

## Venus and Mars Exploration by Planetary Space Telescope, TOPS

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In situ measurements using orbiting spacecraft are absolutely necessary to understand the dynamics of atmosphere and surrounding environment in Venus and Mars. They are the most preferable planets to send scientific equipments since their rather small distance and the moderate conditions in the solar system, as similar to the earth. However, it's still important to monitor this planet with a telescope located on/near the Earth. Only an in-situ planetary orbiting spacecraft would not be enough in the roadmap of planetary science, considering risks, time and cost effectiveness. We propose a space telescope mission, TOPS (Telescope Observatory for Planets on Small-satellite), which is optimized for planet observation, including Venus and Mars. Two off-axis reflecting telescopes with diameter of 30 cm are installed at a small satellite bus (200kg). The telescopes cover in the wavelength range from 100 nm to 1μm with interference filters and liquid crystal variable filters. Four imaging sensors are used according to spectral range and the scientific purposes. TOPS would be a powerful tool for the targets listed below as examples. 1) global distribution of cloud and water vapor in a fixed local time zone 2) Martian dust distribution and information on its particle size, 3) dynamics of ionospheric and outflowing atmospheres, 4) aurora and airglow emissions, 5) distribution of hydrogen corona, 6) lightning flashes on Venus.