

RADIO ASTRONOMY EXPERIMENTS WITH PLANETARY PROBES

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A number of joint milestones linked radio astronomy and exploration of space over the last half a century. This can be illustrated by several radio astronomy experiments conducted with planetary probes, such as VLBI tracking of VEGA balloons in the atmosphere of Venus in mid 1980's. In January 2005, an Earth-based network of radio telescopes helped to pinpoint descent and touch-down of the ESA's Huygens Probe on Titan with one-kilometre accuracy – a remarkable achievement for the most distant controlled landing in Solar System to date.

In this presentation, we will briefly review recent radio astronomy experiments conducted with various planetary and other space science missions. We will also emphasise radio astronomy segments of prospective planetary science missions aimed at a very broad variety of scientific disciplines, from geology and gravimetry to physics of atmospheres. As an example of radio astronomy support to future planetary science missions we will present the Planetary Radio Interferometry and Doppler Experiment (PRIDE) which represents a closely intertwined combination of Very Long Baseline Interferometry (VLBI) and Doppler tracking techniques. As a clear continuation of the 50-year-long interaction between radio astronomy and space science, a very important role in advancing space and planetary science applications will be played by the Square Kilometre Array (SKA). We will present several applications in which SKA in a VLBI or "single dish" mode combined with planetary probes will be able to make scientific impact in planetary science and exploration unachievable by any other means in the foreseeable future.