CHAPTER OVERVIEW

12: Non-inertial Reference Frames

This chapter will analyze the behavior of dynamical systems in accelerated frames of reference, especially rotating frames such as on the surface of the Earth. Newtonian mechanics, as well as the Lagrangian and Hamiltonian approaches, will be used to handle motion in non-inertial reference frames by introducing extra inertial forces that correct for the fact that the motion is being treated with respect to a non-inertial reference frame. These inertial forces are often called **fictitious** even though they appear real in the non-inertial frame. The underlying reasons for each of the inertial forces will be discussed followed by a presentation of important applications.

Thumbnail: This low-pressure system over Iceland spins counterclockwise due to balance between the Coriolis force and the pressure gradient force. (Public Domain; NASA's Aqua/MODIS satellite).