

# *distinguished speakers series*

The Department of Mechanical and Materials Engineering presents:

## **Christian J. Kähler**

Institute for Fluid Mechanics and Aerodynamics, Bundeswehr University Munich Germany

### **A NEW LOOK ON COHERENT FLOW MOTIONS IN TURBULENT BOUNDARY LAYERS**

Turbulent boundary layers are still the subject of intense scientific investigations and with the increasing strength of numerical and experimental techniques, more features of the turbulent motion can be resolved that enhance our picture of near wall turbulence. Due to the enormous progress in optical field measurement techniques (PIV / PTV), today it is possible to non-intrusively sample the flow, even at high Reynolds numbers, with micron resolution in all three spatial directions. This allows for investigations of the scaling of statistical flow quantities and near wall flow effects, such as the small reverse flow events in the near wall region recently predicted in numerical flow simulations. Moreover, it is possible to record turbulent boundary layer features over a large domain in order to study the coherent large scale flow features, such as turbulent superstructures and their scaling. Within this presentation, the large and small scale features of various high Reynolds number turbulent boundary layer flows will be discussed and the link or interaction between the coherent structures will be illuminated to better understand the puzzle of near wall turbulence.



**Queen's**  
UNIVERSITY

THURSDAY, SEPTEMBER 6TH – 1:00 p.m. McLAUGHLIN HALL ROOM 312