UNIVERSITY OF MARYLAND

THE BURGERS PROGRAM FOR FLUID DYNAMICS &
THE DEPARTMENT OF MATHEMATICS PRESENT
A JOINT FLUID DYNAMICS REVIEWS SEMINAR &
MATHEMATICS COLLOQUIUM

FLUID-BOUNDARY INTERACTIONS: TRANSPORT, STRATIFICATION AND CONFINEMENT EFFECTS

Friday, November 8th, 2019 | 3:15 - 4:15pm
Room 3206, Kirwin Hall
(Department of Mathematics)

Guest Speaker

DR. ROBERTO CAMASSA

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ABSTRACT

Arguably some the most interesting phenomena in fluid dynamics, both from a mathematical and a physical perspective, come from the interplay between a fluid and the boundary of its domain. This talk will present recent analytical, numerical and experimental results that illustrate boundary effects in various setups. For an ideal Euler fluid under gravity, smooth contact of material surfaces with horizontal boundaries may persist until loss of regularity occurs. For fluids with a diluted passive or an active scalar, diffusion in the presence of impermeable boundaries further adds to the complexity of the dynamics. In the passive case, such as that of a neutrally buoyant chemical solute transported by the flow in a duct or pipe, the interplay with the cross sectional geometry of the pipe can shape the solute distribution downstream from a release location. In the active case, e.g., when a diluted scalar alters the local density of a fluid under gravity, boundary orientation with respect to gravity can lead to hydrostatic imbalances, which can give rise to self-induced flows with remarkable consequences.

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