# Probing the Most Revealing Layers of the Giant Planets

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The upper atmospheres of Jupiter and Saturn, located several hundred kilometers above the planet's visible cloud decks, are extraordinarily thin, with number densities below 1012 $cm^{-3}$. Being "basically space", however, is not a weakness, but a strength; it makes the region highly sensitive to physical and chemical processes on the planet and to interactions between the planet and its space environment. In this talk, I will focus on two major processes that shape these upper atmospheres: the polar aurorae, which dominate the planet's global upper-atmospheric energy balance, and Saturn's eroding rings, which deposit material into the atmosphere and dominate chemistry. The latter has interesting implications for the evolution and ultimate fate of Saturn's rings. By the end of this talk, I hope to convince you that, if it can be detected, this most revealing layer is worth investigating outside of the solar system.