
CHENG YANG, University of Toronto

Symplectic reduction and perturbation theory

In this talk, we show that the averaged equation for a one-frequency fast-oscillating Hamiltonian system is the result of symplectic reduction of a certain natural system on the corresponding S^1 -bundle with respect to the circle action. Furthermore, if the reduced configuration space happens to be a group, then under natural assumptions the averaged system turns out to be the Euler equation on a central extension of that group. This gives a new explanation of the drift, common in averaged system, as a similar shift is typically present in symplectic reductions and central extensions. This is a joint work with Boris Khesin.