The two largest planets, **Jupiter** and **Saturn**, have nearly the same chemical makeup as the Sun; they are composed primarily of the two elements hydrogen and helium, with 75% of their mass being hydrogen and 25% helium. On Earth, both hydrogen and helium are gases, so Jupiter and Saturn are sometimes called gas planets. But, this name is misleading. Jupiter and Saturn are so large that the gas is compressed in their interior until the hydrogen becomes a liquid. Because the bulk of both planets consists of compressed, liquefied hydrogen, we should really call them liquid planets.

Beyond our own solar system, there are more planets than stars in the night sky. So far, we have discovered thousands of planetary systems orbiting other stars in the Milky Way, with more planets being found. Most of the hundreds of billions of stars in our galaxy are thought to have planets of their own, and the Milky Way is but one of perhaps 100 billion galaxies in the universe.

Earth and Planetary Science Letters (EPSL) is a leading journal for researchers across the entire Earth and planetary sciences community. It publishes concise, exciting, high-impact articles ("Letters") of broad interest. Its focus is on physical and chemical processes, the evolution and general properties of the Earth and planets - from their deep interiors to their atmospheres. EPSL also includes a Frontiers section, featuring invited high-profile synthesis articles by leading experts on timely topics to bring cutting-edge research to the wider community.

The major structural components in the earth that are separated by sharp discontinuities are the crust, the mantle, and the core. The crust forms a very thin surface skin, the mantle is a thick shell that extends half the radius down into the earth, and the core occupies the central part. The crust and upper mantle are known to vary in physical and chemical characteristics, both horizontally and vertically; the lower mantle and core are generally assumed to be uniform because their diagnostic geophysical phenomena are masked by the physical-properties of the upper layers.

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In the following discussion of the interior of the earth, I am using facts from these sources to consider layering, the existence of openings, and the physical state and of the of the rocks and minerals presumed to occur in the earth. Our near of composition are not much better than conjectures at present, but they are reasonably consistent with observations.

The existence of $uch large rooms as in the Carlsbad Caverns brings up the questi0n of how large an opening at a given place underground can be supported by the surrounding r0ck. Sand and gravel like that $hown in the pit in figure I