

**Thursday, October 8, 4:30-5:20 p.m.**

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**The efficiency of photosynthetic carbon assimilation: Adaptation to changing environmental conditions**

A better understanding of the physiological mechanisms influencing photosynthetic CO<sub>2</sub> exchange is needed to distinguish the contribution of various plant communities to the global carbon cycle. Additionally, enhancing the efficiency of CO<sub>2</sub> assimilation in crop species can lead to increased water and nitrogen use efficiency. In an attempt to address these issues, our long-term research goal is to understand how changes in leaf anatomy and biochemistry influence CO<sub>2</sub> and water exchange between plants and the atmosphere. Our research focuses on measuring and modeling the kinetic parameters of key enzymatic reactions of photosynthesis and leaf isotope exchange. This information will provide us with a better understanding of how environmental factors influence the efficiency of CO<sub>2</sub> assimilation in various plant functional types. My presentation will focus on some of our recent research on determining the temperature response of key enzymatic steps of photosynthesis and using stable isotopes to screen for variation in water use efficiency across large populations of plants. This research has the potential to increase our understanding of the diverse mechanisms plants use to adapt to changing environmental conditions as well as identify traits that may lead to increased resource use efficiency and yield production in agriculturally important plants.