

**2012-2013 ICTP POSTGRADUATE DIPLOMA PROGRAMME
EARTH SYSTEM PHYSICS**

**Climate Dynamics (ESP-CD)
(12 lectures : 18 hrs)**

- Vorticity equation for synoptic-scale motion; potential vorticity conservation
- Quasi-geostrophic motion; Thermo-Hydrodynamic equations in pressure coordinates
- Rossby waves; free Rossby waves; forced Rossby waves
- Baroclinic instability; two-layer model
- Equatorial waves; Rossby-gravity waves; Kelvin waves, Gill model
- The General Circulation; Hadley Cell; Ferrell Cell
- Energetics of the General Circulation; Lorenz' energy cycle
- Analysis of climate Variability; EOF analysis, PCA analysis