**Cloud dynamics**

**Referneces**

1. Cloud dynamics by Houze R, 1993

**2.** PHYSICS AND DYNAMICS OF CLOUDS AND PRECIPITATION, by Pao Wang, 2013.

**1. Fundamental of cloud dynamic 2 weeks**

Cloud motion, Adiabatic ascent of unsaturated air parcel: LCL, moist adiabatic process, Buoyancy and static stability, the adiabatic parcel model of cloud formation: CCL and convective process: thermals and plumes, Entrainment: lateral and cloud top entrainment

**2. Shallow-layer clouds:** Cirriform clouds, Altostratus and altocumulus 1 week

**3. Nimbostratus dynamic 1 week**

**3. Cumulus dynamics 2 weeks**

4. Thunderstorms, Supercell dynamic, Gust fronts, Downburts 2 weeks

8. Orographic cloud dynamic 1week

**Introduction**

A cloud is defined as "a visible aggregate of minute particles of water or ice, or

both, in the free air." Clouds cover about half of the earth at any given time.

Thus, from space, the earth appears as a planet semi-enshrouded by these "visible

aggregates" of drops and ice crystals. The pattern of clouds seen from space fluctuates strongly as they form, dissipate, and move in conjunction with the fluid motion of the air. These masses of cloud are an integral part of weather, climate, and the global water cycle.

The focus of this course is on the air motions associated with clouds.

we refer to this discipline as *cloud dynamics.* The development of cloud dynamics has trailed that of cloud microphysics largely because the technologies required to observe and model cloud dynamics are so demanding. The proper documentation of cloud dynamics entails scales of air motion from < 1 km to > 1000 km

To accomplish necessary documentation and understanding across so many spatial scales," special aircraft, radars, computers, satellites, and numerical modeling techniques must be employed