2018 SEMINAR SERIES

Oceanography among the clouds and terrestrial ecology a thousand miles from land: The power of global-scale airborne observations

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Over the past decade, measurements of atmospheric CO2, O2, and related tracers on a series of airborne research campaigns have enabled new insights into fundamental properties of the global carbon cycle. The HIAPER Pole-to-Pole Observations (HIPPO, 2009-2011), O2/N2 Ratio and Airborne Southern Ocean (ORCAS, 2016), and Atmospheric Tomography (ATom, 2016-2018) campaigns are supporting new estimates of 1) the growing season net flux (GSNF) of CO2 with the Northern Hemisphere land biome, 2) the partitioning between northern extratropical and tropical forest carbon sinks, 3) the seasonal net outgassing (SNO) of O2 by the ocean in both hemispheres, and 4) the Southern Ocean CO2 sink. These estimates show that GSNF has increased by > 50% over the past 60 years, that intact tropical forests are a major sink for anthropogenic carbon, that SNO is surprisingly balanced between the hemispheres, and that the seasonal variability in Southern Ocean CO2 exchange is much greater than previously thought. I will present these results and discuss new opportunities for making global-scale aircraft observations a more routine part of the future climate observing system.

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Refreshments 3:15 PM
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