

Meeks' Guides

The Layers of the Atmosphere

Our atmosphere is divided into five distinct layers based on temperature changes. The height of each layer is constantly in flux and is different in different parts of the world based on time of day and temperature. When it's cooler, during the winter months, the air is compressed and the top boundary of the troposphere is lower. The opposite is true in summer when the air is warmer and the boundary is pushed up.

Troposphere

The Troposphere is the lowest layer of the atmosphere. It is here that life lives and most of our weather takes place. The Troposphere contains almost 75% of all of the air in our atmosphere. The upper boundary is 8 - 14 km (5-9 miles) high. The troposphere is marked by lowering temperature with height.

Tropopause

The Tropopause forms the boundary between the troposphere and the Stratosphere. The Tropopause is isothermal meaning the temperature is stable with height. The temperature falls as you go higher in the troposphere, it is the same across the Tropopause, and then begins to increase in the Stratosphere.

Stratosphere

The Stratosphere extends from the Tropopause up to about 50 km (31 miles) high. The air in this layer is drier, much thinner, and gradually warms with height. Dispersed throughout the Stratosphere is Ozone, forming a sub-layer of the Stratosphere. Harmful radiation from the Sun strikes and destroys Ozone, releasing the heat that warms this layer. Storm clouds top out and most commercial aircraft fly in this layer.

Stratopause

The Stratopause is an isothermal region that forms the boundary between the Stratosphere and the Mesosphere.

Mesosphere

"Meso" meaning middle tells us that the Mesosphere is the middle layer of our atmosphere. Again temperatures cool as you go higher. In fact, the temperature of the atmosphere is at its' coldest -90C (-130F) at the top of this region. It is here in this region that most meteors and auroras begin to be seen. It extends up to 85km (53 miles) high.

Mesopause

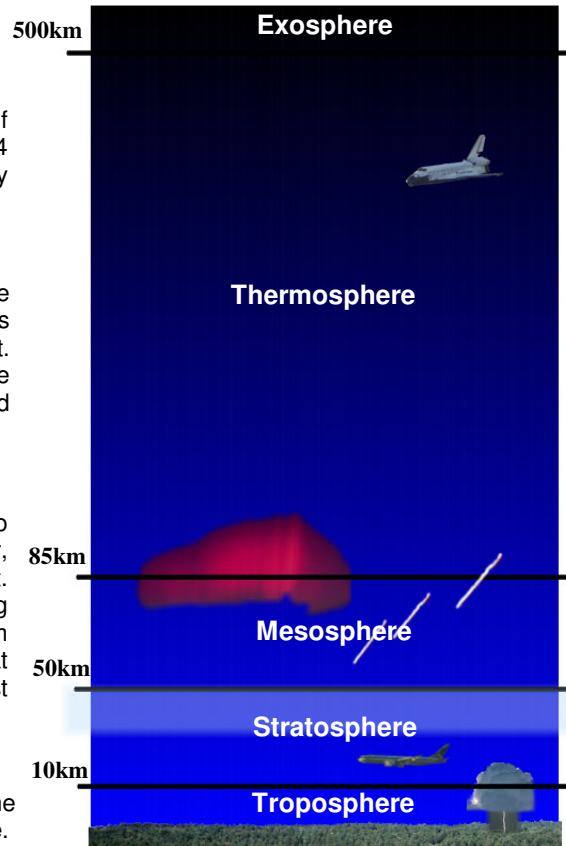
The Mesopause is an isothermal region forming the boundary between the Mesosphere and the Thermosphere.

Thermosphere

The air molecules are so thin and high in this layer that they are warmed by the intense radiation from the Sun and the temperature once again climbs. The thermosphere also contains the various layers of the ionosphere. The Thermosphere reaches up several hundred kilometers (and miles) high and it is in this region that low earth spacecraft (such as the shuttle) orbit.

Exosphere

There is no distinct boundary between the Thermo and Exosphere. The Exosphere is made up of the occasional particles that float at the top of our atmosphere and may extend out several thousand kilometers (miles).



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