JOHNS HOPKINS
Center for Environmental & Applied Fluid Mechanics

Weekly CEAFM Seminar: Fall 2013

Date: **Friday, November 15, 2013**

Time: 11:00 AM

Location: Gilman # 50 (Marjorie M. Fisher Hall)

Speaker: **Dr. Matthew Paoletti** (JHU | APL)

Title: ***"Internal Wave Generation in the Deep Ocean"***

Abstract

Internal waves play a crucial role in the energy budget of the ocean by mediating the conversion of tidal and wind energy to gravitational potential energy through irreversible mixing that results from internal wave breaking. King et al. (2012) recently found that many regions of the deep ocean are too weakly stratified to support internal waves generated by tidal flow over ocean floor topography. Prior theory predicts that tidal energy will not be converted into radiated internal waves in such weak stratifications where the waves would be evanescent (exponentially damped). In contrast, we find that internal waves are generated by tidal flow over all bottom topography in our numerical and laboratory deep ocean models. We show how prior analytical predictions for uniformly stratified fluids (constant density gradient) may be extended to deep ocean environments, where the density gradient can vary by four orders of magnitude.

Bio

Dr. Paoletti received his B.S. degrees in physics and mathematics from Bucknell University in 2005. Afterward, he obtained his Ph.D. in physics from the University of Maryland in 2010, where his research efforts focused on turbulence in quantum and rapidly rotating fluids. Dr. Paoletti shifted his focus to internal waves in stratified fluids as a postdoctoral research associate at the University of Texas, before recently joining the Johns Hopkins University Applied Physics Laboratory. His work utilizes laboratory and numerical techniques to examine geophysical and astrophysical flows, such as those present in the oceans, atmospheres, and accretion disks.