

Center for Environmental & Applied Fluid Mechanics

Speaker: Dr. Anand Gnanadesikan (JHU | Earth and Planetary Science)

Title: *"The role of mixing in the large-scale circulation of the ocean"*

Date: **Friday, September 9, 2011**

Time: 11:00 a.m.

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

Because of their role in storing heat and carbon, the oceans play a critical role in determining the climate of the earth. This talk will review ways in which turbulent mixing affects the structure and large-scale circulation of the ocean. We will begin by looking at mixing driven by breaking internal waves, examining its role in supporting the transformation of dense deep waters into light surface waters. Turning to the role of lateral mixing associated with oceanic eddies, we show that different combinations of vertical and lateral mixing can produce relatively similar oceanic density structure but may result in quite different distributions of chemical and biological tracers. We'll talk a little bit about the state of mechanistic parameterizations of both vertical and lateral turbulent mixing and highlight some areas that are ripe for future research. Finally, we'll discuss the importance of turbulent boundary layers in producing great underwater waterfalls that renew the deep ocean.

Anand Gnanadesikan received his Ph.D. from the MIT/Woods Hole Joint Program in Physical Oceanography in 1994. His graduate work focused on wave-driven turbulence in the oceanic surface layer. From 1995-2011 he held a variety of positions at Princeton University and the Geophysical Fluid Dynamics Laboratory- helping to develop and analyze models of the large-scale ocean circulation for use in both oceanographic research and climate change assessment. His research focuses on how the large scale circulation of the ocean interacts with the atmosphere, biosphere, and cryosphere.