Edriss Titi, Weizmann Institute and UC Irvine

Global regularity for three-dimensional Navier-Stokes equations and other relevant geophysical models

ABSTRACT:
The basic problem faced in geophysical fluid dynamics is that a mathematical description based only on fundamental physical principles, the so-called the “Primitive Equations”, is often prohibitively expensive computationally, and hard to study analytically. In this talk I will survey the main obstacles in proving the global regularity for the three-dimensional Navier–Stokes equations and their geophysical counterparts. Even though the Primitive Equations look as if they are more difficult to study analytically than the three-dimensional Navier–Stokes equations I will show in this talk that they have a unique global (in time) regular solution for all initial data. This is a joint work with Chongshen Cao.