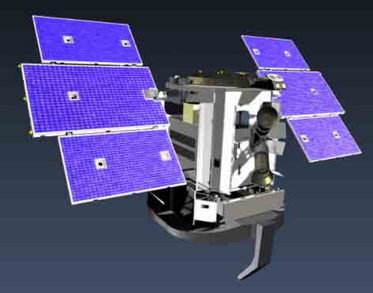
CLOUDSAT

Reading the Clouds



The Mission

CloudSat is an Earth-orbiting satellite that will use radar to study clouds from space. It will be able to see inside the clouds from top to bottom, measuring their thickness, their altitude at top and bottom, their reflective properties, and their water and ice content. Data from CloudSat will be used to improve our ability to accurately forecast the weather and improve long-term global climate predictions.

Reading the Clouds

Clouds, which are collections of water droplets, are beautiful and fun to watch. If we learn to "read" them, we can know what is happening at different levels of the atmosphere and what kind of weather may be on the way. Clouds are classified by their shape or appearance and their height above the ground.

High clouds start above around 6,000 meters (20,000 feet). They often look thin and patchy or feathery. Their names start with "cirro," which means "curl of hair" in Latin:

- **Cirrus** clouds look like delicate strands or hooks. They are made mostly of ice crystals.
- **Cirrocumulus** are thin, patchy clouds that may have rippled or wavelike patterns.
- **Cirrostratus** are thin, sheet-like clouds that cover most of the sky.

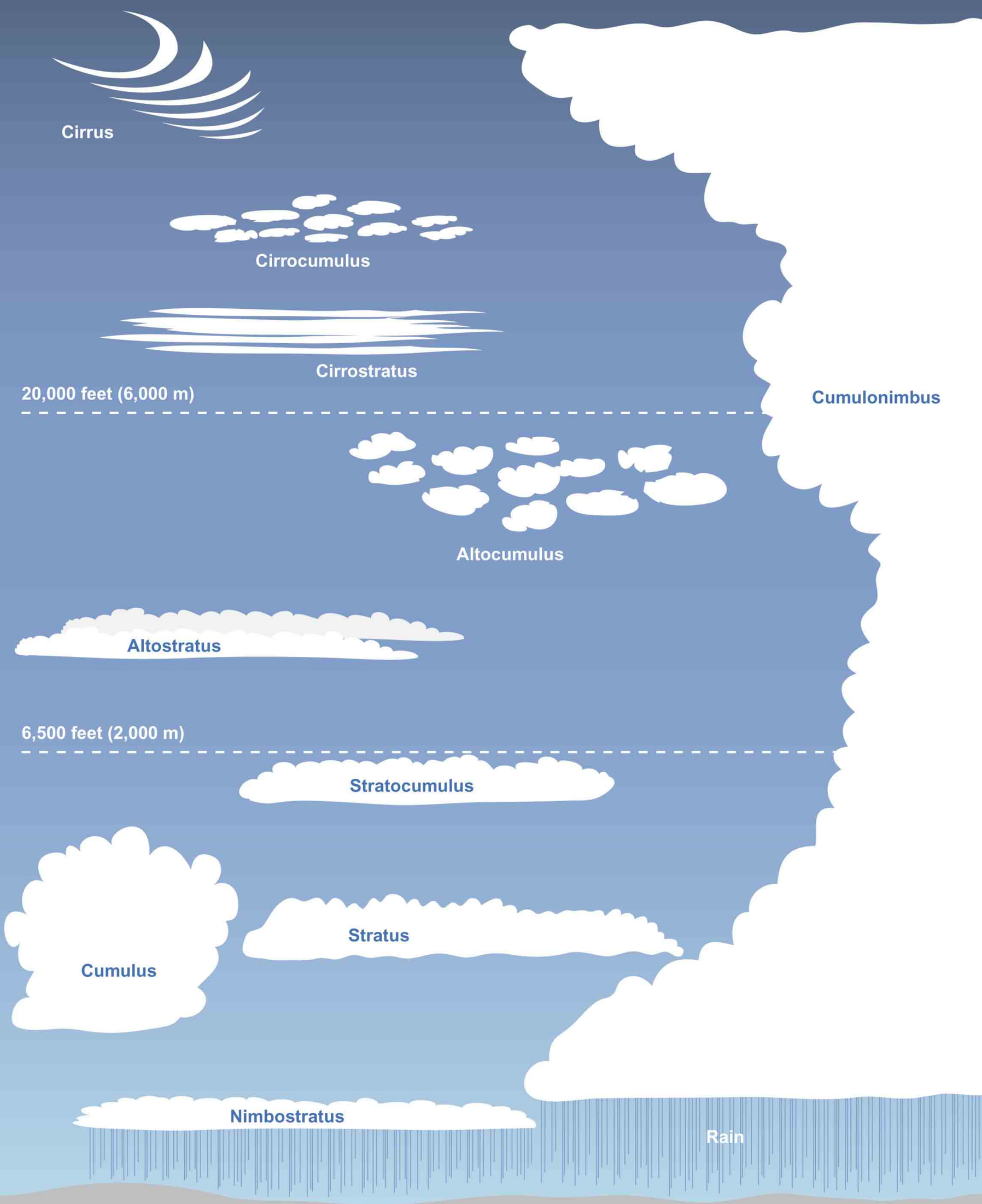
Mid-level clouds form from 2,000 meters (6,500 feet) to 6,000 meters (20,000 feet). They usually look rather flat and layered, because the air at these altitudes doesn't move very much vertically. Their names always start with "alto":

- **Altocumulus** are white or gray puffy, patchy clouds with spaces between them. They may appear to be lined up in rows.
- **Altostratus** form a gray or bluish-gray uniform-looking layer that covers much or most of the sky.

Low-level clouds are found below about 2,000 meters (6,500 feet). They are either flat and layered or rounded on top, with flat bases:

- **Stratocumulus** have distinct gray or whitish rounded patches. They may look rolling or puffy, but are often merged together into layers with no spaces between them.
- **Cumulus** clouds are fluffy and cauliflower-like, with rounded white tops and flat grayish bases.
- **Stratus** form a flat, thin, uniform cloud layer. They usually contain insufficient water to produce significant rain or snow. Stratus clouds that reach down to the ground we call fog.
- **Nimbostratus** are dark, gray clouds that are dropping rain or snow. They usually cover the entire sky. Sometimes nimbostratus are found higher in the atmosphere, in the mid-altitudes.

Cumulonimbus clouds are the kings of all clouds, rising from low altitudes up to more than 12,000 meters (40,000 feet). They grow due to rising air currents called updrafts, with their tops flattening out into an anvil shape. Cumulonimbus are a sure sign of severe weather, with heavy rain and possibly hail.



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