



# SPRING 2016 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES  
3PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING  
THURSDAY MARCH 3<sup>rd</sup>, 2016

## “Improved Ocean Ecosystem Modeling via Improved Optics.”

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### ABSTRACT

Coupled hydrodynamical-biological-optical ocean ecosystem models are playing an increasingly important role understanding the oceans at regional to global spatial scales and daily to decadal temporal scales. Existing models often use very sophisticated treatments of the hydrodynamics and increasingly sophisticated biology, but still grossly oversimplify the optics. However, extremely fast radiative transfer codes now allow accurate light calculations within ecosystem models. Initial simulations for an idealized 3D upwelling-downwelling geometry show near-surface chlorophyll increases of tens of percent after only two weeks when accurate light calculations replace the approximate irradiance models currently used for photosynthesis and heating. Surface heating of the water is consequently greater, with less heating at depth, which increases thermal stratification. Model run times increase by less than 30% when accurate light calculations are used.

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