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Measurement of chlorophyll fluorescence has long been a key method for probing the mechanisms of photosynthesis in laboratory studies. Recent advances in satellite spectroscopy have enabled retrieval of chlorophyll fluorescence from terrestrial ecosystems at a global scale. These retrievals show promising potential as an indicator of photosynthetic rate and environmental stress. Dr. Berry will discuss the basis for the retrievals, calibration studies conducted using yield statistics for the US Corn Belt, and mechanistic studies that form the basis for interpreting and modeling of solar induced chlorophyll fluorescence.