**Ground-based remote sensing of Solar-Induced Chlorophyll Fluorescence of evergreen and drought-deciduous plants at the UCLA Stunt Ranch Santa Monica Mountains Reserve**

Solar-Induced Chlorophyll Fluorescence (SIF) emitted from vegetation can be used as a constraint for photosynthetic activity and is now observable on a global scale from space (e.g. Frankenberg, 2012, 2014). However, the dependence of the SIF signal on environmental conditions, such as water stress, radiation, etc. remains poorly understood on a leaf-to-canopy scale, thus limiting our ability to explore the full potential of SIF observations.
We have developed an automated remote sensing system for ground-based SIF measurements (http://www.kiss.caltech.edu/study/photosynthesis/technology.html). The instrument consists of three thermally stabilized commercial spectrometers that are linked to a 2D scanning telescope unit via optical fiber bundles. Two spectrometers cover the SIF wavelength range at high spectral resolution, and a third provides moderate resolution spectra in order to retrieve vegetation indices and the photochemical reflectance index (PRI).

Within this project, we will install our novel SIF instrument at the Stunt Ranch Santa Monica Mountains Reserve. We will use the instrument to monitor the photosynthetic activity at the site continuously over both the growing season and hot summer period. The instrument is equipped with a scanner that enables us to separately measure the activity of evergreen and drought-deciduous plants. We will compare the Stunt Ranch SIF data to simultaneous observations from a portable chlorophyll fluorometer (PAM) to link the SIF signal to plant metabolism and carbon cycling. The observations will provide a unique new dataset on diurnal and seasonal variations in photosynthetic activity of different California native plants continuously and at high temporal resolution.

*References:*

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