

Activities:

Earth's atmosphere is a natural laboratory in which a wide variety of physical processes take place. It consists of a mixture of gases, mainly nitrogen and molecular oxygen, and minor constituents such as carbon dioxide, ozone and water vapor. Minor components play crucial roles in the radiative balance, the stability of the atmosphere and its impact on biota.

The atmosphere is constantly bombarded by solar photons in the infrared, visible and ultraviolet wavelengths. Part of this solar radiation is returned to space by the atmosphere or reflected by clouds back to space or the Earth's surface. Some of these photons are absorbed by molecules in the atmosphere (especially water vapor and ozone) and clouds, resulting in heating part of the atmosphere; another part of the radiation reaches the Earth's surface and heats it. The optical characteristics of the atmosphere affect the radiative balance of the Earth-Sun-Atmosphere system, consequently, its study and characterization has a wide and continuous interest in scientific research.

Nowadays, remote observation of the atmosphere, both from space with satellite instruments and from the ground with instruments sensitive to solar radiation, provide the most advanced tools we have to determine and quantify cloud cover and the impact of the cloud on solar radiation at the surface. Furthermore, these studies include work aimed at improving the efficiency of solar and wind energy production plants, as well as the analysis of atmospheric parameters for installation feasibility studies.

Finally, the Atmosphere Laboratory also offers consulting services for the installation of specific instruments for the measurement and impact of atmospheric parameters.