Mathematics, Institute of Mathematical Research, Research Division of Mathematical and Statistical Science, The University of Hong Kong, Hong Kong; and Department of Mathematical Sciences, Ulsan National Institute of Science and Technology, Korea. More details can be found in [https://hkumath.hku.hk/~imr/event/CUHK\\_HKU\\_UNIST\\_Analysis\\_and\\_PDE/index.php](https://hkumath.hku.hk/~imr/event/CUHK_HKU_UNIST_Analysis_and_PDE/index.php).

