

Glacial Hydrology and Consequences for Ice-sheet Dynamics

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1:30 - 2:30 p.m.

Clark 507, Quissett Campus, WHOI

Summary

This talk will provide an overview of the concepts and current knowledge surrounding glacial hydrology and its effect on ice-sheet dynamics. The main focus will be on subglacial hydrology; there is strong indication that this exerts key controls on ice motion. I will discuss the theory and evidence for glacial drainage systems consisting of porous till layers, linked cavities, and water-filled tunnels. The effect of these systems on basal shear strength and hence ice velocity will be examined using numerical models, concluding that whilst the latest models can explain most of the observations, we are well short of being able to predict them a priori. The nature of subglacial discharge to the ocean at grounding lines and tide-water termini will also be discussed, along with implications for calving, ice-shelf channeling, and for the marine-ice-sheet instability that is potentially underway in Antarctica.