Transport phenomena constitutes the **dynamical core** of an atmospheric model.

Momentum

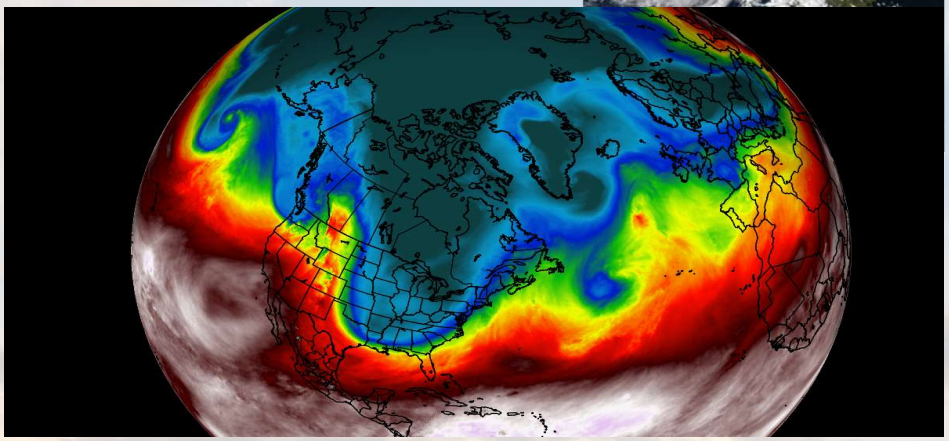
$$\frac{D\vec{v}}{Dt} = \vec{g} - \frac{1}{\rho}\nabla p - 2\vec{\Omega} \times \vec{v} - \vec{D}$$

Heat

$$\rho c_v \frac{DT}{Dt} = -p\nabla \cdot \vec{v} - \nabla \cdot \vec{F} + k\nabla^2 T + \rho\dot{q}$$

Continuity

$$\frac{D\rho}{Dt} + \rho\nabla \cdot \vec{v} = 0$$



Images from Pavel Berloff and www.severe-weather.eu