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# Comparative Planetology using Planetary Exospheres

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Every planetary object has an exosphere. The exosphere is populated by material from underneath, either from the atmosphere (if there is any) or from the surface of the object. Thus, there is a considerable variety of chemical compositions of exospheres among the planetary objects in our solar system. Also the physical state of an exosphere (the temperature, densities profiles, scale heights, ...) vary from object to object. The main reasons for this variability being the different solar input depending on distance to the Sun, the exposure to the local plasma environment (solar or magnetospheric plasma), and the gravity of the object itself. These factors are well understood for solar system objects, thus observed exospheres often can be modelled well using these boundary conditions. The situation is different for exoplanets. With the discovery of an exoplanet its orbital period is known, and if transit observations are available mass and radius can be derived. The exosphere is the next thing that can be studied for an exoplanet. Interpreting these exospheric observations with model calculations allows investigations of its underlying atmosphere, atmospheric mass loss, the plasma environment the exoplanet is embedded in, and the existence of a large-scale planetary magnetic field.