PRITPAL MATHARU, McMaster University
PDE Optimization for Theoretical and Computational Turbulence Problems

Turbulent flows occur in various fields and are a central, yet extremely complex topic in fluid dynamics. Understanding the behaviour of fluids is vital for multiple research areas including, but not limited to: biological models, weather prediction, and engineering design models for automobiles and aircrafts. In this talk, we will introduce PDE optimization techniques utilizing adjoint calculus and computational framework to be used in suitable gradient-based techniques. Then, we will discuss how these techniques and their modifications have been employed for problems in both computational and theoretical turbulence problems, concerning the turbulence closure problem and the "zeroth law of turbulence".