

## Extraterrestrial Sprites

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The emission spectra of sprites (transient luminous events that follow electric breakdown in the upper atmosphere), their morphology and occurrence heights reflect the properties of the planetary atmosphere they inhabit and are related to the intensity of their parent lightning. In Earth's atmosphere, they mostly emit from various molecular Nitrogen species in red and blue wavelengths, and span a vertical range between 50 and 90 km above the surface. We present results of theoretical calculations of the expected occurrence heights and the corresponding pressure conditions of sprites above lightning discharges presumably occurring in the CO<sub>2</sub> atmosphere of Venus, the N<sub>2</sub> atmosphere of Titan and the H<sub>2</sub>-He atmosphere of Jupiter. The expected emission lines are presented and a detection methodology of sprites in planetary atmospheres by orbiting spacecraft is suggested. Planned experimental research of the geometry of streamers and similarity laws in various planetary gases are also presented.