



OSS: an Outer Solar System Mission towards Neptune, Triton and KBO

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The present OSS proposal continues a long lived tradition of collaboration between the communities of fundamental physics and planetary sciences in a single mission with ambitious goals in both domains. OSS is an M-class mission to explore the Neptune system almost half a century after flyby of the Voyager 2 spacecraft.

Several discoveries were made by Voyager 2, including the Great Dark Spot (which has now disappeared) and Triton's geysers. Voyager 2 revealed the dynamics of Neptune's atmosphere and found four rings and evidence of ring arcs above Neptune. Taking benefit of a greatly improved instrumentation, it will result in a striking advance in the study of the farthest planet of the Solar System. Furthermore, OSS will provide a unique opportunity to visit a selected Kuiper Belt object subsequent to the passage of the Neptunian system. Precise tracking of the probe during cruise will be used to test the predictions of General Relativity with unprecedented accuracy. The probe will embark instruments allowing to perform the best controlled experiment which can be done for testing gravitation in deep space.

We propose OSS as an international collaboration giving the capability to ESA-NASA to launch an M-class mission towards the farthest planet of the Solar system, and to a Kuiper Belt object. OSS was proposed for Cosmic Vision Call in December 2010.

One of the main OSS themes addresses the formation of Solar System by examining the hypothesis that Triton is a KBO captured by Neptune, as our proposal enables the comparison between Triton and a KBO within a single mission. In addition, our mission trajectory that covers a vast distance across the solar system will allow testing the validity of General Relativity at an unprecedented precision, on which all models of Solar system formation are based.