

Environmental and Water Resources Engineering, and the Center for Water and the Environment Seminar Series Presents:

Thursday, April 17th 2025, 3:30-4:30pm, ECJ 1.324



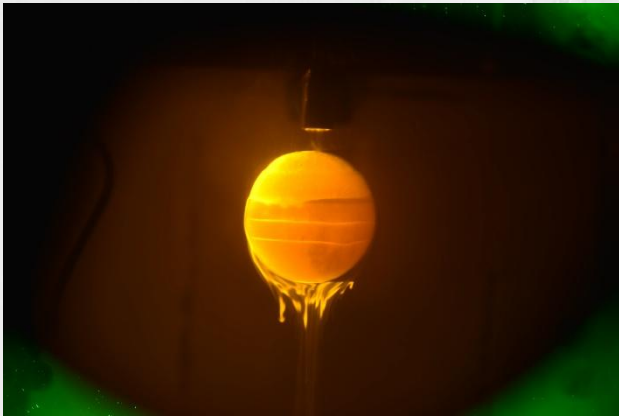
Zoom Link: <https://utexas.zoom.us/j/94105241294>

Enhanced Melting in Isotropic Turbulence

Hiromu Koyama

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Advisor: Dr. Blair Johnson



Glacial melt is a driver of sea level rise. To further our ability to accurately predict and mitigate the effects caused by sea level rise, it is necessary to understand the fundamental mechanisms by which ice melts at the ice ocean interface. However, it is difficult to model the complex interplay between different driving factors such as temperature, salinity, and water velocity. Turbulence's effect on ice melt rates is particularly poorly understood. To provide further experimental data on this relationship, ice was melted in a facility with specified water temperature, salinity, and ambient turbulence. The characteristics of the turbulence was quantified through particle image velocimetry (PIV) analysis.

Levying Subgrid Methodology to Capture High-Resolution Hydrodynamic Flow Characteristics in an Efficient Low-Resolution Model

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Advisor: Dr. Paola Passalacqua

Effectively incorporating topographic and vegetative intricacies in riparian environments relies on the balance between computational efficiency, model resolution, and data availability, which is often limited in current hydrodynamic modeling practices to varying degrees. Improving the ability to incorporate fine-scale interactions throughout a watershed would drastically change the nature in which hydrodynamic research is performed by increasing the ability to more realistically describe surface-water processes. In this presentation, I will discuss preliminary results and methods in reproducing high resolution model flow outputs in a lower resolution model along the Trinity River in southeast Texas. Contextualizing these behaviors through qualitative and quantitative analyses reduces ambiguity and error in modeled eco-hydrologic relationships – giving way to more informed modeling approaches and further bridge the gap between ecology, hydrology, and geomorphology to inform the functionality of complex inland and coastal networks.

