

# CGD SEMINAR



DATE: Wednesday, 4 November 2009

TIME: 3:30 p.m.

LOCATION: Mesa Lab, Main Seminar Room  
NCAR, 1850 Table Mesa Drive

SPEAKER: Long Cao, Carnegie Institution

TITLE: Environmental consequences of  
increasing atmospheric CO<sub>2</sub>: beyond  
greenhouse warming

## ABSTRACT:

It is well known that increasing atmospheric CO<sub>2</sub> causes global warming. It is probably less well known that in addition to its greenhouse effect, increasing atmospheric CO<sub>2</sub> leads to changes in ocean chemistry (ocean acidification) and can also influence global climate through its effect on plant physiology. In this talk, I will first give a global view of CO<sub>2</sub>-induced ocean acidification: the modeled ocean acidification in the coming decades, its relationship with climate change, and the effect of several proposed climate geoengineering schemes on ocean acidification. Then I will discuss the climate effect of CO<sub>2</sub>-physiological forcing (Plant stomata open less widely under elevated CO<sub>2</sub> concentrations, leading to reduced plant transpiration, which in turn affects the global energy balance and water cycle) from NCAR CAM/CLM model simulations. I will discuss the distinctly different nature of climate response to CO<sub>2</sub>-physiological and CO<sub>2</sub>-radiative forcing, and demonstrate the important role of CO<sub>2</sub>-physiological forcing in global climate change.