Apr 24th, 4:00 PM - 5:00 PM

Quantifying Transport of Passive Tracers and Inertial Particles in Geophysical Flows

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MONTCLAIR STATE UNIVERSITY

The MSU Sustainability Seminar Series Presents:

Quantifying transport of passive tracers and inertial particles in geophysical flows

WHEN: April 24, 4:00 pm
WHERE: CELS 120 lecture hall

Dr. Eric Forgoston
Montclair State University

Eric Forgoston's expertise lies in the development of novel mathematical methods for deterministic and stochastic dynamical systems to model and study complex physical and biological phenomena. His recent efforts include the study of material transport in the ocean and other stochastic environments, the use of autonomous vehicles to track Lagrangian coherent structures, the outbreak and extinction of infectious diseases, the behavior of biological and robotic swarms, food web dynamics in ecological systems, and the stability of fluid flows. His work has been funded by the Office of Naval Research and the National Science Foundation. Forgoston was a National Academies' National Research Council Postdoctoral Fellow at the U.S. Naval Research Laboratory in Washington, DC. Prior to that he received the Ph.D. degree in applied mathematics from the University of Arizona, Tucson, in 2006. His current work at Montclair State University is focused on nonlinear systems dynamics, fluid mechanics, stochastic analysis, and the control of multiagent systems with applications to robotics.

There has been a steady increase in the deployment of autonomous underwater and surface vehicles for applications such as ocean monitoring, tracking of marine processes, and forecasting contaminant transport. The underwater environment poses unique challenges since robots must operate in a communication and localization-limited environment where their dynamics are tightly coupled with the environmental dynamics. This work presents current efforts in understanding the impact of geophysical fluid dynamics on underwater vehicle control and autonomy. The focus of the first part of the talk is on the control of collaborative vehicles to track Lagrangian coherent structures and to localize contaminant spills. In the second part of the talk, the focus is on the investigation of the dynamics of inertial particles in geophysical flows which include the Coriolis force.

For more information contact Dr. Jorge Lorenzo-Trueba at 973-655-5320