
Center for Environmental
& Applied Fluid Mechanics

Weekly Seminar: Spring 2011

Date: **Friday, March 11, 2011**
Time: **11:00 AM**
Location: **Gilman Hall 50 (Marjorie M. Fisher Hall)**
Speaker: **Dr. Alan Brandt (JHU | Applied Physics)**
Title: **Stratified Wake Flows – Phenomenology Overview**

Abstract

Oceanic turbulent wakes can arise in the lee of seamounts, due to interactions at the shelf-break, and from the motion of ships, UUVs, and ocean creatures, the latter ranging in size from plankton to whales. As such, stratified wakes can contribute to ocean mixing causing changes in the local density profile, the distributions of nutrients, dissolved oxygen, and CO₂. These changes will affect the propagation of sound and light through the ocean, as well as bio-feeding patterns, primary productivity, and air-sea exchange.

In a stratified environment, as generally is present in the atmosphere and ocean, wakes consist of two components: the turbulent wake itself and the internal wavefield resulting from the fluid displacement of the body and forcing by the turbulent wake. Significant advances in the characterization of these processes have been made during the past thirty years – since the definitive review by Lin and Pao (Ann. Rev. Fluid Mech. 1979, 11: 317-38). These advances include an understanding of: late-wake coherent eddies; the large coupling of wake energy to the internal wave field at low Froude numbers; and, the strong eddy structure present in the early stratified wake. An overview of these stratified wake processes will be presented.

Bio

Dr. Alan Brandt received a Bachelor of Civil Engineering from The Cooper Union in 1961 and M.S. and Ph.D. degrees in Civil Engineering from Carnegie Mellon University in 1963 and 1966, respectively. Upon graduation he joined the Johns Hopkins University Applied Physics Laboratory (JHU/APL). In 1971 he was on sabbatical at the Imperial College in London, working on intermittent turbulent flows. From 1987 to 1993 he was Program Manager for the Physical Oceanography and Coastal Sciences Programs at the Office of Naval Research. Upon returning to APL he was re-appointed to the Principal Professional Staff, and also has a joint appointment in the JHU Dept. of Mechanical Engineering. His research includes studies in fluid dynamics, physical oceanography, and environmental sciences, specifically surface and subsurface hydrodynamics, internal waves, and stratified turbulence.