1077-65-2595 **Nairat Kanyamee*** (nairat@su.ac.th), Department of Mathematics, Silpakorn University, Muang, NakonPatom 73000, Thailand. *Spectral Methods For The Nonlinear Hamiltonian Systems.*

The Hamiltonian system is one of the most important dynamical systems that typically arises as models of conservative physical systems and has many applications in classical mechanics, molecular dynamics, astronomy, and other scientific fields. The system has two significant properties which are energy conserving along the trajectories and symplectic structure preserving. In this talk, we will present spectral methods in solving nonlinear Hamiltonian systems with an emphasis on the three-body problem. Numerical evidences have demonstrated that the proposed spectral methods preserve both energy and symplectic structure up to the machine error in each time step, and therefore have a better long time behavior. (Received September 22, 2011)