# **M**ultidisciplinary **S**imulation, **E**stimation, and **A**ssimilation **S**ystems
## *MIT-WHOI Joint Seminar Series*

# Andone C. Lavery

### Senior Scientist
### Applied Ocean Physics and Engineering
### Woods Hole Oceanographic Institution (WHOI)
### Woods Hole, MA

# *The Audacious Ocean Twilight Zone Project*

**Abstract:** The ocean twilight zone, or mesopelagic zone, spans ocean depths from approximately 200 to 1,000 meters and forms one of the largest habitats on Earth. The twilight zone is home to diverse communities of zooplankton and micronekton, yet relatively little is known about their biology, adaptations, abundance, biomass, or distribution. Recent acoustic inferences suggest that the global biomass estimates of fish in the mesopelagic zone based on net sampling may be an order of magnitude too low. Furthermore, many twilight zone inhabitants participate in daily vertical migration, likely the largest migration that occurs on earth, and play a previously underappreciated role in Earth's climate, helping to control the rate at which the ocean absorbs atmospheric carbon dioxide and transfers it to the deep ocean. However, there is a current technological void for characterizing mesopelagic ecosystems. On April 11, 2018, the Woods Hole Oceanographic Institution was awarded $35 million by the Audacious Project, a new philanthropic collaboration housed at TED, to explore the Ocean Twilight Zone. This talk is aimed at presenting the first wave of new sensors and platforms currently under development at WHOI to enable exploration of the Ocean Twilight Zone. Specifically, this talk will focus on the Deep-See system, which involves a combination of acoustical, optical and genetic sampling systems for ecosystem assessment. This instrument is particularly well suited to understanding the diverse communities of zooplankton and micronekton in relation to environmental variability, such as meso-scale oceanic eddies, fronts, and upwelling regions, and abrupt topography, such as canyons, seamounts, and shelf breaks. Impacts from this research will extend from basic research problems underpinning science-based fisheries management and decision making, to broader societally relevant problems.

## Friday, Apr. 27, 2018
## 3:00PM; Rm. 5-314
### Massachusetts Institute of Technology
### 77 Massachusetts Avenue
### Cambridge, MA 02139

Host:
Pierre Lermusiaux
http://mseas.mit.edu