Center for Environmental & Applied Fluid Mechanics

"What are we Learning from the DNS of Wall-Bounded Turbulence at High Reynolds Numbers?"

Myoungkyu Lee
University of Alabama

Nearly all moving objects on Earth pass through fluids, and many of them move at high speed. This makes high Reynolds Number Re wall-bounded turbulent flows of great technological importance. High spatial and temporal resolution is required to study these flows due to the multi-scale nature of turbulence. Direct numerical simulation (DNS) is a technique in which the Navier-Stokes equations, the governing equations of fluid flow, are solved with sufficient resolution to represent all scales of turbulence. Therefore, DNS is very expensive and always limited by computational capabilities. DNS of incompressible turbulent channel flow at friction Reynolds numbers Re_τ up to 5200 have been performed with more than 500,000 processors to study high Re wall-bounded turbulence. In this presentation, we will discuss the characteristics of high Re wall-bounded flows with simulation results from turbulent Poiseuille and Couette flows.

Fall 2022 CEAFM Seminar Series

September 23, 2022 ✖ 3:00 PM ✖ Gilman Hall 50

https://wse.zoom.us/j/93762992307

JOHNS HOPKINS
WHITING SCHOOL of ENGINEERING