Department of Mathematics
City University of Hong Kong

Colloquium

Organised by Prof. Tong YANG and Prof. Tao LUO

Vesicle Dynamics and Electrohydrodynamics: Modeling and Computations

by

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Taiwan

Abstract :
In this talk, we shall introduce the governing equations and numerical methods for the vesicle problems with or without electrical field in fluid flows. A vesiclemembrane surface is known to be incompressible and exhibits bending resistance. Instead of keeping the vesicle locally incompressible, we introduce a modified elastic tension energy to make the vesicle surface patch nearly incompressible so that solving the unknown tension (Lagrange multiplier for the incompressible constraint) can be avoided. Nevertheless, the new elastic force derived from the modified tension energy has exactly the same mathematical form as the original one except the different definitions of tension. We shall introduce the immersed boundary method to solve the vesicle dynamics in fluid flow for axis-symmetric and 3D cases. Meanwhile, to take the electrical effect into account, a hybrid immersed boundary and immersed interface method will be introduced. A series of numerical tests on the present scheme are conducted to illustrate the robustness and applicability of the method.

Date: 25 April 2017 (Tuesday)
Time: 4:30 – 5:30pm
Venue: B6605 (AC1)
City University of Hong Kong

** All interested are welcome **
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