**Progress in Plant Systems Biology**

Offered in the Spring of 2015 by Partner Institute for Computational Biology

Time: Friday morning 9 – 11 AM

Classroom: SIBS physiology building Room 300

This class will teach the basic concepts, techniques and progresses of the Plant Systems Biology. We will cover the basics of photosynthesis scaling from molecular level, cellular level, leaf level, canopy up until ecosystem levels. The basic measurement techniques and also the basic computational techniques required to study plant systems will be presented. The lectures and hand-on exercises with both equipment and computers will be delivered in the class.

1. Introduction of systems biology and synthetic biology (Xinguang)
2. Photosynthesis overview (Saber)
3. Photosystem II basics (Saber)
4. Photo-protection (Saber)
5. Fluorescence measurement techniques (MPEA, PSI measurements, PAM: Saber)
6. Photosystems I basics (Jemaa)
7. Cyclic electron transfer (Jemaa)
8. PSI measurement techniques (PAM measurement; Saber + Jemaa)
9. Canopy photosynthesis modeling (Qingfeng)
10. 3D canopy reconstruction, ray-tracing modeling (Qingfeng)
11. Models of Reaction Diffusion models and leaf level models (Xiao Yi)
12. Hand-on sessionfor reaction diffusion models (Xiao Yi)
13. Constraint based modeling basics (Wang Zhuo)
14. Constraint based modeling (Hand-on computer work: Zhuo Wang);
15. Network inference and comparison (Guangyong)
16. Computer exercise of network biology (Hand-on computer work: Guangyong)
17. The future of plant systems biology (Xinguang)