

Spring
2016



Mathematical Sciences Colloquium/RTG Seminar

Distinct Roles of Inhibitory Neurons in Brain Oscillations

Oscillations in the brain are associated with learning, memory, and other cognitive functions. Evidence shows that inhibitory neurons play an important role in brain oscillations. Yet, how various types of inhibitory neurons contribute to the generation of oscillations remains unclear. Here we address the issue of what mathematical tools can be used to reveal information flow accompanying oscillations in the brain. By recording inhibitory neurons in the hippocampus of freely behaving mice and using time-delayed mutual information, we identify two classes of inhibitory neurons whose firing activities share high mutual information with the slow theta-band (4-12 Hz) and the fast ripple-band (100-250 Hz) of local field potential, respectively. Information flow direction further suggests their distinct contribution to theta and ripple oscillations. In contrast, Granger Causality analysis fails here to infer the causality between activities of inhibitory neurons and hippocampal oscillations.

Speaker: Songting Li

(Courant Institute Mathematical Sciences, NYU)

**Monday, February 29, 2016
(Joint with RTG)**

Time: 4:00 – 5:00 PM

Location: AE214



Rensselaer



