[EE] Eveningポスター発表 | セッション記号 P (宇宙惑星科学) | P-PS 惑星科学

[P-PS01] Outer Solar System Exploration Today, and Tomorrow

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The giant planets provide many keys to understanding planetary processes. They play an important role in shaping our solar system, and the physical and chemical processes they harbor also provide a unique opportunity to study the phenomena relevant for studying
Earth and other planets, including exoplanetary systems. In this session, we discuss a wide range of topics encompassing the giant planets and their moons, including their origins, interiors, atmospheres, compositions, surface features, and electromagnetic fields. To advocate for current and future outer planets exploration (Cassini, Juno, New Horizons, JUICE, and beyond), we also call for discussions on future missions to explore giant planet systems, including how to develop better international cooperation. Discussion in this latter category will include progress in developing a solar sail mission concept for observing the Jupiter system and its trojan asteroids.

[PPS01-P07]Small Next-generation Atmospheric Probe (SNAP) 小型大気突入プローブによる天王星・海王星の将来探査構想

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キーワード：天王星、海王星、大気、惑星探査

We present a concept for a small, atmospheric probe that could be flexibly added to future missions that orbit or fly-by a giant planet as a secondary payload, which we call the Small Next-generation Atmospheric Probe (SNAP). SNAP’s main scientific objectives are to determine the vertical distribution of clouds and cloud-forming chemical species, thermal stratification, and wind speed as a function of depth. As a case study, we present the advantages, cost and risk of adding SNAP to the future Uranus Orbiter and Probe flagship mission; in combination with the mission’s main probe, SNAP would perform atmospheric in-situ measurements at a second location, and thus enable and enhance the scientific objectives recommended by the 2013 Planetary Science Decadal Survey and the 2014 NASA Science Plan to determine atmospheric spatial variabilities.

We envision that the science objectives can be achieved with a 30-kg entry probe ~0.5m in diameter (less than half the size of the Galileo probe) that reaches 5-bar pressure-altitude and returns data to Earth via the carrier spacecraft. As the baseline instruments, the probe will carry an Atmospheric Structure Instrument (ASI) that measures the temperature, pressure and acceleration, a carbon nanotube-based NanoChem atmospheric composition sensor, and an Ultra-Stable Oscillator (USO) to conduct a Doppler Wind Experiment (DWE). We also catalog promising technologies currently under development that will strengthen small atmospheric entry probe missions in the future. While SNAP is

applicable to multiple planets, we examine the feasibility, benefits and impacts of adding SNAP to the Uranus Orbiter and Probe flagship mission.